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Contents

History and Discoveries

Preface and Acknowledgments

This project was begun in 1992, with the first two volumes (The Great Archaeologists) being published in 1999. The three volumes that comprise History and Discoveries conclude the Encyclopedia of Archaeology. When this project was first conceived I drew up a very long list of countries, people, sites, techniques, methods, theories, issues, styles and traditions of archaeology that I thought provided a comprehensive picture of the evolution of archaeology. As in most projects of this magnitude, the Encyclopdia of Archaeology of necessity changed during the protracted and often difficult journey to publication. The result retains my initial goals: to provide the most in-depth, authoritative, and through reference work on the history of archaeology.

What I see in all five volumes, but in particular the three that comprise Histories and Discoveries is simply a watershed in the history of archaeology. Never before has it been possible for us to contemplate the unity and diversity of archaeology on this scale. It is now more often being observed (indeed Bruce Trigger does so in these volumes) that the history of archaeology is beginning to play a significant role in debates about archaeological theory and the philosophy of archaeology. The entries in these volumes provide a wonderful source of inspiration and information for those fundamental debates, the outcomes of which will directly affect the ways in which human beings search for an understanding of themselves.

The five volumes represent over a million words of text and the direct and indirect contributions of hundreds of people around the world. It is appropriate to begin these acknowledgments by recognizing the work of the contributors whose names are to be found in the following pages. This encyclopedia is their work. Many of the entries in History and Discoveries were translated into English from French, German, Russian, and Spanish. Although the names of the translators are listed at the end of each relevant entry, it is also important to acknowledge that their work has broadened and deepened this history of archaeology.

A large number of the contributors to these volumes were identified by the very many colleagues who used their networks to track people down. I was often touched by the willingness of colleagues from around the world to help, indeed some who at very short notice came up with superb contributions because those who had originally been contracted failed to deliver. I owe particular debts of gratitude to Peter Bellwood, Ian Hodder, Gordon Willey, Peter Robertshaw, Scott Raymond, Wil Roebroeks, Steve Shennan, Richard Bradley, Mark Leone, T.G.H. James, Barry Cunliffe, Rosemary Joyce, Henry

Introduction

Many of the points I have wanted to make about the importance and value of the history of archaeology have already been made in the introduction to The Great Archaeologists (the first two volumes of the Encyclopedia of Archaeology). In those first volumes I was concerned mainly with exploring the role of biography in writing the history of archaeology, and in coming to grips with the great diversity in approach taken by the contributors to those volumes. The essays in The Great Archaeologists have attracted considerable attention (most of it very good), but one comment made by an eminent historian of archaeology struck a particular chord. Contemplating the richness of new information about something that he felt we knew reasonably well, he was moved to remark that in recent decades the history of archaeology had really come of age.

I think that he meant this in two ways. First, that archaeologists were now sufficiently confident about the value of their discipline and its perspectives to seek a deeper understanding of its history-an understanding that had the clear potential to challenge disciplinary orthodoxies. Second, that the sheer scale of archaeology practiced at a global scale gave rise to many interesting questions about the unity of the discipline. In the early 1980s Bruce Trigger and Ian Glover pursued some of these questions in two editions of the journal World Archaeology that were devoted to the exploration of "regional traditions" in archaeology. What Trigger and Glover (and the contributors to their project) were keen to establish was whether the diversity of experience among archaeologists and the societies they served had led to real differences in approach and purpose among nations or groups of nations such as "Anglo-Saxon" or "Francophone," "First World," "Second World" or "Third World," "Colonialist" or "Postcolonialist."

While the first two volumes of this encyclopedia amply demonstrated the diversity of personal histories among influential archaeologists and antiquarians over the past four centuries, they pointed to significant commonalities as well. This notion that there are questions, issues, and fundamental activities, such as classification, that lie at the heart of a discipline like archaeology supports the view that it is possible for archaeologists to communicate with each other (however imperfectly) and to share knowledge. This theme of unity in diversity (and the ambiguities that arise from it) is even more strongly supported in the final three volumes of the encyclopedia that together comprise History and Discoveries.

In these volumes we have histories of archaeology as it has been practiced in most parts of the world, biographies of significant archaeologists in addition

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Abercromby, Lord John (1841-1924)

A Scottish antiquary, the secretary of the society of antiquaries of scotland, and its president from 1913 to 1918, Abercromby is most famous for his typological analyses published in *Bronze Age Pottery of Great Britain and Ireland* (1912).

In 1904 Abercromby used the term *beaker* to describe the decorated, handleless pottery drinking vessels used all over Europe between 4000 and 2000 b.c. He argued that the appearance of beakers in northern and western Europe could only be understood in relation to changes in similar assemblages from southeast and central Europe. While Abercromby's beaker typology remained unchanged until quite recently, his explanation of their uniform spread has been disproved. Abercromby argued for a putative "Beaker folk" who migrated all over Europe with their pottery. It is now thought that it was the pottery style that migrated alone-that the beakers were an interregional and even international style of artifact that were traded over long distances and were widely recognized male status objects used in drinking rituals. Abercromby argued that cultural uniformity meant social and ethnic uniformity-an argument that was later used by some archaeologists to support Nazi ideology in Germany. Nonetheless Abercromby's "new" approach to archaeological evidence (one that still finds support among some archaeologists) was more international than most approaches to the same evidence in England during this time.

Abercromby's influence was virtually confined to Scotland. His bequest to the University of Edinburgh in 1916 endowed the chair of archaeology that still carries his name. vere gordon childe was the first appointment to the Abercromby Chair in 1927, and stuart piggott succeeded him.

Tim Murray

See also

Britain, Prehistoric Archaeology

Absolute Dating Techniques

See Dating

abu simbel

Situated in Lower Nubia (Egypt), the site of abu simbel comprises two temples cut from living rock during the reign of the pharaoh Ramses II, thirteenth century b.c. The temples feature major works of sculpture, in particular seated figures of Ramses II and standing figures of Ramses and his queen, Nefertari.

The integrity of the temples was threatened by rising waters of the Nile River because of the construction of the a new Aswan High Dam and the creation of Lake Nasser in the 1960s. In a model of international cooperation, the United Nations Educational, Scientific, and Cultural Organization (UNESCO) made possible a large-scale survey and excavation of sites that were to be inundated by Lake Nasser and, perhaps more spectacularly, the dismantling and reassembly of the temples at a new site created above the water line. The rescue project lasted from 1960 to 1980.

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Abydos

A major site in Upper Egypt, Abydos, which lies west of the Nile near al-Balyana, was a royal burial site of the first two dynasties and later a major place for the worship of the god Osiris. Excavation of Abydos was begun at the end of the nineteenth century by Emile-Clément Amélineau, but the site is most directly associated with sir william matthew flinders petrie. Grave sites from the archaic period and stelae and ritual architecture of the nineteenth dynasty have been discovered, and excavations continued at Abydos throughout the twentieth century.

Abydos, Egypt

(Spectrum Colour Library)

Tim Murray

See also

Egypt: Predynastic; French Archaeology in Egypt and the Middle East

Acosta, Jorge R.

(1904?-1975)

Acosta was born in China, the son of distinguished Mexican diplomat Alfonso Villalobos. He lived and studied for many years in England, where he attended St. Johns College, Cambridge (1924-1925) and befriended classmate and future Mayanist john eric thompson. Acosta's career as an archaeologist lasted nearly fifty years, from 1928 to 1975.

The long list of sites and regions where Acosta did fieldwork is impressive: Zacaleu, guatemala; Mountain Cow, belize (with Thompson); monte albán, Monte Negro, and other centers in Oaxaca; chichén ítza; Uxmal; palenque; Tres Zapotes (Veracruz); Cholul; Ixcateogpan (Guerrero); Tenayuca; and teotihuacán. His most important investigations focused on three ancient cities, Monte Albán, Tula, and Teotihuacán, where he spent years doing research. In the course of other projects he discovered the famous mural sequence of drinking figures inside the Great Pyramid of Cholula and at Uxmal (Yucatán). He directed an architectural restoration program that greatly influenced the theory and practice of cultural patrimony conservation in mexico. He discovered

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the ceremonial cave under the Pyramid of the Sun at Teotihuacán that probably played a key role in the founding and the general structural plan of that ancient city. His restoration of the Palace of Quetzalpopalotl at Teotihuacán has been considered excessive by some specialists, but it constituted a major success in making a 1,500-year-old building understandable for thousands of visitors.

Acosta's investigations in Oaxaca with Alfonso Caso and ignacio bernal during three decades were fundamental for the development of Mexican archaeology and produced several classic reports, including *The Ceramics of Monte Albán* (1967) and, on Tula, *Revista Mexicana de Estudios Antropologicos.* While Acosta directed his most consequential field seasons at Tula, he was also the field director of Caso's program at Monte Albán.

On the basis of his work at Tula, Acosta's name can be added to the very short list of archaeologists who have rediscovered major ancient civilizations. Acosta proved that ruins at Tula, in the modern Mexican state of Hidalgo, were in fact those of the legendary city of Tollan, capital of the Toltec Empire during the tenth and eleventh centuries a.d. The major part of Acosta's work at Tula was devoted to the excavation and restoration of many of the buildings on the main plaza. These were some of the best investigations of pre-Hispanic architecture ever conducted in Mexico. Acosta's program at Tula functioned as field training for young archaeologists and anthropologists. He died in Mexico City on March 5, 1975.

Roberto Cobean and Alba Guadalupe Mastache Flores

See also

Toltecs

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Adams, Robert McCormick

(1926-)

Born in Chicago and educated in a progressive environment, Robert McCormick Adams developed an interest in archaeology that can be traced to childhood experiences in the American Southwest. He served in the U.S. Navy during World War II and subsequently enrolled at the University of Chicago to study social sciences. In 1950, Adams, with Linda and robert braidwood, participated in an excavation at jarmo in Iraq. During fieldwork there Adams met the social anthropologist Fredrik Barth, and Barth convinced Adams to continue with graduate school. Important intellectual influences on Adams at the University of Chicago came from the social anthropologist Fred Eggan, with his stress on the comparative method, and from Robert Braidwood, who advocated a multidisciplinary approach to prehistoric archaeology. Adams was also influenced by the work of v. gordon childe and his concern with technology, demography, internal social organization, and social evolution. Another critical influence was the New World archaeologist gordon willey, who had done pioneering reconnaissance surveys in the virú valley of peru, using settlement patterns and demography.

In the field of Near Eastern history, Adams worked with the Danish Sumerologist Thorkild Jacobsen, who had worked on archaeological projects sponsored by the University of Chicago's oriental institute. Jacobsen was not only an expert in third millennium b.c. history and the Sumerian language, he was also

an avid reader and writer in the philosophy of history. Adams's interest and training in ecology came in part from his studies and collegial relationships with Sherwood Washburn and Clark Howell in the Department of Anthropology at Chicago and from Washburn's running argument with the social anthropologist Robert Redfield.

Adams received his M.A. at Chicago in 1952, writing on Jarmo pottery and stone vessel industries, and while he was working toward his doctorate, he was appointed to a combined position divided between the Oriental Institute and the Department of Anthropology. Adams received his Ph.D. in 1956 and held this same combined position for the duration of his academic career at Chicago.

Adams undertook fieldwork in mexico and then returned to fieldwork in Iraq in the 1950s and 1960s, where he continued to work until the 1970s when politics made it impossible to continue

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book *Heartland of Cities: Surveys of Ancient Settlement and Land Use on the Central Floodplain of the Euphrates* (1981) in which Adams established an almanac of modern and ancient climatic conditions and agricultural productivity in Mesopotamia as a natural and technological setting for further investigation. The interaction between human beings and their environment resulted in an early urbanism in which city-states attempted to achieve stability over an often politically autonomous and resilient countryside. As the larger and more centralized states of late antiquity were able to maximize the production of cereals and other crops, they minimized the flexibility of a pastoralist-urban life and increased the potentialities of salinization, which turned land into swamps and brought about a massive demographic decline. A classic scenario of increasing short-term gains at the expense of long-term survival is played out to a sorrowful end.

Adams's work has shown that in all the superficially mundane activities of locating sites, seriating objects, and connecting them to stratified material and reconstructing settlement patterns-the very stuff of archaeology-the subject of social change could be apprehended. Today, archaeologists devise survey projects of great sophistication and detail and through their work have transformed our knowledge of regions throughout the world. Although Willey in Peru and William Sanders and colleagues in Mexico were also pioneers of systematic settlement surveys, Adams's work has arguably had the greatest impact on this form of research. Adams not only explored the relation between environmental and human social systems better than others but also analyzed and dignified the activities of the archaeological worker in two ways that became critical in the late twentieth century, both to archaeologists and to their colleagues.

First embedded in the intellectual milieu of anthropologists and historians and often regarded more as technicians than as thinkers, archaeologists corporately earned respect through the persuasive intellectuality of Adams's work. His research is judged to be an original contribution to social knowledge and, in particular, to social evolutionary theory. Adams's research emanates from arduous fieldwork and the synthesis of disparate fields of expertise whose breadth no one else has been able to match or, it seems, even imagine. Second, Adams's work has never given the impression of being dispassionate scholarship that is disassociated from the world in which his research was done and that has nothing to say to the people of Iraq or to the makers of modern western policy.

In 1984, at the height of his distinguished career at the University of Chicago-where he had been a professor in the Oriental Institute (and its sometime director), professor of anthropology, dean of the division of social sciences, and provost of the university-Robert Adams became secretary of the smithsonian institution in Washington, D.C., and served in that position until his retirement in 1994. While at the Smithsonian, Adams was also on the staff of the Departments of Near Eastern Studies and Anthropology at Johns Hopkins University. After his retirement from the Smithsonian he became adjunct professor in the Department of Anthropology at the University of California, San Diego.

Norman Yoffee

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Africa, East, Later

Research on the later archaeology of East Africa has ranged from the need to understand the late Pleistocene and Holocene artifact traditions and linguistic groups in the region (Bower, Nelson, Waibel, and Wandibba 1977; Isaac, Merrick, and Nelson 1972; L.S.B. Leakey 1931, 1935; M.D. Leakey

1945; M.D. Leakey and L.S.B. Leakey 1950; Phillipson 1977a, 1977b, 1985; Soper 1971a, 1971b; Sutton 1966, 1972), the reconstruction of the environmental changes for the period based on analysis of pollen cores from highland lakes and limnological analysis of lakes in the area (Butzer, Isaac, Richardson, and Washbourne Kamau 1972; Isaac, Merrick, and Nelson 1972; Livingstone 1980; Hamilton 1982; Richardson and Richardson 1972), the techniques of artifact making (Kiriama 1986;

questions of terminal-Stone Age/Iron Age population interactions in East Africa in terms that are determined less by implicit assumptions concerning language, culture, and genetics.

Indigenous Archaeologists

Only Kenyan and Tanzanian universities have active archaeology programs in East Africa, although similar programs are offered by history departments. Most indigenous archaeologists in these countries have concentrated on either the terminal-Stone Age or Iron Age periods (Abungu 1989; Kiriama 1984, 1986, 1992; Masao 1979; Mutoro 1987; Onyango Abuje 1976; Wandibba 1977, 1984). Indigenous archaeologists have concentrated on the later periods because most of the lecturers at the universities were more interested in these periods and they tended to encourage their students to undertake projects in their areas of specialization. It should be noted that, first, despite the prominence of East Africa as a cradle of mankind, none of the people conducting research in the early periods taught at local universities, let alone encouraged local students to undertake study projects in this area. Second, the early period has been seen as not being controversial and as not having enough to do with the history of the local populace and the definition of nation states. Thus, local archaeologists have been encouraged to concentrate on the later periods in an effort to negate colonial and racist propaganda that only began with the intrusion of the white man.

Onyango Abuje (1976) and Onyango Abuje and Wandibba (1979) were the first local archaeologists to argue for the local origins of food production. They also maintained that the term *Neolithic,* discarded as not being fit for African food producing societies, should be retained as food producing societies in eastern Africa had the same characteristics as those in Europe. Onyango Abuje (1976) in particular argued for a total indigenous evolution of the East African Neolithic culture, contending that the populations that independently invested in and developed food producing skills were not Caucasoid immigrants but African in origin. He further argued that these people domesticated some livestock and the majority of the crops that are currently grown in Africa. Wandibba (1977, 1980) undertook a reanalysis of the pottery in the Rift Valley of Kenya and showed that the pottery was particular to the given areas where it was found; thus, there was no likelihood of its importation by immigrants. Karega Munene, on the other hand, used an evolutionary-ecological model to argue for a home-grown Neolithic culture. According to him, the domestication of plants and animals was the result of an adaptive response to stress caused by specific historic situations. In other words, the East African population domesticated plants and animals independently as a response to specific local situations and needs.

Even with regard to the Iron Age, local indigenous archaeologists have been involved in disproving the migrationist theories of earlier archaeologists. S. Lwanga-Lunyiigo (1976), for example, argues that Bantu speakers appeared on the East African scene very early and that the postulated expansion from West Africa never took place. He maintains that it is difficult to spot the exact origin of Bantu speakers, that iron smelting was an independent East African innovation, and that the interlacustrine area was the center from which metallurgy, ceramics, and agricultural techniques spread to central and southern Africa. Kiriama (1986, 1987, 1993), on the other hand, has used a technological and contextual approach to argue for the local invention of ironworking techniques. Analyzing iron slag from an early-Iron Age site in Kenya, Kiriama (1987) has shown that there was preheating of furnaces during the prehistoric period, which enabled the ironworkers to attain high furnace temperatures and thus produce high carbon steel. He has also used a contextual approach (Kiriama 1993) to show that various Bantu speakers used their ceramic and iron implements differently. This work negates the argument for common Bantu origin, and Kiriama proposes that the social realm within which ceramics and iron objects were created and used should be studied if we are to understand the origins and spread of ironworking. The social context within which an item of material culture functions can enable one to

understand

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Africa, East, Prehistory

Africa is renowned for its diverse and bountiful fossil record of human and nonhuman ancestors that spans some 50 million years, including Eocene primates from the Fayum deposits of Egypt and a sundry group of hominids (members of the family Hominidae, which is the taxonomic family to which humans and their immediate ancestors belong) that made their evolutionary appearance some 5 million years ago in the Middle Awash of Ethiopia. Tracing humans' ancestral beginnings to this region is but

The History of East African Prehistoric Discoveries

In 1893, geologist J.W. Gregory first recognized the contributive importance of East Africa to better understanding the evolutionary history of ancient technologies when he found evidence of “paleoliths” in and around an ancient lake in Maasai country (Cole 1965). In the twentieth century, German entomologist Kattwinkel noted the presence of fossils in 1911 at a rift escarpment known to the Maasai as Olduway, which shortly led German paleontologist Hans Reck to continue work at Olduway (later called olduvai gorge). Reck noticed that important paleontological localities occur where the Side Gorge meets the Main Gorge. But with World War I beginning, his work came to an abrupt halt. When the war came to an end, extensive archeological research resumed across all of Africa, especially in East Africa. Yet the main scientific quest was not to discover more forgotten material cultures; rather, current scientific interests strove to elucidate past climatic events in order to better understand the chronological framework of the fossil and archaeological records that were already known. This is exactly what prompted E.J. Wayland to survey Uganda while he served as the Director of Geological Survey of Uganda. In 1934, he reported an ancient split-pebble industry based on rolled material taken from the Kafu River in western Uganda, which was later extended to include other Ugandan sites, such as Kagera Valley and Nsongezi, by South African archeologist C. van Riet Lowe. It was the nature of the sedimentary record that led Wayland to describe environmental intervals he called “pluvials,” literally meaning *rains,* that he thought would link Europe's four-glacier concept to Africa. Today, the Kafuan industry is not recognized as a legitimate stone-tool technology because the stone tools (split-pebbles) are the result of natural fractures, most likely caused by the river environment from which they were found, and the pluvial concept is long forgotten. Wayland was also responsible for describing the Sangoan and Magosian Middle Paleolithic industries from type-sites also located near the Kafu River; the Sangoan is still recognized as a legitimate industry, but Magosian tools fall within the range of variation of an Acheulean-Levallois techno-complex.

Prior to the time that the Kafuan industry made its debut, another famous paleoanthropologist and prehistorian, l.s.b. leakey, was working fervently at stone tool sites in Kenya, dinosaur sites in Tanzania (then Tanganyika), and hominid-bearing deposits in South Africa. After getting his field techniques down in Tanzania and describing simple stone tool manufacture and more recent stone tool technologies of Kenya, in 1931 he organized an expedition to Olduvai Gorge with the help of Hans Reck. He quickly recognized the significance of the stone tools found in the layer cake stratigraphy deposits that ranges in date from 1.9 million years ago at the base, to 1.8 million years ago at Bed I, to recent at Bed IV. Before long, Leakey was back at Olduvai, and from 1935 to 1958 he and members of his team had many celebrated accomplishments in terms of collecting fossil mammals and plenty of stone tools, but had discovered no stone tool maker. That wouldn't come until 1959 when his wife, mary leakey, discovered Zinjanthropus (*Australopithecus boisei*), a.k.a. the nutcracker man and, as no surprise, Louis's stone tool maker. Over the decades, the meticulous excavations

Early Paleolithic and Middle Paleolithic Industrial Complexes

Until very recently, African simple flake and small pebble tool technologies were vaguely separated into the Early Stone Age (ESA), while the larger bifacially worked cores and flakes were referred to as the Middle Stone Age (MSA); comparable technologies throughout Europe are known as Early Paleolithic (EP) and Middle Paleolithic (MP), respectively. To lessen confusion, ESA and MSA categories are sometimes interposed with the-just as vague-European system of classification. The only practical classification system is one that critically assesses true industrial complexes (e.g., Oldowan, Karari, Developed Oldowan, and Acheulean) or degree of technological innovation, such as J.D. Clark's Mode 1-5 preparative frameworks.

Early Paleolithic (ca. 2.5 million-250,000 years ago; e.g., Oldowan, Developed Oldowan, Karari, Acheulean, Mode 1, and Mode 2)

The earliest flaked stone technology consisting of split cobbles and simple flakes made mostly of trachyte, rhyolite, basalt, and quartz come from the Gona sequence of Ethiopia dated at 2.6 million years ago and the Hadar sequence, both within the Kada Hadar Member of the Hadar Formation, dated at 2.3 million years ago. Although Gona has the oldest known stone tools, the Kada Hadar stone flakes were recovered on surface and in situ where the A.L. 666 maxilla (upper jaw) attributed to early *Homo* was discovered (Kimbel et al. 1996). In addition, stone tools dated at 2.3 million years ago have also been recovered from the Omo deposits in southern Ethiopia and at Lokalalei, West Turkana, from the Nachukui Formation.

Oldowan Industrial Complex-Early Oldowan is a lithic industry based upon artifact assemblages from Bed 1 and Bed 2 at Olduvai Gorge (Leakey 1971). Overall the Oldowan complex consists of modified (deliberate flaked) pieces of stone or battered cobbles that are classified into several types: hammerstones, choppers, scrapers, discoids, polyhedrons, spheroids, subspheroids, burins, and protobifaces. Overall assemblages are classified by artifact type and relative frequency. For instance, typical Oldowan assemblages are localized and consist of 28 to 79 percent choppers made from varied resources (e.g., quartzite and chert) and in proximity to raw sources. Less than 28 percent of choppers for all tools/cores in assemblages may be indicative of a more progressive lithic complex. Two examples that are thought to lead to the Acheulean Industry are:

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(2) Developed Oldowan B-Lithic industry based upon artifact assemblages from lower Bed II through middle Bed III at Olduvai Gorge (Leakey and Roe 1994) and from Melka Kontouré of Central Ethiopia ca. 1.7 to 0.1 million years ago. Artifact assemblages have a greater frequency of core forms (discoids and choppers), and the first appearance of a small bifaces (albeit few in number). Many have argued that this industry can be subsumed in the Acheulean industry; however, Mary Leakey maintained that the Developed Oldowan B is consistent with Oldowan tool traditions.

Acheulean Industry-Lithic industry originally based upon large bifaces found at St. Acheul (France), but in Africa this industry is based upon artifact assemblages from upper Bed II at Olduvai Gorge and at Konso (Ethiopia), Olorgesailie, and Melka Kontouré-to name a few of the more important sites. Artifact assemblages are composed of large bifaces, like handaxes, picks, and cleavers, and all show a high degree of standardization, something that was missing form earlier flake stone techno-complexes. Isaac (1977) suggests that African Acheulean is characterized by the use of very large flakes (less than 10

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Levallois-type cores are prepared by an elaborate

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Summary

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Africa, South, Prehistory

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that France has perhaps never fully recovered from its loss of talent in World War I and that that war broke colonial efforts into two segments. A third phase of investigations is the postindependence emergence of African national research aspirations.

Pre-1914: Africa Intrudes upon the Prehistorian's Consciousness

The Maghrebian states of Algeria, Morocco, and Tunisia are the exception to the rule of marginalization even during the pre-1914 period. Large corps of colonial amateurs scoured the countryside around the major cities of Constantine, Tebessa, Oran, and Tunis. They established societies of *prehistoire* (Stone Age) and *archeologie* (classical archaeology), and each had its own publications, the first of which, the *Journal de la Societe Archeologique de Constantine*, was founded in 1894. Exceptionally, French professionals were attracted to North Africa, and one of them, P. Pallary, published the first monographic regional synthesis in 1909. For decades, the attraction for amateur, professional, and the whole of the metropolitan establishment was the so-called Capsian-Aurignacian debate.

Resemblances between the blade component of the Maghrebian Capsian and the European Aurignacian periods were remarked upon as early as 1890. It was, however, the professional prehistorian Jacques de Morgan who started the debate by claiming that the similarities were the result of independent development under similar environmental conditions. This position was consistent with the cultural evolutionist, paleoethnological school of gabriel de mortillet, but de Morgan was immediately criticized by some professional archaeologists such as Louis Capitan. De Morgan was particularly criticized by local amateur archaeologists who argued not only that a land bridge had once spanned the Mediterranean but also that North Africa was the source of the technological advances made during the Upper Paleolithic period. Breuil himself provisionally accepted the position of de Morgan's opponents in 1912. Most influential among these amateurs was Albert Debruge, who described what he believed to be Neanderthaloid skeletal remains as “ancient Aurignacian.” These remains were found during his 1912, 1914, and 1923 excavations at the important site of Mechta El Arbi.

It was not until the 1940s that the Capsian was finally accepted as being much more recent than the Aurignacian. Significantly absent from the debate was the question of the advisability of classifying local assemblages in terms of the dominant tool typology of France. The bane of francophone African archaeology until very recently was this modified evolutionary presumption, that the stages of the French Paleolithic period anticipated identical or analogous stages elsewhere and that such stages could be recognized by a relatively few type tools *(fossiles directeurs)*.

A racist view of the world lay behind the making of highly subjective surface collections of “belles pieces” in the forested lowland basin of central Africa. Bored stones and fine-ground stone axes had been carried back to French-occupied territory by early explorers (e.g., H.M. Stanley and G. Schweinfurth), and this tradition was continued by the administrators and engineers of the early days of French and Belgian colonialism. These collections of artifacts became primary evidence for the theories of cultural evolutionists such as E. Dupont, the head of the Belgian Royal Institute of Natural Sciences. These evolutionists argued that all people throughout the world went through the same stages in the manufacturing of implements and tools, based on the similarity of African stone tools and those found in Europe. They also argued that different people passed from manufacturing stage to manufacturing stage at a faster or a slower rate determined by their race, their environment, or both. Well into the twentieth century, ethnographies of stone tools using “contemporary ancestors, such the forest Pygmies,” were used to illustrate the lifestyles of Paleolithic peoples.

Stone and metal tools were displayed in the Central African Geological Exhibition at King Leopold II's imperialistic showpiece, the 1897 Brussels International Exhibition. Two years later, one of the

geologists responsible, X. Stainier, published *L'Âge de la Pierre au Congo,* in which he sought to demonstrate the backwardness of the African peoples. For Stainier, African prehistory simply replicated (albeit more recently

without history by demonstrating the importance of West African cities and their great empires. His efforts led the Académie des Inscriptions et Belles Lettres to cosponsor Desplagnes at El Oualdgi and to send Bonnel de Mezieres to the presumed capital of Ghana. Still, the interpretive paradigm (of outside stimulation leading to the emergence of historical states and cities) was fixed and remained unchallenged during the following post-World War I period; indeed, it underlay much of postindependence research. This paradigm described the area's history as unprogressive local populations forming advanced political forms and urban centers only after contact with traders or colonists from the “centers of radiation” across the Sahara.

High Colonialism: Local Particularism from World War I to 1960

The paradigm of Arab cultural stimulation provided a backdoor for the legitimacy and, incidentally, the professionalization of West African prehistory that began in the 1930s. Although on the extreme periphery of the areas covered by Gabriel Camps's prehistory and history of North Africa (1980), the towns and states of the southern desert and the Sahel were, nevertheless, worthy of attention as legitimate parts of the Islamic Arab-Berber world.

It is important to note that the purpose of archaeological work at those sites was to confirm a particular location as a place named in the Arabic chronicles, to recover (cross-datable) North African imports, and to expose monumental stone-built structures (especially mosques). Major “medieval” sites investigated during this period include, in Mauritania, Azugi (by Theodore Monod and Raymond Mauny), Tegdaoust in Mauritania (by Mauny), and the presumed capital of Ghana, Koumbi Saleh (by Lazartigues, Thomassey, and Mauny; Mauny and Szumowski); in Mali, Gao (by le Pontois, Kikoine, and Michel; Bartoli; Mauny), Teghaza (by Langlais and Bessac; de Beauchene; Bourgrat), Tadmekka (by Lhote; Mauny), Timbuktu (by Mauny); in Guinea, the presumed capital of Mali, Niani (by Cooley and Binger; Vidal; Gaillard; Montrat; Mauny); and in Niger, Takedda (by Lieutenant Roy; Lombard; Lhote; Mauny). Raymond Mauny pulled together these disparate archaeological efforts, along with Arab and European documentary sources and oral traditions, in his masterly *Tableau Géographique de l'Ouest Africain au Moyen Age* [A Geography of West Africa during the Middle Ages, 1961], which remains the prime secondary source on the latest prehistory and early history of West Africa.

Mauny's career is illustrative of the professional winds tugging at all of francophone Africa. Trained as a lawyer-administrator, he arrived in Senegal in 1938, the founding year of the premier African research center, the Institut Français d'Afrique Noire (IFAN). By 1947, an avocational historical bent had matured, and he headed the prehistory and proto-history (“metal age and medieval”) department at IFAN. Mauny took a polymath's interest in all periods (lithics and rock art included), visited most known sites, hounded amateur excavators for their unpublished field notes, compiled answers to questionnaires sent to administrators, and displayed his exceptionally interdisciplinary vision in over 220 articles and several synthetic monographs.

If not brilliant, Mauny's excavations were at least up to the standards of most other professionals in francophone Africa (and no worse than even some today). Mauny recruited George Szumowski for IFAN at Bamako (Mali), and he dug innumerable (and poorly published) *petits sondages* (test pits dug nonstratigraphically) in the many habitation sites of the middle Niger (Mema, Mopti), near Segou, and in many rock-shelter deposits near Bamako. Similar work was done, for example, by P. Jouenne and J. Joire on the megalithic and earthen monuments of Senegal and by Mauny and a host of administrators on the tells and tumuli in the lakes region of the middle Niger. Were these efforts better than amateur scratchings? Stratigraphic excavation was the exception, no ceramic sequences or formal pottery typologies were developed, and the recording of the Sahara's prolific rock art was generally inadequate (except by Monod). And in lithic studies, with the exception of Laforgue and Hubert, there was no

critique of the continuing reliance upon haphazard surface collections and *fossiles directeurs* derived from the European sequences.

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active local research societies (especially in Oran, Constantine, and Tebessa) and the great interest in Maghrebian prehistory taken by leading figures in France (e.g., marcellin boule, editor of *L'Anthropologie*), the Bordesian analytical revolution penetrated faster in North Africa. The abundance of local sequences, most unusually for Africa, was complemented by several generations of regional syntheses (Vaufrey in 1955, Balout in 1955, Camps in 1974, Hugot in 1979). The downside was a marked deference to the European stages and typological terms.

The remnant Aurignacian question was put to rest by R. Vaufrey, who demolished the land-bridge thesis and showed that the Capsian geometrics and microburins were of Mesolithic (Tardenoisian) age. From the 1930s, under Lionel Balout of the Musée Bardo in Algiers, students such as G. Souville, G. Camps and H. Camps, J. Tixier, and H. Huget received training that stressed the inadequacy of the diagnostic or index artifact. The typological work of R. de Bayle de Hermens (Capsian), H. Camps-Fabrer (bone), and J. Tixier (epipaleolithic) was particularly exacting. Unfortunately, the pace of research in North Africa slowed appreciably as a result of the violence of national independence and the economic and political conditions of the modern Maghrebian states.

Postindependence: Emergence of National Research Goals after 1960

Although the pace of research diminished after independence, there was also a break with traditional North African research in the form of greater internationalization and greater institutional support. Most work continues along the typological direction set by J. Tixier (experimental knapping) and L. Balout (refined local sequences and classification), but some of their younger colleagues (G. Aumassip, A. Gautier, A. Muzzolini, and C. Roubet) have tried to go beyond lithics to a reconstruction of past ways of life. Perhaps these efforts would be more advanced were more North Africans at the forefront of research, but such is not the case despite the opening of serious instruction at the University of Algiers in 1952. Instead, the weight of research is directed toward environmental adaptation or processes, such as the origin of food production, and has shifted east to Libya and more especially to the Egyptian western desert and the prehistoric Nile Valley.

The biggest difference between international efforts in the mahgreb-such as projects run by the Canadian D. Lubell and the German B. Gabriel-and efforts that have a more traditionally typological thrust is a greater appreciation of interassemblage, intersite, and interregional diversity. The Bordesian quantitative standards have been accepted with a Bordes-like resistance to functional studies. In rock art, too, there is an overwhelming tendency by otherwise outstanding observers such as Italian archaeologist Alfred Muzzolini to look for regions of coherent, homogeneous style or design choice-which are thought to be characteristic of bounded, coherent peoples. Change in art style is presumed to be evidence of migration or of population swamping. Still, the institutional support of Mahgrebian research continues, and the Centre Algérien de Recherches Anthropologiques, Préhistoriques et Ethnographiques, and the Laboratoire d 'Anthropologie et Préhistoire et d'Ethnologie of the University of Provence sponsor new research. One clearly sees the integration of older typology and emerging processual concerns in the *Encyclopédie Berbere*, compiled on a continuing basis by G. Camps, and in the journal *Sahara* begun by Muzzolini in 1988.

If the overall effect of independence has been a diminution of research in Congo (formerly Zaire), there has been much new high-quality work in the surrounding central African nations, and the influences of internationalization and greater institutional support are as evident here as they are in North Africa. Although there was not a single archaeologically trained Congolese national at independence, the situation has slowly improved with a steady trickle of students returning from the Free University of Brussels and with the establishment, in 1975, of the Institute of the National Museums of Zaire (IMNZ). The IMNZ is charged with regulating excavations and antiquities generally and has the enormous

ongoing task of stemming the free flow of art and antiquities out of the country.

industrial-scale production. Ethnographers and ethnoarchaeologists have linked studies of ancient iron production to those of the social role of blacksmiths (E. Bernus and N. Echard). Particularly noteworthy is the work on the ancient linkage of social and production concerns by the Senegalese archaeologist H. Bocoum, who is in the vanguard of a new French theoretical paradigm, the *chaines operatoires.*

Research on West African ceramics has also profoundly influenced the direction of French research. On the side of microexamination, there is the experimental physics conducted on Malian lakes region ceramics by the Group Nucleaire d'Orsay (Fontes, Person, Saliege). Concerning interpretation of ethnicity and symbolism of identity, the pioneering work on (Malian) Sarakole pottery by the Swiss A. Gallay (and of various middle Niger groups by E. Huysecom and A. Mayor) has stimulated an interest in ethnoarchaeology in France. T. Togola has begun a study of the technical and social organization of gold production in the famous Bambouk fields of western Mali, and processual studies of settlement evolution and early urbanism have had the most profound impact on the understanding of the early history of West African societies.

Beginning at jenné-jeno (middle Niger) in the late 1970s and continuing up to 1994 with a program of multisite coring (including the present town of Jenné), S. McIntosh and R. McIntosh used controlled stratigraphical excavation, complemented by regional survey, to show that considerable revisions were needed in the historians' conclusion that towns, heterogeneous populations, and long-distance trade were a late (early-second millennium) gift from traders coming across the Sahara. The Jenné-jeno research was just the first glimpse of extensive east-west trade networks, urbanism (often taking a distinctive clustered form), and occupational specialization that developed during the first millennium. The fact that these were indigenous developments was confirmed by subsequent surveys and excavations along the middle Niger by the McIntoshes (at Dia in 1986-1987 and Timbuktu in 1983-1984), by T. Togola at the clustered Akumbu and Boundouboukou sites in the Mema (late 1980s), by the (1982-1987) Malian Institut des Sciences Humaines inventory project (Sanogo, Dembele, Raimbault) in the lakes region immediately upstream of the Niger Bend, and (since 1989) by the Dutch Projet Togue (van der Waals) in the upper inland delta floodplain.

Since 1990, the McIntoshes and their Senegalese collaborator, H. Bocoum, have repeated this successful settlement pattern examination in the middle Senegal Valley in a 460-square-kilometer region flanked by the excavated sites of Cubalel and Sioure and, upstream, at the hinterland of the large site of Sincu Bara. Small early-Iron Age settlements evolved into specialized iron production centers and habitation clusters here as well. However, true urbanism and social complexity appear to have developed genuinely late. Members of the middle Senegal Valley team, I. Thiaw and D. Wolfman, initiated the first application of archaeomagnetic dating to francophone Africa with a dating curve covering the first to the fourteenth centuries a.d.

Conclusion: The Politics of Internationalization

The relationship between France and its ex-colonies continues to be debated, and if anything, the debate became more heated after the end of the cold war. Some people question whether that relationship has retarded democracy in Africa (“Dangerous Liaisons” 1994) and, in a similar vein, whether the close cleaving of francophone African archaeologists to metropolitan paradigms and methods has retarded an appreciation of the richness and originality of the continent's past. Two hotly debated issues are critical to the future of internationalization of francophone African archaeology: the exclusivity of La Francophonie and the traditional French distrust of theory.

The concept of La Francophonie goes beyond the ideal of a geopolitical commonwealth of French-speaking nations. Particularly when applied to Africa, it refers to the sentimental assertion that

France's ties to its ex-colonies are charmed, and quite unlike those of other ex-colonial powers, because of a unique spiritual understanding. Idealized in France, the concept is often vilified in Africa as a justification

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Africa, Horn of

The Horn of Africa includes the modern states of Eritrea, Ethiopia, Djibouti, and Somalia. The region consists of temperate highlands surrounded by arid and semiarid lowlands and cut by a rift generating the Danakil Depression. The Horn is inhabited by Cushitic-, Semitic-, Omotic-, and marginally Nilo-Saharan-speaking peoples. The region has the longest cultural record in the world, from the earliest steps in human evolution to the present.

The Horn of Africa is one of the richest regions in Africa with respect to archaeological remains. They cover practically the whole time span from the beginning of the early Stone Age to the nineteenth century, and they reflect the very complex cultural history of the region. Despite this richness, archaeology in the Horn is still in its infancy and in many aspects backward when compared with other African regions. The Horn region is still largely unexplored archaeologically, and what work has been done has focused on only a few specific topics (early prehistory, rock art, megaliths, early historical monuments, medieval monuments), which has resulted in a very fragmentary view of the past of the region (Anfray 1990; Brandt 1986; Clark 1954).

Archaeological research in the Horn has a quite long history, with the earliest records of ancient monuments in northern Ethiopia and Eritrea going back to the early sixteenth century (Anfray 1963; Brandt and Fattovich 1990; Fattovich 1992; Mussi 1974-1975; Michels 1979). In a strictly historical perspective, three main phases (explorative, descriptive, interpretative) can be distinguished in the development of archaeological research in the region.

The explorative phase (ca. 1520-1900) was characterized by the activity of travelers and explorers who focused their attention on the ancient monuments visible in northern Ethiopia and Eritrea, mainly at Aksum, which was the capital of an early Christian kingdom dating to the first millennium a.d. The most eminent ones were F. Alvarez in the sixteenth century; C.J. Poncet in the seventeenth; J. Bruce in the eighteenth; and H. Salt, E. Ruppel, Th. Lefebvre, A. Raffray and G. Simon, and Th. Bent in the nineteenth. These explorers contributed to the popularization, at least in academic circles in Europe, of the existence of an ancient civilization in the region, and they set the foundations for historical archaeology in the Horn.

The descriptive phase (ca. 1900-1950) was characterized by the first semisystematic excavations and reconnaissances conducted by professional archaeologists in different regions of the Horn. G. Revoil was the first traveler to record the occurrence of ancient sites in northern Somalia in the late nineteenth century, and only Salt and Bent suggested some hypotheses about the origins of Ethiopian civilization (Brandt and Fattovich 1990; Fattovich 1992).

In Ethiopia and Eritrea, the most representative of these archaeologists were R. Bourg de Bozas (1906) and henri breuil and Pierre Teilhard de Chardin, (Breuil 1934; Breuil, Teilhard de Chardin, and Wernet

1951), who collected the first Stone Age evidence in southern and eastern Ethiopia and rock-art evidence in eastern Ethiopia; H. Neuville (1928) and F. Azais (Azais and Chambard 1931), who investigated the megalithic monuments (dolmens, tumuli, stelae) in eastern, central, and southern Ethiopia; R. Paribeni (1907), E. Littmann, S. Krencker, and Th. von Lupke (1913), G. Dainelli and O. Marinelli (1912), and S.M. Puglisi (1940), who conducted surveys and excavations in Eritrea and Tigray (northern Ethiopia) and provided relevant knowledge of the ancient Aksumite civilization; A.A. Monti della Corte (1940), G. Bianchi Barriviera (1962, 1963), A. Mordini (1961, Mordini and Matthews 1959), and D. Buxton (1946, 1947, 1971), who systematically explored the medieval rock-hewn churches in northern Ethiopia.

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Africa, Maghreb

See Maghreb

Africa, Nubia

See Nubia

Africa, Sahara

Apart from some hints of legendary origins provided by Arab historians, two sets of factors precipitated the birth of a Saharan archaeology. First, Napoleon's campaign in Egypt, the craze for "Egyptian antiquities," and jean-francois champollion's decipherment of Egyptian hieroglyphics in 1822 that marked the beginning of a prestigious discipline, Egyptology. Second, Algeria was occupied by the French in 1830, just as E. Geoffroy Saint-Hilaire, G. Cuvier, and j. boucher de perthes were laying the foundations of two new disciplines within France, animal paleontology and prehistory. The existence of a proper Saharan rock art was also discovered: the engravings of the Monts des Ksour (Saharan Atlas), first mentioned in 1847 by army officers Jacquot and Koch, and also those of the Mathendous, in Libya, where the German explorer Heinrich Barth identified an engraving known as the "Garamantic Apollo" in 1850. Other nineteenth-century explorers (H. Duveyrier in Algeria, G. Nachtigal in the Tibesti, karl richard lepsius in Nubia, E. von Bary in the Air Mountains) mentioned rock pictures. In 1898 Foureau, with Lamy and a strong escort, headed a remarkable scientific expedition that traveled from Algiers to the Congo. He registered the prehistoric sites he encountered and collected artifacts. The publication of his travels and discoveries marked the end of the

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Africa, Maghreb

See Maghreb

Africa, Nubia

See Nubia

Africa, Sahara

Apart from some hints of legendary origins provided by Arab historians, two sets of factors precipitated the birth of a Saharan archaeology. First, Napoleon's campaign in Egypt, the craze for "Egyptian antiquities," and jean-francois champollion's decipherment of Egyptian hieroglyphics in 1822 that marked the beginning of a prestigious discipline, Egyptology. Second, Algeria was occupied by the French in 1830, just as E. Geoffroy Saint-Hilaire, G. Cuvier, and j. boucher de perthes were laying the foundations of two new disciplines within France, animal paleontology and prehistory. The existence of a proper Saharan rock art was also discovered: the engravings of the Monts des Ksour (Saharan Atlas), first mentioned in 1847 by army officers Jacquot and Koch, and also those of the Mathendous, in Libya, where the German explorer Heinrich Barth identified an engraving known as the "Garamantic Apollo" in 1850. Other nineteenth-century explorers (H. Duveyrier in Algeria, G. Nachtigal in the Tibesti, karl richard lepsius in Nubia, E. von Bary in the Air Mountains) mentioned rock pictures. In 1898 Foureau, with Lamy and a strong escort, headed a remarkable scientific expedition that traveled from Algiers to the Congo. He registered the prehistoric sites he encountered and collected artifacts. The publication of his travels and discoveries marked the end of the

era of the explorers, whether adventurers or scientists. The discipline of Saharan prehistoric archaeology had been founded.

Saharan Archaeological Sites

The First Half of the Twentieth Century: Diffusion, Classification, and Chronology

At the beginning of the twentieth century the French penetrated more deeply into the Hoggar. However, archaeological research in French-speaking Africa concentrated almost wholly on the Maghreb until 1920 to 1930. There, rich historical civilizations and prehistoric cultures were found that looked similar to European ones. They were studied in the same way, with the same words, and with the same goal of organizing the finds into sets of synchronous elements that constituted "stages," analogous with geological and paleontological stages. Then the stages were ordered into chronological sequences. Later on Saharan archaeology was built upon the same fundamental concepts. The first things looked for were the links with Maghreb cultures and the influence, thought to be evident, of pharaonic civilization.

The rock art of the Saharan Atlas was the topic of the first synthesis by G.B. Flamand, *Les Pierres Ecrites* ("Engraved Stones") published after his death in 1921. The classification it proposed is crude: an earlier group in naturalistic style, called "prehistoric," but already recognized as "Neolithic," and a later group in schematic style, called "libyco-berber," with pictures of horses, camels, and inscriptions in the Libyan alphabet. These two groups, which were later named "Precameline" and "Cameline," constituted the fundamental frame of reference for all Saharan classifications.

In 1925 another important work appeared-L. Frobenius and h. obermaier's *Hadschra Maktouba*, which focused on the engravings of the Saharan Atlas. Frobenius was searching Africa for proof of the "Hamitic hypothesis," although neither he nor anybody else ever found it. This theory, developed by C.G. Seligman and others, was in vogue at the time and held that "civilization" had been diffused south of the Sahara (read in the Africa of the Negroes) by either the oriental or northern Hamites, who were pastoral

sites of the Saharan Atlas. He also defended his views on “Egyptian affinities” with rock art, attributed to his NCT where Egypt was regarded as the inspiration and the colonizer.

Libya, an Italian colony since 1912, began to be studied for its prehistory and rock-art sites. A. Desio and P. Graziosi published various sites, mainly rock-art sites, and Graziosi took up that focus again in 1942 in a classical synthesis entitled *L'arte rupestre della Libia* (cave art of Libya). Another classic work of this time was Frobenius's *Ekade Ektab* (1937) on the Mathendous engravings.

The Tassili paintings had been known since 1910, but their importance was not recognized until the 1930s. In 1932 the Tamadjert paintings were discovered, and in 1933 the extraordinary Oued Djerat group. This resulted in several reconnaissance missions to the Djerat, in which the young naturalist, Henri Lhote participated. But World War II halted all projects in central Sahara.

The First Half of the Twentieth Century: The Eastern Sahara Opens

Other Saharan regions had been neglected, and it was not until the 1930s that some reports on the art of Tibesti, Borkou, and Ennedi began to appear. Engravings from Nubian rocks, with their pharaonic boats, were also reported. But between the Nile and the Tibesti stretched 1,000 kilometers of Libyan Desert, the Great Sand Sea-an eternal no-man's-land.

Yet it was not quite absolute desert. The Gorane caravans spoke of a permanent spring in a mountain situated halfway between the Nile and Kufra. In 1923 an Egyptian, Hassan-Bey, crossed from Sollum, on the Mediterranean, to Darfour with a caravan of camels. On his way he recognized the Uweinat granite massif, where there is, in fact, water, and he remarked on its rock art. This was crucial for the development of Saharan research because with this central watering point, the eastern desert was no longer impenetrable. By 1924 Prince Kemal-el-Din reached Uweinat by tractor and described the paintings of the important site of Karkur Talh. During the following decade the rock art of Uweinat as well as that of the neighboring massif, the Gilf Kebir, were studied by many English missions. The Gilf Kebir was supposed to contain the legendary oasis Zerzura, but its location remains a mystery. Barbary sheep still live in the Gilf Kebir.

From 1938 to 1939 the first synthesis on Nubian engravings by Hans A. Winkler was published. His interpretative schemes, based on “autochthonous” and “Eastern Invaders,” considered bold at the time, have become progressively unacceptable. Immediately after World War II two books on central Sudan appeared, and both had great impact: *Early Khartoum* (1949) and *Shaheinab* (1953), both by A.J. Arkell. They were the first reports of true excavations in Sahara-modern, scientific, and multidisciplinary efforts that went beyond mere surface collection. Work on the two Sudanese sites of Khartoum and Shaheinab finally put to rest the Hamitic hypothesis. Indeed, they proved the undoubted antiquity of a Nilotic culture (but not an Egyptian one) and of a “civilization” in black Africa. The discovery of the Sudanese sites had great significance, equivalent to gertrude caton-thompson's proof, twenty years earlier, that the ruins of great zimbabwe were not Phoenician or Sabean but the product of an authentic indigenous African culture.

Arkell's work greatly excited Africanists. Some indulged in lyricism, within the context of the fashionable diffusionist tradition, and changed the details of Hamitic theory to that of a mysterious “Sudanese crucible” where an “African Neolithic” was forged, sending its “civilizing” influence toward the west and across the immense Sahara.

Since 1950: The Central and Western Sahara and the Origin of the Saharan Neolithic

During the immediate postwar period and in the 1950s and 1960s, all the states that occupy the Sahara

gained their political independence in one way or another. In 1956 the Centre Algérien de Recherches Anthropologiques Préhistoriques et Ethnographiques (CRAPE) was founded in Algiers. Travelers' reports and the occasional surface collection of tools (e.g., those of the Missions Berliet Tassili-Tchad in 1959 and 1960) gave way to stratigraphical excavations on

sites of the Saharan Atlas. He also defended his views on “Egyptian affinities” with rock art, attributed to his NCT where Egypt was regarded as the inspiration and the colonizer.

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Gal Huard tried to group together all rock art into vast pan-Saharan cultures, such as a pre-Neolithic "Culture des Chasseurs" (culture of hunters) and then a Neolithic "Culture des Chasseurs-Pasteurs" (hunters and pastoralists). But these grandiose structures are open to criticism.

Scene with camels (ca. 0 B.C.), In-Itinen (Tassili, Algeria), painting in ochre color. Total length of the scene about 150 centimeters

(Alfred Muzzolini)

Only recently, in a remarkable and copiously documented study by J.-L. Le Quellec (1993), has an effort been made to interpret some thematic classes, using entities borrowed from the history of religions and supposed to be common to all cultures: the categories of the sacred and its symbols.

The Eastern Sahara since 1950

In the late 1960s, several modern excavations just north of Khartoum, at Chador, Saggai, and El Kadada, tried to define more precisely the Mesolithic and the Neolithic described by Arkell. The Neolithic of Shaheinab was found to begin very early, somewhere around 4000 b.c.

Systematic excavations and large-scale surveys were also undertaken, mainly in the Western Desert of Egypt, just north of the border with the Sudan, by the Combined Prehistoric Expedition (Wendorf, Schild, and Close 1984). Several sites, spread from 150 to 500 kilometers from the Nile-notably, Bir Tarfawi and Bir Sahara for the Paleolithic and Nabta Playa and Bir Kiseiba for the Neolithic-have yielded surprising results. Some are of very old occupation, from the Acheulean and then the Mousterian and Aterian, with fauna both from savannah and steppe. A very long hiatus followed, as everywhere else, corresponding to the post-Aterian Hyperarid phase, and a Holocene reoccupation has been noted from around 7800 b.c.

From as early as 7500 to 7000 b.c., there are a few bone fragments of small-sized cattle, ecologically unexpected in a desert biotope and incompatible with other wild fauna recorded at the same site. For these reasons A. Gautier argued that the cattle were domestic, existing a good millennium before the first domestic cattle in the Middle East and three millennia before those from the Neolithic of Merimde in Egypt-a proposition that has aroused controversy. Toward 6000 b.c. ceramics appeared, along with the traces of village structure at

Nabta Playa. However, dozens of living sites of a similar age were discovered between the Nile and the Libyan border, in the Dakhlah oasis, and in the Sudanese Wadi Howar and its surroundings by an important German expedition led by R. Kuper. This picture of a steppe that was relatively inhabited and traveled through during the wet phase of the early and middle Holocene, at least from 6000 to 5000 b.c., will probably prove to be identical to that of the entire Libyan Desert and the plains north of the Tibesti.

Throughout this period of the early Holocene, up to about 4000 b.c., Egypt apparently was a relatively poor province archaeologically because the Neolithic in the Fayum and at Merimde occurred near 4000 b.c., that is, not earlier than at Khartoum. The most important change to the conceptual field of Saharan prehistorians over the last decades is the vision of an Africa with precociously fragmented populations.

The majority of Saharan archaeological studies are concentrated on the periods of the early and middle Holocene. Recent proto-historic periods are, as already pointed out, relatively less studied. It follows that, contrary to what can be noted in sub-Saharan Africa, this prehistoric research, essentially focused on the Neolithic period, is regarded by indigenous people as an intellectual exercise. Although admittedly useful to the understanding of humankind and human evolution, it has no links with their own ethnic or current national identity. Perhaps this is why there are still very few indigenous researchers-far too few to solve such vast problems. Meanwhile, mass tourism has increased, endangering rock art and rock paintings. And because most countries of northern Africa are burdened by war, rebellion, or bandits, they are unable to offer researchers the security needed to conduct their studies.

Alfred Muzzolini

See also

Africa, Francophone; Africa, Sudanic Kingdoms; Maghreb; Rock Art

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Africa, South, Historical

Close to the shores of False Bay in the Cape Town suburb of Muizenberg stands what is believed by many people to be the oldest extant nonindigenous dwelling in South Africa. Dated through the Deeds Office, Cape Town, to 1673, the Posthuys (Post House), formed part of a VOC (Verenigde Oostindische Compagnie, Dutch East India Company) outpost. Fittingly, perhaps, it was also the earliest colonial site to be excavated (in the 1970s) by an archaeologist, in this case, Hennie Vos. When offered a post at the Stellenbosch Museum forty kilometers east of Cape Town shortly afterward, Vos naturally concentrated his further efforts in and around that town, doing any archaeological work that came to hand. This included a great deal of rescue archaeology, and Vos has played a major role

the effects of European contact on African tribalism, ethnicity, and identity. The marrying of the two sets of principles promises to yield interesting results.

Yvonne Brink

See also

Africa, South, Prehistory; Australia, Historical

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Africa, South, Prehistory

When the first world prehistories came to be written in the mid-nineteenth century, traces of Stone Age peoples were known from Europe, Egypt, and southernmost Africa. The prehistory of the rest of the globe was then largely terra incognita. The fact that there were stone artifacts recorded from the ends of the African continent should have been reason enough to expect that an important part of the human story was played out on that continent, but it has taken more than a century of observation for that idea to be amply confirmed. Much of the information on the prehistory of southern Africa considered here comes from the Republic of South Africa, but reference is made to the independent states of Lesotho, Swaziland, Namibia, Botswana, Zimbabwe, and Mozambique, countries that share common boundaries with the Republic of South Africa. Proximity means there have been strong links in the development of archaeology in this part of the continent.

South Africa is an elevated subcontinent of plateaus, escarpments, and mountains where surface soil mantles tend to be thin. It lies mainly south of the African woodland savannah and has a significant extratropical area. The vegetation cover is shrub and grassland with thicket and open woodland in the more tropical areas; there are only relict patches of Afro-alpine forest. Archaeological exposures are generally good, and the landscape is littered with traces of the presence of prehistoric peoples as befits a region that has seen changing populations over some 2 million years.

Discovering a Prehistoric Past

It was the remarkable wealth of stone artifacts in South Africa and a Victorian yen for collecting

the effects of European contact on African tribalism, ethnicity, and identity. The marrying of the two sets of principles promises to yield interesting results.

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Discovering a Prehistoric Past

It was the remarkable wealth of stone artifacts in South Africa and a Victorian yen for collecting

stone artifacts, which were associated with extinct kinds of animals found in Europe. Penning (1886), a geologist of Stow's generation, appreciated that surface finds were not necessarily recent in age. The land surfaces of southern Africa had not been glaciated in the Ice Age, as had happened in Europe, and therefore they were not covered with glacial debris. In a region not affected by glaciation, artifacts occurring on the surface may still be tens and even hundreds of thousands of years old.

Perhaps the clearest statement on how old artifacts in the South African landscape might be came from L. Péringuey, a French-trained entomologist. Péringuey's work took him to the vineyards around Stellenbosch where Acheuean artifacts are regularly plowed out of the ground. Such artifacts were also known to occur in great quantities in the gravels mined for diamonds along the Vaal River and had been found as far afield as Swaziland and Victoria Falls in Zimbabwe. Péringuey recognized that similar kinds of stone artifacts were known from the oldest deposits in France and claimed that the stone artifacts from Stellenbosch were as old as the most ancient in Europe (Péringuey 1900). At the turn of the century it was a revolutionary idea that people may have had as long a history of living in Africa as in Europe.

Péringuey became the director of the South African Museum, and after the turn of the twentieth century, with the growth of museums in South Africa, he and other museum directors were active in promoting archaeological studies. The museums became the storehouses for collections, and the close association between archaeology and museums has continued to the present. One of Péringuey's counterparts, J. Hewitt, a zoologist and director of the Albany Museum in Grahamstown from 1910 to 1954, spent weekends and holidays investigating coastal shell middens and excavated a number of rock shelters. His most important excavations in the 1920s and 1930s were on three farms: Wilton near Alicedale, Howiesons Poort near Grahamstown, and Melkhoutboom, which is inland from Port Elizabeth. These were among the first systematic excavations undertaken in South Africa. Although trained as natural scientists and not as archaeologists, researchers like Hewitt brought a new rigor to the fledgling subject of archaeology.

Beginnings of Professional Studies

The first South African to be trained as an archaeologist was Astley John Hilary Goodwin. Born in Pietermaritzburg in 1900, Goodwin studied archaeology under Miles Burkitt and Alfred Haddon at Cambridge University and returned to South Africa in 1923 (J. Deacon 1990; Schrire, Deacon, Hall, and Lewis-Williams 1986). He gave himself the task of making archaeology a more systematic study. The museum collections had been accumulated by casual rather than systematic collecting, and they represented a body of information that needed to be put in order. In a series of writings in the 1920s, Goodwin developed and publicized his ideas. The culmination was the publication of the *Stone Age Cultures of South Africa,* written in collaboration with Clarence van Riet Lowe (Goodwin and van Riet Lowe 1929). The concept of the book owed much to Goodwin, and van Riet Lowe supplied the information on the archaeology of the interior of the country that he had gathered while working as an engineer engaged in building bridges.

That publication had a lasting influence on the development of archaeology in South Africa. In it, the authors proposed a three-stage division of the Stone Age into the earlier, middle, and later Stone Ages. The earlier Stone Age was characterized by large bifacial (flaked over both faces) artifacts with Acheulean hand-axes being the diagnostic form. The middle Stone Age was characterized by the use of prepared or Levallois-type cores to produce triangular or parallel-sided flakes. The definition of the later Stone Age suggested a technology designed to produce microlithic tools and blades but stressed the association with the San, rock art, and burials. The later Stone Age, therefore, was the link with historical times.

The three Stone Ages proposed were properly technological stages much like christian jürgensen thomsen's three-age system or the three-fold division of the Paleolithic adopted in Europe in the nineteenth century. Goodwin

(1958) in particular took pains to avoid adopting a Euro-biased terminology that would imply far-flung correlations that could not be demonstrated. It is not possible to force South African Paleolithic prehistory into the tripartite European divisions, not the least because there is no equivalent of the Upper Paleolithic represented in sub-Saharan Africa. The later Stone Age of southern Africa is Epipaleolithic, not Upper Paleolithic, in character.

A further legacy of the Goodwin and van Riet Lowe publication is the terms derived from the names of places where type or reference collections were found. The type site name is conventionally used as a label to identify similar artifacts at other sites, the underlying assumption being that differences in artifacts denoted peoples of different cultures, languages, or tribes. It is now known that much of the variability in the stone artifacts had to do with time-successive innovations and that at any one time, similar artifacts were made over much of southern Africa. The archaeological record, for the most part, is too coarse to distinguish social or linguistic groupings. Some labels continue to be used as an archaeological convenience, and considerable effort has been expended in redefining such terms and understanding what implications they carry.

Goodwin and van Riet Lowe had no means of establishing anything other than the relative ages of the stages they recognized from the somewhat meager stratigraphic information at their disposal. At least collections and archaeological sites could be ordered in a gross chronological sense. The later Stone Age was thought to date to the last 2,000 years, with the middle Stone Age extending back perhaps a further 2,000 years. It was not until the advent of radiocarbon dating in the 1950s that more precise estimates of age ranges could be obtained. The radiocarbon revolution when combined with other dating techniques has shown that the guessed ages of these pioneers were out by a factor of at least ten. Thus, 21,000 years is a better estimate for the duration of the later Stone Age than their guess of 2,000 years, while the middle Stone Age may have begun as much as 250,000 years ago.

The two men were the dominant figures in South African archaeology from the 1920s to the 1950s. Goodwin carried out extensive fieldwork in Western Cape Province in the 1930s, notably at the site of Oakhurst (Goodwin 1938) and Cape St. Blaize Cave (Goodwin and Malan 1935) at Mossel Bay. These excavations were aimed at investigating the divisions of the middle and later Stone Ages. After the interruption of World War II, Goodwin devoted himself more to the promotion of archaeology through the founding of the South African Archaeological Society in 1946 and editing the *South African Archaeological Bulletin,* the main publication of the society. This journal published material on the archaeology of different regions in sub-Saharan Africa.

Van Riet Lowe became director of the Archaeological Survey in South Africa and, apart from being the spokesperson for archaeological concerns in the country, he made a major contribution through his studies of the Acheulean gravel deposits of the Vaal River (van Riet Lowe 1952). He died in 1957, a year after his retirement, and Goodwin died in 1959. In two short years, South African archaeology lost its two leading authorities.

Coming of Age

The Archaeological Survey in South Africa was disbanded in 1962, and one of Goodwin's former students who had worked in the survey, B.D. Malan, became secretary of the Historical Monuments Commission, a forerunner of the National Monument Council and the present South African Heritage Resources Agency. Another of Goodwin's students, R.J. Mason, became the founding staff member of a new Department of Archaeology at the University of the Witwatersrand. In 1960, Goodwin's teaching position at the University of Cape Town was filled by R.R. Inskeep, who was initially responsible for training a number of students to fill new posts as they became available.

The economic boom of the 1960s saw archaeology, worldwide, enter a growth phase, and the same was true in South Africa. New posts were created in museums and universities, and from a complement of some 6 professionals

the study of the spread of agriculture, both Khoekhoe pastoralism and the settlement of mixed farming communities; and a field outside the scope of this article, the study of the colonial period, the last 350 years.

Human Origins

It has been established since the 1960s that some sedimentary units in two of the best-known sites, Sterkfontein (Kuman 1994) and Swartkrans (Clark 1993), include undoubted Oldowan and Acheulean artifacts and bone tools. These can be dated by the associated faunas to 2 million years old and are among the oldest dated archaeological occurrences. It has been suggested that the number of burned pieces of bone discovered at Sterkfontein (Brain and Sillen 1988) in deposits that may date to about a million years ago may be early evidence of the antiquity of fire-minding if not of fire-making. After half a century of research, these caverns continue to be a focus of archaeological attention as they continue to provide new evidence of early human behavior.

There are few, if any, acceptable Oldowan-aged sites other than the solution cavern occurrences. However, there is a very strong presence of Acheulean biface makers known throughout the subcontinent, and these would date to between more than 1 million years ago and some 300,000 years ago. They are evidence of the establishment of significant human populations on the subcontinent. As a result of alluvial diamond diggings, the Vaal River terraces and gravels north of Kimberley became known as a prolific source of Acheulean artifacts. Systematic research initiated in the 1930s by van Riet Lowe (Söhnge, Visser, and van Riet Lowe 1937; van Riet Lowe 1952) established Canteen Koppie near Barkly West and Riverview Estates near Windsorton as two of the main sites. Expectations that five or more substages of what Goodwin and van Riet Lowe (1929) defined as the Stellenbosch (Acheulean) culture could be recognized on the principle that bifaces took on more refined forms through time have proved too simplistic (H. J. Deacon 1975). The collections were selected from mining dumps and excavated samples (Beaumont 1999; Mason 1988), and more stratigraphic and dating controls became available only later.

Cornelia in Free State Province and Elandsfontein in Western Cape Province are some of the few Acheulean sites that have provided adequate faunal samples, but in neither case can the fauna be directly associated with the artifacts. A date in the range 400,000-700,000 years ago can be ascribed to these faunas (Klein and Cruz-Uribe 1991), and at Elandsfontein, the Saldanha calvarium, which is morphologically similar to the Kabwe skull from Zambia, was recovered in 1952.

Most Acheulean sites are open stations, and other than the solution cavern occurrences, only three cave sites are known to have been occupied in this time range: Cave of Hearths, Montagu Cave, and Wonderwerk. A human mandible was recovered during 1952 excavations at the Cave of Hearths (Mason 1988) as well as a limited fauna, younger than that from Cornelia. Montagu Cave was reexcavated in 1964 (Keller 1973) and produced large artifact samples of Acheulean and younger age but no fauna. Wonderwerk, a large, deep tunnel-like cave but with some seven meters of deposits of different ages, was again disturbed by guano mining, and it includes important Acheulean horizons (Beaumont 1999). Acheulean sites have proved very difficult to study because of poor preservation of context and associations, which has limited progress in developing hypotheses about the meaning of the Acheulean occurrences.

Since the 1960s, Acheulean studies have emphasized the evidence for activity variation in the relative proportions of large, heavy bifacial tools to small flake tools in separate lake margin occurrences in East Africa. In such situations, the context was assumed to be one of little disturbance. As research has progressed, this assumption has not proved justified, and it is apparent the patterning is more readily

explained by the selective transport of different sizes and masses of artifacts (Isaac 1977). Most South African open-air Acheulean sites are in valleys and on their margins, and although these areas have been geomorphologically active there has not been same degree of winnowing of artifact

modern behavior hypothesis, equates modern behavior with the level of symbolic expression evident some 40,000 years ago with the spread of the Upper Paleolithic into western Europe.

The alternative, earlier modern behavior hypothesis recognizes that behavior is context specific and sees the Upper Palaeolithic as a regional phenomenon not represented in sub-Saharan Africa. It holds that by the beginning of the late Pleistocene (H. J. Deacon 1998), evidence concerning the organization of living space, the arbitrary changes in styles of artifact designs, and the use of colored pigments at middle-Stone Age sites in Africa indicates a capacity for modern symbolic communication. This is part of an ongoing debate that is taking the study of the origins and dispersal of modern humans out of regional contexts and making it global in compass.

Recent Stone Age Ancestors

Southern Africa is one of the few areas of the globe where there are extant communities of hunter-gatherers, the San. Systematic studies of San language and ethnography were initiated in the 1870s by Wilhelm Bleek (Lewis-Williams 2000) and continued after his death by his sister-in-law, Lucy Lloyd (Bleek and Lloyd 1911), and his daughter, Dorothea. After the turn of the century, interest in San ethnography continued, but within South Africa there had been an almost total disruption of traditional San societies. However, San communities continued to exist in Namibia and Botswana (D. F. Bleek 1928), and it was in those countries that there was a revival of research stimulated in the 1950s by the Marshall family (L. Marshall 1976; T.E. Marshall 1959) and later by researchers associated with the University of Harvard and other overseas institutions.

The Bleek and Lloyd historical records and the corpus of more recent ethnographic research continue to provide a rich source of analogies for later-Stone Age studies. Goodwin and van Riet Lowe (1929) appreciated a direct link between the historical San and the later Stone Age but struggled to explain the relationship between the major Wilton and Smithfield cultures they recognized and perceived similarities between the Wilton and the Capsian of North Africa.

Goodwin (1938) had laid the basis for later-Stone Age research through his excavations at Oakhurst, but this work was not followed up with a new phase of excavations until after the 1950s. Holocene Wilton and Smithfield sites could be dated by radiocarbon at the Council for Scientific and Industrial Research facility in Pretoria, which was started by J.C. Vogel. This facility played a large part, not only in ordering Stone Age sites but also in dating the advent of agriculture. Chronologies showed that the cultures Goodwin and van Riet Lowe had assumed to be geographically and culturally distinct entities were better explained in a temporal sequence of innovations and changes in San technology (J. Deacon 1974). Radiocarbon dating has also resolved the age of the youngest middle-Stone Age occurrence to 22,000 years at Strathalan (Opperman and Heydenrych 1990) and the oldest later Stone Age to 21,000 at Boomplaas (H. J. Deacon 1995). The latter age estimate is close to that for the earliest Epipaleolithic industries throughout the continent, which suggests that there was indeed some basis for Goodwin and van Riet Lowe's concern with similar industries found in North Africa.

The continuity between the later Stone Age and the ethnographic present is very impressive with items like ostrich eggshell containers and tortoise-shell bowls still being made as they were 15,000 years ago. This continuity finds no better demonstration than in the use of historical ethnography like the Bleek and Lloyd records to understand the metaphors expressed in the rock art. Although the art has long been trivialized as childlike drawings and engravings to do with hunting magic, myths, and legends, research since the 1960s (Lewis-Williams 1981; Vinnicombe 1976) has highlighted the symbolic significance of depictions like those of the eland and has shown that the art is essentially shamanic and religious. There are more than 10,000 rock-art sites known in South Africa alone, and many more have been recorded

in Namibia, Botswana, Zimbabwe, and Mozambique. Southern African rock art covers the area where San click-language speakers were known or can be suggested

to have been present. An outlier of rock art with similar metaphors occurs in central Tanzania where click languages are also spoken.

Herders and Farmers

Within the last 2,000 years, herding economies have developed in the more arid, western part of the subcontinent and mixed agriculture, in the wetter, eastern half. Historically, herding communities were Khoekhoe speakers, and the largest extant community is the 100,000-strong Nama in Namaqualand and southern Namibia. The identification of sheep remains associated with bag-shaped pottery at Die Kelders in southern Namibia (Schweitzer 1974) showed that it was possible to investigate the history of Khoekhoe settlement through archaeology. A stock post was identified at Boomplaas where age profiles of the animals indicate that stock raising was intensive (H. J. Deacon 1995). A main kraal, or settlement, was identified at Kasteelberg (Smith 1992) in which the remains included not only sheep but cattle that ethnography suggests were ritually slaughtered. Khoekhoen and San interaction was recorded historically, but with the fluid nature of economic and social groupings, it has proved difficult to document them archaeologically.

The Zimbabwe-type settlements attracted early interest not the least because of their association with gold artifacts. However, the first serious archaeological investigation of the ruins of great zimbabwe was undertaken by gertrude caton-thompson (1931), and she was able to show that the settlement was medieval in age based on its porcelain imports. This find was followed by extensive excavations at the Iron Age sites (eleventh to twelfth centuries a.d.) of K2 and Mapungubwe (Fouché 1937) in the Limpopo Valley of the Northern Transvaal in South Africa. Although pioneers like Schofield (1948) continued to study the pottery finds from early farming settlements, such studies only achieved formal recognition after World War. This recognition came through the proposal of the term *Iron Age* (Summers 1951) as distinguished from the Stone Age. With this recognition came the appreciation that the unwritten history of many extant communities in southern Africa was accessible only through archaeology (Mason 1989). Early farming communities contained metalworkers and miners as well as stock farmers; cultivators of millet, sorghum, and other crops; and the manufacturers of regionally and temporally distinctive styles of pottery. Iron technology was a prerequisite for their expansion as it enabled them to bring new fields under cultivation.

The Iron Age of southern Africa is part of the wider phenomenon of the expansion of siNtu, or Bantu, language speakers (Vansina 1995) in equatorial, eastern, and southern Africa. Since D.W. Phillipson's (1977) synthesis, the main debates have been when and by what pathways or “streams” different movements of peoples into southern Africa may have taken place, which underscores the popularity of migration models (Huffman 1989). With large parts of subequatorial Africa underresearched and given that range expansion rather than purposeful migration was involved, the models remain relatively general in their resolution of past events.

The best attested expansion was down the eastern coast, and radiocarbon dating has shown that the distinctive pottery at the site of Silver Leaves in Mapumalanga, dated to a.d. 350, is similar to that which appeared on the Tanzanian coast at Kwale a scant 150 years earlier. Other expansions traced through pottery styles and radiocarbon chronologies appear to have been along a route through Malawi into Zimbabwe and through a western corridor from Angola and Botswana into South Africa. The southernmost limit of the coalescence of these expansions was near modern East London in the Natal province of South Africa, a limit imposed by edaphic and climatic factors.

Radiocarbon dating and the seriation of pottery styles have shown there were a number of expansions and contractions in the agricultural settlement of the subcontinent that are explicable in terms of climatic

forcing and socioeconomic conditions. Largely as a consequence of prosperity brought about through trade with the east coast, progressively more-complex hierarchical societies emerged in the Limpopo Valley (Hall 1987). The best-known sites remain K2 and Mapungubwe, but it is only recently that their significance as precursors to Great Zimbabwe have been appreciated.

PREV NEXT

Great Zimbabwe (a.d. 1250-1450) emerged as the capital of a state (Huffman 1981), an African kingdom similar those that flourished in other parts of sub-Saharan Africa in the last 2,000 years as world trade expanded. Portuguese competition for the Indian Ocean trade routes and internal conflicts fragmented the original Zimbabwe state into several lesser states, which survived into historical times. This fact allows for confidence in linking the Zimbabwe state to Shona language speakers. The histories of the Sotho and Nguni language speakers are less clear, but through tracing traditional decorative motifs in pottery, it can be shown that they were present in southern Africa from the early part of the last millennium (ca. 1000 a.d.). Linking prehistory to the very short period of recorded history remains a goal of researchers.

Perspective

From Victorian antiquarianism, prehistoric archaeological studies have developed in stages. The very visible surface trail of stone artifacts in the landscape encouraged an interest in the peopling of the subcontinent. Beginning in the 1930s, discoveries of the australopithecine remains preserved in solution caverns in dolomites provided a window of opportunity to explore the prehuman ancestry that raymond dart suggested for the Taung child. True human populations making Acheulean artifacts more than 1 million years old are widely represented although progress in the study of these populations has been slow because preservation of remains other than stone is rare and the occurrences are difficult to sample and date. The roots of modern humans now appear to be in the middle Pleistocene in Africa (Howell 1999), which makes the later Acheulean and the Fauresmith of developing interest. The finds of early modern human remains and associated evidence for the emergence of symbolic behavior in beginning late Pleistocene, middle-Stone Age sites like Klasies River have questioned the conventional wisdom that the first evidence of such behavior is in the Upper Paleolithic in Eurasia.

The occurrence of long-sequence cave and rock-shelter sites has made it possible for considerable advances in the study of the middle and later Stone Ages, and a wealth of historical and ethnographic data have aided in these studies. An accessible part of this Stone Age record is the rock art, which, with well in excess of 15,000 sites, is a considerable cultural resource for heritage management. Not only are there surviving San communities, but the descendants of Khoekhoe herders and Iron Age farmers make up the main population of the subcontinent. As archaeology in southern Africa enters the new millennium, it is poised to make a greater contribution to educating communities about their unwritten and largely forgotten past.

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This entry is a contribution made within the University of Stellenbosch research project The Origins of Modern Humans, *Homo Sapiens,* in Africa. I thank Tim Murray for his encouragement to prepare the chapter.

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See also

Africa, South, Historical; Lithic Analysis; Rock Art

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Africa, Sudanic Kingdoms

Between a.d. 800 and a.d. 1500, the important kingdoms of Ghana, Kawkaw (Gao), Takrur, and Mali flourished in the Sudanic zone of West Africa between Lake Chad and the Atlantic Ocean. Repeatedly mentioned and described in varying degrees of detail by Arab chroniclers of the period, the capitals and

major entrepôts of these polities have attracted considerable archaeological attention, much of which has been conducted in an historicist mode with archaeology serving mainly to identify the towns and trading posts described in the Arab texts. Archaeological data were sought to embellish or fill out textual accounts; they were rarely used to address questions beyond those already raised by text content or analysis. Because the core areas of the kingdoms lay mainly within the former French West Sudan, the influence of French scholars on the trajectory of research in this century has been considerable. Since the 1970s, however, scholars trained outside the French system, including Dutch, Swiss, Germans, Norwegians, British, and Americans, have increasingly made important contributions.

The Colonial Period (1900-1960s)

For the first half of the twentieth century, archaeological undertakings relevant to the Sahelian kingdoms were pursued by French civil servants and military personnel. There was no professionalization of archaeology analogous to that in England, where scholars of the caliber of mortimer wheeler and gertrude caton-thompson mounted important excavations at sites such as Mohenjo Daro and great zimbabwe. Rather, in French West Sudan, curious administrators and officers who lacked any formal training were offered a variety of opportunities to investigate highly visible archaeological sites. As with the explorers who set out to map the course of the Niger River in the nineteenth century, some of these officials had a gift for systematically describing what they saw along the way but most did not.

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For the first half of the twentieth century, archaeological undertakings relevant to the Sahelian kingdoms were pursued by French civil servants and military personnel. There was no professionalization of archaeology analogous to that in England, where scholars of the caliber of mortimer wheeler and gertrude caton-thompson mounted important excavations at sites such as Mohenjo Daro and great zimbabwe. Rather, in French West Sudan, curious administrators and officers who lacked any formal training were offered a variety of opportunities to investigate highly visible archaeological sites. As with the explorers who set out to map the course of the Niger River in the nineteenth century, some of these officials had a gift for systematically describing what they saw along the way but most did not.

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on the excavations at the two sites, no material was recovered that would permit positive identification of them as the sites of Awdaghost or the capital of Ghana described by early chroniclers. The strong case for these identifications is archaeological rather than epigraphic in nature.

Among the major questions that remain unanswered is the nature of the settlement system at Koumbi Saleh and Tegdaoust. The "city-centric" approach of the Devisse team, which mainly focused on the central area of stone-built ruins, involved little systematic investigation of sites in the hinterland of these two towns. We thus do not know if Koumbi Saleh and Tegdaoust existed essentially as ports of call, supported by trade and local agriculture but largely isolated from other sites of appreciable size, or whether they functioned as part of a well-integrated network of villages and hamlets. Bonnel de Mezières (1923) commented on the dense zone of archaeological material that extended around Koumbi Saleh in a zone thirty-five kilometers in diameter. Because there is no pottery sequence for the region, it is impossible to know which of the sites in this zone were contemporaneous with Koumbi Saleh at various points in its evolution. Thus, we know little of the developing settlement system, which is fundamental to any reconstruction of the nature of the Ghana polity.

The emphasis on the medieval paradigm on North African artifacts and influences has also left us remarkably uninformed as to the Sudanic aspects of the Ghana polity. Al-Bakri's information establishes firmly, however, the very sub-Saharan nature of the kingdom. In his description of the pagan cults of Ghana we readily recognize the forest shrines, fetishes, and sorcery that are widespread in the Mande religion and elsewhere in West Africa.

French archaeological activity in the middle Senegal Valley (MSV), in the area of the early kingdoms of Takrur and Sila mentioned by al-Bakri, was relatively rare during the colonial period and most often took the form of casual surface reconnaissance. The unsystematic collection of a small number of appealing artifacts from surface walking or small-scale sondages was a common method of fieldwork into the 1980s. The animating spirit of these collections, registered with minimal notes or accompanying observations at IFAN in Dakar, was strongly antiquarian.

Internationalization (1970s Onward)

The general site inventory accomplished between 1971 and 1973 under the leadership of Charles Becker (a historian by training) was an important step toward a more systematic approach to archaeology in the MSV (Martin and Becker 1974, 1984). Contemporaneous with the inventory by Martin and Becker were large-scale excavations undertaken by the IFAN physical anthropologist Guy Thilmans and IFAN research associate Annie Ravisé at Sincu Bara. Important not only for highly significant finds of brass and silver artifacts, the excavations also ushered in an era of modern archaeology in the Senegal Valley. The excavation report includes specialized analyses of pollen, sediments, metals and slags, and animal bone, and the spectacular brass and silver artifacts, which suggest that Sincu Bara functioned as an elite site within the Takrur or Sila polity, are thoroughly described. Pottery did not receive equal attention, however, so the establishment of a basic pottery sequence for the region was relegated to a future time. Other important excavations in the MSV were conducted by Bruno Chavane (1985) in the mid-1970s.

With an increasing internationalization of archaeology in the western Sudan after the late 1970s, new paradigms, perspectives, and methodologies were applied to research on the Sudanic kingdoms. Partly as the result of the participation of Americans familiar with research paradigms in mesoamerica and mesopotamia, a diachronic and regional perspective on the origins and development of complex societies was introduced along with methodologies appropriate to those concerns (McIntosh and McIntosh 1984). The fundamental building blocks of this approach are the establishment of detailed

chronological sequences through controlled stratigraphic excavation and a detailed study of domestic pottery assemblages, systematic site survey and surface investigation using

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may have been integral to the political and commercial activities of the Takrur polity (Robert-Chaleix and Sognane 1983; Robert-Chaleix 1994).

For the other two great polities of the western Sudan, Gao (known to Arab authors as Kawkaw) and Mali, our knowledge remains largely historical. The two archaeological sites known at Gao are the old town (Gao ancien), north of the existing town, and Gao Sané, several kilometers to the east on the opposite side of a channel (which likely flowed perennially in the late first millennium) leading north to the Tilemsi Valley. Numerous brick structures are visible on the surface of both sites, some of which were excavated by Colin Flight of the University of Birmingham to reveal a confusing sequence of building and razing episodes (Insoll 1996 provides a very useful summary). Tim Insoll's archaeological work in 1994 included excavations at both Gao ancien and Gao Sané. Although very limited in scale, his excavations have provided concrete details on the appearance of trans-Saharan trade goods, including ceramics and glass, in the tenth or early eleventh century and insights into the process of Islamization. Gao apparently was a part of trade networks extending to North Africa and Spain.

In the thirteenth century, all the regions discussed above became consolidated within the hegemony of the Empire of Mali, and little archaeological information is available for Mali. The Polish research project at Niani in Guinea (Filopowiak 1979) is noteworthy for its regional perspective, even though claims that the site was the capital of Mali visited by Ibn Battuta in the fourteenth century are problematic. There is, in fact, little compelling evidence from the excavations for occupation deposits dating to this period (McIntosh and McIntosh 1984). Excavations in the Arab Quarter, for example, produced mostly material dated to the seventh to eleventh centuries a.d. and a notable lack of imported goods.

However, from that material we can get a glimpse of Mali society during the period of small villages and petty chiefdoms described by eleventh- and twelfth-century Arab authors in the area called Malal. In this regard, Filopowiak's surface survey of fifty sites (iron-smelting sites, funerary tumuli, small villages) located within a four-square-kilometer area around Niani offers the potential for understanding an evolving settlement system. Of particular interest are small stone tumuli with rock-cut shaft-and-chamber collective graves similar to graves in the southwestern part of modern Mali, which indicate strong first-millennium cultural connections within this whole area that became the political heartland of the Empire of Mali in the thirteenth century. Unfortunately, the systematic study and description of the Niani pottery necessary to establish the chronological relationships of these hinterland sites has not yet been accomplished.

Conclusions

From a colonial, medievalist paradigm concerned mainly with recovering objects, inscriptions, and architecture that testified to outside influences at work in the empires of western Sudan, archaeology has moved since the 1970s to documenting local contexts and components of change. The opening of archaeology in the former French West Sudan to broad international collaboration has resulted in a variety of more regionally based research projects concerned with the establishment of the basic chronological sequences and site inventory data that are the foundation of all sustainable archaeological interpretation. As comparative regional data on settlement systems become available for the first time from different parts of western Sudan, important theoretical issues for archaeology as a whole emerge from the diversity of trajectories leading to the social complexity that may be detected there (McIntosh, S., 1999a, 1999b, 1999c). As a consequence, the empires of western Sudan, which have been largely marginal to mainstream archaeological theorizing about the rise of complexity until now, may in the future play a more prominent role.

Susan Keech McIntosh

See also

Africa, Francophone; Jenné and Jenné-Jeno; Maghreb

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Akrotiri-Aetokremnos

Until the excavations by Alan Simmons at Akrotiri-Aetokremnos, there was no evidence of any pre-Neolithic occupation of cyprus. This small, collapsed rock shelter on the south coast of the island contains deposits of stone tools and animal bones representing a relatively short period, approximately 10,000 b.c. A large proportion of the bones are of the pygmy hippopotamus, which became extinct at the end of the Pleistocene period. It is possible that human predation was a factor in this extinction. Although the site has been important in establishing an early date for Mediterranean island colonization, it is still difficult to use this single site as the basis for developing more general models of the processes involved.

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Aldrovandi, Ulisse

(1522-1605)

A scholar of tremendous range with a focus on natural history and an interest in antiquarianism. Aldrovandi taught medicine at the University of Bologna in Italy in the late sixteenth century. Among his many researches was the natural history of "ceraunia," thought to be thunderbolts but actually worked flints and stone tools, which he discussed at considerable length in his *Musaeum Metallicum* (1648). Although another scholar at the time, michele mercati, was persuaded that many of these stones had been shaped by human beings, Aldrovandi preferred to account for them as the result of natural geological processes.

Ulisse Aldrovandi

(Ann Ronan Picture Library)

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Lithic Analysis

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Alesia

Alesia is located at Alise-Saint-Reine in the department of Côte d'Or in France. There were two battles of Alesia. The first, against Julius Caesar, was by a large Gaulish tribal coalition led by Vercingetorix in 52 b.c., and it resulted in the defeat of the latter. The other, which is still taking place today, began in 1850 when scholars began debating the exact location of the famous siege of Alesia, at either Alise on Mount Quxois in Burgundy or Alaise in the department of Franche-Comté, the two most favored sites for this great event. However, tradition also provided the scholars with another site to dispute, the village of Alise-Saint-Reine, which had replaced a Gaulish *oppidum* (fortified town) with a Gallo-Roman town and which, in fact, is the real site of Alesia. In the ninth century a.d., scholars had recorded this link, but it had been forgotten by the Middle Ages. In 1838, a military officer making a relief map of the site of Alise was struck by its coincidental resemblance to Caesar's description of Alesia. Several years later, the people of Franche-Comté, supported by the relief map and the analysis of Caesar's troop movements, debated this claim and proposed Alise as the alternative.

With the encouragement of Napoleon III, soundings were made around Alise between 1861 and 1865, and they revealed the traces of pickax diggings made during a Roman, Gaulish, or German siege. The siege pits corresponded to Caesar's general descriptions, and the many remains of arms and coins dated the battle. Pits were dug alongside the basic *oppidum* and confirmed the existence of a Roman settlement, and a "Gaulish wall" was excavated, but it could have been built after the conquest.

In the years from 1950 to 1990, the corpus of coins, ranging from bronze forgeries of the golden statere of Vercingetorix to coins used during the nineteenth century a.d., was analyzed. Aerial prospecting

revealed many traces of the pits, contours, and camps installed by Caesar around the citadel. Excavations by a Franco-German team made Alise, for the scientific world at least, a special reference site for dating other contemporaneous sites and for the study of Roman army camps. The traces of the pits and camps were validated by excavations in the nineteenth century and Caesar's written descriptions. The pits were laid out on

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the site exactly as he had described them, and a rigorous study of movable artifacts confirmed their origins and dates. One of the Gaulish walls of the *oppidum* was built before the siege, and the archaeological proof of that fact is incontrovertible.

The hill of Alesia is attached to the chalky Auxis range by only a narrow pass. It resembles a plateau, with a ninety-hectare surface surrounded by steep cliffs, and the impression from the Laumes Plain is much less grand than Caesar's description of it as being as high and great as Sienna's. Rather it is similar to the Puy d'Issolud (Vayrac, Lot), and resembles Uxellodunum, which Caesar put under siege in 51 b.c. The rampart was very little enlarged, because the cliffs discouraged direct attack. However, it is on the plain, as Caesar himself noted elsewhere, that the traces of battle can be best found.

The identification of the site of this battle gave archaeologists a fixed location point for an absolutely certain and essential chronology for the history of weapons, armaments, and coinage. Some of the coins did not have dates, only rare inscriptions of the name of chiefdoms, and only their weights and the alloy compositions enabled them to be classified. The presence of money in Alesia attests to its circulation in 52 b.c., and at this point it is enough to find a monetary series. As Vercingetorix called on the troops from all across Gaul to come to his rescue, Alesia must be considered a reference site for regions that were far away but participated in the uprising.

Caesar's genius was exemplified not only in the conduct of the war's operations, which caused the surrender of the Gaulish coalition, but also in his political exploitation of the situation. In 52 b.c., not only were the so-called conquered cities in revolt but also the great tribes of Bituriges, Arvernes, and all of their allies led by the Heduens. After many months of indecisive fighting, Vercingetorix called for another army to come and help him, but it never reached him; it was unable to penetrate Caesar's defense.

Caesar went into battle at the most decisive moment of the war, and the siege of Uxellodunum the following year was the consequence of this. Contemporaries echo their general's description of this secondary *oppidum* as a key site for a "Gaulish nation," which was of their invention and for their glory. The kings, the emperors, and later the school of the Third Republic changed the rebellion of the Gaulic tribes into the first manifestation of the resistance of a French nation to an enemy. The hexagon shape of france can be justified in two ways: the space was defined by natural frontiers-the Rhine River, the Alps, and the Pyrenees Mountains; in time, it was the coalition of Gaulish peoples around Vercingetorix, who founded a modern French nation at Alesia.

It took more than 100 years of archaeological research to prove that the written record of history was, in part, Caesarian propaganda.

Oliver Buchsenschutz

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Altamira

Altimira is the name of a cave in Santander Province, northern spain, where Don Marcelino Sanz de Sautuola, a local landowner, discovered Paleolithic paintings and engravings in 1879. The ceiling of the cave is particularly famous as it is decorated with an array of polychrome bison figures. Unfortunately, Sautuola's claims for the art's antiquity were rejected by the archaeological establishment for twenty years as a result of several factors-among them, he was an unknown amateur, no Paleolithic art had previously been found outside France, and the animal figures looked too fresh and sophisticated to be genuinely ancient.

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Altamira contains a wealth of other paintings and engravings, including “masks” and quadrilateral signs like those of the cave of El Castillo in the same region. The two caves also contain identical multiple-line engravings of deer, both on the walls and on shoulder-blade bone of animal remains found in the cave, and some of these bones have been radiocarbon dated to 13,550 b.c. Altamira's art probably spans a period from about 20,000 to 14,000 years ago. Charcoal from black figures in different parts of the cave has produced direct dates from 16,480 to 14,650 years ago.

Paleolithic cave painting from Altamira

(Ann Ronan Picture Library)

The ceiling is clearly a complex palimpsest of figures from different phases, but scholars from Sanz de Sautuola onward have believed that the polychrome bison were produced in one episode or even by a single artist. However, charcoal in some of the ceiling's bison has yielded radiocarbon results from 14,820 to 13,130 years ago, which, if valid, suggests that the figures may not constitute a single homogeneous composition after all.

Paul Bahn

See also

Rock Art Studies

American Academy in Rome

The American Academy in Rome is the U.S. center in Rome for scholars, architects, artists, and musicians and incorporates a School of Classical Studies. Originally two separate schools-the American School of Architecture in Rome, founded in 1894 by Charles Follen McKim, and the American School of Classical Studies in Rome, established in 1895 by the archaeological institute of america (AIA)-the American Academy in Rome (AAR) became a single institution in 1912.

The architectural school had taken the French Academy in the grand Villa Medici in Rome as its model, and McKim had envisioned it as a center for architects to study the noble buildings of ancient Rome. Its first home was, however, anything but imperial, consisting of eight rented rooms in the Palazzo Torlonia. The classical school was the second such school the AIA founded, and its model was the American School of Classical Studies in Athens, established in 1882, also in emulation of older European institutions. The Rome classical school, too, began life in rented quarters-in the Villa Aurora on the Pincio Hill.

The two American schools in Rome moved from their separate quarters to a new building on the Janiculum Hill in 1914. This main building, together with the neighboring Villa Aurelia (a 1909 bequest to the architectural school) and several other buildings, is the home of the AAR to this day, and the complex houses a research library, art studios, music rooms, exhibition galleries, and residential and dining facilities. The American Academy in Rome is unique among the many foreign schools in that city because of its status as a privately funded organization and its diverse Rome Prize fellowship program that brings together archaeologists, philologists, historians, art historians, architects, painters, sculptors, and musicians to form a vibrant intellectual and artistic community.

Unlike its sister institution in Greece, the American School of Classical Studies in Rome was unable to

undertake any excavations in Italy for half a century after its foundation. Its members consequently confined their activities to the study of architecture, topography, inscriptions, and classical statuary. Among the noteworthy studies produced during the AAR's early years were Esther Van Deman's on Roman construction techniques and Samuel Ball Platner's on Roman topography.

It was not until after World War II that a more receptive attitude in Italy toward foreign excavation permitted members of the AAR to begin major fieldwork. In 1948, under the direction of

Frank E. Brown, a U.S. team began to uncover the remains of the Republican colony of Cosa on the coast northwest of Rome, focusing on the temples of the Capitolium, the civic buildings of the Forum, and some private houses. Publications of the excavations have appeared in several volumes of the *Memoirs of the American Academy in Rome.* The academy donated the site and its museum to Italy in 1981. In Rome itself, the AAR has excavated in the Regia and the Atrium Vestae in the Forum Romanum and, most recently, on the slope of the Palatine Hill.

Fred S. Kleiner

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American Antiquity

American Antiquity is the quarterly journal of the Society for American Archaeology (SAA), and it includes articles on the archaeology of North and South America and archaeological method and theory worldwide. The SAA was founded in 1934 to promote communication within the professional archaeological community and between professional and avocational archaeologists through various means, including a journal. In 1937, Carl E. Guthe proposed the name *American Antiquity* for the journal, following the lead of the English journal *Antiquity*.

All members in the society receive *American Antiquity,* and funding for its publication comes primarily from dues paid to the society. Prior to 1958, authors paid for some or all of the cost of illustrations. Until 1993, a single nominee for editor was selected for a four-year term (shortened to three years in 1978) by the society's nominating committee and was "elected" by the membership. Now, as a result of a change in the bylaws, the editor is selected by the SAA executive board and is no longer a voting member of that governing body.

The early editors managed the journal from their institutional office with editorial assistance from spouses, students, and assistant editors representing different geographical areas or archaeological specialties. As the workload increased, associate editors were added for different sections of the journal. In 1989, a full-time managing editor took over many of the production tasks.

Review of articles submitted was in the hands of the editor and the assistant editors until 1969 when peer review of each submission by two people was instituted. The number of reviewers for each manuscript was increased to four in 1989. Prior to peer review, the acceptance rate of article submissions was 65-90 percent, and at times editors were desperate for copy. After peer review began, a change that coincided with a period of tremendous growth in the society, the acceptance rate fell below 50 percent.

The general character of the journal's contents has remained fairly uniform even though the organization

has changed. The principal purpose of the journal from the beginning was to present research articles, and these make up the majority of each issue. Although issue contents are usually determined by what is submitted, occasional special issues are designed with a particular geographic or topical focus. The twenty-fifth and fiftieth anniversaries of the SAA were occasions for special issues of historical interest.

In the early issues, a correspondence section was included to provide a forum for brief comments by amateurs, but as it worked out, professional archaeologists dominated that section along with the others. A facts and comments section was added in 1938. The notes and news section continued the annual archaeological fieldwork summary compiled by the National Research Council's Committee on State Archaeological Surveys and published in *American Anthropologist* until 1932. That section, which became current research in 1962, provided up-to-date

summaries of archaeological research in the Americas and for a brief period (1973- 1976), the Old World. The section was dropped in 1994 because of space constraints.

The book review section, always important for membership participation and reader interest, includes books from all areas of the world. An important section published annually is the report of the society's business meeting, including committee reports. Until 1974, this section also included titles of papers given at the annual meeting.

As membership in the SAA has always been dominated by citizens of the United States, articles in *American Antiquity* have had a strong focus on America north of Mexico, even though there have been occasional complaints from the membership about the number of Mesoamerican articles. Steps to internationalize the journal include publication of a few articles in Spanish in the 1940s, inclusion of translated Russian articles in the early 1960s, institution of an annual review of Old World archaeology in 1978 (discontinued in 1990), and publication of Spanish abstracts for articles beginning in 1989. In the late 1980s, the demand for a journal specifically devoted to Middle and South America was strong enough that the society created *Latin American Antiquity*, which is available to SAA members at an additional charge. This journal began publication in 1990, and since then, *American Antiquity* has focused more on articles on archaeology in the United States and Canada and on archaeological method and theory. As foreign membership and subscription increased in the 1970s, particularly in Europe, *American Antiquity* became the medium by which the state of American archaeology is judged.

The contents of *American Antiquity* provide a fairly good measure of the interests and theoretical orientations of professional archaeologists in the United States, but the journal does not reflect the work of Americanists in other countries nearly as well. In one study of the journal's contents for the first fifty years, articles on excavation, material culture, and culture process were found to account for 60 percent or more of the articles until the last half of the 1960s. Since that time, the number of articles devoted to these three areas has declined, and articles on floral and faunal remains and analytical methods have increased to give a more balanced coverage of archaeological topics.

In another study that looks at the trends in articles emphasizing data, method, or theory for the first forty years of the journal, articles emphasizing data consistently made up 60 percent or more of the total published until the term of the last editor in the sample, Edwin N. Wilmsen, when the proportion dropped to one-third. Interestingly, this dramatic shift also occurred at the time when peer review was introduced. Articles on method consistently represented around 20 percent of the articles until the 1960s when they began to increase, reaching 50 percent by the early 1970s. Articles on theory were always 10 percent or less except during the terms of the earliest and latest editors, when they reached 15 percent.

Archival materials relating to *American Antiquity* are housed in the National Anthropological Archives of the National Museum of Natural History of the Smithsonian Institution. Materials over ten years old are available to researchers except for confidential files, such as referee comments, which are restricted for fifty years.

Andrew L. Christenson

American Journal of Archaeology

The *American Journal of Archaeology* is the official journal of the archaeological institute of america (AIA). In January 1885, fewer than six years after the formation of that institute, Arthur Lincoln Frothingham, Jr., published the first issue of the *American Journal of Archaeology for the Study of the Monuments of Antiquity and of the Middle Ages.* The new journal was to be “the official organ of

the Archaeological Institute of America," and its stated goal was "to further the interests for which the Institute was founded."

Twelve years later, the young periodical, now simply called the *American Journal of Archaeology (AJA),* marked the inauguration of its second series by placing the institute's seal on its title page and adopting as its subtitle, "the Journal of the Archaeological Institute of America." The rationale for the second series was to bring

"greater unity and uniformity" to the institute's diverse publications. Henceforth, *AJA* would be the sole venue for the publication of articles on the fieldwork and research conducted by the AIA's new American schools of classical studies established in 1882 in Athens and in 1895 in Rome. Although *AJA* no longer has a monopoly on AIA research (the American School in Athens, for example, has published its own journal, *Hesperia,* since 1932), more than a century later the second series continues to appear in quarterly fascicles. *AJA* remains the AIA's official journal and publishes each April the abstracts of the papers presented at the institute's annual meeting in December; the citations of the AIA's awards for scholarship, teaching, and service; and the texts of important resolutions of the AIA's governing council.

Although the original mission of *AJA* was to "treat all branches of Archaeology and Art-Oriental, Classical, Early Christian, Mediaeval, and American," the archaeology of the AIA's own continent never gained a strong foothold in the journal, and scholars of medieval art preferred to publish their research in art history publications rather than archaeological journals. From the beginning, *AJA,* like the AIA itself, reflected its founders' preoccupation with the classical world, especially Greece. The defined scope of *AJA* today is "the art and archaeology of ancient Europe and the Mediterranean world, including the Near East and Egypt, from prehistoric to late antique times." In recent years, although retaining its focus on Greece and Rome, *AJA* has published articles on all periods of Old World art and archaeology as well as newsletters on fieldwork in Cyprus, Iraq, Israel, Jordan, Sardinia, Syria, and Turkey. Other regular features have been a series of critical reviews of Aegean prehistory, book reviews, obituaries, and the proceedings of the AIA's annual meetings.

In conformity with an AIA 1973 resolution opposing the illicit international trade in antiquities and the despoliation of archaeological sites, *AJA*'s editorial policy precludes "the announcement or initial scholarly presentation of any object in a private or public collection acquired after 30 December 1973, unless the object was part of a previously existing collection or has been legally exported from the country of origin."

Fred S. Kleiner

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American School of Classical Studies at Athens

The American School of Classical Studies at Athens, the largest foreign research center in Greece, is dedicated to the study of Greek archaeology, history, and culture. Founded in 1882 by the archaeological institute of america (AIA), the American School of Classical Studies at Athens (ASCSA)

was conceived as a place where U.S. scholars could study classical Greek monuments at first hand. In establishing a research center in Greece, the AIA was following the lead of France, whose school in Athens had opened in 1846, and of Germany, which had inaugurated the Athenian branch of the Deutsches Archäologisches Institut in 1874. But unlike its European counterparts, the ASCSA, like the AIA itself, was (and still is) a privately funded organization dependent on college and university support as well as the generosity of individuals and foundations.

The ASCSA began in rented quarters near the Arch of Hadrian, but two years later the Greek government donated land for a permanent home on the south slope of Mt. Lykabettos adjacent to the plot previously given to the British School of Archaeology. The Americans moved into their newly constructed Main

Building in 1888, which was enlarged in 1913-1916, 1958-1959, and 1992. Construction of a residential/dining facility, Loring Hall, took place in 1930.

In 1922, Joannes Gennadius, a prominent Greek diplomat, offered to donate his extensive personal library on the history and culture of Greece to the ASCSA if the school would build a separate building to house it and make the collection available to researchers of any nationality. A gift from the Carnegie Foundation made possible construction of the Gennadeion, a neoclassical marble structure, which opened in 1926. It houses not only rare books but also Edward Lear landscapes of Greece and archival material on the archaeologist Heinrich Schliemann.

Immediately after its foundation, the ASCSA launched a program of excavation and publication-even before the school began construction of its permanent headquarters. The first major ASCSA site was the Argive Heraion, excavated between 1892 and 1895. The school's two largest continuing excavations are at Corinth and in the Athenian Agora, but members of the school have explored Greek sites that span a very wide range, both chronologically and geographically, including Franchthi Cave, Lerna, Olynthos, Messenia, Nemea, Samothrace, Keos, and Kommos.

Work began in Corinth in 1896, and the excavation of a major ancient Greek city lent prestige to the fourteen-year-old U.S. institution. The French and Germans had earlier secured permits to excavate at Delphi (the Americans had also wanted a permit to excavate there but had failed to obtain one) and Olympia, respectively. Excavation in the historic Plaka district of Athens to uncover the classical Agora started in 1931. Reconstruction of the Stoa of Attalos to serve as the excavation headquarters; a museum was begun in 1953 and completed in 1956.

The ASCSA initially published reports of its fieldwork in the *American Journal of Archaeology,* but the opening of the Agora excavations prompted the school to create its own journal, *Hesperia,* in 1932. The ASCSA also publishes a multivolume series for each of its major excavations, monographs on diverse topics, site guides, and a series of inexpensive *Picture Books* for the general public. The school offers a formal curriculum as well as research fellowships for graduate students during the academic year and a summer program for both students and teachers. It is the official liaison between more than 150 affiliated North American colleges and universities and the Greek Ministry of Culture, which grants all fieldwork permits.

Fred S. Kleiner

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American Schools of Oriental Research

The American Schools of Oriental Research (ASOR) is the principal North American research organization for the study of the ancient Near East. Founded in 1900 under the aegis of the Archaeological Institute of America (AIA), the Society of Biblical Literature, and the American Oriental Society, the ASOR is a consortium of approximately 140 North American colleges, universities, museums, seminaries, and libraries. Its administrative offices are currently on the campus of Boston University and are housed in the same building as the AIA's national headquarters.

Like its AIA siblings, the American School of Classical Studies in Athens and the American Academy in Rome, ASOR is a privately funded rather than a government-funded institution. ASOR has three permanent research centers abroad: the W.F. Albright Institute of Archaeological

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Research (AIAR) in Jerusalem; the American Center of Oriental Research (ACOR) in Amman, Jordan; and the Cyprus American Archaeological Research Institute (CAARI) in Nicosia. These centers sponsor scores of field projects in the Middle East.

ASOR publishes the *Bulletin of the American Schools of Oriental Research* (the first issue appeared in 1919), the *Journal of Cuneiform Studies* (begun in 1947), *Biblical Archaeologist* (a popular journal launched in 1938), and several monograph series. ASOR celebrated its centennial on 15 April 2000 with a conference at the Smithsonian Institution in Washington, D.C., entitled "Footsteps in the Dust: A Century of ASOR Discoveries in the Ancient Near East."

ASOR established its first overseas research center in 1900 in Jerusalem. The AIAR's present home, just north of the old walled city, opened in 1925. Originally called the American School of Oriental Research, the AIAR assumed its present name in 1970 in honor of william foxwell albright, a pioneer in the scientific excavation of sites in Palestine and a longtime director of the school. The building, which was enlarged in 1930 and renovated in 1985, houses a research library, laboratories, and residential and dining facilities for fellows and visitors. The AIAR sponsors seminars, workshops, and lectures and currently coordinates the excavation, surveying, and publication of approximately twenty archaeological sites, chief among them Ashkelon, Caesarea, Sepphoris, and Tel Miqne-Ekron.

ASOR's Jordanian center was born in 1968 after the Six-Day War in June 1967 between Israel and the Arab world brought an end to AIAR work in the Hashemite Kingdom. The Jordanian government regarded the new branch of ASOR, originally called the American Research Center in Amman, as an exiled operation of the Jerusalem school. Reflecting the new political reality of the Middle East, in 1970 the Amman Committee of ASOR became a separate corporate entity and assumed its present name (the Jerusalem school took on its new name at the same time). ACOR is now the largest research institute in Amman and is the liaison between the Jordanian Department of Antiquities and North American excavators and researchers. ACOR's present headquarters, constructed in 1984-1986, are in a five-story structure located near the University of Jordan and the British and German archaeological institutes. The building houses a research library, offices, workrooms, a lecture hall, a conservation laboratory, and residential and dining facilities. ACOR currently coordinates about thirty excavations, surveys, or publication projects covering several millennia of the history of Jordan. Among the most notable sites are 'Ain Ghazal, Petra, Aqaba/Ayla, and the Citadel of Amman.

The newest of ASOR's research centers, CAARI, founded in 1978, is the only foreign organization in Cyprus dedicated to archaeological study, and it opens its doors to visitors from all over the world. CAARI's headquarters, a remodeled two-story residence built in the 1930s, is in central Nicosia near the Cyprus Museum. Like the AIA institutions in Jerusalem and Amman, CAARI houses a research library, laboratory, workrooms, and residential quarters; sponsors lectures and symposia; and offers research fellowships. As the liaison between the Cypriot Department of Antiquities and North American scholars, CAARI facilitates numerous American field and research projects on the island from prehistory through the classical, Byzantine, Venetian, and Ottoman periods.

Fred S. Kleiner

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Andersson, Johan Gunnar (1874-1960)

The first major archaeological fieldwork in china was carried out by Western scientists attached to the Geological Survey of China established in Beijing in 1916. J.G. Andersson was a

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fossil hunter and explorer who spent long periods in China, where he became fascinated with stories of "dragon bones," which were highly valued by the Chinese for their magical and pharmaceutical uses. In 1921, the search for fossils led Andersson to Zhoukoudian Cave, in Hebei province near Beijing, which was a giant fissure in a limestone cliff filled with fossil animal bones. Excavation revealed a major Chinese Paleolithic site, containing human skeletal material in the same levels as crude stone tools, animal bones, and traces of thick hearths. Zhoukoudian was excavated under the direction of Canadian anatomist Davidson Black. The first skull cap of *Homo erectus*, known initially as Peking Man or Sinanthropus, was excavated by Chinese archaeologist pei wenzhong in 1929. The site has yielded the only large population of *Homo erectus*, with fragments of more than forty individuals of the species worldwide. Most of the bones were lost during World War II.

Tim Murray

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Antiquity

In 1925, o.g.s. crawford, then age thirty-nine, had the idea of a new archaeological publication to serve the very lively and active group, the then-young generation of archaeologists working in England. Existing journals smoldered on, but they neither flamed nor gave light. Unusually, Crawford did not seek a publisher, for he wanted a completely free hand to say and to publish whatever he liked. Instead, he set up *Antiquity* as his own enterprise with money borrowed from a friend.

Sending a prospectus to 20,000 names and addresses, he soon had over 600 subscribers, and the venture was launched as a quarterly journal in 1927. Reports on the Glozel affair, the faking of Neolithic writing in eastern France, helped energize the new venture, and in 1928, the journal published the first scholarly report of leonard woolley's excavation of the royal tombs at ur in mesopotamia.

In rereading the early articles published in *Antiquity*, the journal's distinctive character is evident. In each number, Crawford wrote a lively editorial with snippets of news, comment, and reports of passing events and curiosities with an archaeological aspect; as he said, "Try living on a desert island with a book of verse and no loaf of bread-or *Antiquity* without a jug of wine!" (Crawford 1955, 177). His own interests in aerial photography are evident, and the field reports start from the focal area in the classic landscapes of southern Britain, especially its chalk land. Crawford's broader interests are also revealed in the coverage of Africa; there is, for example, pioneering work in the field that would now be called "ethnoarchaeology." Great names of the next generation, like christopher hawkes and stuart piggott, are conspicuous. Names from the Americas are largely absent.

The first number of the tenth volume, for March 1936, shows the pattern in its 128 pages: editorial, six long reports ("The Coming of Iron," "Pit and Pit-dwellings in Southeast Europe," "Roman Barrows," "Easter Island," "Anglo-Saxon Vine-Scroll Ornament," and "Cyclopean Walls at Tarragona"), ten short reports and a pair of air photographs, book notes, and twenty-two book reviews. Of one book, Crawford commented, "We are surprised that the Oxford University Press should sponsor such a shocking piece of work as this." The diversity is important, and the range of subjects in each of the year's other three numbers is equally diverse.

Crawford edited *Antiquity* largely on his own, and when he died in 1957 it was found that no provision had been made for a successor. glyn daniel was persuaded to take it on, in tandem with his wife, Ruth

Daniel, as production editor, and he published his first issue early in 1958. In order to safeguard the future of the journal, £5,000 was gathered from well-wishers to buy the publication, and a nonprofit organization, Antiquity Trust, was created to own it in perpetuity.

Like Crawford, Daniel had a good eye for news and the telling of anecdotes, and his Cambridge, television, and book-editing contacts made for a continuing broad vision. The makeup of a typical Daniel issue, the first number of the

fortieth volume, for March 1976, is as follows: editorial, six long reports ("Prehistoric Archaeology in Thailand," "The Origins of Writing in the Near East," "The Destruction of the Palace of Knossos," "Ugarit," "The Ezero Mound in Bulgaria," and "The Vix Mound"), eleven short reports including an air-photographic report, and twelve book reviews.

During the long Daniel era, which lasted until 1986, it became harder for *Antiquity* to maintain its established role. The "general readers," people with a broad interest in archaeology among many other things, seemed to be disappearing (if they had ever existed), and the publication could no longer be part journal, part popular magazine. About half of the circulation of *Antiquity* went to libraries, mostly in universities, and the balance to individuals who were often in some way in the business of archaeology. The world of archaeology continued to expand in every way, but *Antiquity* did not. Production costs reduced it to three thinner issues a year instead of four, so it began to have too few pages to cover that larger world with any fullness.

I was appointed editor in 1987 in succession to the Daniels, again in partnership with the editor's spouse, Anne Chippindale. *Antiquity* was switched to the then-new printing technology of desk-top production. In 1988, it was again published quarterly with a total of about 1,000 pages a year. The content has remained the same-a personal editorial, research reports of varied length, and a strong review section-and so has the commitment to lively and novel work, to rapid publication, and to good presentation. Various devices have been created with its review editors, first Timothy Taylor and then Cyprian Broodbank, to cover new publications well in the review section, it being quite impossible to keep up with *all* that is new.

Archaeology is becoming more specialized and more subdivided, as other sciences have before it. Nearly all the general journals of science have disappeared, leaving only *Nature* and *Science*-the two heavyweights-and I think the same will be true in archaeology. *Antiquity* has been able to cover a broad field of archaeology only by becoming larger. As I envisaged it, inside each larger number of *Antiquity* there is a smaller number, different for each single reader, of those contributions that are of telling interest. [Editorial note: Christopher Chippindale was editor of *Antiquity* until the end of 1997.]

Christopher Chippindale

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Crawford, O.G.S. 1955. *Said and Done: The Autobiography of an Archaeologist.* London: Phoenix House.

Anyang

Anyang is one of the most significant sites of the Shang dynasty in china (approximately thirteenth century b.c.). Excavated by archaeologist li chi between 1928 and 1937, Anyang comprises a royal cemetery of massive shaft graves and a diversity of major public buildings, residences, and workshops. Anyang has been a major source of information about Shang material culture and burial practices, and the scale of the remains has been thought to demonstrate that the site was the capital of late Shang China.

Tim Murray

Arabian Peninsula

The Arabian peninsula is an area in which archaeological research has always been conditioned by a host of political, economic, religious, and social factors over which individual researchers have had little

or no influence. The relative isolation of the region until recently has meant that the constraints affecting archaeology have remained obscure to all but those actually engaged in fieldwork there. Indeed, Arabia is, generally speaking, obscure in most people's imaginations-a land of harsh climatic conditions, ultraconservative religious movements, and oil; a land without the obvious heritage of Persia, mesopotamia, or Egypt; a land in which little of archaeological interest or value is thought to exist. The experience of the last few decades in particular has proved these assumptions wrong, but few people are aware of the reasons why it took so long for this change in awareness to occur.

Histories of Arabian exploration abound. The pre-twentieth-century exploration of the peninsula

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Histories of Arabian exploration abound. The pre-twentieth-century exploration of the peninsula

is well summarized by F. Hommel (1903) and david g. hogarth (1904), but for the first half of the twentieth century, A. Grohmann (1963) is the only comprehensive survey yet published. Quite obviously, there is a difference between exploration and archaeology. The heroic accounts of the often dangerous expeditions to Yemen led by Joseph Halévy in 1869, Eduard Glaser in 1884-1894, and Count Landberg in 1898; of the journeys to Madain Salih, al-'Ula, and Tayma in the Hejaz (northwestern Arabia) undertaken by Charles Doughty in 1876-1878, Julius Euting in 1884, Charles Huber in 1884, and the Dominican fathers A.J. Jaussen and R. Savignac from 1907 to 1910; and of the unparalleled survey of central Arabia conducted by G. and J. Ryckmans, Captain P. Lippens, and H. St. J.B. Philby in 1951 do not, properly speaking, belong to the history of Arabian archaeology. These investigations were primarily epigraphic ones, for the early "penetration of Arabia," to use Hogarth's phrase, was largely the work of scholars of Semitic languages seeking to throw new light on the Bible.

Nineteenth-century scholars, many of whom were products of the German comparative philological method, looked to the newly discovered inscriptions of southern and northwestern Arabia for answers to Old Testament riddles. As Hommel wrote in 1903: "The queen of Sheba proved Solomon with hard questions, all of which in his wisdom he answered her. Now we who study the Old Testament, reversing the process, go to the wonderland of that queen with a multitude of inquiries, to many of which it has already given us a satisfactory reply. For the fact that we now have such comparatively clear views on all these points is due chiefly to the results of epigraphical researches in Arabia during the nineteenth century" (751).

When Hommel and Hogarth praised the intrepidness of the likes of Halévy and Glaser, they did so with good reason. More than one would-be explorer of Yemen lost his life in the attempt, and political conditions throughout most of the Arabian peninsula during the nineteenth century, with the possible exceptions of Bahrain and Oman, were indeed anarchic by any standard. Ottoman influence was only slight in Yemen and al-Hasa, today's eastern province of Saudi Arabia; inner Arabia was lawless and outside the sphere of the great powers; and diplomatic representation was nonexistent in all but a few ports of call in the Arabian Gulf. Thus, in contrast to Mesopotamia, iran, turkey, Syria, and Egypt, where more-stable political conditions permitted the undertaking of archaeological excavations by British, French, and eventually American and German missions in the late nineteenth and early twentieth centuries, the Arabian peninsula was virtually untouched until after World War II. With this general background in mind, let us turn now to a closer examination of the individual subregions of the Arabian peninsula, since the history of archaeological research in each has followed a unique trajectory.

Yemen

Despite the fact that the first southern Arabian inscriptions were copied as early as 1810 by the German schoolteacher Ulrich Jasper Seetzen, Yemen's archaeological heritage has only been slowly revealed since that time. Tribal conflict in Yemen has long been endemic, which had precluded field research on anything but a very restricted scale.

Excavations at al-Huqqa in 1928 by C. Rathjens and H. von Wissmann were the first ever conducted in Yemen, and helped by the British political presence in Aden, gertrude caton-thompson and R.A.B. Hamilton worked in the Hadhramaut in 1937-1938. World War II interrupted the fieldwork, and there was little activity until 1951-1952, when the American explorer and later oil baron, Wendell Phillips, launched his American Foundation for the Study of Man (AFSM) expeditions to Timna (capital of the kingdom of Qataban), Hajar Bin Humaid (a major stratified prehistoric site), Marib (capital of the kingdom of Sheba), and Khor Rori (a southern Arabian colony founded on the coast of Dhofar in what is now Oman. The work at Marib ended abruptly when relations broke down between the team's epigrapher, Father A. Jamme, and the local governor and the Americans were forced to flee Yemen

after a series of incidents involving harassment, intimidation at

gunpoint, and temporary confinement by the military.

Although sporadic discoveries were reported in the decades following 1952, it was not until 1974 that a French mission, working at Shabwa, capital of the kingdom of Hadhramaut, resumed regular excavations, which have continued, off and on, to this day. By the late 1970s, a research station of the German Archaeological Institute (deutsches archäologisches institut) had been established in Sanaa, the capital of Yemen, and in the early 1980s, an important Italian expedition began working on Bronze Age remains in the country. At about the same time the AFSM resumed work in the Wadi al-Jubah under the direction of J. Sauer. Several years later, a Soviet team, working in what was then the communist People's Democratic Republic of Yemen, established a mission with excavations both at Qana on the coast and Raybun in the Hadhramaut.

At the time of writing, tribal conflicts had once again curtailed work by Italian, French, and German scholars in the northern part of Yemen where the political authority of the central government is weak. The 1990 political unification of the two Yemens also brought tensions to the surface between authorities who had formerly been responsible for antiquities in each state, which exacerbated an already difficult situation.

Bahrain, Kuwait, Qatar, and the United Arab Emirates

A primitive attempt to excavate several burial mounds on Bahrain in 1879 by Captain E.L. Durand was the first archaeological excavation of any kind on the Arabian peninsula. Durand was followed by a series of amateurs, including Mr. and Mrs. T. Bent (1889), A. Jouannin (1903), Captain F.B. Prideaux (1906), Major C.K. Daly (1921-1926), and E.J.H. Mackay (1925). In the early 1950s, T.G. Bibby, an employee in Bahrain of the Iraq Petroleum Company, developed an interest in the mystery of the more than 100,000 burial mounds that dot the northern portion of the main island. Bibby contacted his old friend, the Danish prehistorian P.V. Glob. Bibby, who had worked with Glob in Norway and had himself married a Dane, proposed that a Danish team come to work on Bahrain. At the same time, R.H. Dyson of the University of Pennsylvania made a similar proposal to the emir of Bahrain, who consulted his British adviser, Sir Charles Belgrave, as to how best to proceed. Belgrave chose to toss a coin, and the Danes won.

That was the beginning of what grew into the largest foreign expedition ever mounted by Denmark. Glob put separate teams to work in the 1950s and 1960s not only at the great mound of Qalat al-Bahrain but on Bronze Age and Hellenistic settlements on Failaka (Kuwait), prehistoric sites in Qatar, and third-millennium graves and habitation sites (Umm an-Nar, Hili, Qattarah) in what were then the Trucial States (now the United Arab Emirates). An entire generation of Danish archaeologists participated in the Gulf expeditions, including H.H. Andersen, K. Frifelt, K. Jeppesen, H. Kapel, P. Kjærum, and P. Mortensen. Frifelt subsequently went on to conduct her own fieldwork at Bat in Oman while several of the others are or have been involved in the publication of the massive amount of material generated by the dozens of excavations and surveys conducted by the expedition. Publication of these results has been a major problem, however, partly because most of the people involved went on to assume posts dealing with Danish prehistory that gave them neither the time nor the institutional context in which to adequately digest and analyze the results of the fieldwork.

Since the end of the Danish expedition in 1965, much excavation has been conducted by French scholars such as M. Kervran and P. Lombard, and during the 1990s, a British expedition at Saar has been uncovering a large settlement of the early second millennium. Bahrain is also exceptional for the high level of involvement on the part of local nationals. The Department of Antiquities has conducted salvage excavations at literally thousands of graves threatened by development during the fifteen years

before 2000.

Unable to continue her work in Iran after the 1966 excavations at Bampur, the British archaeologist B. de Cardi began survey work in Ras al-Khaimah, the northernmost of what was then the Trucial States, in 1968. This was followed in

1973 by the visit of a team of Iraqi archaeologists on a goodwill mission to the newly created United Arab Emirates (UAE). The Iraqis conducted soundings at a host of important sites, including Tell Abraq, ed-Dur, Mleiha, Julfar, and al-Qusais. Excavation activity remained sporadic, however, until the mid-1980s when teams from Belgium, Great Britain, Denmark, France, Germany, Japan, and Switzerland began to focus their efforts on a wide range of prehistoric and early historic sites. More recently, Australian and Spanish teams have also begun work in the UAE.

The reasons behind this flurry of activity, which continues to this day, are varied. Many of the scholars involved had formerly worked in Iran or Iraq, areas no longer accessible for political reasons. The comparative ease of working in the UAE, the high level of support given to foreign teams by local governments, the relatively unbureaucratic nature of the enterprise when compared to conditions in many other countries in western Asia, and the inherent interest of the archaeological problems being investigated have all contributed to a burgeoning of archaeological research in southeastern Arabia.

Archaeology in Kuwait, initially dominated by the Danish expedition, was later pursued by the American T.H. Carter and, from 1983 to 1988, by a French mission led by J.-F. Salles. Interrupted by the Gulf War, French excavations have now resumed on several of the smaller offshore islands.

Archaeology in Oman, on the other hand, has had quite a different history. Following the expulsion of Wendell Phillips's team from Yemen, the AFSM turned its sights on Oman where R. Cleveland initiated excavations at Sohar in 1958. Prior to that time, the region had been only sporadically explored during the mid-nineteenth and early twentieth centuries. It was not until Sultan Qaboos deposed his father Sultan Taimur in 1970 that the country moved from a state of medieval isolation to one of comparative wealth as its oil resources were exploited.

The creation of a Ministry of Heritage and Culture was an early, enlightened move on the part of the new ruler, as was the appointment of the late Andrew Williamson from Oxford, an expert in the archaeology and economic history of medieval Iran, as the ministry's archaeological adviser. Williamson invited archaeologists from Harvard University to undertake the first systematic surveys and test excavations in Oman, and other scholars, including B. de Cardi and M. Tosi, soon initiated new projects.

In spite of the death of Williamson in 1975, when the Land Rover he was in (with a military escort) hit a landmine in Dhofar (where the communist-backed guerrillas supporting the separation of Dhofar Province from the Sultanate of Oman had only recently been suppressed), archaeological exploration by foreign teams flourished in the 1970s and early 1980s, not least because of the care and support provided by the Italian archaeologist P. Costa, who succeeded Williamson as archaeological adviser. A major focus of work by a team led by G. Weisgerber from the German mining museum in Bochum has been the investigation of copper metallurgy in the Oman mountains and the identification of Oman with the copper supply area known in Mesopotamian cuneiform sources as *Magan.* Italian surveys and excavations by M. Tosi and P. Biagi have focused on maritime adaptation in coastal Oman.

Saudi Arabia

Territorially speaking, the Kingdom of Saudi Arabia occupies the largest portion of the Arabian peninsula, but paradoxically, archaeological exploration there has lagged far behind what has been achieved in most of the other countries on the peninsula. The earliest explorations in the Hejaz brought to light important epigraphic finds, many of which are to be found today in the louvre in Paris (since most of the early explorers were French) and Istanbul (because the Hejaz was, nominally at least, part of the Ottoman Empire). However, the fanaticism and xenophobia of the population, most of whom belonged to the Wahhabi sect of Islamic fundamentalists, meant that exploration was very limited throughout the

early twentieth century, and individuals who were able to travel freely throughout Saudi Arabia, such as H. St. J.B. Philby, a close friend of the founder of the kingdom, Abdul Aziz Ibn Saud, were rare. A major influx of American oilmen and their families began in the 1930s,

however, and over the years many employees of Arabian American Oil Company (ARAMCO) made important surface finds that were communicated to scholars in Europe and America.

It was not until 1968 though that the first archaeological excavations were sanctioned in the kingdom. In that one year, T.G. Bibby was granted permission to work at Thaj, a large Hellenistic city in northeastern Arabia; P.J. Parr led a survey team to the Hejaz; and G. van Beek undertook a survey and soundings at Najran near the Saudi-Yemeni border. A Society of History and Archaeology was established in the history department at the University of Riyadh (now King Saud University) in 1969 (the present Department of Archaeology and Museology dates only to 1978), and in 1972, A.R. Al-Ansary, a specialist in pre-Islamic Arabian epigraphy and a student of the Leeds Semitist B.S.J. Isserlin, initiated excavations at the late pre-Islamic site of Qaryat al-Fau in the interior of Saudi Arabia where generations of Saudi nationals have gained field experience in Arabian archaeology.

A. H. Masry, a Saudi national who earned his Ph.D. under robert mccormick adams and robert j. braidwood at the University of Chicago, returned to Riyadh in 1973 as director of antiquities, and three years later, he launched an ambitious program of survey and test excavation around the country. Known as the Comprehensive Survey of the Kingdom of Saudi Arabia, the project aimed at surveying the country, making surface collections, identifying sites of particular importance for future investigation and protection, and laying the groundwork for a network of provincial museums. The comprehensive survey continued until the mid-1980s and was followed by select excavations at sites such as Thaj and Tayma. Many Saudi nationals who had gained their initial training in Riyadh with Al-Ansary and later field experience in the Department of Antiquities and Museums were sent abroad during this period to do postgraduate study in the United States and Great Britain. The drop in oil revenues during the late 1980s, the ensuing budget deficit in Saudi Arabia, and the departure of Masry to a nonarchaeological post in London led to stagnation in archaeological research in Saudi Arabia.

Retrospect and Prospect

The fact that, for political reasons, little fieldwork was possible in the Arabian peninsula during the nineteenth and early twentieth centuries has meant that, relative to the surrounding regions, much less was known of this area until recently. Since the 1950s, however, there has been a steady stream of foreign teams working in all of the countries of the peninsula. Obviously, the rate of progress depends very much on foreign and local funding sources and political stability. Tribal wars in Yemen and the 1990 Gulf War are examples of political events that have halted or severely curtailed archaeological research on the Arabian peninsula.

The institutional framework of the archaeology being carried out by foreign teams varies greatly. Many expeditions owe their existence to the interests of one scholar who builds up a team of colleagues and brings funding from his or her nation's public and private funding agencies. The French work in the Gulf states has been more of a coordinated effort on the part of the National Center of Scientific Research (CNRS), and Yemen is the only country on the peninsula with permanent, foreign research “schools” (French, German, and American). It is apparent that in the case of such schools, archaeological research is viewed as part and parcel of an overarching policy of cultural exchange between the country sponsoring the foreign teams and the host nation. In such a situation, archaeology, benefiting from government funding, is used as an arm of foreign (cultural) policy. The presence of a team from a given foreign country in a particular Arab state is viewed as beneficial by the foreign power, as its presence helps to spread goodwill, heighten awareness of that country, contribute to local heritage interests, and ultimately, sell the products of that country in a foreign market.

With the exception of the extraordinary efforts made by the Bahraini Department of Antiquities to

excavate graves threatened by the construction of new urban areas, it cannot be said that the large number of foreign missions working on the Arabian peninsula has been matched by a corresponding number of local ones. National museums exist in all countries of

the peninsula, but degrees of awareness of archaeology, heritage, and history vary greatly from country to country. Journals for the dissemination of archaeological research exist in Oman *(Journal of Oman Studies)* and Saudi Arabia *(Atlal),* and in varying degrees, antiquities laws have been passed and departments of antiquities have been set up and empowered to protect local sites and monuments. Finding bright and competent nationals to pursue careers in archaeology has been difficult, however, for in many of the countries of the peninsula the monetary rewards to be won in business by a bright student so far surpass what one can expect to earn and achieve as a civil servant that few of the best and brightest have been attracted to a career in archaeology.

The neocolonial aspect of foreign teams exploiting the past of a host country is only part of the truth, however, for in many cases the attitude taken toward archaeologists is the same as that taken toward petroleum engineers or any other foreign technical specialist. If non-Arabs from the West have the particular expertise needed to investigate the past that is lacking locally, then there is no harm in letting such work be done by them. Moreover, in all of the countries of the peninsula there is a certain population of nonlocal Arab archaeologists working on a contract basis for the universities and antiquities departments, which often includes scholars with advanced degrees from universities in the West. Just as American or British engineers seek lucrative employment in the tax-free Gulf states, so, too, do archaeologists from the Sudan, Egypt, India, Pakistan, Iraq, Jordan, Lebanon, and Syria for whom the language and culture of the Arabian states is no barrier to the pursuit of their profession. In some rare cases, such as Oman, however, programs to nationalize the workforce have tended to push foreign “experts” out of certain jobs, including archaeological advisory ones, which has affected Arab and Asian archaeologists as well as Western ones.

D. T. Potts

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Arambourg, Camille (1888-1969)

Born in Paris, Camille Arambourg graduated as an agricultural engineer and became interested in paleontology when he discovered fossil fish while working at improving the water supply of his parents' vineyard in Algeria. He fought in the Dardanelles and in Macedonia during World War I, and afterward his interest in fossils led him to undertake further studies in geology.

In 1920, Arambourg became professor of geology at l'Institut Agricole d'Alger where he worked for the next ten years. During that time he also studied in Paris under marcellin boule at the Muséum National

d'Histoire Naturelle. In 1932-1933, he led an expedition to the Omo Valley in Ethiopia where he collected Pleistocene vertebrate fossils and made a detailed study of the geology of the region. In 1938, he succeeded Boule at the museum and moved to Paris.

After World War II, Arambourg returned to work in North Africa. In 1947-1948, he excavated at Saint Arnaud (now Ain Hanech) in northern Algeria, and along with other fossils located in this early Pleistocene site, Arambourg found worked, spheroid stone tools, the first to be found in North Africa. In 1954-1955, he excavated at Ternifine near Mascara in northwestern Algeria, and there he found fragments of three hominid mandibles, a parietal bone in association with Acheulean bifaces, Clactonian-like stone tools, and a rich variety of extinct mammalian bones. Based on this evidence, Arambourg argued that the Acheulean stone toolmakers had been “pithecanthropoid” hominids, a theory that was reinforced by a similar discovery at a Moroccan site in 1955. Arambourg

also argued that these North African remains were similar to the bones found at the site of Choukoutien (now Zhoukoudian) in China, and, indeed, these mandibles, and those from Zhoukoudianzhen are now recognized as belonging to *Homo erectus*.

Arambourg also excavated the cave of Tamar Hat in Algeria. The only Ibero-maurusian sequence excavated to bedrock, it has been dated at ca. 20,600 b.p. The cave was used as a camp for hunting Barbary sheep, and its three meters of deposit indicated that it had been used and reused by people for nearly 5,000 years.

Arambourg was seventy when he retired from the museum, but he remained actively involved in research until his death. Between 1967 and 1969, he led the French team of the International Palaeontological Research Expedition to the Omo Valley in Ethiopia, and during the first field season, Arambourg and his colleague Yves Coppens found an Australopithecine mandible. The Omo research expedition was a complex paleoanthropological project, and its results became a keystone in understanding the chronology of African prehistory.

Arambourg's monograph on North African vertebrate paleontology was published posthumously in two parts in 1970 and 1979. He was president of the Societé Geologique de France and the Societé Prehistorique Francaise, he received the Gaudry Prize in 1959, and he was elected to the Academie des Sciences in 1961.

Tim Murray

See also

France; Maghreb

Archaeological Heritage Management

The concepts of antiquities, monuments, and heritage are relatively recent innovations. An awareness of the special qualities of structures and artifacts produced by earlier peoples and generations developed slowly and sporadically over a long period in various parts of the world. The deliberate collection of artifacts from earlier periods was observed in china during the Han dynasty in the first century b.c. (Schnapp 1993), and there were conscious efforts by Roman emperors, notably Hadrian (a.d. 117-138), to protect and conserve notable structures from past epochs, such as dynastic Egypt and classical greece. It is arguable, however, whether such activities can be interpreted as conscious attempts at heritage management. In both cases, collectors may well have been motivated by a mixture of religious, philosophical, political, and aesthetic objectives.

The systematic study of relics from the past and deliberate actions designed to ensure their conservation may be deemed (in Europe at least) to have begun with the Renaissance and the reintroduction of the values of classical antiquity. Rome was where the values encapsulated in the remains of its imperial past were first identified and where conscious efforts were made to conserve them starting in the latter part of the fifteenth century. The artist Raphael (Raffaello Sanzio, 1483-1520) was instructed by Pope Leo X in 1515 to carry out a survey of the monuments of the city of Rome (Jokilehto 1999, 32 ff.) and was given the resounding title of “prefect of marbles and stones.” In a report produced four years later, Raphael set out in meticulous detail the requirements of such a survey, which was carried out by other papal functionaries. From this time onward, the buildings of imperial Rome and the marble statuary and facings that decorated them no longer served solely as a quarry for bedecking palaces and churches (or, worse, as a source of materials for lime kilns).

Meanwhile, in northern Europe, a second movement was developing that was to lay the foundations of modern heritage management. The systematic study and recording of antiquities, both portable and monumental, diffused northward through the work of French antiquaries such as Nicolas-Claude Fabri de Peiresc (1580-1637). As such work moved into lands that had been little, if at all, influenced by Roman culture, the quest for information shifted to the landscape-in particular, the many field monuments such as earthworks and stone settings-that were still to be found in profusion at that time. Attention was also directed toward early buildings such as castles, monasteries, and churches whose origins owed nothing to classical models. In England, John Leland (1506?- 1552) was appointed to the post of king's antiquary by Henry VIII in 1533, and his peregrinations

around the country produced a paradigm for future investigations. Of those who followed Leland, the most influential was william camden (1551-1623), and his monumental work *Britannia,* published in1586, was the first general guide to the antiquities of a single country. Its subjects ranged from prehistoric stone circles (notably Stonehenge) to Roman ruins (such as the forts of "the Saxon shore") to Saxon work preserved in later churches.

In Great Britain, Camden's work was continued by diligent field antiquarians such as Robert Plot (1640-1696) and edward lhwyd (1660- 1708) in Wales and john aubrey (1626-1697) and william stukeley (1687-1765) in England. Elsewhere in northern Europe similar studies were being carried out by peripatetic scholars. In Denmark, ole worm, or Olaus Wormius (1588-1654), published several works on the antiquities of that country in which he sought to establish direct links between monuments and history. He was influential in the composition of a royal decree that was sent in 1626 to all Danish clergy requesting them to report on all the historical remains in their parishes. johan bure, or Johannes Bureus (1568-1652), spent much of his long life touring his native land of Sweden studying antiquities, in particular, runic inscriptions. Bure became the first holder of the post of royal antiquary. It was in Sweden that the first university chair of antiquities was created, at the University of Uppsala in 1662.

Elsewhere in Europe, similar studies were being undertaken by scholars who adopted the title of "antiquary." In France, the major figure was the Benedictine priest bernard de montfaucon (1655-1741), whose initial paleographic and philological studies led him to the study of antiquities and culminated in his seminal book, *L'antiquité expliquée et représentée en figures* (1719). His work inspired other French antiquaries to begin the systematic survey of the historic landscape. In the last volume of his *Recueil d'antiquités égyptiennes, étrusques, grecques, et gauloises* (1767), another major figure, Anne Claude Philippe de Turbières de Grimoard de Pestels de Lévis, comte de caylus, published detailed surveys of many prehistoric and Gallo-Roman field monuments in France.

In the eighteenth century, there were attempts by European scholars to analyze and classify the whole of nature and human life. The work of the encyclopedists and of Carolus Linnaeus (Carl von Linné, 1707-1778) had a profound influence on antiquarian studies, and the most significant impact was probably that exercised on christian jürgensen thomsen (1788-1865). When he was appointed the first curator of the Danish National Museum 1816, he was called upon to prepare some rational form of presentation for the many thousands of ancient artifacts in that heterogeneous "cabinet of curiosities," and to do so, he derived the three-age system (Stone, Bronze, and Iron Ages), which laid the foundations for modern prehistoric studies.

The Development of Legislation

In 1666, four years after Olof Verelius became the first professor of antiquities at Sweden's Uppsala University, he was appointed royal antiquary. The first result of this appointment was the promulgation of a royal proclamation that declared all field monuments in the Swedish kingdom (which at that time included Finland) were the property of the crown, which undertook to protect and preserve them. The decree also imposed strict controls over all forms of intervention on such monuments. Three years later, a second royal proclamation extended this protection and control to all "portable" antiquities, which similarly became crown property. There are two interesting features in this pioneer legislation. First, while the ownership of monuments and artefacts was vested in the crown, their protection and preservation was in the name of the Swedish people, as part of their heritage. Second, antiquities were deemed to be protected even before they were discovered; thus, protection was accorded to them from the moment of their discovery.

It was another seventy years before another European state introduced similar heritage protection

legislation. The discovery of the buried cities of herculaneum and pompeii led Charles IV, the Bourbon king of Naples, to assert in 1738 royal ownership of all buried materials and sites in his kingdom. This relatively simple

colonies, based on what became known as “the Westminster model constitution,” and British legislation in India served as the basis for the formulation of improved protection of the cultural heritage of that newly independent country.

Over the second half of the twentieth century, there was progressive extension and improvement of heritage legislation. Every year was marked by new or amended laws being passed by national legislatures in at least one country in the world. In addition, work began within the framework of the League of Nations in the interwar years that led to the drafting and adoption in the 1970s of international conventions, under the aegis of the United Nations Educational, Scientific, and Cultural Organization (UNESCO), designed to protect and preserve the cultural heritage. Similar conventions have also been prepared at the regional level, notably by the Council of Europe.

Managers

Legislation is effective only if provision is made for its implementation and for the enforcement of penalties when it is transgressed. The earliest recorded appointments of what today would be known as “heritage managers” were made by Renaissance popes, as in the case of Raphael. There was a continuous policy of restoration and conservation of ancient monuments in Rome, supervised by different commissions and executed by distinguished artists and architects such as Antonio Canova (1757-1822). Similar provisions applied in other cities and states of pre-unification Italy, such as Naples.

A number of European countries followed the same pattern in the late-eighteenth and early-nineteenth centuries. In most cases, this began with the appointment of a voluntary commission of experts drawn from the academies and universities and employing architects and conservators on specific contracts. However, these bodies found themselves requiring the services of full-time professional officials as interest in and concern for antiquities grew. The role of architects in the development of heritage management was an important one. In Germany, Karl-Friedrich Schinkel (1781-1841) played a crucial role in the preservation of monuments in the territories of the kingdom of Prussia. He proposed the establishment of a formal organization for this work, but it was not until two years after his death that the first conservator of artistic monuments was appointed. France had anticipated such an appointment, the post of inspector-general of historical monuments in France being created by Louis-Philippe shortly after his accession in 1830. The first such inspector was Ludovic Vitet (1802- 1873), and he was succeeded in 1834 by Prosper Mérimée (1803-1870), better known as the author of *Carmen* but notable for his intervention to save the Roman and medieval defenses of Carcassonne in southern France.

German conservators such as Schinkel and, in particular, the Bavarian Leo von Klenze (1784-1864) provided professional advice to the new Greek state after 1830. The first general conservator was Kiriakos Pittakis (1798- 1863), and he was assisted by Danish and German architects. In Russia, an Imperial Archaeological Commission was set up in 1859, and soon afterward the country's first full-time inspector was appointed.

The Scandinavian tradition began with the appointment of Verelius as royal antiquary in 1666. The monuments service grew steadily, and from the nineteenth century onward, it made extensive use of the talents of the leisured, educated middle class (clergymen, teachers, retired army officers) for the surveying and recording activities that spread over the entire country. Denmark did not follow suit until the first decade of the nineteenth century, but work there developed very rapidly, not only in the evolution of museology but also in systematic field survey. jens jacob worsaae (1821-1885), who had worked with Thomsen (whom he succeeded in 1865) at the National Museum, was appointed inspector-general of antiquities in Denmark by the king in 1847, and he traveled over the entire country in the years that followed recording monuments of all kinds. He built up a professional staff from 1865

onward, and in 1873 began the systematic survey of all the field monuments in Denmark, with voluntary assistance. This work was to continue for some fifty years, and the field reports,

urban renewal, pipeline projects, open-cast mineral working, deep plowing, illegal excavations, drainage of wetlands, military training, and uncontrolled tree growth. This was the period, beginning in the late 1950s, of "rescue archaeology," with its dramatic overtones.

The conventional professional services were overwhelmed by the tasks that confronted them, and different strategies emerged. In some cases, the professional bodies were considerably enlarged, as in Japan and Sweden, so as to be able to undertake the work demanded of them from their own resources. In others, more modest enlargement was accompanied by the extensive use of archaeological contractors (universities, museums, private professional groups), as in the United Kingdom and Germany and, more recently, in Italy and Sweden. It is noteworthy that systems of this kind are becoming increasingly common, not only for rescue excavations but also for inventory and physical conservation. In the United States, where there has never been a centralized monuments service, this work has been undertaken almost entirely by private agencies following the passage of the 1974 Archaeological and Historic Preservation Act, which required funds to be allocated for archaeological mitigation in all projects on federally owned land or projects financed by the federal government.

Solutions to the problems of archaeological heritage management vary according to the constitutional structures of different countries. In federal states, such as Australia, canada, and Germany, responsibility for heritage management is largely devolved down to the state or province level. In a sense, the same is also the case in the United Kingdom, where there are separate services for England, Scotland, Wales, and Northern Ireland. In certain countries with centralized governments, such as the People's Republic of China, Italy, and spain, there is a central supervisory body responsible for overall policymaking and the disbursement of central government funds, but executive control rests with provincial administrations or, in the case of Italy, regional superintendents. Finally, there are those countries, which make up the majority, in which heritage management is the responsibility of a centralized agency. However, a movement toward decentralization is becoming increasingly apparent, and in the United Kingdom, the management of protected monuments is now being transferred to local authorities; currently, there are proposals to introduce a similar system in Mexico.

Henry Cleere

See also

Individual countries

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Archaeological Institute of America

The Archaeological Institute of America (AIA) is the oldest and largest archaeological organization in North America. Founded in 1879 in Boston, Massachusetts, by Charles Eliot Norton and eleven other Bostonians, the AIA quickly formed additional chapters in New York, Baltimore, and Philadelphia and, by the end of the century, in the Midwest as well. A chapter opened in Los Angeles, California, in 1903. Today, the AIA has more than 100 local societies throughout the United States and Canada and more than 11,000 members on several continents. In 1994, the Archaeological Institute of

America/Institut Archéologique d'Amérique was incorporated in Canada as an independent affiliate of the AIA in the United States.

The original goal of the nineteenth-century organization was to support archaeological excavation and publication both at home and abroad, but Old World archaeology, especially classical archaeology, has always played a dominant role in the AIA. Although the institute founded a School of American Archaeology in 1907 (today the School of American Research in Santa Fe, New Mexico), the first archaeological schools the AIA created-and still its principal affiliated organizations-were the american school of classical studies at athens, founded in 1882, and the American School of Classical Studies in Rome, established in 1895, now a division of the American Academy in Rome. The AIA is also the "parent" of the american schools of oriental research, founded in 1900, which oversees three archaeological schools in Jerusalem; Amman, jordan; and Nicosia, cyprus.

The AIA's first excavations took place between 1881 and 1883 at Assos in northwestern turkey, with the cosponsorship of the recently established Boston Museum of Fine Arts. (In one of the last agreements of its kind, the Turkish government granted the Boston museum permission to export one-third of the excavated finds to help build its collections of classical art.) After the AIA opened research schools abroad, almost all subsequent U.S. excavations in the Mediterranean and Mideast have been conducted under the auspices of AIA's affiliates or individual universities rather than the institute itself.

Consistent with its founders' belief in the importance of publication as well as exploration, the AIA inaugurated the *american journal of archaeology (AJA)* in 1885. A magazine aimed at a much larger popular audience, *Art and Archaeology,* appeared in 1914 but ceased publication two decades later. In 1948, the AIA launched a successor magazine, *Archaeology,* which currently appears bimonthly and has a circulation exceeding 200,000. Unlike *AJA,* which is a journal of Old World archaeology, *Archaeology* is global in scope. Between 1948 and 1973, the AIA also published a series of monographs in cooperation with the College Art Association, and in the 1990s, the institute initiated a new publication series consisting of both monographs and colloquium proceedings. The AIA also oversees the publication of the American volumes of the *Corpus Vasorum Antiquorum.*

Other than its status as a privately funded nonprofit organization, one of the distinctive features of the AIA that separates it from many other national archaeological societies is that it counts thousands of laypeople among its members. Central to its public outreach effort is its national lecture program, begun formally in 1896 although the institute had sponsored a lecture series by Rodolfo Lanciani a decade earlier. Currently, the AIA sends three lecturers annually to each of its local societies. The institute also holds an annual meeting at different cities throughout the United States and Canada at which scholars present the results of their fieldwork or research projects.

Fred S. Kleiner

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Archaeometry

Although the term *archaeometry* is of fairly recent origin, it is now used to cover an important field of archaeological research, one that has its own journals, major symposium sessions, and research centers. The term *archaeometry* was coined by the British archaeologist christopher hawkes to name the bulletin of the Research Laboratory for Archaeology and the History of

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Art at Oxford University, which began publication in 1958. Yet archaeometry is now more than just the name of a journal; it is a field of study. Indeed, the discipline of archaeometry was practiced for many years before it was actually named. In a historical review on scientific measurement in archaeology, Stuart Fleming (1982), of the Museum Applied Center for Archaeology at the University of Pennsylvania, places the origin of archaeometry in the late 1920s when an astronomer, andrew ellicot douglass, from the University of Arizona pioneered the dating technique of dendrochronology.

Although the journal was not initially explicit about what archaeometry was, its articles were restricted to the hard sciences, i.e., they were based in physics and chemistry. To understand the history of archaeometry is to understand the major developments within the hard sciences in answering archaeological questions. Archaeological geology, for instance, has a long history. In the early nineteenth century, charles lyell's *Principles of Geology* gave time depth to the world, which early European archaeologists used to incorporate their models of human antiquity and theories of evolution. Geology thus gave the means for associating flint tools with fossil mammals and the relative dating of the ice ages.

Occasional examples of the application of chemistry and physics in answering questions about the past can be found throughout the nineteenth and early twentieth centuries, yet the true development of archaeometry can be traced to later in the twentieth century and is intertwined with two developments. The first concerns archaeologists' seeking answers to specific problems that were a product of the theoretical developments within the discipline. The second is tied to advances in science and technology. Two approaches are presented here: the use of characterization studies in identifying trade and exchange and the use of dating techniques in determining time depth. The post- World War II developments in nuclear science have been crucial in both instances.

Characterization Studies

Advances in science and technology have made the sourcing and characterization of many archaeological materials that provide evidence for the physical identification of their movement easily available. These advances have gone hand in hand with a shift in archaeological theory in which archaeologists began to see the usefulness of using trade and exchange in modeling the distribution of materials over space and in explaining changes in societies over time.

The identification of traded archaeological material is not a recent phenomenon. Perhaps the most famous early study was by Anna Shepard, who in the 1930s and 1940s postulated the exchange of pottery over wide areas of the U.S. Southwest by analyzing mineral inclusions in thin sections to pinpoint the origins of such minerals (Shepard 1965). Chemical techniques to identify the elemental composition of archaeological materials as a means of characterization are also not new. Neutron activation analysis was applied to coins from the Louvre in 1952, and in 1957, oriental ceramics were analyzed using the nondestructive methods of X-ray fluorescence spectrometry (XRF) and X-ray diffraction (XRD) analysis (Young and Whitmore 1957). Access to these techniques, however, was restricted and costly.

A major advance in the chemical analysis of archaeological material came from the initiative of Robert Oppenheimer. On 8 March 1956, he assembled a group of archaeologists and chemists at the Institute of Advanced Studies, Princeton, to discuss the possibility of applying methods of nuclear research to the study of archaeology (Sayre and Dodson 1957). As a result of this meeting, work was undertaken at two laboratories, the Brookhaven National Laboratory in the United States and the Research Laboratory for Archaeology and the History of Art in Oxford, England. Techniques deployed included neutron activation analysis (NAA) and spectrographic methods.

Those studies were reasonably successful in being able to separate pottery wares from Asia Minor,

greece, and italy or different factories of Samian ware, and the studies laid the foundations for chemical analyses in the next three decades, in which thousands of analyses using varying techniques were carried out on many types of objects including pottery, stone (obsidian,

marble, chert, volcanic rocks), amber, and metals, including coins. Apart from NAA, XRF, XRD, and spectrographic methods, techniques currently in use include proton-induced X-ray emission and proton-induced gamma ray emission (PIXE-PIGME), inductively coupled plasma emission spectrometry (ICP), lead isotope analysis, and electron microscopy. Major changes in the instrumentation of these techniques have meant that more elements can be analyzed with higher precision. The choice of technique depends on the availability to the archaeologist and the cost.

A variety of archaeometric techniques could be used to characterize these wine cups and containers from a newly discovered storeroom.

(Gamma)

The need for characterization studies is the result of a reorientation in the ways archaeologists have perceived how trade and exchange have operated in the past. The realization that migrationist/invasion models could not adequately explain the distribution of material across the landscape, or changes in societies over time, led archaeologists to look at other mechanisms. By studying trade and exchange, the intention was to reconstruct the economies and organizations of past societies and their changes over time. Access to and control over prestige goods through trade and exchange were seen as the prime movers for change leading to ranked societies.

Dating Techniques

Colin Renfrew (1982, 94) pointed out that dating is the most fundamental archaeometric technique available to archaeologists. Two of the most important techniques that revolutionized archaeology are dendrochronology and radiocarbon dating. Today, many techniques are used in dating, including luminescence, fission track, potassium argon, fluorine and nitrogen dating, obsidian hydration dating, and amino racemisation analysis on bone. When these techniques were developed, archaeologists were ready to apply them.

Dendrochronology

Dendrochronology was pioneered in the beginning of the twentieth century by the astronomer A.E. Douglass. The Laboratory of Tree-ring Research at the University of Arizona was set up shortly afterward, and a few more laboratories added forty years later. Toward the

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beginning of the twenty-first century, there were over 100 tree ring programs (Dean 1997, 33). The technique entails the use of tree growth rings for dating and studying climatic variations in the past. Although Douglass had been researching tree growth rings since the beginning of the twentieth century, it was in the 1920s that he applied the technique to archaeology by constructing a chronology for Pueblo ruins of the U.S. Southwest. A tree adds a ring (xylem growth) each year, so by counting the number of rings one can obtain an estimate of age. The thickness of the ring is dependent on climatic variations: wet years produce thick rings; dry years, thin rings. Ring patterns from different species of trees are compared and cross-dated with known age samples to form a baseline with which to compare older samples, thus building up a sequence of tree ring growth back into the past.

The Radiocarbon Revolution

One of the most important archaeometric techniques is radiocarbon dating, one of a number of techniques that use radioactive decay. It was pioneered by willard libby, then of the University of Chicago, in the late 1940s and is based on the premise that all living organisms have an uptake of radiocarbon (carbon-14) that ceases when they die. As carbon-14 is unstable, it decays at a half-life of what Libby thought was 5,568 years. By measuring the amount of radioactive carbon of organic matter in an archaeological sample (charcoal, bone, or shell) of known age and comparing it to the radiocarbon in living matter, Libby was able to estimate the time lapse since the organism died.

Radiocarbon dating has undergone many changes since its advent, in particular with regard to refinement in the calculation of the half-life, the development of a calibration curve to give calendar years, and in the techniques for measuring the amount of carbon-14 in a sample. Accelerator mass spectrometry (AMS), for instance, is a relatively new method that determines the amount of carbon-14 in a sample by measuring the atoms directly. Although more expensive than the conventional C-14 dating, this method can utilize much smaller samples.

The importance of radiocarbon dating for both chemistry and archaeology cannot be overestimated. Libby was awarded the Nobel Prize for Chemistry in 1960, and laboratories were set up at the University of Pennsylvania in 1951 and in various centers in Europe soon after the one at Chicago. For the first time, chronologies could be established for areas where conventional dating techniques were difficult to apply. The human time depth of areas such as Australia, Southeast Asia, and the Pacific was recognized for the first time, and a “revolution” occurred in dating Europe's prehistory, which had been previously based on cross-dating to objects of known age. For a full discussion on the radiocarbon revolution on European and U.S. archaeology see Renfrew (1976) and G. Marlowe (1999), respectively.

Luminescence Dating

Although first suggested in the mid-1950s and there was an application to archaeological pottery in the 1960s, it has only been since 1970 that thermoluminescence dating (TL) has been applied routinely in archaeology with levels of precision of plus or minus10 percent. Major developments occurred after dedicated laboratories were set up, such as that by Michael Aitken at Oxford University during the 1960s, and a book on the technique and its application to archaeology was published in 1979 (Fleming 1979).

The advantage of TL is that it dates the artifact itself. TL has been used to date archaeological materials that have mineral grains, such as quartz and feldspar, and have been exposed to heating: pottery, flint, burned stone, earth ovens, etc. TL is based on the assumption that energy from long-term exposure to ionizing radiation is built up or trapped over time in the lattice of crystals. When heated above 500 degrees centigrade, this stored energy is released in the form of emitted light called thermoluminescence,

and the TL clock reset back to zero. The measurement of TL emitted can indicate the time elapsed since the last firing.

Major advances have occurred since the development of the technique, including the use of optical dating (OD). Rather than dating minerals

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Major advances have occurred since the development of the technique, including the use of optical dating (OD). Rather than dating minerals

that have been exposed to heat, OD measures exposure to light, that is, the stored energy released by an exposure to a beam of light, for instance, blue/green light or infrared radiation (see Aitken 1997, 183). Optically stimulated luminescence (OSL) is defined by Aitken as "commonly used as an umbrella term that includes both types of stimulation as well as use of other wavelengths" (Aitken 1997, 183).

The discovery of the 5,000-year-old frozen "ice man" in 1991 afforded a unique opportunity for the application of biological techniques to an archaeological find.

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Optical dating, like thermoluminescence, allows the dating of sediments. The dating of sediment became possible in the 1980s, with the dating of unburned sediment extending the chronology of Australia (Roberts, Jones, and Smith 1990).

Future Directions in Archaeometry

Advances in science have given archaeologists unique insights into the social and economic development of societies through identifying trade and exchange, and they have given chronological depth to the discipline. These advances have been supported by the development of institutional laboratories. The collaboration between archaeology and physics was to bear fruit in the 1950s with the establishment of the Oxford Research Laboratory for Archaeology and Art, which arose out of the collaboration between an archaeologist (Christopher Hawkes, professor of European archaeology) and a physicist (Lord Charwell, professor of physics). Other early laboratories include the Applied Science Center for Archaeology at the university of pennsylvania museum of archaeology and the british museum. These laboratories set the standards for interlaboratory comparisons, and meeting places were arranged to ensure open dialogue among the practitioners. Subsequently, a series of conferences arose, including the International Symposium on Archaeometry, which is held every two years (the thirty-second symposium was held in 2000).

Since 1980, there has been a proliferation of journals, societies, and news groups covering the many different types of applications of science to archaeology. Since the success of the journal *Archaeometry*, other journals have been started, including *Journal of Archaeological Sciences,*

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Argentina

The Early Nineteenth Century

The quest for knowledge of our past is one of the most universal human preoccupations, but it is not necessarily the first priority of a nation, state, or people. For this reason, in Argentina (as in many other countries) it is difficult to pinpoint the particular moment in time when archaeological inquiry began. Travelers, pioneers, and colonizers left important references and data about this huge South American country beginning in the early sixteenth century when the Spanish first arrived on its shores, looking for a maritime passage between the Atlantic and Pacific Oceans. After Argentina gained its independence from Spain in 1816, many of its intellectuals began to be influenced by the great European naturalists of the nineteenth century, not only through their books but also through their visits to the country.

Under this naturalist boom the Argentine government established the Museo Nacional in 1864, which was the foundation of archaeological research there. The museum comprised an archaeological section where researchers such as Burmeister, F.P. Moreno, F. Ameghino, J.B. Ambrosetti, E. Boman, Outes, Casanova, and Gallardo began Argentine archaeology. They were influenced by Charles Darwin, Alexander von Humboldt, and William Wallace and also by the Argentine historical movement known as

the Generación de 1880. Scholars such as F. Ameghino, F.P. Moreno, and R. Lista explored Argentina and collected different kinds of scientific information, including archaeological evidence.

The results of this research were initially circulated within a small academic milieu-among the staff at the Museo Nacional and the Sociedad Científica Argentina, for example. It was not until the creation of the Museo de Ciencias Naturales at the Universidad de La Plata (ULP) in 1880 and the Museo Etnográfico at the Universidad de Buenos Aires (UBA) in 1904 that archaeology was inserted into the curriculum of some history courses.

This first Argentine archaeology was characterized by a historical perspective and the meticulous description of collected artifacts. Important museum collections were established as a result of different expeditions, and most of the archaeological materials were gathered from exploratory excavations or exposed surfaces. The interpretations of the collections were based on linguistics, ethnography, and ethnohistory, focusing

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This first Argentine archaeology was characterized by a historical perspective and the meticulous description of collected artifacts. Important museum collections were established as a result of different expeditions, and most of the archaeological materials were gathered from exploratory excavations or exposed surfaces. The interpretations of the collections were based on linguistics, ethnography, and ethnohistory, focusing

on the relationship between the known native populations and the recovered archaeological artifacts. Archaeology was regarded as part of the natural sciences, but two different influences affected it: the first and most common was the naturalist influence, as expressed in the works of Moreno and Burmeister (which in turn influenced Lista, Roth, and Pico), and the second was the evolutionary influence, as seen in the work of the Ameghino brothers and Ambrosetti. Between these two perspectives were the works of people such as S. Lafone Quevedo, Zeballos, Rusconi, Montes, and Vignati. Patagonia, the Argentine northwest, and the Pampas were the regions most explored during the nineteenth century, primarily by researchers who lived in Buenos Aires and La Plata. There were few local researchers in other cities, with the exception of A. Quiroga in Catamarca.

The last thirty years of the nineteenth century were important for the development of Argentine archaeology because they established the regionalization of future work. During these years travelers, naturalists, and explorers were able to conduct research because leaders of the Generación de 1880 were establishing and maintaining territories and boundaries to support their political and economic interests. In Patagonia, for instance, Argentina disputed the frontier with chile, which necessitated constant territorial reconnaissance; inhabited by hunter-gatherers, Patagonia was regarded as a land of savagery. In the northwest region, the Argentine government was trying to establish certain industries, including the sugar industry, and it needed the cooperation of local workers; the social structures of the northwest, given the Inca influence and the significant and large Creole population there, were easy to incorporate into the Argentine economy. (The difference between these two regions-a very real one from both anthropological and archaeological points of view-became the basis of the stereotype that has been perpetuated over time.) The Pampas-the land of gauchos and *estancias* (large rural holdings)-was far away from frontier problems and Creole populations, and it, too, was easily incorporated into the Argentine economy. These three regions would be the subjects of major archaeological investigations in the twentieth century.

The First Half of the Twentieth Century

The first decades of the twentieth century were significant because of the number of foreign researchers at work in Argentina's northwest region, among them R. Lehmann Nitsche, Boman, and E. Nordenskölld. The Museo de La Plata held the most important archaeological collections, including one from F.P. Moreno. In 1911 the Instituto Geográfico Argentino, which had supplied more funds for archaeological projects than any other institution, disappeared, and the Sociedad Científica Argentina began to support archaeological investigations. The University of Buenos Aires and the University of La Plata also started to fund archaeological research and expeditions, the most important of which were those of UBA's Museo Etnográfico and ULP's Museo de Ciencias Naturales specifically in the northwest region. In addition, significant private support for archaeology came from individuals, such as B. Muñiz Barreto. During these years Argentina began to participate in and be recognized by the rest of the scientific world, and it hosted two international congresses of Americanists, one in 1910 at Buenos Aires and the other in 1932 at La Plata. At both congresses significant discussions were devoted to the archaeology of Patagonia and the northwest.

Even as archaeological investigations of the Pampas comparatively decreased, more archaeological expeditions headed to the northwest region than to any other area of Argentina in the first decades of the twentieth century-including those by Ambrosetti (see photo, page 108), Weiser, Lehmann Nitsche, max uhle, and Gerling. Meanwhile, the first chronological frameworks for Argentine archaeology began to appear: for the northwest by Ulhe, Boman, and Ambrosetti; for Patagonia by junius bird; and for the Pampas by the Ameghino brothers. Archaeology was still only taught in single courses at the Universities of Buenos Aires and La Plata, and the naturalist influence on archaeology slowly waned, with historical

and ethnohistorical explanations becoming more popular. In the 1930s Imbelloni was the first archaeologist to

use the methods of the Vienna school. In 1936 the Sociedad Argentina de Antropología was created, with only ten members; Outes served as its first president. This society arranged a number of important scientific meetings-the Semana de Antropología-for the discussion of anthropology and archaeology.

Section of the Pucará de Tilcara, Jujuy

(Photo by Noel Montoya)

During the economic depression of the 1930s, and throughout World War II, archaeology and prehistory courses were given at other universities such as Rosario, Cuyo, Tucumán, and Córdoba, resulting in a significant increase in the number of researchers and research projects. In addition, archaeological investigations of whole new areas were launched-in the Mesopotamia regions by Serrano and de Aparicio and in Cuyo by Canals Frau and Semper. However, most of the fieldwork was still done in the northwest; the least was done in the Pampas and Patagonia.

The Second Half of the Twentieth Century

During the post-World War II period Argentine archaeology flourished. This was the consequence of the work of Wendell C. Bennett and A.R. González in the northwest and the arrival in Buenos Aires of O. Menghin. After 1955, with the advent of radiocarbon dating, more-regional explanations of archaeological variation were discussed. Between 1950 and 1960 both the University of Buenos Aires and the University of La Plata began to teach anthropology and to specialize in archaeology, definitively incorporating both in an Argentine university degree. Other universities followed their example over the next decades.

The work of González and Menghin characterized Argentine archaeology after the 1960s. González, working in the northwest, and Menghin, working first in the Pampas and later in Patagonia, resolved the theoretical framework for each region, and their studies were followed up by other archaeologists, such as Cigliano, Bórmida, Schobinger, and Lafon. However, they also represented two opposing traditions and schools of thought: González the North American culture-history school and Menghin the Vienna school. Both of them established general regional chronologies that would be used for the next forty years.

The Argentine national government became

with the need to build middle-range theory and in the amount of work related to formation processes (taphonomy), faunal analysis, and regional studies.

The rebirth of democracy at a national level has led to the return of the exiled archaeologists who emigrated in 1976, the creation of new careers in archaeology at other universities, and more opportunities for research. The Argentine National Congress of Archaeology now meets regularly and more frequently than in the past-every two to three years-and a number of important regional meetings address specific topics. Northwest regional studies have begun to flourish once again, and the Pampas has been definitively incorporated into archaeological discussions, as have the Sierras Centrales, Cuyo, and the Mesopotamian regions. New research areas in Patagonia have also been incorporated. Unfortunately, however, some parts of Argentina, such as the Chaco, remain almost archaeologically unknown today.

After the 1980s it became common for Argentine archaeologists to pursue postdoctoral work overseas-especially in the United States and the United Kingdom-and Argentine archaeologists now routinely attend international congresses and meetings, not only submitting papers but also organizing symposiums. In addition, a number of Argentine students have taken postgraduate courses in North American and European universities since 1995.

Argentine Archaeology Today

As a normal consequence of the maturing of Argentine archaeology, there are few debates today pitting the northwest against Patagonia or processual against more traditional archaeology. Theoretically and methodologically speaking, Argentine archaeology now comprises a variety of perspectives: the evolutionist approach (Lanata, Borrero); social theory in all its different aspects (Nielsen, Acuto, Lazarri, Zarankin); postprocessual archaeology (Haber); historical archaeology (Senatore, Bárcena); urban archaeology (Weissel); underwater archaeology (Elkin); and heritage and conservation (Endere and Curtoni). There is also an increase in contract archaeology. The chronological frameworks of the northwest from the 1960s are being rebuilt and extended not only by members of younger generations of archaeologists, such as Ratto and Muscio, but also by older and more established members of the field, such as Pérez Gollán and Tarragó. Finally, the Asociación de Arqueológos Profesionales de la República Argentina (AAPRA) was founded in 1998, and J. Rodriguez was elected as its first president.

José Luis Lanata

See also

Bolivia; Brazil

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Ashmolean Museum

Opening on 24 May 1683, the Ashmolean Museum in Oxford, England, was originally based on the private collection of Elias Ashmole (1617-1692), which was presented to the University of Oxford. At the core of Ashmole's gift was a collection originally assembled by John Tradescant the elder (died 1638) and his son John Tradescant (1608-1662).

The first curator of the Asmolean Museum was Robert Plot, an antiquary of distinction. Unusually, from the start the Ashmolean was open to the public and had clear research and teaching (as well as display) functions. The fortunes of the museum waxed and waned over the next 150 years with the natural history side of the collections assuming greater importance than the human antiquities.

However, from the mid-nineteenth century onward, the character of the Ashmolean Museum changed to the form we know today, comprising

with the need to build middle-range theory and in the amount of work related to formation processes (taphonomy), faunal analysis, and regional studies.

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José Luis Lanata

See also

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significant collections of antiquities derived from archaeological excavation and collection. Many famous collections have been presented to the Ashmolean, an example being sir richard colt hoare's donation of "the Douglas collection" of Anglo-Saxon antiquities in 1827. The museum has also benefited from the activities of its keepers, the most famous of whom was sir arthur evans. Under Evans, the Ashmolean once again rationalized its exhibits, expanded, and moved into new premises in Beaumont Street in Oxford. These changes have ensured that the Ashmolean remains one of the most significant archaeological museums in the world, and the research of its staff allows it to remain at the cutting edge of world archaeology.

Ashmolean Museum

(Ancient Art and Architecture Collection Ltd.)

Tim Murray

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Atwater, Caleb (1778-1867)

An early American antiquary and amateur archaeologist who was born in North Adams, Massachussets. Atwater received a B.A. from Williams College and became a Presbyterian minister; he later studied and practiced law in New York City. After moving his legal practice to Circleville, Ohio, in 1815 to practice law, he used his spare time to study and record local earthworks and antiquities. The American Antiquarian Society (established in 1812) published his *Descriptions of the Antiquities Discovered in the State of Ohio and Other Western States* (1820) in the first volume of their transactions.

The earth mounds discovered west of the Appalachian Mountains contained artifacts made of pottery, shell, and native copper, and they challenged the widespread belief that native American Indians were too primitive and inferior to create such "sophisticated" artifacts and complex structures. Indeed at that time the bulk of observers could not accept that the ancestors of native American Indians were capable of such building feats, and their origins of the earth mounds became the focus of an ongoing debate. Some antiquarians and members of the public argued that they were built by Vikings or other Europeans, or by the ancestors of Mexicans

who later moved south. Other scholars proposed that indigenous Americans had destroyed the civilization that built the mounds, and used this as part of a justification to in turn destroy them. Atwater had his own theory about their origin, arguing that the mounds had been constructed by Hindus who had migrated from India, via Ohio, to Mexico. Notwithstanding these now discredited hypotheses, Atwater's study contained valuable descriptions of the earthmounds, which were later destroyed.

Atwater became an active local politician, and in 1829 he was appointed by President Jackson to help negotiate a treaty with the Winnebago and other Indians at Prairie du Chien in what is now Wisconsin. In 1833 he published an account of this process and his travels, which included his earlier study on antiquities in *The Writings of Caleb Atwater.* In 1838 he published *A History of the State of Ohio, Natural and Civil,* one of the earliest histories of the state.

Tim Murray

See also

Jefferson, Thomas; United States of America, Prehistoric Archaeology

Aubrey, John (1626-1697)

John Aubrey was born and grew up near Malmesbury, Wiltshire, England, where Neolithic remains cover the countryside. The son of local gentry, Aubrey was a close friend of the philosopher Thomas Hobbes and attended Trinity College, Oxford, where he indulged his passion for learning and his insatiable curiosity for all things old.

John Aubrey

(Ann Ronan Picture Library)

The formative influence on Aubrey's early career was william dugdale's *Antiquities of Warwickshire* (1656), which inspired him to begin a similar survey of Wiltshire. Most of the material he collected for his “Wiltshire Antiquities” could be classified as local history and his compilations were for the most part fairly conventional and in the tradition of Dugdale.

The unconventional material in his collections related to ancient stone monuments and earthworks, to which he was powerfully attracted. His familiarity with Wiltshire had made him aware of the large number of standing stones, tumuli, and barrows scattered across the country, and his imagination was stirred by his attempts to guess the origin and purpose of these monuments. Stonehenge had always fascinated him, but he himself discovered the even larger Neolithic monumental complex at avebury in 1649, when he was out hunting. The nucleus of Avebury was largely known as an ancient site, but Aubrey was the first to recognize the full extent of the monument and to appreciate that it was not a camp but some kind of ceremonial site, the scheme of which had been obscured by the growth of the village on the spot. He identified the circle of megaliths for the first time as a man-made construction and he returned many times to map the complex and reflect on its significance. He traced the bank and fosse, proving that it was not part of a defensive system. He identified the first section of the great avenue and suspected it had a ceremonial function. He was able to reconstruct a secondary circle of stones within the greater circle. He also tried to locate the complex within the landscape, by noting the old approach roads and the relationship of Avebury to Silbury Hill and to neighboring barrows.

As his interest in the explication of ancient monuments grew he abandoned “Wiltshire Antiquities” and began a new manuscript devoted

Australia, Historical

Formal British settlement of Australia did not begin until 1788, with the establishment of the convict colony at Sydney, but there is a much longer history of European exploration, which began with the Dutch in the seventeenth century. Along the north coast of Australia there was also an extensive trading system with fishermen from Southeast Asia that dates to at least the eighteenth century (McKnight 1976). European settlement began in earnest in the nineteenth century, and the archaeological record of colonization has been shaped by the influences of global economies and industrial technologies, which were by then well established. Since the 1970s terrestrial and maritime archaeologists have begun to investigate this material record, and vital and dynamic fields of research have emerged. The archaeology of the postcontact period is typically called "historical archaeology," although "contact archaeology" and "Aboriginal historical archaeology" are also used to describe the archaeology of the Aboriginal people during the same period.

The origins of historical archaeology in Australia date to the 1960s and the first excavations of European settler sites. At the Australian National University in Canberra, Jim Allen (Allen 1969) undertook Ph.D. research on Port Essington, in the Northern Territory, while Campbell McKnight (1976) studied the Macassan trepang industry (sea slug harvesting) that flourished in the same region, also for a Ph.D. At the University of Sydney, Judy Birmingham (1976) carried out excavations at James King's pottery at Irrawang, New South Wales, and at the Tasmanian Aboriginal settlement of Wybalenna on Flinders Island. At the University of New England, Graham Connah began the study of the pastoral establishment of Winterbourne (Connah, Rowland, et al. 1978). In Melbourne, Bill Culican from the University of Melbourne excavated the Fossil Beach cement works on the Mornington peninsula (Culican and Taylor 1972). During the same decade, sport divers in Western Australia discovered the wreck sites of Dutch East India Company ships, among them the *Batavia* and the *Vergulde Draeck* (Green 1973, 1989), and maritime archaeology in Australia began.

Ian Jack (1985, 153-156) attributes the emergence of historical archaeology at this time to two developments. One was an increasing interest in what he terms *local history* within university history departments and the attendant interest in its surviving physical remains. The second development came from within departments teaching classical and Near Eastern archaeology where a need was identified for a less costly means of training students in excavation methods than the traditional practice of taking them to sites overseas. Thus, one of the important forces shaping historical archaeology in Australia was, from the outset, its institutional home in departments of prehistory, classical, and Near Eastern archaeology.

As those departments were themselves closely modeled on British university systems, anthropology was not as great an influence in Australian historical archaeology as it was in the United States. In addition to those with a training in archaeology, other early practitioners came from a variety of backgrounds, including history, geography, architectural history, and engineering. All of these scholarly traditions influenced the field, and the wide-ranging and multidisciplinary nature of historical archaeology in Australia was thus established from the beginning. In 1971, the Australian (now Australasian) Society for Historical Archaeology (ASHA) was formed, and it was followed in 1982 by the Australian Institute of Maritime Archaeology (AIMA).

The field grew rapidly during the 1970s, led by scholars at the University of Sydney and the University of New England and as a result of the emergence of cultural heritage management. By 1983 and the publication of the first issue of ASHA's journal *Australian Journal of Historical Archaeology* (later *Australasian Historical Archaeology*), Jane Wesson (Wesson 1983, 1984) was able to compile a bibliography of more than 450 entries. Many of these studies were necessarily descriptive, as

researchers attempted to define the nature of material record of Australia's settler society.

Other scholars, however, were already seeking to understand local sites within wider historical and archaeological contexts. Allen (1973)

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Australia, Prehistoric

The practice of archaeology in Australia has always been conditioned by two major factors: by ideas that European Australians have had about the nature and history of Aboriginal society and by the fact that European Australians have maintained a close and abiding interest in the history of European civilization. For the greater part of the last 200 years, archaeology in Australia has generally meant

archaeology done by Australians in the Mediterranean and the Middle East, as part of a more general inquiry into the history of civilization and (more particularly) the archaeology of the Bible. This area remains a significant focus for archaeological activity by Australians, with courses in ancient history, art history, classics, and Near Eastern studies being offered at many Australian universities and with considerable funds being provided by the Australian government to support field research in italy, greece, cyprus, Egypt, turkey, jordan, and Syria.

Since the 1960s, however, there has been a tremendous growth of interest in the archaeology of Aboriginal Australia and in the historical archaeology of European settlement. During this period university departments teaching Australian archaeology have been established, legislation protecting the archaeological heritage of black and white Australians has been passed by state and federal departments, major government agencies (such as the Australian Heritage Commission) have been established to administer such legislation, thousands of sites have been located, recorded, and excavated, and Australian archaeology has acquired international prominence. By far the majority of Australian archaeologists work in this field, and it has now become clear that their discoveries have revolutionized white people's understanding of Aboriginal society in Australia. The implications of that improved understanding (particularly a growing acceptance of the value of Aboriginal Australia and of the need to restore self-determination to the traditional owners of the continent) have become powerful elements in contemporary Australian politics and society.

In this entry these two branches of Australian archaeology are discussed separately because,

notwithstanding the fact that they are frequently taught at the same universities (with students taking courses in both areas), there has been remarkably little professional contact between the two fields until recent times. This is partly explained by the real differences in technique and approach that exist between them, but these differences are just as great in the archaeology of Africa, Southeast Asia, and the Pacific, where many Australians also work. A more complete explanation would encompass an understanding of the cultural and institutional contexts of the two fields and of their very different histories.

Australian Prehistoric Archaeological Sites

The Archaeology of European Civilization

Australians of European ancestry have long been interested in the history of European civilization. Although formal courses in the art and archaeology of the Mediterranean did not begin at the University of Sydney until 1946, the Nicholson Museum (the core collection of which was given to the university in 1860) became

a focus for students of Classical antiquity before that time. In 1948 the Department of Archaeology was established, and the professor Dale Trendall (Australia's most eminent classical scholar) was joined by J.R.B. Stewart (who would become a professor) to expand offerings in the archaeology of Cyprus and the Middle East. Since then the teaching of classical and Middle Eastern archaeology has flourished, especially at the University of Sydney but also at the Universities of Melbourne, La Trobe, Macquarie, Monash, New England, Queensland, and Tasmania and at the Australian National University (ANU). Field research has been undertaken in Greece at Zagora on the island of Andros, at Torone in the Chalkidiki, and at Koukos near Sykia. Australian teams have also worked at Pompeii and I Fani in Italy, at Teleilat Ghassul and Pella in Jordan, and in Egypt, Cyprus, Turkey, the Persian Gulf, and Syria. Universities and the great state galleries and museums have not been the only sources of funding and inspiration for research into the archaeology of the Middle East. Indeed, one private foundation, the Australian Institute of Archaeology in Melbourne (founded in 1946 with a focus on using archaeology to prove the literal truth of the Bible) has made significant financial contributions to research and the education of the general public. The vigor of this field of archaeology is reflected in the recent founding of the journal *Mediterranean Archaeology* as a vehicle for the publication of research undertaken in Australia and elsewhere. Perhaps most significant was the foundation of the Australian Archaeological Institute at Athens. Begun in 1981 by Alexander Cambitoglou, then professor of Classical archaeology at Sydney University, the institute has developed into a significant force for the promotion of classical scholarship and has branches in all the states of Australia.

The Archaeology of Australia

Although the archaeology of Australia has only recently been taught in Australian universities, an interest in the archaeology of the region began with the European conquest of the continent in 1788. Detailed studies of Aboriginal life and customs were undertaken for a wide variety of purposes, but questions of origin and antiquity were always prominent. Where had the Aborigines come from? How long had they been in Australia? Were the inhabitants of Tasmania and the Aborigines of the mainland really the same people? What lessons could Europeans learn from the Aborigines?

It was soon recognized that the conquest of Australia would have disastrous consequences for the traditional landowners, as dispossession was frequently followed by death due to social dislocation, disease, and frontier violence. These factors underscored the conventional wisdom about “strong” races overcoming the “weak” and led to the widespread acceptance of the inevitability that traditional Aboriginal society would die out. This popular understanding gave further impetus to those hoping to record examples of the most savage (and hence most primitive) of all the human races, before all evidence of the “childhood of humanity” disappeared from view. Thus, from the first, an understanding of the antiquity of Aboriginal Australia and the need to document traditional societies under great stress became part of the same process. Archaeology, ethnography, and anthropology have had an enduring relationship in Australia ever since.

The sense that Australian Aborigines were a “people without history” stemmed from the fact that for the greater part of the nineteenth century European observers could not imagine a people more primitive than contemporary Aborigines. This meant either that Aboriginal society had remained fixed and unchanged since the initial colonization of Australia or that it had experienced periods of growth and stasis and degeneration over the centuries. In either case the contemporary inhabitants (particularly the Tasmanians) were believed to be the best examples of what Europeans had looked and behaved like long ago. Thus an important early stimulus to archaeological inquires was the sense that Europeans were documenting their own history in their studies of Australia. Yet there were always inconsistencies in this approach, especially when it was recognized that the real social and cultural differences between

Aboriginal societies at contact were magnified by differences in

numbers of archaeologists, the expanding range of working environments (from universities and museums to private consultancies, government agencies, and Aboriginal organizations), the vast increase in government and private funds being applied to archaeological investigations, and the increasing importance attached by Australians to the archaeology of their country. Beginning with the appointment of john mulvaney to the History Department at Melbourne University in 1953 and greatly strengthened by appointments made to the Anthropology and Prehistory Departments at Sydney and ANU shortly afterward, the archaeology of Aboriginal Australia has become a very significant element in Australian culture. Since 1970, thousands of sites have been recorded and excavated, and our understanding of the human history of the continent has been transformed. Sites such as Lake Mungo have been placed on the World Heritage register, and the presence of significant cultural remains in Kakadu National Park and southwest Tasmania contributed to their World Heritage listings as well. Australians now understand that the Aboriginal history of their country exceeds 40,000 years and is marked by great cultural change and variety. Australian archaeology is taught in every mainland state and territory today, and it plugs into an increasingly complex infrastructure of government agencies created to administer heritage legislation and promote an understanding of Aboriginal Australia (such as the Australian Institute of Aboriginal and Torres Straits Islander Studies, founded in 1961). During this period Aboriginal people have reasserted their rights and interests in the investigation and management of their heritage. As a result Australian archaeologists of the modern era are more aware that they are investigating not the relics of a dead or dying society but the history of a living one. The implications of this fundamental change of focus have been very significant indeed.

Oceania, Asia, and the Archaeology of Contact

During this same period Australian archaeologists also paid increasing attention to the islands adjacent to the tropical coastlines. Although a great deal of the focus has been on Papua New Guinea and Melanesia, Australians have worked (and continue to work) in Timor, Indonesia, and Southeast Asia. Research initiatives, such as the Lapita Homeland Project organized by Jim Allen, first professor of archaeology at La Trobe University in Melbourne, were based on a perception that understanding the history of oceanic exploration and settlement required the assembly of an international team of researchers. Much the same thinking has supported a more consistent push by Australian-based researchers into China and south Asia.

Although there has long been a strong focus on establishing the antiquity of human occupation in Australia, the 1990s also witnessed a rapid expansion in contact archaeology, a branch of the general discipline that deals with the archaeology of Aboriginal Australia during the phase of initial contact by Europeans, Macassans, and, in some cases, Chinese. It is widely recognized that contact archaeology's subject matter can be more general than this-for example, it might cover longer periods of interaction between Aboriginal people and others at places such as mission stations as well as pastoral and industrial enterprises. Again the question of what constitutes contact is quite vexed because it is now understood that items of European material culture were entering Aboriginal societies well in advance of actual European exploration or settlement. This type of “wave effect” certainly applies to disease, for Aboriginal populations (particularly in the southeast of the continent) were already seriously jeopardized by the introduction of exotic viral and bacterial infections.

Interest in contact archaeology is increasing among archaeologists, but it has long been a significant inquiry for Aboriginal people. Although some see it as the archaeology of the “end” of traditional Aboriginal society and the beginning of European Australia, others are beginning to realize that contact studies might allow us to examine the archaeology of present-day Aboriginal Australia-particularly of Aboriginal communities that have been established since the middle of the nineteenth century. It is

frequently difficult to identify Aboriginal people in

the absence of identifiably Aboriginal material culture (such as stone tools), but archaeologists are developing approaches that integrate oral histories, archaeological investigation, and documentary evidence (such as maps, company records, private diaries, and the records of government departments) to overcome this "invisibility" factor.

The benefits of this new approach have been seen in our enhanced understanding of how Aboriginality has changed and developed in institutional environments such as the Lake Condah Mission (Victoria) and Wybalenna (Flinders Island). Contact sites associated with less-structured contexts, such as Macassan trepanging (sea slug harvesting) sites (northern Territory) or stock camps such as Burghley (Tasmania), are also being investigated.

Past, Present, and Future?

Understandings of the nature and significance of the human history of Australia have long had great influence beyond the shores of the island continent. In the nineteenth century (and well into the twentieth century), reports of the customs, technologies, and societies of indigenous Australians played a vital role in the development of anthropology and archaeology. Indigenous Australia was considered to be one of the great laboratories of "primitive" human beings. With the great expansion of archaeological research beginning in the 1960s, Australians came to understand the scale and richness of the history of Australia before the European invasion in the late eighteenth century. These developments also attracted the attention of archaeologists (particularly in the United States and the United Kingdom) who were keen to conduct ethno-archaeological studies among contemporary indigenous Australians. The primary purpose of these studies was to pursue inquiries about prehistoric society, technology, and human ecology on the world scale. These studies attracted considerable interest among local archaeologists, but by far the bulk of their attention was (and still is) firmly focused on establishing the antiquity of human beings on the continent and documenting the changing relationships between people and environment. The benefits deriving from this foundational work are undeniable, but they have led to a sense of theoretical stagnation within a discipline concentrated on absolute dating technologies as well as a decline in the impact of archaeology on Australian society. Thus, although the archaeology of Australia continues to pose great methodological and theoretical challenges to the field, the struggle to broaden the focus of research beyond a concentration on antiquity and human ecology is perhaps the greatest challenge of all.

Tim Murray

See also

Australia, Historical; Golson, Jack; McCarthy, Fred; Papua New Guinea and Melanesia; Polynesia

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Austria

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Archaeology in Austria is carried out within two academic disciplines: classical archaeology and pre- and proto-history. The investigation of the Stone, Bronze, and Iron Ages is the domain of prehistory; the archaeology of the provinces of Raetia, Noricum, and Pannonia, in part coeval with the area of modern Austria is the domain of classical archaeology. Prehistorians study all of the areas north of the Danube, i.e., those that lay beyond the limits of the Roman Empire, in the Roman imperial period, migration period, and early Middle Ages. Generally speaking, medieval and historical archaeological research in Austria today is conducted more by prehistorians and less often by classical archaeologists. An exception to this rule is provided by the archaeological investigation of churches and urban centers, which is mainly conducted by classical archaeologists. The study of the epigraphic finds, so important for Roman provincial history, is the domain of ancient history, and ancient coins found in the country are the province of numismatists. In Austria, provincial Roman archaeology is not an independent discipline.

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One of the first scholars interested in antiquities in Austria was Thomas Ebendorfer von Haselbach (1387-1464), who founded the discipline of history at the University of Vienna. Other scholars in the humanist tradition linked to the court of Emperor Maximilian I included Konrad Celtis and Johannes Cuspinian; later there were Carolus Clusius and Wolfgang Lazius, the latter the first scholar to publish on the Roman monuments of Vienna and to inspire a corpus of ancient coins. The first collections began at this time, and the imperial collection in Vienna and the antiquarian collection in Ambras Castle in the Tirol should be noted. The most important find of this period is the Jüngling of Magdalensberg ("youth" or "young man of Magdalensberg"), which was discovered in state of Carinthia (German, Kärnten) in 1502.

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finds and their publications. In this way, *Carinthia* came to be the most important scientific journal for Austrian archaeology.

Provincial Roman Archaeology

Most of the scholarly institutions concerned with classical archaeology were founded during the second half of the nineteenth century. In 1869, Alexander Conze was appointed to the newly established Lehrkanzel für Klassische Archäologie (Chair of Classical Archaeology) at the University of Vienna, and together with Otto Hirschfeld (holder of the Lehrkanzel für römische Geschichte, Altertumskunde, und Epigraphik [Chair of Roman History, Archaeology, and Epigraphy]) he founded the Archäologisch-epigraphische Seminar (Archaeological-Epigraphic Institute) in 1876. Conze was followed in the Chair of Classical Archaeology by Otto Benndorf, Emil Reisch, Camillo Praschniker, Otto Walter, Fritz Eichler, Hedwig Kenner, and Jürgen Borchhardt.

Other institutions founded in Vienna included the Archäologisch-philologische Gesellschaft (Archaeological-Philological Society) at the University of Vienna. Established in 1889, today it is known as Eranos Vindobonensis, as well as the Kommission zur Erforschung des römischen Limes (Commission for the Study of the Roman Limes). Limes are the boundaries of Roman defense and influence. Established by the Academy of Sciences in 1889 as a result of a proposal from Friedrich von Kenner, the commission publishes the series *Der römische Limes in Österreich (RLÖ)* [The Roman Limes in Austria]. At the instigation of Otto Benndorf, the Österreichische Archäologische Institut (Austrian Archaeological Institute) was founded in 1898. Benndorf's successors as director included Robert von Schneider, Emil Reisch, Camillo Praschniker, Rudolf Egger, Josef Keil, Otto Walter, Fritz Eichler, Hermann Vetters, and Gerhard Langmann. The institute not only organizes numerous excavations, it also publishes excavation reports on Roman provincial sites in the supplements of its *Jahreshefte* [Yearbooks].

The Institute für Klassische Archäologie (Institute of Classical Archaeology) of the University of Graz was founded in 1895 (the first professor in 1890 was Wilhelm Gurlitt, followed by Rudolf Heberdey, Arnold Schober, Erna Diez, and Hanns-Thuri Lorenz), and the Institute für Klassische Archäologie of the University of Innsbruck was begun in 1899 (professors since World War II were Alfons Wotschitzky, Bernhard Neuss, and Elisabeth Walde). Both of these institutes concentrated on the art history aspects of classical archaeology in the Roman provinces. Studies of funerary monuments and bronzes were particularly stressed. More recently, settlement studies and research on Roman villas have been carried out. Provincial Roman archaeology has been represented at the University of Salzburg since the 1970s in the Institut für Alte Geschichte (Institute of Ancient History) where Norbert Heger, Kurt Genser, and Erwin M. Ruprechtsberger have been active in the field.

In addition to the national institutions already named, regional ones have carried out the bulk of the fieldwork in the field of provincial Roman archaeology in Austria. It is impossible to name all of the regional and city museums, associations, institutes, and their members who have been involved in this work (for more information see Niegl 1980). Most of the significant cities of Austria Romana, including Carnuntum, Vindobona, Solva, Teurnia, Virunum, Aguntum, Lauriacum, Lentia, Iuvavum, Veldidena, and Brigantium, have been investigated, though only rarely have architectural remains been preserved. Exceptions include the Archäologische Park Carnuntum (Carnuntum Archaeological Park), adjacent to the Museum Carnuntinum (established 1904) as well as the site displays created by Gernot Piccottini at Magdalensberg and by Wilhelm Alzinger at Aguntum.

Of the many archaeologists involved in such work, some of the outstanding ones who were active in the early twentieth century were Maximilian Groller von Mildensee, Friedrich von Kenner, Wilhelm

Kubitschek, Rudolf Egger, Erich Swoboda, Arnold Schober, Rudolf Noll, and Hedwig Kenner. The focus of their work was, in addition to art history problems, early Christian monuments and the Roman *limes.* In his book on the provincial capital Carnuntum (reprinted three times), Erich Swoboda, professor of ancient history at the University of Graz,

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combined the results of archaeological fieldwork with provincial Roman history. Treatments of grave and votive inscriptions were undertaken by ancient historians beginning with Otto Hirschfeld and Eugen Bormann who worked on *Corpus inscriptionum latinarum* III with Theodor Mommsen. Today, this tradition is carried on by Ekkehard Weber and Manfred Hainzmann. The numerous publications of Fritz Lochner-Hüttenbach are also noteworthy.

Supraregional, monographic studies of small finds are rare. Ceramic research was initiated by August Schörgendorfer and Éva Bónis (Hungary), and *terra sigillata* (red ware pottery) studies were begun by Paul Karnitsch (Austria). Lamps were first systematically studied by Franz Miltner (Austria); *fibulae* (broaches) by Ilona Kovrig (Hungary) and Jochen Garbsch (Germany); bronzes by Robert Fleischer (Austria); bronze vessels by Aladar Radnóti (Hungary); and bricks by Alfred Neumann (Austria). These subjects are researched today by numerous archaeologists working in various parts of Austria. The bibliography in the journal *Pro Austria Romana* gives a good overview of this material. The *Kärntner Museumsschriften* [Kärnten Museum Series] and *Der römische Limes in Österreich* [The Roman *limes* in Austria] are two important series in which individual categories of finds are treated in monograph-length studies.

Research Foci since 1960

The establishment in 1966 by the Austrian Academy of Sciences of the Kommission für das Corpus der Skulpturen der Römischen Welt (CSIR, Commission for the Corpus of Sculpture in the Roman World) is an initiative in which many archaeologists, both from the regional museums and from the Federal Monuments Authority (Bundesdenkmalamt), participate. In 1969, a second chair in Klassische Archäologie mit besonderer Berücksichtigung der Feldarchäologie (Classical Archaeology with Particular Attention to Field Archaeology) was established. First occupied by Vetters, it has also been led by Fritz Krinzinger. Since 1978, the Numismatische Kommission der Österreichischen Akademie der Wissenschaften (Numismatic Commission of the Austrian Academy of Sciences), under the direction of the late Robert Göbl, has published *Die Fundmünzen der römischen Zeit in Österreich* [Numismatic Finds of the Roman Period in Austria]. Thus, for the systematic cataloging of individual categories of material, the various commissions established by the Austrian Academy of Sciences since the 1960s have been of enormous value, particularly since old groups of finds have been restudied in their entirety and published in a new, improved format.

Today, archaeological research in Carinthia is particularly noteworthy, e.g., Piccottini's investigations of traces of early Roman settlement at Magdalensberg and Franz Glaser's work on early Christian churches at Hemmaberg and a late antique bishopric in Teurnia. Such research projects, carried out systematically over a number of years with the results regularly published, are a hallmark of Austrian archaeology.

Another area of research focus is the Roman *limes.* In recent decades Herma Stiglitz and Hannsjörg Ubl have undertaken numerous excavations, although final publications for most of their sites have yet to appear. As a result it is difficult to get an overview of the excavations of Carnuntum, the most important Roman city in Austria, particularly as excavations have been carried out at numerous locales and only rarely published in a coordinated way. Around Carnuntum the damage done by illicit excavators working with metal detectors is clear, as are the problems created by so much uncoordinated fieldwork. Thus, one must conclude that the fragmentation of the research efforts of a relatively small number of investigators among such a large group of institutions and publications is an unfortunate characteristic of provincial Roman archaeology in Austria. The journal *Pro Austria Romana,* founded by Rudolf Noll in 1951, and the annual Österreichische Archäologentage (Austrian Archaeologists Meetings), which began in 1983, have been helpful in facilitating the exchange of up-to-date information. The most important major congress in recent years was the 14. Internationale Limeskongreß (Fourteenth

International Limes Congress) held in Carnuntum in 1986 (proceedings published in *RLÖ* in 1990).

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Prehistory

Prehistoric research in Austria began slightly later than classical archaeology. The foundations of prehistoric inquiry were laid down by Moritz Hoernes around 1860, albeit not in an academic context. In 1870, the Anthropologische Gesellschaft in Wien (Anthropological Society of Vienna) was founded under the leadership of Ferdinand Freiherr von Andrian-Werburg, and the subjects of prehistory, ethnography, ethnolology, and physical anthropology all found a common home there. A prehistoric collection was displayed in the Anthropologisch-ethnographischen Abteilung (Department of Anthropology and Ethnography) of the Naturhistorischen Hofmuseum (Imperial Museum of Natural History), founded in 1889. In 1878, the Prähistorische Commission (Prehistoric Commission) of the Kaiser was founded by the Akademie der Wissenschaften (Imperial Academy of Sciences), under the chairmanship Ferdinand von Hochstetter.

In 1889, Hoernes described Eduard Freiherr von Sacken and Ferdinand von Hochstetter as the two prongs of prehistoric research in Austria, and the division between theoreticians (Sacken) and practitioners (Hochstetter), so typical of Austrian prehistory, was already apparent. Hoernes received the first lectureship in prehistoric archaeology at the University of Vienna in 1893; in 1899, he was appointed to an extraordinary position, albeit in geography; and in 1911, he was given an established chair. Thus, the prehistoric research institutions, which remain important to this day, were all established in Vienna in the second half of the nineteenth century.

Hoernes's study of classical archaeology, his work in the Natural History Museum, and his association with the Anthropological Society laid the foundation for the three research interests that are prominent in his major publications: prehistory as an historical discipline (*Die Urgeschichte des Menschen nach dem heutigen Stand der Wissenschaft* [Prehistory of Mankind in the Light of Current Research], 1892); prehistoric archaeology in the sense of an art history of the remote past (*Urgeschichte der bildenden Kunst in Europa* [Prehistory of the Fine Arts in Europe], 1898); and prehistory as an anthropological discipline with links to physical anthropology and ethnology (*Natur und Urgeschichte des Menschen* [Nature and Prehistory of Mankind], 1909). Hoernes was, first and foremost, a compiler, but in his later years he was also a teacher.

Following Hoernes, Oswald Menghin thought of prehistoric archaeology as a branch of universal history. His close connection with the Viennese school of ethnology, which was deeply influenced by the culture area *(Kulturkreis)* theories of Father Wilhelm Schmidt, influenced Menghin's view of history, which is made clear in his major work *Die Welgeschichte der Steinzeit* [World History of the Stone Age]. The geographical breadth of Menghin's lectures attracted many foreign students as well, and this breadth, which extended well beyond the confines of Austria, is clearly reflected in the Wiener Prähistorische Gesellschaft (Viennese Prehistory Society, which emerged in 1914 from the Anthropological Society and returned to it after 1945) and its journal, *Wiener Prähistorische Zeitschrift* [Viennese Journal of Prehistory].

In 1945, after World War II, Richard Pittioni became the new professor at the University of Vienna. In his *Urgeschichte des österreichischen Raumes* [Prehistory of the Austrian Region], Pittioni elaborated a systematic view of Austrian prehistory, the roots of which were first published in 1937. This work was last revised in 1980. Methodological questions were of particular interest for both Menghin and Pittioni. In this regard, the position of prehistory within a family tree of the sciences was of particular interest, as was its relationship to related disciplines and to complementary natural sciences. In addition, Pittioni was responsible for a sophisticated terminology. On the other hand, his use of parallels between prehistoric find complexes and sociological entities seems too mechanical now, and his overall presentation of prehistory seems too schematic.

J. Ramsauer's excavations in the cemetery at Hallstatt between 1846 and 1863 mark the beginning of scientific excavations in Austria, and Ferdinand von Hochstetter's work was also significant. At the request of the Academy of Sciences, Hochstetter introduced lake-dwelling research

For the late Bronze Age (Urnfeld period), the cemetery studies of Clemens Eibner and the long-term settlement excavations of F. Felgenhauer and Herwig Friesinger are particularly noteworthy.

Four-thousand-year-old body discovered in an Austrian glacier

(Gamma)

Research into the early Iron Age (Hallstatt period) has concentrated on the eponymous site of Hallstatt. New excavations begun there by Karl Kromer in the 1960s were taken over by Fritz Eckart Barth and continue to this day. The excavations of the prehistoric salt mines of Hallstatt are not only unique in Austria but constitute an important research focus of mining archaeology in a broader European context. Two research projects are of particular importance for the late Iron Age (la tène period): the excavations of Dürrnberg bei Hallein in Salzburg and Magdalensberg in Kärnten. *Die Kelten in Österreich* [The Celts in Austria] by Gerhard Dobesch, professor at the Institute of Ancient History in Vienna, brings together all of the ancient sources for this period and forms the foundation for the historical interpretation of the relevant archaeological remains.

In general, it can be said that settlement archaeology has been most prominent since the 1960s, whether studies of specific settlement areas (e.g., Stillfried), valley systems (e.g., the Kamp, Inn, and Danube Valleys), or larger regions (e.g., the Bischofshofen area). Thematic investigations, such as the mining study of the Grauwacken area and the establishment by Franz Hampl of an open-air museum in Asparn on the Zaya River in the 1960s (opened in 1970), are also important. Similarly, the development of modern archaeological techniques, particularly aerial photography, has been significant. The large-scale investigations of the numerous prehistoric cemeteries and settlements of the Traisental (lower Austria) have opened up entirely new perspectives. For the first time, large cemeteries have been excavated and salvaged, and beginning in 1981, Neugebauer has been in charge of some ongoing, year-round salvage excavations.

Proto-history

In 1940, Eduard Beninger became the first Austrian to write a doctoral thesis dealing with

proto-history, and he was followed by Herbert Mitscha-Märheim, Herwig Friesinger, and Falk Daim. Proto-history was still not recognized as a separate discipline as late as 1952, as is shown by the fact that Mitscha-Märheim's *venia legendi* (right-to-lecture qualification) from the University of Vienna included the awkward title "non-Roman archaeology of the first millennium in Central Europe." In 1949, a Conseil du Haute Moyen-Age (Council of the High Middle Ages) was formed in Linz, and members included, among others, Wilhelm Albert R. von Jenny, Rudolf Egger, Erich Zollner, and Mitscha-Märheim.

Thanks to the systematic study of Germanic, Avar, and Slavic finds by Friesinger and students of Mitscha-Märheim (who succeeded to the chair formerly held by Pittioni in 1978), the state of proto-history publications is relatively good. Peter Stadler's studies on the seriation of Avar cemeteries have broken new ground, methodologically speaking, in terms of both chronology and spatial analysis. A series edited by Daim entitled *Studien zur Archäologie der Awaren* [Studies in the Archaeology of the Avars] publishes work by many colleagues in countries east of Austria. Close cooperation with the Institut für österreichische Geschichtsforschung (Institute of Austrian Historiography) has been particularly stimulating and has led to important discussions of ethnogenesis as well as to academic conferences in neighboring countries, including the regular symposia on *Ausgewählten Problemen der Frühgeschichte* [Selected Problems of Protohistory].

One of the first articles on medieval ceramics was by Beninger (Beninger 1958), and for this reason he can be considered a pioneer in the field of medieval archaeology. Later scholars active in this area included Hertha Ladenbauer-Orel, for city and church excavations; F. Felgenhauer, who founded an archive for medieval archaeology; and Pittioni, who in 1976 proposed the creation of a Kommission für Mittelalter-Archäologie (Commission for Medieval Archaeology) within the Prehistoric Commission of the Austrian Academy of Sciences. In 1989, Sabine Felgenhauer completed a doctorate in medieval archaeology, and in 1992, Daim was appointed to an extraordinary professorship in proto-history and medieval archaeology at the Institute of Pre- and Protohistory of the University of Vienna.

The roots of the archaeology of the modern era go back to the terms *Industriearchäologie* ("industrial archaeology") and *Gasthausarchäologie* ("inn" or "hotel archaeology") introduced by Pittioni in 1968 and 1969, respectively. Thereafter, rescue excavations took place in advance of major building projects in, for example, Salzburg and Vienna. In 1989, Spindler's activities in this regard were recognized institutionally with the establishment of an Abteilung für Mittelalterarchäologie und Neuzeitliche Archäologie (Department of Medieval and Modern Archaeology) in the Institute of Pre- and Protohistory. Methodologically speaking, "modern" archaeology remains closely linked to medieval archaeology. Industrial archaeological investigations have been particularly important along the Steirisch rail line, and practitioners in this field have recently investigated battlefields and remains of World War II. The significance of such sites was discussed at a symposium convened in 1990, but most participants were sceptical of their worth.

Protection of Monuments

With respect to archaeological excavation and the protection of sites and finds, the highest civic authority in Austria is the Bundesdenkmalamt, which succeeded the Zentralkommission zur Erforschung und Erhaltung der kunst- und historischen Denkmale (Imperial Central Commission for the Investigation and Preservation of Historical and Artistic Monuments). The role of the Department of Sites is to make determinations regarding the protection of endangered sites and monuments as well as to organize and carry out salvage excavations in Austria. However, because of a general policy of not using consultants, the personnel of the department are often overworked. Other duties, consistent with those of monuments authorities elsewhere, include the maintenance of a country-wide registry of all archaeological sites as

well as assistance with conservation and restoration projects. Normally regional archaeologists (e.g.,

Fritz Moosleitner in Salzburg, Diether Kramer in Steiermark, and Karl Kaus in Burgenland) collaborate with the Bundesdenkmalamt on salvage excavations, but the ultimate responsibility for these excavations rests with the Department of Sites within the Bundesdenkmalamt.

Education

Today, there are two institutes of pre- and proto-history and four institutes of classical archaeology in Austria. Pre- and proto-history are taught at the Universities of Vienna and Innsbruck, and classical archaeology is offered at the Universities of Vienna, Salzburg, Graz, and Innsbruck. In addition, archaeology is taught in the Institute of Ancient History at the University of Salzburg. Roughly half of the lecturers are not employed by the universities but teach in addition to their regular work in museums or the Bundesdenkmalamt.

Archaeology in Austria Today

The fragmentation of archaeology into different academic disciplines has led to the frequent absence of fruitful, positive discussion. Moreover, it has made it much more difficult to gain a synthetic view of the country's past. To date, interdisciplinary research institutes with particular thematic concentrations have not been established, and the fact that most projects, financed by grants, are funded only over the short term hardly helps matters. Even sensational new finds, such as the Bronze Age Ice Man discovered in 1991, fail to improve the situation.

Compared to similar institutions in other countries the Austrian Bundesdenkmalamt functions poorly. The general regard in which archaeology is held in Austria is low, and the legal foundations of the relevant legislation concerning sites and monuments are often divorced from reality. Fulfilling the requirements of the existing laws is almost impossible, and the cooperation between regional and federal offices required by the archaeological research increases the difficulties of compliance.

Moreover, a publicly available register of all protected sites and monuments, and clear signs in the landscape to point them out to visitors, are lacking, so the public is scarcely aware that certain sites are, in fact, protected. The Österreichisches Nationalkomitee zur Koordination und Beratung im Bereich der archäologischen Forschung Österreichs (Austrian National Committee for Coordination and Advice on Archaeological Research in Austria), an advisory council, has as its main task a long overdue review and reorganization of the structures in place. Coordination of all federal, regional, and local offices; amateur investigators; and folk museums and a definition of their jurisdictions and responsibilities, along with the identification of opportunities for cooperation in the protection of monuments and the prosecution of research, would be highly desirable.

Otto H. Urban; translated by Dan Potts

See also

Czech Republic; German Prehistoric Archaeology; Slovenia

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Avebury

Located in southern England, the site of Avebury comprises a large enclosure that features extensive earthworks and arrangements of standing stones of the late Neolithic age. First brought to prominence by the patient recording work of william stukeley in the eighteenth century, the site has been much damaged, and many of the standing stones have been buried or broken up. Stukeley's map is therefore invaluable, and its accuracy has been confirmed by excavation and nondisturbing remote sensing techniques such as aerial photography. Avebury and the slightly later site of Stonehenge have often been compared as they both stand at the center of large landscapes featuring earthworks and other associated sites. Located in the Avebury landscape are the West Kennet Long Barrow, Windmill Hill (both earlier than the monument

itself), and Silbury Hill (roughly contemporaneous with Avebury).

The Cove in Avebury, England

(Corel)

Tim Murray

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Avebury, Lord (Sir John Lubbock)

(1834-1913)

Best known to archaeologists as the author of *Prehistoric Times* (which went through seven editions from 1865 to 1913), Sir John Lubbock was also prodigiously talented in other areas. Born into a titled family (his father was a baronet), Lubbock went to Eton and then entered the family banking business. However, in common with many people of his social standing in England, Lubbock spent his time away from banking engaged in a wide range of scientific pursuits. In this respect he was following in the footsteps of his father, who was an amateur astronomer and a friend of Charles Darwin. Lubbock's views on natural history (and eventually on human evolution) were strongly influenced by Darwin. Equally, Lubbock's position as an influential Victorian scientist (he held offices in the Royal Society, the British Association for the Advancement of Science, the Geological Society of London, and the Linnaean Society, among others) was of great value to Darwin when the time came to promote public acceptance of his account of the evolution of life on earth.

Lord Avebury, from an 1884 print

(Ann Ronan Picture Library)

Notwithstanding his activities as a banker, member of Parliament, vice-chancellor of the University of London, and keen student of insects and wildflowers, Lubbock's enduring fame results from his central role in the foundation of prehistoric archaeology in Great Britain. Through the publication of *Prehistoric Times* and a later work, *The Origins of Civilization* (1870), Lubbock set much of the agenda for the emerging science of prehistoric archaeology. His keen

interest in the antiquity of human beings, his classification of the Stone Age into Paleolithic (old Stone Age) and Neolithic (new Stone Age), and his firm belief that the purpose of archaeology (and anthropology) was to demonstrate the essential unity of human beings did much to establish the public face of prehistoric archaeology as a legitimate scientific pursuit. This work bore fruit in 1882 when, as a member of Parliament for the University of London, Lubbock's long years of advocacy paid off with the passage of the first Ancient Monuments Protection Act, a measure designed to preserve the physical remains of the prehistory of Britain.

After the passage of this Act, Lubbock's fascination with prehistoric archaeology had to compete more directly with his other research in natural history, but he continued to serve as a senior member of the core anthropological and archaeological societies in Britain and to carry on a voluminous correspondence with scholars from all over the world. Lubbock's advocacy of the three-age system was instrumental in its acceptance in England, but subsequent research indicates that his translation of Swedish archaeologist sven nilsson's *The Primitive Inhabitants of Scandinavia* (1868) stressed an evolutionary message that was somewhat at odds with the original text. There is no modern biography of Lubbock.

Tim Murray

See also

Britain, Prehistoric Archaeology

Aztecs

"Aztecs" is the name popularly used today to label the people of central mexico that Hernán Cortés conquered in 1521. Actually, "the Aztecs" never used the term to describe themselves; rather, they were Nahuatl-speaking peoples divided into about twenty different ethnic groups. The most famous of these groups, and the preeminent one when the Spaniards arrived in Mexico, were the Mexica, whose capital was tenochtitlán.

An Aztec calendar stone

(North Wind Picture Archives)

B

Babylonian Civilization

Although sharing roots with other Mesopotamian civilizations, such as the Sumerian and the Assyrian, the Babylonian civilization derived from the city of Babylon, a major city in southern mesopotamia (now Iraq). Much of what we know about the history of the Babylonian civilization comes from the analysis of cuneiform texts that have been preserved among the ruins of palaces, temples, and administrative buildings. Monuments and other items of material culture have been used to give further texture to information derived from the excavation of cities and from surveys of the landscape of the region.

Fragment from an early Babylonian royal stela

(Ann Ronan Picture Library)

The empire of Hammurabi (1792-1750 b.c.) marks the emergence of Babylon as the major cultural and political center of the region as a result of warfare and later economic reorganization. The empire barely survived Hammurabi's reign, however. The decline of the old Babylonian kingdom after Hammurabi was most likely the result of a complex interplay of political and environmental factors, the latter directly related to the changing behavior of the Euphrates River as a source of water for irrigation. After Babylon was attacked by the Hittites in 1595 b.c., the political picture becomes hazy until the mid-fifteenth century b.c. when the Kassites seized control of Babylon. Although

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there is ample evidence for political upheavals both before and after the Kassite period, it is also clear that the language and other cultural institutions that lay at the heart of the Babylonian civilization continued to prosper. The political instability of Babylon was further increased by the growing power of the Assyrian empire, and on more than one occasion the city was occupied by Assyrian kings or their nominees.

That situation persisted until the end of the seventh century b.c., when the Babylonians (in league with the Medes) turned the tables on the Assyrians and destroyed them. This change of fortunes ushered in the neo-Babylonian empire under Nebuchadnezzar II (604-562 b.c.), which included a major restoration and expansion of Babylon, the most famous features of which were the Ishtar Gate and the Hanging Gardens.

However the neo-Babylonian empire was as short-lived as Babylon, and the territory fell victim to the Persians under Cyrus II (559-530 b.c.). The gods and religious customs and the language of Babylon lay at the heart of its civilization, but in the long term, loss of political independence meant that its distinctive form lost out after an eventful 1,200-year history.

Tim Murray

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Iran; Layard, Sir Austen Henry; Rawlinson, Sir Henry Creswicke

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Bahrain

See Arabian Peninsula

Ban Chiang

Jointly excavated by the University of Pennsylvania and the Thai Department of Fine Arts in the 1970s, Ban Chiang, a major site in northeastern Thailand, essentially set the framework of a regional chronology. Although the dating of the site (via radiometric means) remains somewhat controversial, there is little doubt that the long sequence of occupation (from about 3600 b.c. to a.d. 500) makes it an ideal place to explore the cultural history of the region.

The value of Ban Chiang is further enhanced by the richness of the site, which boasts evidence of early rice cultivation (once thought to predate that in China but now believed to postdate it), early bronze technology, and a diversity of ceramic, metal, and shell objects. Aside from the long cultural sequence (which spans technological developments from the Stone Age through the Bronze Age to the Iron Age), one of the reasons for the richness and diversity of the cultural remains found at Ban Chiang is that there is evidence of ordinary habitations as well as graves.

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Banerji, Rakal Das

(1885-1930)

R. D. Banerji worked for the Archaeological Survey of India in the second and third decades of the twentieth century and became, after his early retirement from the survey in 1925, a professor of Indology at Banaras Hindu University. He specialized in several fields of ancient Indian studies-sculpture and architecture, numismatics, epigraphy, and palaeography and archaeological field investigations-and he was the first archaeologist to conduct excavations at the Indus Valley site of Mohenjo Daro, which had been noticed both by him and by D.R. Bhandarkar, a contemporary officer in the survey.

Banerji also excavated the eighth-century a.d. Buddhist stupa and monastic site of Paharpur in modern Bangladesh in 1924. In the field of sculpture and architecture, his contribution lay in the publication of *The Temple of Siva at Bhumara* (1924), *Basreliefs of Badami* (1928), and *Eastern Indian School of Mediaeval Sculpture* (1933). The publication of the last volume may be said to have cohesively established the existence of a distinct school of sculpture in eastern India which demonstrated the impact of the state of Orissa on the architecture of the region.

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PREV NEXT

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published in the Calcutta Asiatic Society journals and proceedings. He edited a large number of inscriptions for *Epigraphia Indica* (see vols. 15, 16, 18, 19), and the range of his edited inscriptions was chronologically and geographically wide. His mastery of the primary sources of ancient India led him to a study of its political history, and one of his books on the subject is *The Age of the Imperial Guptas* (1933). He wrote extensively in his mother tongue, Bengali, even writing a large number of historical novels with themes selected from ancient India.

Dilip Chakrabarti

See also

Indus Civilization; South Asia

Banpo

Excavated between 1954 and 1957, the Neolithic village of Banpo is a short drive from Xi'an, the capital of Shaanxi Province in central china. Banpo has great significance in the history of Chinese archaeology for several reasons. First, the well-preserved remains of houses, ditches, and burials and the large number of artifacts that were found during excavation make this a type site for the Yangshao phase of the early Chinese Neolithic period (about 5000 b.c. to 4000 b.c.).

Second, the site was interpreted as providing clear evidence of the existence of a matrilineal society during the Neolithic period, an interpretation that accorded very well with the analysis of precapitalist societies put forward by Friedrich Engels (ca. 1884) in his *Origins of the Family, Private Property, and the State* and subsequent Marxist ideological interpretations encouraged by the Chinese Communist Party. Third, the site was transformed into a major museum based around a building that completely enclosed a large portion of it, including different types of houses and burials. This major museum, which recently had a tourist village constructed adjacent to it, continues to play a significant role in informing the Chinese people about life in Neolithic China.

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Bay Springs Mill, Mississippi

In 1836, one George Gresham built a water-powered sawmill and gristmill on Mackeys Creek in northeastern Mississippi, and in 1852, the Bay Springs Union Factory was built at the same location to spin cotton and wool raised locally. Unlike most textile mills of the period, the Bay Springs Mill spun yarn that local families knitted into socks and wove into cloth for themselves and for sale. The development of power looms in New England had largely made this kind of symbiosis impractical by 1820, but at Bay Springs this relic of the early years of industrialization continued operating until 1885 when the mill burned.

In 1979, a team of researchers led by William H. Adams investigated the mill and surrounding community, including a general store, a Masonic lodge, a barracks, nine farmhouses, six millworkers' houses, and two other mill buildings. Much of the original equipment remained on the site, and Steven D. Smith, Timothy B. Riordan, and Albert F. Bartovics analyzed the archaeological remains. The historical

geographer Howard Adkins researched the documentary history of this community, and the folklorists David F. Barton and Stephen Poyser interviewed over sixty people-their recordings are in the Library of Congress, the Mississippi Department of Archives and History, and the Indiana University Folklore Archives. The community approach used at silcott, washington, and waverly plantation was used at Bay Springs as well to provide a broader historical context for the material recovered. The study of commodity flows by Riordan and Adams provides a model for quantifying material culture within the context of the national market.

W. H. Adams

Beazley, Sir John Davidson

(1885-1970)

Beazley was born in Glasgow, the son of a member of the Arts and Crafts movement, so it is perhaps not surprising that he was to be fascinated by craftsmen and artists for most of his life. He attended Balliol and Christ Church Colleges at Oxford, where he later became Lincoln

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professor of archaeology. Beazley was a fine classical scholar and an excellent teacher, but his major interests were Greek art and Attic vase-painting. Vase-painting, because of its quality and the fact it had survived when all other forms of painting in ancient greece did not, made it particularly important to the history of art. Beazley's work on vase painting was to revolutionize the disciplines of art history and archaeology.

By the early twentieth century the collections of Greek pottery formed by sir william hamilton and other aristocratic antiquarians during the early nineteenth century had found their way into museums across Europe. German scholars such as Hartwig, Hauser, and Furtwangler had noted that some pots carried short inscriptions, including what appeared to be “signatures” or short texts giving the name of an artist, followed by a verb, as in “made or painted by,” which allowed a typology based on signed works to be created. German scholars applied this typology only to those pots that were signed and were diagnostic of a particular style or technique.

Beazley broadened this method to include the whole corpus of Attic pottery. By identifying the unconscious details of individual artists-such as painted features and elements-he was able to add unsigned pieces to the rest of the corpus of signed ones-and so tens of thousands of Attic red-figure and black-figure pottery could be grouped as the works of individual artists. Beazley's method has been described as identifying the “hands” of the painters and potters of Athens, and these additional identifications supplemented the names of craftsmen that appeared on the pottery. Thus he was able to transform the hitherto chaotic study of vase-painting into an organized field of study, similar to other documented schools of painting. He went on to successfully apply his method to Etruscan, Corinthian, Eastern Greek, and South Italian pottery.

Tim Murray

See also

Britain, Classical Archaeology

Beidha

Excavated by English archaeologist Diana Kirkbride between 1958 and 1967, Beidha is a significant Natufian and prepottery Neolithic site in southern jordan. Excavation revealed changes in domestic architecture and provided evidence of the early cultivation of barley and emmer wheat (prior to the development of a domesticated morphology for these plants). Beidha also exhibited evidence of long-distance trade in obsidian, the origins of which are at Anatolia in central turkey.

Tim Murray

See also

Syro-Palestinian and Biblical Archaeology

Belgium

The state of Belgium was founded in 1830. Within its small territory (30,513 square kilometers), it comprises two major language groups, which has been an important factor in the country's recent political history. Since 1980, Belgium has been a federal state divided into three regions, each with substantial autonomy. The Flemish region, which occupies the northern part of the country, consists of sandy lowlands bordering the North Sea and part of the central Belgian loam belt covering a range of

low foothills. The linguistic border between the Flemish- and French-speaking populations runs across these hills from east to west. Brussels is a separate bilingual region.

To the south, there are Cretaceous limestone formations dissected by the Sambre and Meuse Rivers. From there, the land rises to the Ardennes uplands with a maximum altitude of just below 700 meters above sea level. Belgium was the first country on the European continent to go through a process of industrialization early in the nineteenth century, and this industrialization entailed major infrastructural and mining activities. The country's geographical features, political developments, and economic prosperity have all been influential in the development of archaeology in Belgium.

The leading role of Belgian naturalists and geologists in the establishment of prehistory during the later nineteenth century is well known. Earlier, however, historians had been

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independent mediator between all parties involved in archaeology, has a crucial part to play.

Phillip van Peer

See also

France; Netherlands

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Belize

Belize, until 1973 the Crown Colony of British Honduras, is the only part of the Americas within the British Empire in which an ancient civilization flourished. Located on the eastern side of the Yucatán Peninsula bordering mexico and guatemala, it occupies part of the area in which the preclassic, classic, and postclassic Maya culture thrived from the first millennium b.c. until the Spanish conquest in the sixteenth century a.d., a span of over 2,500 years. The presence of Maya ruins, the absence of other archaeological remains, and the British colonial history of Belize, which set it apart politically and culturally from its hispanophone neighbors, all governed a distinctive progress of archaeological investigation in the nineteenth and twentieth centuries.

The history of Maya archaeology generally can be divided into five successive periods (Hammond 1983b). During the first two of these-*the era of the Spanish travelers* (1524- 1759) and *the era of the Spanish explorers* (1759- 1840)-Belize remained little settled and archaeologically unnoted. Two Americans, john lloyd stephens and frederick catherwood, passed through Belize in October 1839 on their first expedition to visit maya sites in Central America and Yucatán, but their visit did not encourage archaeological interest in this small nation. Nor was interest sparked when Patrick Walker, the colony's secretary, led an expedition from Belize hoping to forestall Stephens at the ruins of palenque on the far side of the Maya lowlands.

During the succeeding *period of the major scholars* (1840-1924), little attention was paid to archaeology in Belize until the end of the nineteenth century, although Belize City was the port of entry for traffic into the Peten, Guatemala's northern rain forest department where many of the most noted Maya cities stand. Even the publication in London of Alfred Maudslay's great *Biologia Centrali-Americana: Archaeology* (1889- 1902), which showed in detail how impressive the sites of tikal, Palenque, Quirigua, Copan, and chichén itzá were, apparently had no impact on British Honduras, although the sites of Lubaantun and Xunantunich were known and reported in the local press toward the end of the century.

PREV NEXT

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Bell, Gertrude Margaret Lowthian

(1868-1926)

Born in County Durham, the daughter of Sir Thomas Hugh Bell, a local industrialist, Gertrude Bell was among the first female students at Oxford at Lady Margaret Hall. She graduated in 1888 at the age of twenty with first class honors in modern history, the first woman to attain this level at the university.

Gertrude Bell

(Hulton Getty)

Bell began her long relationship with the countries of the Near East when she first visited her diplomat uncle and aunt, Sir Frank and Lady Lascelles, in Tehran, Iran. She learned Persian and later published a verse translation of Persian poetry. However it was in 1899, when Bell spent some time in Jerusalem learning Arabic and visiting Petra and Palmyra, that she really became interested in desert travel and archaeology. Bell's love of alpine mountaineering occupied her for the next five years, as she explored the Engelhorner mountains and ascended the Matterhorn from the Italian side.

In 1905 Bell traveled from Jerusalem, through Syria and Cilicia, to Konya in central Turkey. She became a self-taught and competent field archaeologist and in 1907, with Sir W.M. Ramsay, explored the Hittite and Byzantine site of Bin-Bir-Kilisse. In 1909 she traveled down the Euphrates from Aleppo and returned by way of Baghdad and Mosul in Iraq. She explored Ukhaidir, a huge Abbasid Palace, in 1911. All of these travels resulted in popular publications. Bell then set out to explore central Arabia, where only one other European woman had been. Starting from Damascus she traveled to Hail but was not allowed to travel any further and was kept as an honored prisoner until she had no alternative but to go back to Baghdad.

PREV NEXT

In 1914 with the outbreak of war Bell joined the Red Cross and worked in Boulogne, France. In 1915 she was sent back to London to reorganize Red Cross headquarters. In the same year when the Arabs rebelled against Turkish rule Bell was drafted into the War Office's Arab Intelligence Bureau and moved to Cairo. Her task was to collect and summarize information about the Bedouin tribes and sheikhs of northern Arabia whose rebellion against Turkey was supported by the British. She was later attached to the military intelligence staff of the Mesopotamian Expeditionary Force and became political officer and Oriental secretary to Sir Percy Cox. Her special knowledge of Arab politics, her prewar friendships with Arab leaders, and her linguistic abilities were valuable to successful liaisons between the British and the rebelling desert tribes. Bell moved to Baghdad in 1917, after its capture, and she continued to act as an adviser in a civil capacity, as chief political officer, completing an administrative review of mesopotamia in 1920. She and Sir Percy Cox, then high commissioner in Mesopotamia, strongly supported the election of Saud Emir Feisal and the creation of a new Arab government in Iraq.

While she continued to work as political secretary, Bell was made Iraq's Director of Antiquities, responsible for all archaeological excavations and for establishing an antiquities service and a national museum at Baghdad. The museum was inaugurated in 1923 and moved into its new building in 1926. Bell was looking for a permanent director of antiquities so that she could return to England after her ten years of service in Iraq, when she died in Baghdad. She was buried in the English cemetery in Baghdad and in 1927, at the suggestion of King Feisal, a wing of the Baghdad Museum was named for her.

Tim Murray

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Belzoni, Giovanni Battista

(1778-1823)

When Napoleon invaded Egypt he took with him dozens of scholars and scientists to explore and record its ancient monuments. The twenty-four volume *Description d'Egypt* published in 1809 introduced Europe to ancient Egyptian civilization, provoking enormous interest both popular and museological, which led to the development of a lucrative market for Egyptian antiquities. Napoleon's army and his agent Drovetti had already plundered many antiquities when the British consul-general in Cairo, the former portrait painter Henry Salt, hired Giovanni Belzoni to ensure Britain's share. The Italian Belzoni had been a strong man in a circus before he began to collect antiquities on Salt's behalf, and his collecting techniques reflected this background. There was nothing scientific or careful about his removal of artifacts. Indeed it was his strength and his abilities to use levers and pulleys that enabled Belzoni to transport the monumental granite head of Rameses II from Thebes, and Rameses III's sarcophagus from the Valley of the Kings, back to England. In October 1817 Belzoni discovered the tomb of Seti I, the most richly decorated of all Egyptian royal tombs in the Valley of the Kings. Because it could not be transported as a whole Belzoni spent a great deal of time and effort recording the details of the wall paintings of the tomb for posterity.

Belzoni returned to England in 1819 and was taken up by London society. In 1821 he opened the Egyptian Hall in the british museum. He died in Benin in West Africa in 1823 on an expedition to find the source of the River Niger.

Bernal Garcia, Ignacio

(1910-1992)

Born in Paris, France, the son of a wealthy landowning Mexican family, Ignacio Bernal Garcia first studied law before transferring to study anthropology at the National Institute of Anthropology and the National Autonomous University of Mexico (UNAM), from which he received a Ph.D. and an LL.D. in 1949.

Bernal is best known for his work at the great sites of monte albán, Dainzu, and others in the southern highland Mexican state of Oaxaca and for excavations and restorations at teotihuacán. He was professor of archaeology at both UNAM from 1948 and at Mexico City College from 1950 to 1962. He was director of anthropology at the University of the Americas from 1948 to 1959 and the National School of Anthropology and History from 1950 to 1955 and director of the National Museum of Anthropology from 1962 to 1968. He also worked for the United Nations Educational, Scientific, and Cultural Organization (UNESCO) during the 1950s in the areas of international and prehistoric monument protection and education.

Tim Murray

See also

Mexico

Bersu, Gerhard (1889-1964)

A German archaeologist and Director of the Romisch-Germanischen Kommission in Frankfurt, a key German archaeological institution, Bersu was removed by the Nazis in 1935 for refusing to adhere to National Socialist ideology. He emigrated to Britain, where he introduced Continental methods of excavation to English archaeologists. These included the open area excavation of settlement sites, which comprised the stripping of large areas to reveal the plans of buildings and other structures and the spatial and chronological relations between them.

These methods were used in the now-classic excavations at the Iron Age farm of Little Woodbury in Wiltshire from 1938 to 1939. Little Woodbury was an oval ditched enclosure in which potholes were found. Occupied from 400 to 200 b.c., it contained one large round house, a small circular structure, four post granaries, and storage pits.

During the Second World War, Bersu excavated Iron Age houses on the Isle of Man during his internment there as a German citizen. From 1947 to 1950 he was professor of archaeology at the Royal Irish Academy, Dublin. In 1950 he returned to Frankfurt.

Tim Murray

See also

German Prehistoric Archaeology

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Beyer, Henry Otley (1883-1966)

In the history of Philippine archaeology the name Henry Otley Beyer is prominent. A pioneer in Philippine anthropological research, Beyer was one of the first scholars to explore the beginnings of Philippine society and culture. By organizing the enormous amount of archaeological data he collected during his years of active work in the philippines, he launched the search for explanations regarding the peopling of the archipelago and the cultural relationships that existed between Filipinos and their Southeast Asian neighbors.

Beyer was born into a pioneering German-American family in Edgewood, Iowa, on July 13, 1883. Even as a young boy he was noted to have the interests of a naturalist, and he enjoyed spending time by himself in the woods near the farm where he grew up.

Majoring in chemistry and geology, Beyer graduated from the University of Denver in 1904. During archaeological fieldwork in the summer he probed the remains of the Indians of the Southwest. This apparently was his first exposure to archaeology and he also worked on the collection of artifacts from the ruins. In 1910 he went to Harvard on a scholarship, completing a one-year graduate program in anthropology.

Beyer was first introduced to the Philippine culture when he visited the 1904 Louisiana Purchase Centennial Exposition in Saint Louis, Missouri. The exposition included an exhibit on Philippine ethnic groups that featured complete

Bernal Garcia, Ignacio

(1910-1992)

Born in Paris, France, the son of a wealthy landowning Mexican family, Ignacio Bernal Garcia first studied law before transferring to study anthropology at the National Institute of Anthropology and the National Autonomous University of Mexico (UNAM), from which he received a Ph.D. and an LL.D. in 1949.

Bernal is best known for his work at the great sites of monte albán, Dainzu, and others in the southern highland Mexican state of Oaxaca and for excavations and restorations at teotihuacán. He was professor of archaeology at both UNAM from 1948 and at Mexico City College from 1950 to 1962. He was director of anthropology at the University of the Americas from 1948 to 1959 and the National School of Anthropology and History from 1950 to 1955 and director of the National Museum of Anthropology from 1962 to 1968. He also worked for the United Nations Educational, Scientific, and Cultural Organization (UNESCO) during the 1950s in the areas of international and prehistoric monument protection and education.

Tim Murray

See also

Mexico

Bersu, Gerhard (1889-1964)

A German archaeologist and Director of the Romisch-Germanischen Kommission in Frankfurt, a key German archaeological institution, Bersu was removed by the Nazis in 1935 for refusing to adhere to National Socialist ideology. He emigrated to Britain, where he introduced Continental methods of excavation to English archaeologists. These included the open area excavation of settlement sites, which comprised the stripping of large areas to reveal the plans of buildings and other structures and the spatial and chronological relations between them.

These methods were used in the now-classic excavations at the Iron Age farm of Little Woodbury in Wiltshire from 1938 to 1939. Little Woodbury was an oval ditched enclosure in which potholes were found. Occupied from 400 to 200 b.c., it contained one large round house, a small circular structure, four post granaries, and storage pits.

During the Second World War, Bersu excavated Iron Age houses on the Isle of Man during his internment there as a German citizen. From 1947 to 1950 he was professor of archaeology at the Royal Irish Academy, Dublin. In 1950 he returned to Frankfurt.

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German Prehistoric Archaeology

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Biblical Archaeology

See Albright, William Foxwell; Mesopotamia; Syro-Palestinian and Biblical Archaeology

Bibracte

Bibracte is located at Mont Beuvray in the commune of Saint-Leger-sous-Beuvray in the French department of Saône-et-Loire. The *oppidium* (fortified town) of Bibracte, the city of Greater Gaul that witnessed the return of Julius Caesar on many occasions, was the capital of the tribe known as Heduens, who lived west of what is now the region of Burgundy. The Heduens were allies of the Romans and defected to Caesar at the beginning of the revolt of 52 b.c. It was in Bibracte that Vercingetorix pleaded his case for a union of tribes against Caesar, it was in Bibracte that Caesar compiled most of his book on Greater Gaul during the winter of 52-51 b.c., and it was close to this city that the Helvetians had fought their battles in 58 b.c. at the beginning of the rebellion.

By the fifteenth century a.d., it was traditional to locate Bibracte on Mont Beuvray, but scholars of the eighteenth century, anxious to claim greatest antiquity for the town of Autun, refuted that location. However in 1851, a young wine merchant, Jean-Gabriel Bulliot, began to reexamine all of the evidence through with a survey of the area and its archaeological evidence. It took him fifteen years, and the moral and financial encouragement of Emperor Napoleon III, to justify his thesis to his scholarly adversaries-Bibracte was on Mont Beuvray. The archaeological research was pieced together between 1867 and 1895, the year his nephew archaeologist joseph déchelette, the celebrated author of the *Manuel d'archéologie,* took over the project and continued his uncle's work until 1907. The research on Bibracte played a large role in the development of archaeological methods in France and in what became known as Iron Age studies: “the Beuvraisian” was for a long time the name given to the last phase of the late la tène period, 140-30 b.c.

Mont Beuvray, which stands out from the southern Morvan Mountains, is more than 800 meters in altitude and comprises three hills whose rounded slopes are joined by gentle plateau. Covered by fir tree forests, it was still partly cultivated and partly planted with beech and chestnut trees as late as the 1950s. The substrata, disturbed by numerous tectonic movements, is essentially composed of rhyolites. Bulliot located a rampart five kilometers long that ran in part along the upper reaches of the slopes and delimited a surface area of approximately 135 hectares. Recent research has identified a second line of defense, even older, that encircled an area of 200 hectares.

Bulliot noted the first rampart in 1867, but it was not until 1868, after the publication of research concerning the fort of Murcens, located in Cras in the department of Lot, by E. Castagne that Bulliot began to establish links between his structure of beams and rocks and “the Gaulish wall” written about by Caesar during the siege of Bourges (Avaricum) in 52 b.c. (*Bello gallico* 7.23). The extent of this wall, with its beams fixed into each other by long iron pieces, and the development of monumental

gateways marked the impetus to establish, for the first time in the Celtic world, an urban area or town, not just a hill fort, that was distinct from the surrounding country.

Bulliot insisted that the original occupations of this built-up area would have included parts of the town that were devoted to artisans working in iron, bronze, and enameling. There would have been a residential quarter grouping the houses of the rich together, which would have been constructed from local materials but would have used Roman plans and building techniques. Part of the plateau would have been

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taken up by a market and sanctuaries. If this urban plan is taken at face value today, then the idea of living conditions, which reflect the workings of a real town, from the end of the second century b.c. become characteristic of the late La Tène period, and subsequently the reply to F. Braudel's question, “Was there really a type of Gaulish town before the Roman conquest?” would be yes.

The archaeological remains were reexamined in 1984, supported by a research center that was welcomed by university teams from all over Europe because the site of Mont Beuvray had remained an important point of reference for all Celtic specialists. The large numbers and variety of artifacts attracted numismatists, epigraphers, and ceramologists, and the stratigraphy, as an open-area site, was the source of much useful archaeological research. The first results focused on what had developed essentially between the second and the first centuries b.c., between the La Tène C (II) and the Roman stratigraphic horizons, wedged before the camps of the German limes (fortified frontier). Neither the buildings, nor the phases of construction, nor the events of the years 58-52 b.c. could be read at the site, but dendrochronology provided some sort of precision in dating, with the identifiable phases in combination with all the variables covering a period of about twenty years.

The remains of the Porte du Rebout revealed at least four principal phases of construction between 90 and 10 b.c. The first phase of this gate was more than twenty meters in size, gigantic in comparison to similar gates found at more modern Celtic *oppida.* The gate's northern access consisted of a passage forty meters in depth. During subsequent phases, its size was reduced, and the Gaulish wall was replaced by wooden foundations and earthen embankments. The fortification, with its role as much monumental as defensive, would have necessitated thousands of hours of work, dozens of tons of iron, and thousands of cubic meters of wood.

Bulliot had already assigned a significance and luxury to the houses of the rich residential quarter, which rivaled the houses of pompeii. One of the houses covered 3,000 square meters, and its atrium and peristyle were Roman in style. The remains revealed five successive building stages and floors, all built during the first century b.c., and the original wooden construction was little by little transformed into a stone mansion.

Trade and the craft industry evolved more quickly than architecture. Artisan production soon became mass production, for example, in the fabrication of fibulae (metal pieces); materials, shapes, and molds were modified to ensure greater productivity. We can follow the evolution of the supply of wine, from different parts of italy and spain, thanks to the innumerable amphorae at the site.

It is this process of acculturation that is being followed today at Bibracte. The sanctuary, the lanes, and the tombs will all reveal, in a very short time, how they were transformed from an *oppidum,* a concept that was perhaps completely new in the second century b.c., into a veritable Roman town. It was the generosity of the Emperor Augustus, when he allowed the creation of the town of Autun-Augustodum to be built from the remains of Bibracte in about 15 b.c., that ruined the site and eventually led to this archaeological project of the late twentieth century.

Oliver Buchsenschutz

See also

Alesia; Celts

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Binford, Lewis R.

(1929-)

One of the most influential archaeologists of the twentieth century, Lewis R. Binford was born in Norfolk, Virginia. After high school he attended Virginia Polytechnic Institute (1948-1952), and

following a stint with the U.S. Army in Korea he gained a B.A. in anthropology from the University of North Carolina (1957). Moving to the University of Michigan, Binford received his M.A. in 1958 and his Ph.D. in 1964. Although Binford was at this stage primarily a student of North American prehistoric archaeology, his interest in world prehistory and general archaeological method and theory was already apparent.

Between 1961 and 1965, Binford taught in the Department of Anthropology at the University of Chicago, a period in which he took the first steps toward defining an original position on the relationships between archaeology and anthropology. During these years, Binford's focus on the nature of the archaeological record, on ethnoarchaeology, on the use (and abuse) of inference and analogy in archaeology, and on understanding variability in lithic assemblages made him the center of changes sweeping the practice of archaeology in North America. Although these changes would be later thought of as “the new archaeology,” or processual archaeology, and attract a large following, it is clear that Binford was following a research agenda of research of a breadth and significance that was not widely understood.

In 1966, he left Chicago for the Department of Anthropology at the University of California, Santa Barbara, and soon after moved to the Department of Anthropology at the University of California, Los Angeles. It was during this period that Binford's fame as the progenitor of the “new” archaeology first gained widespread attention, especially in 1968 with the publication of *New Perspectives in Archaeology,* a book of essays by the most significant of the new archaeologists, which he edited with his wife, Sally Binford. In 1968, Binford moved to the Department of Anthropology, University of New Mexico, staying there until he became the distinguished professor of anthropology at Southern Methodist University in Dallas, Texas, in 1991.

After 1968, Binford continued to develop his ideas about the nature of the archaeological record and the role of the archaeologist as anthropologist. He has published numerous books and articles, given conference addresses, seminar presentations, and been an invited speaker at many of the major archaeological departments around the globe. Although his focus has tended to be on the prehistoric record, Binford has undertaken significant ethnoarchaeological field research in Alaska and observed similar studies in Australia. He has also pursued fundamental research into site formation processes and taphonomy as well as continuing his interests in assemblage variability and the origins of humanity. A noted speaker and fierce debater, Binford has collected volumes of his essays, which are made more interesting still by frequent asides and vignettes of his personal history. Binford remains a strong opponent of those who seek to move archaeology away from a concern with science.

For an archaeologist of his undoubted influence and significance, Binford has been granted few honors by the members of his profession. He received an honorary doctorate from the University of Southampton in the 1980s, and in 2000, the University of Leiden in the Netherlands conferred a doctorate on him.

Tim Murray

See also

United States of America, Prehistoric Archaeology

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Bird, Junius Bouton

(1907-1982)

Born in Rye, New York, Bird became an accomplished sailor and outdoorsman at an early age and sailed to the Arctic several times, where he undertook his first research in Greenland and Labrador. A pioneer of radiocarbon dating methods and the study and conservation of textiles, Bird worked as an archaeologist at the American Museum of Natural History in New York City for fifty years.

Between 1936 and 1937 Bird excavated Fell's Cave and other sites in Chilean Patagonia, where he found human artifacts in association with extinct fauna, establishing the antiquity of the Paleo-Indian occupation of South America. In 1941 Bird excavated a long prehistoric sequence in the Atacama region in northern

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chile. From 1946 to 1947 he worked in peru, as part of the virú valley survey, where he excavated the mound at Huaca Prieta. Data from this excavation not only proved the existence of pre-ceramic cultures on the Peruvian coast, but also established textiles as the major form of expression of ancient Andean culture. Bird continued to work at smaller sites in South America, but in his final years he worked in panama.

Bird received the Viking Fund Medal and the Order of the Sun of Peru. He was president of the Society of American Archaeology and chairman of the Anthropology Section of the New York Academy of Sciences. He received an honorary doctorate from Wesleyan University in 1958.

Tim Murray

Biskupin

The site of Biskupin is located in Bydgoszcz Province in northwestern poland. It is an early-Iron Age fortified settlement belonging to the late Lusatian culture and dates to approximately 750-550 b.c. Biskupin is the country's best known archaeological site both within Poland and outside of it.

Biskupin

(Klaudyna Kucharska/Archivum Fotograficzne Meseum Archeologicznego)

The settlement at Biskupin was situated on an island, defended by timber breakwaters, and fortified by ramparts of timber compartments filled with earth and stones. The earth embankments were usually built on a foundation of beams and secured by vertical piles. The gateways to the settlement were an important part of fortifications, and the main feature of each was an approach that was lined on both sides by massive palisade walls and was probably covered on the top.

The settlement inside was constructed according to a plan, with a regular network of streets and communication tracks. The main arterial road was the street leading around the ramparts, and there were eleven parallel streets perpendicular to the arterial road. There was a small square near each of the gateways. The settlement consisted of 104-106 rectangular timber

houses laid out on a regular street system, and they may have housed up to 1,000 people. Each house interior was divided into two parts with the entrance fulfilling economic functions. Two phases of occupation have been distinguished, and 75 percent of the site has been excavated thus far.

Plan of Biskupin

The fortified settlement of Biskupin was found in 1933 and excavation began in 1934. Fieldwork was directed by józef kostrzewski and Zdzislaw Rajewski with the participation of Wojciech Kocka, Tadeusz Wieczorowski, Feliks Wydra, and Jozef Szubert. Excavations were carried out in the years 1934-1939, and when they resumed in 1946 after World War II, they continued until the 1960s. Various specialists from complementary disciplines participated: soil and geological studies (Feliks Terlikowski, Jozef Czekalski, Karol Paulo), palynological analyses (Adam Paszewski, Julian Witold Rafalski), archaeozoological studies (Edward Lubicz-Niezabitowski), botanical and dendrological studies (Bronislaw Jaron, Tadeusz Dominik), ethnographic research of the Biskupin architecture (Stanislaw Poniatowski), and others.

Photographic documentation of the site was very important. Wojciech Kocka developed the technique of taking pictures from a small balloon, and there were very successful attempts to produce color photographs as early as 1939. Research at Biskupin marked enormous progress in Polish archaeological studies. It was truly comprehensive, owing to the fruitful cooperation with specialists from other disciplines. This cooperation was characterized by real partnership, and it led to the development of new methods of excavation. The large scale of the research was also significant. After World War II, Biskupin was the place where practical courses on excavation methods for students of archaeology, history, and the history of art were organized. As a result, the great majority of students of that time gained their archaeological experiences in Biskupin.

Biskupin is now a well-known archaeological open-air museum. It was, and still is, an important center for experimental archaeology, especially in building, tillage, food preparation, stone and flint work, antler and bone work, wood and wool work, clay processing, and the obtaining of tar.

Arkadiusz Marciniak

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Blegen, Carl William (1887-1971)

Born in Minneapolis, Minnesota, Blegen excavated at Korakou, Prosymna, and Pylos in greece, but he is best known for his extensive excavations at Troy. Blegen was professor of classical archaeology at the University of Cincinnati, Ohio (1927-1957). As secretary of the american school of classical studies at athens, Blegen, along with Alan Wace, director of the British School in Athens, devised a chronology for mainland Greece for the Early, Middle, and Late Helladic periods through the pottery sequence from their excavation of the

prehistoric site of Korakou in Corinthia (1915- 1916). Blegen and Wace were convinced that although Minoan in origin Mycenean civilization was not the result of the conquest of mainland Greece, as argued by sir arthur evans, but was a combination of Minoan civilization with another civilization on the mainland.

To elucidate the relationship between Mycenean and Minoan civilization Wace began excavating Mycenae in 1921 (and finished, after many interruptions, in 1955) while Blegen investigated Troy, which he regarded as a key Aegean and Anatolian site. Between 1932 and 1938 Blegen tested sections of the mound that had not been touched by heinrich schliemann and wilhelm dorpfeld, finding that the previously identified nine cities of Troy only represented two or more phases in the Bronze Age out of a total of forty-six phases. He attributed Homer's Troy to the major period VIIa (ca. 1250 b.c.) because there was strong evidence that the city was destroyed by war.

In 1939 Blegen returned to mainland Greece to find the Mycenean capital of Messinia, which Homer had said belonged to "King Nester of Pylos." He excavated the hilltop of Espano Englianos and found a Mycenean palace, the excavation of which was not completed until 1966. The palace of Pylos was much better preserved and more carefully excavated than those at Mycenae or Tiryns, even if it was not as large. While its layout and decoration were similar to those of Minoan palaces, it was more fundamentally like Greek Mycenean palaces. In this architectural analysis Blegen had accurately defined the extent of Minoan influence on Mycenean Greece. Of equal importance were hundreds of clay tablets inscribed with early European script and dating from ca.1250 b.c. discovered by Blegen at Pylos. Blegen's account of the history of Pylos received important confirmation when michael ventris deciphered Linear B in 1951.

Tim Murray

See also

Linear A/Linear B

Bogazköy

Bogazköy is the site of the ancient city of Hattusha, the capital of the Hittites. Located in north-central Anatolia (turkey), Bogazköy was first discovered in 1834 by French archaeologist Charles Felix Marie Texier, who also recorded bas relief carvings of humans and animals and some unusual hieroglyphs. The site was further described on several occasions during the late-nineteenth century, but it was not until 1906 when Hugo Winckler (an Assyriologist) began to excavate that a great archive of cuneiform tablets was uncovered. Some of these were in Hittite, but a sufficiently large number were in Akkadian, an ancient language that had already been deciphered. Excavation by German teams at Bogazköy has continued and has revealed much about Hittite history.

Tim Murray

Bolivia

Colonial Period (1530-1824)

After the discovery of the New World, the Spanish colonial system was established in a large part of the Americas, including what is now Bolivia. During this period, early Spanish chroniclers started to describe the customs, traditions, and monuments of native cultures.

An extensive array of documents was produced, such as the early chronicles and descriptions by both Spaniards and Creoles, legal and litigant documents, and administrative censuses for taxes. Such efforts

have had a variety of purposes: they provide the information needed to “adapt” the native socioeconomic institutions into the colonial system; to “civilize” and christianize the Indians; to claim ancient rights pertaining to land, wealth, and status in favor of native elites; or to denounce the abuses of Indians on the part of theSpanish authorities and *encomenderos*. Because of the varied nature of such documents, each provides a different perspective on the impact that the colonial system had on native Bolivian populations. These documents are also of great anthropological value for understanding complex cultural variability in the Andes and for an accurate combination of the archaeological and ethnohistorical disciplines in the reconstruction of the prehistoric Bolivian past.

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Tim Murray

See also

Linear A/Linear B

Bogazköy

Bogazköy is the site of the ancient city of Hattusha, the capital of the Hittites. Located in north-central Anatolia (turkey), Bogazköy was first discovered in 1834 by French archaeologist Charles Felix Marie Texier, who also recorded bas relief carvings of humans and animals and some unusual hieroglyphs. The site was further described on several occasions during the late-nineteenth century, but it was not until 1906 when Hugo Winckler (an Assyriologist) began to excavate that a great archive of cuneiform tablets was uncovered. Some of these were in Hittite, but a sufficiently large number were in Akkadian, an ancient language that had already been deciphered. Excavation by German teams at Bogazköy has continued and has revealed much about Hittite history.

Tim Murray

Bolivia

Colonial Period (1530-1824)

After the discovery of the New World, the Spanish colonial system was established in a large part of the Americas, including what is now Bolivia. During this period, early Spanish chroniclers started to describe the customs, traditions, and monuments of native cultures.

An extensive array of documents was produced, such as the early chronicles and descriptions by both Spaniards and Creoles, legal and litigant documents, and administrative censuses for taxes. Such efforts

have had a variety of purposes: they provide the information needed to “adapt” the native socioeconomic institutions into the colonial system; to “civilize” and christianize the Indians; to claim ancient rights pertaining to land, wealth, and status in favor of native elites; or to denounce the abuses of Indians on the part of theSpanish authorities and *encomenderos*. Because of the varied nature of such documents, each provides a different perspective on the impact that the colonial system had on native Bolivian populations. These documents are also of great anthropological value for understanding complex cultural variability in the Andes and for an accurate combination of the archaeological and ethnohistorical disciplines in the reconstruction of the prehistoric Bolivian past.

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The Republican Period (1825-1890)

The consolidation of Bolivia as a state brought with it a series of changes in the way native antiquities were perceived. Still with a colonialist approach, a new interest emerged in ancient cultures and native groups. During the first part of this period, foreign scholars visited Bolivia with a renewed interest in ethnography, ancient monuments, natural sciences, zoology, and botany. Their focus was mostly descriptive, and the value of their documents lies in the extensive descriptive information provided. The most important scholars visiting Bolivia at this time included Alcides D'Orbigny (1839), a French naturalist whose main goal in the 1830s was to compile information about the diversity of the

human races in South America; Johan J. Tschudi (1851), a German naturalist who described the early native monuments around 1838-1842; and Francis de Castelnau (1851), who argued that Tiwanaku was an influential predecessor of the Inca empire. Ephraim George Squier (1870), a U.S. diplomat appointed to Lima, peru, in the 1860s, stands out for his detailed description and mapping of Tiwanaku and other important archaeological sites (Albarracín-Jordan 1999; Ponce Sanginés 1995).

Bolivian Archaeological Sites

On the local level, the consolidation of Bolivia as a nation state was coupled with the need of emerging Creole elites to develop their own sense of identity, one that was different from that of colonial Spain but still divorced from the oppressed Indian populations. Additionally, the increasing visits of foreign explorers involved with diplomatic affairs renewed the interest of the Bolivian government in its ancient monuments. For example, the Bolivian president José Ballivian ordered nonsystematic excavations in Tiwanaku with only the goal of collecting archaeological pieces for the local museum in the city of La Paz (Ponce Sanginés 1995). The perception that archaeology was simply part of art history, involved with the recollection and collection of aesthetic artifacts, was part of a broader tendency in the first stages of archaeology before its consolidation as a science. During this period, and even later, most of the archaeological work in Bolivia was restricted to the collection of artifacts and description of archaeological monuments.

The Beginnings of Archaeology (1890-1952)

During the last decade of the nineteenth century and the first half of the twentieth, the beginnings of Bolivian archaeology emerged with a more scientific approach. These first efforts were by foreign researchers visiting Bolivia, most of them part of research programs promoted by international museums. The goal of these scholars was, not just scientific inquiry, but in some cases, to acquire archaeological collections for exhibition in foreign museums. This practice of acquiring collections of artifacts from developing countries for display in the home country's museums was part of the colonial approach to archaeology and typical of those times. On a national level, this was the period of intensive exploitation and export of tin and the advent of liberalism and modernism into the Bolivian political arena.

Adolph Bandelier, an archaeologist working in the American Museum of Natural History in New York City, visited different places in Peru and Bolivia during 1892-1897. From Bolivia, Bandelier (1910) provided important descriptions, maps, and collected indigenous myths of origin from the Island of the Sun, the Island of the Moon, and Tiwanaku (the mythical centers of origin of the Inca empire). He also collected archaeological objects that were later transported to the American Museum of Natural History.

Erland Nordenskiöld, a Swedish scholar, also conducted several scientific expeditions with an archaeological and ethnographical focus in different areas of Bolivian territory during 1901-1914. His work was conducted not only in the Bolivian highlands, but he was also one of the first to provide firsthand information about the intermediate valleys and Amazonian tropics. He described the variety of ethnic groups inhabiting those areas, and he also carried out excavations at several habitation mounds in the lowlands (Trinidad), at sites located in the valleys of Cochabamba (Mizque, Caballero, Saipina), and in Santa Cruz. He provided the first relative chronologies and detailed artifact inventories, and he identified previously unknown archaeological cultures. His extensive work was published in 1953.

The work of Arthur Posnansky (1904-1940) also stands out. As a naval engineer from Vienna who was impressed by the ruins of Tiwanaku, Posnansky (1945) produced detailed maps of the monuments and structures in Tiwanaku. He also speculated that this ancient culture was the cradle of American humans

and that Tiwanaku was on the shores of an ancient lake.

In 1903, a multidisciplinary French expedition directed by Georges de Crèqui-Montfort made the first excavations in Tiwanaku. Several areas of Tiwanaku were excavated such as the pyramid of Akapana, the semi-sunken temple of

late intermediate period and Inca remains (Rydén 1952, 1957). During 1958, a German, Heinz Walter, conducted excavations in the regions of Mizque-Lakatambo (Cochabamba) and Icla-Chullpamoko (Chuquisaca) to investigate the chronology and stylistic distribution of local ceramic styles (Walter 1968).

In 1955, the American archaeologist alfred kidder from the Museum of Pennsylvania visited Bolivia and studied the ruins of Chiripa, the cultural predecessor of Tiwanaku during the formative period. He excavated the ceremonial mound of Chiripa, along with Gregorio Cordero, a Bolivian archaeologist working at the National Museum of Tiwanaku (Kidder 1956). Unfortunately, little information about these excavations was published. Between 1974 and 1975, David Browman also focused his efforts on the excavation of Chiripa, providing a new interpretation of the origins and formation of Tiwanaku as the capital of a multiethnic confederation and highlighting the role of llama caravans in the economic and political integration of the Bolivian highlands and valleys (Browman 1981).

There was almost an absence of Bolivian archaeologists excavating or generating theoretical interpretations during this period. Among the few and most important ones were Maks Portugal Zamora and Gregorio Cordero Miranda, both of whom were involved in the direction of the National Museum of Tiwanaku. Portugal Zamora (1957) excavated different archaeological sites such as Chiripa and others in the highlands while Cordero Miranda (1955, 1978) focused his research in Tiwanaku and excavating different areas, including the Pumapunku pyramid. However, most of their investigations were neither documented nor published, which is a loss for Bolivian archaeology.

Another significant feature of this period is the near absence of Bolivians participating in international archaeological projects. When Bolivians did participate, their role was secondary. There are three main reasons for this situation: first, Bolivian archaeology was not as yet institutionalized; second, Bolivian researchers did not have a clear vision about the role of archaeology as a scientific discipline; and third, the economic support of archaeology by the Bolivian state was minimal.

Institutionalization and the Rise of National Archaeology

The nationalist revolution in 1952 had a great impact on the way Bolivian archaeology was organized and structured at the government level. One of the goals of the new revolutionary government was to reinforce the image of a unified nationhood by creating a sense of national identity. In this process, the construction of a glorious past became an important element, and archaeology gained the support of the emerging elites. In 1958, the Center of Archaeological Investigations in Tiwanaku (CIAT) was created under the direction of the Ministry of Education, and its main goal was to conduct extensive research and archaeological excavations in Tiwanaku.

The creation of CIAT constituted the first systematic effort of the Bolivian state toward the institutionalization of archaeological research. Starting in 1957, under the direction of Carlos Ponce Sanginés and the sponsorship of the Bolivian government, different areas of Tiwanaku such as Kalasasaya and Akapana were extensively excavated, preserved, and restored, constituting what is today one of the most important sites of Bolivian patrimony. As a result of these excavations, Ponce formulated an evolutionary sequence for Tiwanaku, based on radiocarbon dating, as follows: (1) Hamlet Tiwanaku, b.c. 1590-a.d. 43; (2) Urban Tiwanaku, a.d. 43-667; and (3) Imperial Tiwanaku, a.d. 667-1050. It is clear that Tiwanaku was not just a ceremonial center, as previously suggested (Bennett 1934), but an extensive urban center and the capital of an expansive empire (Ponce Sanginés 1981). Ponce's ideas and interpretation remain pivotal for the understanding of the Tiwanaku polity, and they were spread widely through a series of publications.

In 1975, the National Institute of Archaeology (INAR) was established as the main government

organization in charge of executing, organizing, sponsoring, and regulating archaeological research in all of Bolivia. Ponce Sanginés, its main promoter and first director, organized a series archaeological projects in

of archaeological projects and have promoted the protection of the prehistoric cultural heritage in those regions. Added to these efforts, the creation of the Department of Anthropology and Archaeology at the University of San Andrés in La Paz in 1984 provided a firm base for the education of a new generation of Bolivian archaeologists.

Current Archaeological Research

Since the 1980s, new multinational and multidisciplinary projects have been conducted in Bolivia. The Wilajawira archaeological project, under the direction of Alan Kolata and Oswaldo Rivera Sundt, has revealed the importance of raised fields in the Tiwanaku agricultural economy, the centralized structure of the Tiwanaku state (with a quadripartite hierarchical system), and the nature of urbanism in the Tiwanaku core (Kolata 1989, 1993).

The International Seminar of Archaeological Excavations in Tiwanaku, a part of the Wilajawira project directed by Kolata and Ponce Sanginés, developed a number of specifically oriented research areas such as paleoethnobotany and diet analysis (Lennstrom, Hastorf, and Wright 1991), settlement pattern studies (Albarracín-Jordán 1990; Mathews 1992), household and domestic archaeology (Bermann 1994; Janusek 1994), craft specialization (Rivera Casanovas 1994), public architecture (Couture 1992; Manzanilla and Woodard 1992; Rivera Sundt 1989; Sampeck 1991), physical anthropology and demography (Blom 1999), paleozoology (Webster 1993), and ceramic analysis (Alconini 1995; Sutherland 1991). Undoubtedly, the Wilajawira archaeological project constituted the largest multinational effort, produced a great body of information about Tiwanaku, and set the foundation for a multidisciplinary approach to Bolivian archaeology.

Other multinational and multidisciplinary projects have been conducted in the highlands. Since 1992, Christine Hastorf, head of the Taraco archaeological project, has been conducting an extensive investigation of the site of Chiripa, a pre-Tiwanaku polity that arose during the formative period near the shores of Lake Titicaca. The most important contributions of this project were the excavation and exposure of the ceremonial core of Chiripa, comprising a series of terraced platforms, specialized architecture, and burial and domestic areas around a semi-sunken temple. The project has also refined the chronological sequence of the site, conducted regional studies, and paleobotanical analysis (Hastorf et al. 1996). Another large-scale project was the Iwawe archaeological project, which was directed by William H. Isbell and Juan Albarracín-Jordán between 1995 and 1998 in the Iwawe region near Lake Titicaca. This work clarified our understanding of the formative period and the origins of Tiwanaku before it became a state (Isbell 1993). Charles Stanish and others have conducted extensive excavations and settlement studies at the Island of the Sun, Lake Titicaca (Stanish et al. 1996).

Small-scale projects, with Bolivian participation, have also been conducted in the Bolivian highlands. These include the Yaya-Mama archaeological project, coordinated by Karen Mohr Chavez, Sergio Chavez, and Eduardo Pareja in the region of Copacabana and adjacent areas since 1993, which seeks to understand the role played by religion in the unification of the various polities around the lake before the emergence of Tiwanaku. A new approach to archaeology has been implemented by Sergio Chavez in his promotion of the participation of local indigenous Aymara communities in different stages of archaeological research, part of a strategy to make them active participants in the reconstruction and reappropriation of their own cultural past.

Other regions of Bolivia were also subjected to similar multinational and multidisciplinary projects in the decade 1990-2000. Albert Meyers (1997), from the University of Bonn, and a German-Bolivian team have extensively excavated, conserved, and restored different areas of Samaipata, an Inca complex with one of the largest carved rocks in South America located at the margins of the sub-Andean piedmont

before the rise of the Amazonian savannas. Other small-scale binational projects have been conducted in these tropical areas. In Beni, Clark Erickson, along with Bolivian and American archaeologists, has documented the landscape,

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Bonampak'

A classic Maya site in Chiapas in southern mexico, Bonampak' is most famous for the well-preserved murals adorning the interior walls of its principal temple. For decades the temple had been a place of worship by the Lacandon Maya, who today inhabit the region, but the murals became known to the outside world only in 1946.

Bonampak' was the capital city of one of the many small kingdoms that formed the map of the Maya world during the Maya classic period (a.d. 250-900). It alternated between peaceful and bellicose relations with its neighbors, and like many other kingdoms during the classic period was at times dominant and at other times subservient in the hierarchy of kingdoms in the complex political geography of the times. The most famous king of Bonampak' was Yajaw-Chan-Muwa:n, who was responsible for most of the carved monuments that survive at the site. Yajaw-Chan-Muwa:n, who was related by marriage to the royal family of Yaxchilan that lived in a neighboring kingdom, became king of Bonampak' in a.d. 776, toward the end of the capital's history. In one of his carved stelae (Bonampak' Stela 2), he portrays himself about to let blood from his genitals, flanked by his wife (a princess of Yaxchilan) and his mother.

Yajaw-Chan-Muwa:n also built and decorated Structure 1 of Bonampak', which contains the famous

murals. These murals are among the best preserved in Mesoamerica and give a fascinating glimpse into classic Maya ritual, warfare, and courtly life. The murals cover the surfaces of all three rooms of the temple. The first room portrays an elaborate procession at the Bonampak' court, in which the key event is the public presentation of the young son of Yajaw-Chan-Muwa:n as the heir apparent to the throne of the kingdom. In the second room is the depiction of a pitched battle in which Yajaw-Chan-Muwa:n and his allies are victorious. Over the doorway of this room, the captives-destined for sacrifice-are displayed before Yajaw-Chan-Muwa:n. The murals in the third room show the victory dance of the triumphant Bonampak' lords while a captive is being sacrificed and members of the court are engaged in letting their own blood.

A view from the back, toward the entrance, Temple of Murals, Bonampak'

(Ann Ronan Picture Library)

These wonderful murals were intended to be a lasting record of the ceremonies surrounding the designation of Yajaw-Chan-Muwa:n's son as heir to the throne. The irony is that the young boy portrayed in the murals almost certainly never became king, for, apparently, the site was abandoned before he ever came of age, and

there are indications that the murals were never quite completed.

Peter Mathews

See also

Maya Civilization

Bordes, François

(1919-1981)

One of the most influential Paleolithic archaeologists of the twentieth century, François Bordes was most famous for his standard Mousterian stone tool typology. He created the typology during the 1950s and refined it over the next decades until it gained enormous influence in the classification of Mousterian materials in Europe and southwestern Asia.

Bordes's great area of influence was in the heartland of French Paleolithic archaeology, southwestern france, including the Périgord region, and is best expressed by his classic excavation of the sites of Combe Grenal and Pech de l'Azé. Bordes's great advance on previous classifications was in his use of statistical analysis for very large assemblages, which allows the archaeologist to plot changing distribution of artifact types between sites and over time. Bordes also argued that his system allowed the archaeologist to identify the existence of distinct tribes during the Mousterian period in southwestern France, his logic being that distinct toolmaking traditions were the expression of distinct tribal ethnicities. This argument was strongly contested by American archaeologist lewis binford (among others), who contended that the variability that Bordes had identified was more likely the product of the different functions the tools were used to perform, different raw materials, different stages in a total production process for tools (reduction sequence), or different

time periods. Notwithstanding these arguments, many archaeologists would readily accept the assertion that Paleolithic archaeology was transformed by Bordes's vision. In his spare time, Bordes wrote science-fiction stories and cultivated an interest in cartooning.

Tim Murray

See also

Lithic Analysis

References

For references, see *Encyclopedia of Archaeology: The Great Archaeologists, Vol. 2*, ed. Tim Murray (Santa Barbara, CA: ABC-CLIO, 1999), pp. 773-774.

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The son of distinguished Italian historian Carlo Botta, Paul Emile Botta was physician to Pasha Mohammed Ali of Egypt. In 1833 Botta was appointed French consul in Alexandria and in 1840 he was transferred to Mosul in northern Iraq with instructions to find and excavate the biblical city of nineveh.

Botta began excavating at Quyunjik, which was believed to be Nineveh, in 1842 but found little to interest him in his initial excavations. There appeared to be more of archaeological interest at nearby Khorsabad, and in 1843 Botta moved his excavations to this site, where he unearthed the palace of Sargon II (721-705 b.c.). With the support of the French government, and with 300 workmen, Botta dug Khorsabad for two years, acquiring magnificent bas-reliefs, artifacts such as four-meter-high winged bulls with human heads, and many cuneiform tablets, which were displayed at the louvre in Paris in 1846. Botta's discoveries caused huge interest in Paris-equivalent to the excitement engendered by Napoleon's Egyptian expedition.

Botta and artist Eugene Flandin published the *Monument du Nineve,* a four-volume record and illustration of the site, between 1846 and 1850. The Paris revolution of 1848 put an end to French work in Mesopotamia, and in 1851 Botta was dismissed in political disgrace. He was transferred to minor diplomatic posts in Jerusalem, Tripoli, and Syria. He died in Lebanon in 1870.

Tim Murray

See also

French Archaeology in Egypt and the Middle East; Mesopotamia

Boucher de Perthes, Jacques

(1788-1868)

A French customs official, an amateur antiquary, and a provincial man of letters, Boucher de Perthes has been sometimes described as the founder of the discipline of prehistory because of his discovery of ancient bifacially flaked stone tools in the gravels of the Somme River in northern France, tools that he attributed to “antediluvian” (pre-flood) human beings.

As president of a regional learned society he began his career in prehistory at the age of 49, assisting his

friend Dr. Casimir Picard, who was compiling an archaeological survey of the Somme Valley. He continued this work after Picard died. In 1837 during an excavation underneath the town walls of Abbeville, Boucher de Perthes found stone tools in the same stratigraphic levels as animal remains and pottery. While these artifacts became part of the Natural History Museum's collection, they were not recognized by the scientific establishment as being made by humans, and were classified as geological and paleontological-of natural rather than human scientific interest.

Boucher de Perthes also excavated at Menchcourt-les-Abbeville, a site formerly dug by Georges Cuvier, which was full of fossil elephant and rhino bones. Here he found not only stone tools but also polished pebble stone axes. Boucher de Perthes believed that if the tools and the bones were found in the same undisturbed stratigraphic unit then they were likely to be of the same age. In 1842 he retrieved a bifaced stone tool from these units and he continued to find and collect stone tools from numerous local railway cuttings, canal building sites, and quarries. Boucher de Perthes begun to write up his discoveries in what was to become the first part of *Antiquités celtiques et antédiluviennes,* in which he argued for the great age of the stone tools he had discovered. In this highly idiosyncratic work Boucher de Perthes advocated the need for methodological conventions of description and analysis that he felt would distinguish a science of archaeology, while at the same time arguing that his stone tools had been made by Celts who lived before the biblical flood. While he was not without supporters, the French scientific establishment,

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As president of a regional learned society he began his career in prehistory at the age of 49, assisting his

friend Dr. Casimir Picard, who was compiling an archaeological survey of the Somme Valley. He continued this work after Picard died. In 1837 during an excavation underneath the town walls of Abbeville, Boucher de Perthes found stone tools in the same stratigraphic levels as animal remains and pottery. While these artifacts became part of the Natural History Museum's collection, they were not recognized by the scientific establishment as being made by humans, and were classified as geological and paleontological-of natural rather than human scientific interest.

Boucher de Perthes also excavated at Menchcourt-les-Abbeville, a site formerly dug by Georges Cuvier, which was full of fossil elephant and rhino bones. Here he found not only stone tools but also polished pebble stone axes. Boucher de Perthes believed that if the tools and the bones were found in the same undisturbed stratigraphic unit then they were likely to be of the same age. In 1842 he retrieved a bifaced stone tool from these units and he continued to find and collect stone tools from numerous local railway cuttings, canal building sites, and quarries. Boucher de Perthes begun to write up his discoveries in what was to become the first part of *Antiquités celtiques et antédiluviennes,* in which he argued for the great age of the stone tools he had discovered. In this highly idiosyncratic work Boucher de Perthes advocated the need for methodological conventions of description and analysis that he felt would distinguish a science of archaeology, while at the same time arguing that his stone tools had been made by Celts who lived before the biblical flood. While he was not without supporters, the French scientific establishment,

through the Academie des Sciences, flatly rejected his claims in 1846.

Jacques Boucher de Perthes

(Science Photo Library)

Ten years later Boucher de Perthes experienced a kind of rehabilitation. In 1858 the Geological Society of London, largely prompted by the great hugh falconer, visited Abbeville to examine his evidence and to compare it with material found in England. In 1859 the Royal Society of London upheld that "flint implements were the product of the conception and work of man," and that they were associated with numerous extinct animals. In 1859 Albert Gaudry, the French Natural History Museum's paleontologist, defended Boucher de Perthes's findings to the Academie des Sciences, and this time that learned establishment recognized the antiquity of mankind and the evidence for it. Charles Darwin's *Origin of Species* was published that same year.

Tim Murray

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Boule, Marcellin

(1861-1942)

Marcellin Boule was born on 1 January 1861 at Motsalvy, in the French province of Cantal and was introduced to the natural sciences in his youth by the local pharmacist, Jean-Baptiste Rames, who was also an amateur geologist. Boule studied first in Toulouse and took degrees in natural science and geology. While there, he met the prehistorians and cave art specialists emile cartailhac and Louis Lartet, and they introduced him to paleoanthropology and prehistory. In 1886, he won a scholarship to Paris to study, and there his chief mentors were Ferdinand Fouque, a geologist at the College de France who introduced him to petrography, and Albert Gaudry, a paleontologist at the Muséum National d'Histoire Naturelle. In 1892, Boule became Gaudry's assistant at the museum and succeeded him as professor of paleontology in 1903, a position he held to his retirement in 1936.

Boule received the Chevalier de la Légion d'Honneur for his reorganization of the museum's paleontology gallery, which was opened in 1898. He was one of the founders and editor (1893-1930) of the distinguished journal *L'Anthropologie*. Boule was the unrivaled leader of French paleontology in the first third of the twentieth century, receiving the Huxley Medal from the Royal Institute of Anthropology of Great Britain and Ireland and the Wollaston Medal from the Geological Society of London. He taught and inspired many French paleontologists.

Two major works stand out from his prolific output. The first is the study of the La Chapelle-aux-Saints skeleton, in which Boule was able to explain his ideas on paleontology by proposing an original identification and reconstruction of Neanderthal man. He insisted that Neanderthals could not be ancestral to modern man, that they were a genuine fossil with no descendants. He was to use the same argument later about *Homo erectus,* the pithecanthopines discovered in Indonesia and China. He believed that there was a yet-to-be-found hominoid ancestor from which modern humans had

descended.

The second major work is his popular book *Les hommes fossiles, eléments de paléontologie humaine* (1921), which summarized his thinking

about human ancestry for the general public. Albert I, prince of Monaco, was so impressed by this book that he founded the Institut de Paléontologie Humaine in Paris in 1914. The first organization for specialized research in the field, Boule was the Institute's first director when it opened in 1920.

Boule believed that the function of paleoanthropology was to revitalize prehistory by giving it the status of a "historical science," one that was indispensable to the study of the earliest humans. In the context of late-nineteenth-century prehistory, Boule's contribution was innovative. Using Quaternary geology, paleontology, and archaeology, Boule provided an alternative method to the study of prehistory. His method replaced the predominant one elucidated by gabriel de mortillet, one that was based exclusively on the classification of artifacts manufactured by humans. Boule argued that stone tools could only be used as chronological data if they were a proven part of geology and paleontology.

Nathalie Richard; translated by Judith Braid

See also

France

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For references, see *Encyclopedia of Archaeology: The Great Archaeologists, Vol. 1*, ed. Tim Murray (Santa Barbara, CA: ABC-CLIO, 1999), p. 273.

Boxgrove

In West Sussex (United Kingdom), 12 kilometers inland from the current shoreline of the English Channel, lies the parish of Boxgrove, where Middle Pleistocene sediments have been exposed in quarries along the southern margin of the hills of the South Downs. From the beginning of the twentieth century onward, similar deposits in the region were reported to yield archaeological finds. Research by the British Geological Survey in the 1970s demonstrated the occurrence of archaeological materials within the deposits at Boxgrove, and a survey and trial excavation undertaken by Mark Roberts in 1983 established the presence of a rich archaeological horizon. Funding by English Heritage enabled further research in 1984, and in 1985 the Boxgrove Lower Palaeolithic Project was set up by the Institute of Archaeology, part of University College London.

Excavations carried out until 1996 under the direction of Mark Roberts and Simon Parfitt have revealed extensive lithic scatters comprising large amounts of debitage (debris made by stone tools), numerous hand-axes, and some cores and flake tools. Moreover, the site complex has yielded one of the most diverse vertebrate faunas from a Lower Paleolithic context in Europe. The assemblages have been dated on the basis of mammalian biostratigraphy to the last temperate stage of the Cromerian Complex, tentatively correlated with Oxygen Isotope Stage 13 (524,000-478,000). Although later dates have been proposed on the basis of other data, such as the calcareous nannofossils, Boxgrove occupies a prime position in the ongoing debate about the earliest occupation of northern Europe. A robust hominid tibia found at Boxgrove in 1993 has been assigned to *Homo* spp., with possible further reference to *Homo* cf. *heidelbergensis* on temporal and geographic grounds.

Geologic study suggests that the archaeological remains were deposited within a markedly changing environment. Under decreasing marine influence the area developed from a beach setting, through a lagoonal setting in which artifacts were left on intertidal mudflats, and into a more terrestrial setting that later became inundated with freshwater. The excellent preservation of artifacts in the lagoonal silts and their exposure over relatively large areas have earned Boxgrove the description of "a Middle Pleistocene

pincevent," as have the detailed excavation and documentation procedures applied.

The assemblages recovered at Boxgrove are interpreted in terms of the procurement and processing of animal and lithic resources by hominids. Large mammal bone fragments with cut marks and percussion damage suggest meat and marrow exploitation. Use-wear on a small number of hand-axes is interpreted to stem from contact with meat and hide. All the lithic artifacts are made of locally available flint, and refitting data suggest that lithics in varying stages of reduction were transported. Other finds include an antler hammer with splinters of flint embedded in the striking surface and a horse scapula with damage suggested to be the result of a projectile impact.

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The excellent preservation and documentation of archaeological data from Boxgrove have fueled expectations that assemblage studies will yield new insights into hominid behavior. Different data sets have been compiled to suggest that the hominids who left their artifacts at Boxgrove hunted large game, cooperated with each other, planned ahead, and used spoken language. Although these characteristics would not be unbecoming to those thought to be among the earliest colonizers of northern Europe, they remain contested. As research continues, the data from Boxgrove may prove particularly informative for the potential of and the limits to archaeological interpretation.

Josara De Lange

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Braidwood, Robert John (1907-)

Robert Braidwood, born in Detroit, Michigan, in 1907, first studied to be an architect but returned to university in 1930 to study art history and anthropology because of the adverse effects of the Great Depression on the building industry. He traveled to Iraq in 1930-1931 to participate in the excavation of Seleucia, and this trip marked the beginning of his long interest in and significant contributions to Near Eastern archaeology. Braidwood worked briefly in Illinois and New Mexico, but all the rest of his fieldwork was under the aegis of the University of Chicago's oriental institute: Syria, 1933-1938; Iraq, 1947-

1948, 1950-1951, and 1954-1955; iran, 1959- 1960; and turkey, 1963 until the mid-1990s.

Seleucia, south of Baghdad. Robert Braidwood participated in an ongoing excavation here, which eventually uncovered four levels of occupation.

(© Arthur Thevenant/CORBIS)

During the 1930s, Braidwood participated in Amuq expeditions in Syria directed by henri frankfort, who became professor of Near Eastern archaeology at the Oriental Institute and was the head of Braidwood's dissertation committee. In 1945, Braidwood became the first specialist in prehistory to hold a full-time position at the institute (as well as a joint appointment in the University of Chicago's Department of Anthropology). He held both positions until 1978 when he became emeritus professor of Old World prehistory at the institute and emeritus professor of anthropology.

Braidwood's name is most closely associated with a major transition in the human past-the origins of food production in the Near East-and with the site of jarmo in northern Iraq, for many years the oldest village of farmers and herders known anywhere in the world. Braidwood's contribution, in the 1950s and 1960s, to the archaeology of agricultural origins and to archaeology more generally was primarily methodological, conceiving and implementing interdisciplinary staffs at the fieldwork level. He initiated a highly productive research trajectory that has claimed the attention of several generations of archaeologists and natural scientists. The interdisciplinary investigations he pioneered in Iraq and Iran became models for elucidating agricultural transitions and have also been acknowledged as the best means to delineate regional culture-historical sequences.

Members of Braidwood's project teams also intitiated two other important firsts in Near Eastern field archaeology: systematic ethnographic observations for archaeological purposes and the recovery of pollen from deeply stratified wet contexts. Much of what Braidwood pioneered is now central to archaeological research design, and he was a powerful force in world archaeology for at least three decades.

Patty Jo Watson

See also

Mesopotamia

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Brazil

Periods in the History of Archaeology

The history of archaeology in Brazil has been divided into phases following different criteria. Most authors consider that archaeology should have its own disciplinary history, untied to the overall political history of the country. André Prous (1992) identified five periods and Alfredo Mendonça de Souza (1991) followed the same disciplinary history approach but proposed only four periods.

The history of archaeology in Brazil should not, however, be considered independent from Brazilian history. Because the development of archaeology's practice, theory, and methodology depends directly on the sociopolitical conditions in a given country, it is possible to relate the social practice of archaeology and political changes. As with any intellectual endeavor, archaeological activities are the result of social conditions and relations prevailing in different periods. Thus, we can say that archaeology in Brazil went through seven phases: the colonial period (1500-1822); the Brazilian Empire (1822-1889); the early republic (1889-1920s); an intermediate period (1920s-1940s); the inception of university research (1950-1964); the military period and the constitution of an archaeological establishment (1964-1985); and democracy and a pluralist archaeology (1985 onward).

The Colonial Period (1500-1822)

There are few references in colonial sources to archaeological sites, though Fernão Cardim (1925) referred to shellmounds, known in Brazil by their Tupi name *sambaquis,* and Feliciano Coelho's soldiers, as early as 1598, mentioned rock inscriptions (Prous 1992, 5). However, travelers and writers such as Yves d'Euvreux (1985), Gabriel Soares (1944), G. Carvajal (1942), Father Anchieta (1988), André Thevet (1944), and Hans Staden (1930) described native inhabitants and their culture, furnishing a good deal of data on Indian material culture. Thanks to these sources, it is possible to study native settlements while taking into full account the historical evidence relating to the following areas: the East Amazon basin area (Porro 1992; Taylor 1992; Erikson 1992;

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The Brazilian Empire (1822-1889)

Peter Wilhelm Lund, born in Copenhagen in 1801, is considered to be the first scholar to describe Brazilian prehistory. He went to Brazil as early as 1825, staying for three years and returning in 1833. Lund established a paleontological laboratory in the village of Lagoa Santa, in Minas Gerais Province, where he found human and animal fossils. The Brazilian emperor Peter II, under the influence of classical German education, went in person to Lagoa Santa to visit the Danish scholar. Between 1834 and 1844 Lund surveyed some 800 caves and found fossils thousands of years old. He collected a great deal of material and studied a variety of extinct fauna. At Sumidouro Lake he found human bones associated with extinct animals. Paleontologists who followed Georges Cuvier, such as his pupil Lund, believed there had been a universal biblical deluge and that the association of human remains with extinct animals meant that men had lived in the New World before the deluge. Although Lund was not sure that Cuvier's universal deluge theory was useful for the Americas, he was a Christian, and he did not choose to challenge current ideas, preferring instead to isolate himself and avoid controversial attitudes. Lund was a leading pioneer in his field, and his position illustrated the tensions arising from undertaking scientific archaeological work in Brazil. Dogma and supposedly established truths, when challenged by evidence, tended to prevail and force people to comply.

At the same time, the National Museum, thanks to Charles Wiener (1876), pioneered the studies of lithic material, and the Canadian Charles Friedrich Hartt (1871, 1872, 1874, 1876, 1885) explored the Amazon basin, a region also studied by D.S. Ferreira Penna (1876) and J. Barbosa Rodrigues (1876, 1892). Karl Rath (1871) studied shellmounds, and the German scholar Fritz Mueller was employed by the National Museum as natural and human material collector. The activities of all these researchers were an outgrowth of the enlightened character of the Brazilian royal court. During the second half of the nineteenth century, thanks to Emperor Peter II and his European outlook, there was official sponsorship of fields such as paleontology and ethnology. Ladislau Neto (1876, 1885a, 1885b), as director of the National Museum, was perhaps the first Brazilian to explicitly study and write about archaeology as such. Neto sought out Native Americans and was very much in touch with international academic standards. His exchange of letters with the French scholar Ernst Renan is a prime example of the good communications existing between these early Brazilian and European scientists. It is clear that, from its inception, archaeology in Brazil was linked to both foreign influence and state patronage.

The Early Republic (1889-1920s)

Archaeology during the early republican period continued to be dominated by people attached to museums. With the growing importance of the State of São Paulo within the federation of Brazilian states

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Wright 1992); the North Amazon region (Farage and Santilli 1992; Menéndez 1992; Amoroso 1992); the South Amazon area (Perrone-Moisés 1992; Franchetto 1992; Lopes da Silva 1992); the northeast (Paraíso 1992; Dantas, Sampaio, and Carvalho 1992); the southwest (S. Carvalho 1992); the south (Monteiro 1992; Kern 1982); and the entire country (Fausto 1992). Evidence provided by these documents include written descriptions as well as drawings and paintings that are very useful in the analysis of material remains; Hans Staden's drawings are perhaps the best example of this kind of early evidence. But the use of all this early evidence necessitates an awareness of the bias of the early authors. U. Fleischmann and M.R. Assunção (1991) studied the documents, emphasizing that the authors were not describing but interpreting native customs according to both their own ideologies and their own interests. This means that colonial sources, iconography, and written documents alike, although very useful, must be interpreted within their social context. They are overwhelmingly biased against Native Americans, Africans, and even poor Europeans, and thus they must be studied carefully by archaeologists.

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hegemony, there was cultural shift in the country from the court in Rio de Janeiro to the new Paulista elite. This shift explains the role the Paulista Museum played in the field from the beginning of the twentieth century. To be sure, there were people studying elsewhere, such as the Swiss Emílio Goeldi (1897-1898, 1900), who explored the Amazon basin from his post at the Museu do Pará (now known as the Museu Paraense Emílio Goeldi), or Alberto Loefgren (1893, 1903), who studied shellmounds from São Paulo and Rio de Janeiro, as did Ricardo Krone (1902, 1909, 1910, 1914, 1918). However, long-standing archaeological activities were in São Paulo. The German scholar Hermann von Ihering (1895, 1902, 1904, 1907, 1911) became director of the Paulista Museum in 1895 and was in charge until 1916, when he was dismissed for political reasons (Losano 1992, 99). Although Ihering was a racist and even defended the extermination of native Indians in Brazil, and although he opposed the idea that shellmounds were evidence of prehistoric human settlements, he should be considered as the first conservative ideologist of Brazilian archaeology. It is interesting to note that he was, at the same time, out of touch with modern research in Europe and a political reactionary. The conservative establishment born in the 1960s would inherit this outlook.

Teodoro Sampaio (1916, 1918, 1922) was perhaps the best example of this generation of pioneer scholars, none of them professional archaeologists. His general paper entitled “Brazilian Archaeology” (1922) and believed wholeheartedly that rock scratches should be interpreted as hieroglyphic writing.

The Formative Period (1920-1949)

Important changes occurred in Brazil during this period, particularly in terms of political, social, and cultural upheavals. Rebellions, revolutions, and dictatorship went hand in hand with cultural transformation. Modernism and later fascist and communist ideas fostered discussions on democracy in intellectual circles. From that point on intellectuals would address the peoples' interests, and even as the masses were the subject of intellectual discourse, they were also its ultimate audience. The establishment of the first university in Brazil in the early 1930s, São Paulo State University (USP), was a direct result of this new situation. As a side effect archaeologists began to take the public into account and tried for the first time to carry out taxonomic scientific analysis.

This period thus witnessed two new developments in archaeology: the study of artifact collections and the publication of manuals. Anibal Mattos continued the tradition of earlier periods but produced scholarly manuals, especially on material from the State of Minas Gerais. Mattos's *Brazilian Prehistory Handbook* (1938) is still worth reading, particularly his introductory assessment of the disputes between different practitioners. Angyone Costa (1935, 1936, 1984) produced the first overall introductions to Brazilian archaeology and prehistory. Frederico Barata (1944, 1950, 1952) wrote the first introduction to prehistoric art in Brazil. The Argentinean Antônio Serrano (1937, 1938, 1940,1946) studied Brazilian collections of artifacts and thus established a new field in Brazilian archaeology. This whole period before the introduction of archaeology into the Brazilian academic world (that is, prior to the 1950s) is usually dismissed by students of the history of Brazilian archaeology. But the significance of the publication of the first manuals and the inception of collection studies should not be underestimated, considering that archaeology in Brazil continues to lag behind that of other Latin American countries in both these areas. Consequently, this formative period should be reinterpreted as an important landmark. If there is a lack of handbooks and collection studies later on, notably after 1964, the reasons should be sought not in the period from the 1920s to the 1950s but rather in the military clampdown on the academic world in the 1960s and 1970s.

The Inception of University Research (1950-1964)

After World War II Brazil enjoyed its longest democratic period. The participation of Brazilian soldiers

in the Allied fight against fascism in Europe (1942-1945) established the basis for the overthrow of the Brazilian dictatorship

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hegemony, there was cultural shift in the country from the court in Rio de Janeiro to the new Paulista elite. This shift explains the role the Paulista Museum played in the field from the beginning of the twentieth century. To be sure, there were people studying elsewhere, such as the Swiss Emílio Goeldi (1897-1898, 1900), who explored the Amazon basin from his post at the Museu do Pará (now known as the Museu Paraense Emílio Goeldi), or Alberto Loefgren (1893, 1903), who studied shellmounds from São Paulo and Rio de Janeiro, as did Ricardo Krone (1902, 1909, 1910, 1914, 1918). However, long-standing archaeological activities were in São Paulo. The German scholar Hermann von Ihering (1895, 1902, 1904, 1907, 1911) became director of the Paulista Museum in 1895 and was in charge until 1916, when he was dismissed for political reasons (Losano 1992, 99). Although Ihering was a racist and even defended the extermination of native Indians in Brazil, and although he opposed the idea that shellmounds were evidence of prehistoric human settlements, he should be considered as the first conservative ideologist of Brazilian archaeology. It is interesting to note that he was, at the same time, out of touch with modern research in Europe and a political reactionary. The conservative establishment born in the 1960s would inherit this outlook.

Teodoro Sampaio (1916, 1918, 1922) was perhaps the best example of this generation of pioneer scholars, none of them professional archaeologists. His general paper entitled “Brazilian Archaeology” (1922) and believed wholeheartedly that rock scratches should be interpreted as hieroglyphic writing.

The Formative Period (1920-1949)

Important changes occurred in Brazil during this period, particularly in terms of political, social, and cultural upheavals. Rebellions, revolutions, and dictatorship went hand in hand with cultural transformation. Modernism and later fascist and communist ideas fostered discussions on democracy in intellectual circles. From that point on intellectuals would address the peoples' interests, and even as the masses were the subject of intellectual discourse, they were also its ultimate audience. The establishment of the first university in Brazil in the early 1930s, São Paulo State University (USP), was a direct result of this new situation. As a side effect archaeologists began to take the public into account and tried for the first time to carry out taxonomic scientific analysis.

This period thus witnessed two new developments in archaeology: the study of artifact collections and the publication of manuals. Anibal Mattos continued the tradition of earlier periods but produced scholarly manuals, especially on material from the State of Minas Gerais. Mattos's *Brazilian Prehistory Handbook* (1938) is still worth reading, particularly his introductory assessment of the disputes between different practitioners. Angyone Costa (1935, 1936, 1984) produced the first overall introductions to Brazilian archaeology and prehistory. Frederico Barata (1944, 1950, 1952) wrote the first introduction to prehistoric art in Brazil. The Argentinean Antônio Serrano (1937, 1938, 1940,1946) studied Brazilian collections of artifacts and thus established a new field in Brazilian archaeology. This whole period before the introduction of archaeology into the Brazilian academic world (that is, prior to the 1950s) is usually dismissed by students of the history of Brazilian archaeology. But the significance of the publication of the first manuals and the inception of collection studies should not be underestimated, considering that archaeology in Brazil continues to lag behind that of other Latin American countries in both these areas. Consequently, this formative period should be reinterpreted as an important landmark. If there is a lack of handbooks and collection studies later on, notably after 1964, the reasons should be sought not in the period from the 1920s to the 1950s but rather in the military clampdown on the academic world in the 1960s and 1970s.

The Inception of University Research (1950-1964)

After World War II Brazil enjoyed its longest democratic period. The participation of Brazilian soldiers

in the Allied fight against fascism in Europe (1942-1945) established the basis for the overthrow of the Brazilian dictatorship

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(which held power from 1937 to 1945). Democracy meant the introduction of broader concerns with intellectual discourse and the spread of the university and other learning institutions throughout the country. Furthermore, industrialization, especially in south Brazil, made relatively large funds available for cultural activities.

It was in this context that academic or scholarly archaeology was created by the leading Brazilian humanist Paulo Duarte. Thanks to his friendship with Paul Rivet, director of the Musée de l'Homme in Paris, and complementing his own struggle for human rights in Brazil, Duarte created the Prehistory Commission at USP in 1952. An outstanding Brazilian intellectual, he was able to change long-standing features of Brazilian archaeology-its tendency to be parochial, racist, and out of touch, in the tradition of Ihering and others. Duarte was not a museum director pretending to be a scholar, as was the case of directors before and after him. Rather, he was an intellectual and human rights activist who struggled to introduce ethical principles into the very act of creating archaeology as an academic discipline. Duarte also worked politically to craft legislation to protect Brazilian heritage, and thanks to his efforts, the Brazilian Parliament enacted a federal bill (approved as Bill 3924 in 1961) protecting prehistoric assets (Duarte 1958). He studied shellmounds (1952, 1955, 1968, 1969) and encouraged French archaeologists Joseph Emperaire and Annette Laming-Emperaire (1975).

The Military Period and the Constitution of an Archaeological Establishment (1964-1985)

On April 1, 1964, there was a military coup in Brazil, and the armed forces held power until March 15, 1985. Twenty years of authoritarian rule meant that all kinds of human rights abuses were committed. From 1964 until 1968 political repression involved the suppression of formal liberties. After 1968 the military introduced more violent practices, such as expulsion, detention without trial, torture, and murder. Within academia, suppression meant censorship first and expulsion later. The very slow process of relaxing this repression began in the late 1970s and continued until 1985.

In archaeological terms, the main contributors to the discipline during this period were two Americans, Clifford Evans and Betty Meggers (1947, 1954). Although they had excavated at the mouth of the Amazon River as early as 1949 and had produced papers before 1964, it was only after the military coup of April 1964 that Evans and Meggers were able to set up a network that would result in the development of an archaeological establishment.

Duarte's scholarly archaeology project was mildly opposed by people in power at first, so between 1964 to 1969 he was deprived of funding (the most subtle but effective weapon). Cuts in university budgets in general affected, first and foremost, the human and social sciences, and in the case of archaeology budgetary restrictions were a very powerful way of hindering development. This passive strategy changed as the military begun to use force to rule the country and subdue intellectual opposition in general. The new and violent approach of the authorities was evidenced by the official support of death squads in the late 1960s, introducing Brazilians to the disgusting concept of “missing people” (i.e., people who were arrested and executed secretly because of their political beliefs). Intellectual life underwent radical changes. In the words of Octávio Ianni (1978):

For those who controlled state power from the 1964 coup, there was and there is, in 1978, a need to control, to marginalize, to curb or to suppress dissident voices. The cultural policy in Brazil in the period 1964-1978 divides intellectuals in three categories. There is an encouraged or protected intellectual production; it is the official one. For people in power, this is the only sound production. Then, there is the tolerated overlooked production. Finally, there is the forbidden, censored one.

The archaeological establishment created by the military followed the official line, using Ianni's terms, and

Brazilian archaeology was once again in the hands of museum directors and other bureaucratic officials. Perhaps the best (or worst) example involved Paulo Duarte.

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The scholarly study of historical sites in Brazil has been particularly seminal in the two areas of African material culture and Jesuit missions. Carlos Magno Guimarães has been studying Maroon (fugitive slave) settlements in Minas Gerais for more than a decade, and he has examined written documents and archaeological material. Other scholarly archaeological research on runaway slaves started in 1992 at the Palmares *quilombo,* the largest maroon settlement, which blossomed during almost all of the seventeenth century (Funari 1991a; Orser 1992a). The study of African material culture is important both scientifically and socially, as these scholarly enterprises can address the problem of the struggle for freedom by ordinary people. The archaeological study of the Jesuit missions in the south of Brazil has been going on for years and is now the best example of what scholarly historical archaeology has achieved in Brazil. Arno Alvarez Kern (1982, 1984, 1985, 1987, 1988, 1989, 1991a, 1991b) has been directing fieldwork at different Jesuit mission towns. He established a field school for students and has trained many undergraduate and graduate pupils, typically using written documents and material culture. In addition, papers and books on the mission sites have been regularly published, which is unusual and worthy of particular praise.

In Brazilian archaeology in general during this period, no handbook was produced, and the overwhelming majority of papers were excavation or survey reports, often in the form of master's theses or Ph.D. dissertations. These works usually dealt with a single site or even a single fieldwork season, as the titles of two dissertations-"Archaeological Excavations at Corondo Site, 1978 Season" (E. Carvalho 1984) and "Rescue Archaeology at Tucurui Region" (Costa 1983).

Current Trends (1985 Onward)

"I know enough history to realize that great crises move slowly, and such poor little chaps as ourselves can only take pride in our resignation." Marc Bloch's words (in Fink 1991, 54) describe the feelings of Brazilian intellectuals who survived the long ordeal of military rule. By the late 1970s Brazilian humanities scholars and social scientists were able to reintroduce free and uncensored discussion to academia, and as a result Brazilian scholarship in history, anthropology, and sociology became both scientifically structured inside the country and more widely recognized abroad through different interpretive schools and trends. This has been a much tougher task for archaeology for many reasons, not least of all because the archaeological establishment, impervious to change, continued to control funds for fieldwork. Walter A. Neves (1988, 205) emphasized that "no law, no political determination, no governmental aims or potential competence can stand up to the academic corporativism." Even foreign researchers such as Anna Roosevelt (1991, 106-107) had problems publishing evidence and interpretations contradicting established truths. Others, among them Denis Vialou and Vilhena Vialou, were the targets of different attacks by local patrons, despite the fact that they authored many papers on Brazilian prehistory that were published abroad.

Brazilians continue to be victims of human rights abuses, massacres by security forces (Margolis 1992), and death squad activities. However, the restoration of civilian rule in 1985 has meant that freedom of expression, if nothing else, is once again viable. It has become possible to develop some unconventional approaches, and the publication of an issue of *Les dossiers d'archéologie* on Brazil (March 1992) bears witness to the renewed blooming of Brazilian archaeology. The first interpretive handbook on archaeology written by a Brazilian came out in the late 1980s (Funari 1988). In addition, Prous (1992) has published a 605-page description of archaeological activities in Brazil, and summarizing papers have also been published (e.g., Prous 1987).

The History of Archaeological Theory in Brazil

Brazilian archaeology's theoretical trends have depended directly on the overall, changing political

background. The early historical and humanist approach of the years between 1950 and 1964, under direct European influence (cf. the case of the other social sciences, as described in Pereira de Queiroz [1989]), was overturned by

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Breuil, Abbé Henri

(1877-1961)

Born in Mortain in the Department of Manche in france, Henri Breuil trained as a priest and was ordained in 1900. His interest in paleontology began during his priestly education, but his career as a prehistorian took off later under the influence of the archaeologists emile cartailhac, Louis Capitan, and denis peyrony. Between 1901 and 1905, Breuil helped Capitan and Peyrony investigate several major prehistoric sites and caves in the Dordogne region of France, such as Les Combarelles and Font-de-Gaume, and he accompanied Cartailhac on his cave explorations, including the one to altamira in spain.

In 1905, on the basis of his experience and his resulting publications, Breuil became a professor at the Catholic University of Fribourg, and in 1910 he went to Paris to become professor of prehistoric ethnography at the Institut de Paléontologie Humaine. From 1929 until 1947, Breuil was the first professor of prehistory at the Collège de France.

Breuil reclassified the artifact sequences and chronology of the Paleolithic period, and his scheme of successive cultural periods still forms, with some revisions, the current framework for the interpretation of European prehistory. Breuil not only added several new Paleolithic stages-the Clactonian, Levalloisian, and Tayacian-but also refined the Chellean period into the Acheulean, which then progressed and was transformed into the Mousterian. He also revised the chronology of the upper Paleolithic period, arguing for the significant impact of Aurignacian cultures on Mousterian traditions and establishing that the Aurignacian preceded the Solutrean; he also divided the Magdalenean into six phases based on changes in tool types.

Breuil's explorations of cave art continued as well. In 1906, he and Cartailhac explored the cave of Niaux in the Ariège, and much later, he was the first to enter the cave of lascaux after its discovery by schoolboys in 1940. He was recognized as the international expert on Paleolithic cave art, and with each new discovery, he became the arbiter of authenticity. He visited, recorded, and reproduced cave art and cave decorations, not just in western Europe, but in Africa, the Sahara, Abyssinia, Asia Minor, and china . Breuil saw in this art not only the fruit of artistic spontaneity but also a communal religious and magical expression testifying to collective interests linked to the way of life of the great hunters of prehistory. Breuil was the first prehistorian to explore and decipher this art, and he also established the

chronological and methodological bases for its study.

Breuil worked briefly in China at Zhoukoudian in the early 1930s and after World War II in southwestern Africa and Rhodesia (now Zimbabwe). He received many awards and honors, including being elected to the Institut de France in 1938 and receiving the Huxley Medal from the Royal Anthropological Institute in 1941.

Claudine Cohen

See also

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Britain, Classical Archaeology

The British, so precocious in the study of the prehistory of their own islands (Daniel 1967, 34-47), were at first, by Continental standards, slow and amateurish in their contributions to the study of classical archaeology. To this day,

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Britain, Prehistoric Archaeology

Scholars writing about the prehistoric archaeology of Britain have played a central role in the development of archaeology in the Anglo-Saxon world. Given this fact, it is remarkable that no substantial, book-length history of British archaeology has yet been written. This observation is even more striking when we consider that archaeologists such as glyn daniel (1943, 1964, 1967, 1971, 1975, 1976, 1981) and stuart piggott, not to mention vere gordon childe, j. g. d. clark, and david clarke, have made such significant contributions to the historiography of archaeology generally.

Of course, there are studies of specific episodes or periods in the history of archaeology in Britain. Graham Parry (1995), Piggott (1975, 1976, 1978, 1981, 1985), and Michael Hunter (1975) have written illuminatingly about the history of antiquarianism, particularly about the work of william stukeley, william camden, john aubrey, and others. Barry Marsden (1984) has produced an often amusing (and richly detailed) account of the activities of antiquaries and archaeologists during the nineteenth century. Analyses of the role of archaeologists such as lord avebury (Sir John Lubbock) and augustus pitt rivers in the passage of heritage-preservation legislation in the nineteenth century (Chapman 1989a; Chippindale 1983; Murray 1990) have appeared alongside detailed discussions of the discovery of high human antiquity (Grayson 1983; Murray 1997; Van Riper 1996). In addition, more specific discussions of changing perceptions of sites such as Stonehenge (Chippindale 1985), the historiographic significance of sites such as the Glastonbury Lake Village (Coles, Goodall, and Minnitt 1992) and Little Woodbury (excavated by gerhard bersu) (Evans 1989), or the history of British Paleolithic archaeology (Davis and Charles 1999; Roberts 1999; Roe 1981a; Spencer 1990) have provided much-needed context to broader considerations. And notable archaeologists have been encouraged to indulge in autobiography (see, for example, Daniel and Chippindale 1989), complementing a growing list of biographies and biographical essays (particularly those of Gordon Childe, Pitt Rivers, sir flinders petrie, gertrude bell, and T.E. Lawrence, as well as the entries in both volumes of *The Great Archaeologists,* ed. Tim Murray, 1999).

At a larger scale historians of science such as P. Levine (1986) have explored the professionalization of British archaeology within the context of British history. And some general histories of archaeology, including those written by G.E. Daniel (1975) and B.G. Trigger (1987), in the course of reconstructing the origins and growth of archaeology and the archaeological perspective, have provided an outline of the history of prehistoric archaeology in Britain. These overviews have to some extent been matched by the introductory chapters to surveys of British prehistoric archaeology, such as those by T. Darvill (1987, 13-27), J. Hunter and I. Ralston (1999), I. Longworth and J. Cherry (1986), C. Renfrew (1972), and D. Roe (1981b).

Notwithstanding the importance of these general overviews, however, our understanding of the context of archaeology and archaeological knowledge in British society is still quite rudimentary. A great deal of fundamental research into all aspects of that history remains to be done. In recent years some attention has been given to the need to study the histories of county and metropolitan archaeological societies (particularly those founded in the nineteenth century), and considerable encouragement has been given to efforts to explore the lives of the less famous British archaeologists (especially women-see, for example,

M. Diaz-Andreu and M.L.S. Sorensen 1998). But there is still a very long way to go.

This state of affairs is all the more curious when we consider the major role played by British archaeology (and archaeologists) in the development of archaeological theory in the last

usefully by the enigmatic James Douglas (1753- 1819), whose *Nenia Britannica* (1793) was a thorough and at times brilliant discussion of the burial customs of "ancient Britons."

Generations of systematic (and frequently unsystematic) fieldwork had, by the end of the eighteenth century, created a crisis in British antiquarian circles. Although a great deal of material culture had been excavated, swelling the collections of antiquaries and providing the foundations for the collections of new museums, its usefulness for writing history was severely curtailed by what seemed to be insuperable problems with establishing chronology. Many of the more careful observers (especially those with field experience in either excavation or survey) well understood that everything could not be the same age and that there was variation within and between sites and artifact types, but things basically came to a grinding halt at that point. Naturally, this did not stop antiquaries from continuing their researches. Indeed, in many ways the problem became even more acute through the systematic work of richard colt hoare, william cunnington, and others; in *Ancient Wiltshire* (1810-1821), for instance, Colt Hoare took pains to limit his interpretations to the physical data he had at hand-interpretations that were consequently confined to admitting his inability to write the history of prehistoric Wiltshire.

It is well known that the solution to Colt Hoare's problems-the three-age system-had already been worked out in Scandinavia by c. j. thomsen and jens jacob worsaae. Although Thomsen's great work was not translated into English until 1848 (as the *Guide to Northern Archaeology*) and Worsaae's was not issued in English until 1849 (as *The Primeval Antiquities of Denmark*), some British antiquaries were *au fait* with the system before then. Nonetheless, the three-age system received a mixed welcome in Britain and from institutions such as the British Museum. Thomas Wright, who regarded himself as one of the leading British antiquaries, would have none of it, but Sir John Lubbock enthusiastically embraced it as a major step forward. Throughout the rest of the period (and continuing for the remainder of the nineteenth century) differences of opinion about the value of the three-age system (or perhaps more spectacularly the discovery of high human antiquity) were aired in a wide variety of scientific and antiquarian associations. The case study that follows focuses on the British Archaeological Association (BAA) and the Royal Archaeological Institute (RAI), but the same kinds of issues were the meat and drink of debate and dispute in similar associations in Britain (and, of course, elsewhere in Europe).

Certainly, excavation continued right across Britain, but the goals of such work became increasingly diverse as the problems with chronology, so apparent in the efforts of Colt Hoare and his predecessors, were gradually resolved by adjusting the three-age system to more closely fit regional realities in British prehistoric archaeology. One example of this growing diversity was the work of John Thurnam (1810-1873), whose primary interest was in the skeletal remains found in barrows and tumuli. Thurnam (later in partnership with J.B. Davis [1801-1881]) sought to use these remains to write the racial history of Britain, a goal that he and Davis believed they had achieved with the publication of *Crania Britannica* (1856- 1865). Others, such as Thomas Bateman (1787- 1835), Charles Roach Smith (1807-1890), and the indefatigable Canon William Greenwell (1820-1918), continued to dig barrows at a fast pace and with rather broader interests in mind. Greenwell's *British Barrows* (1877) represented the high tide of antiquarian activity in a world where the kind of prehistoric archaeology undertaken had clear cultural and political implications. It is testimony to the three-age system that the resolution of chronological problems, however imperfect it was, could release such passion and creativity among those writing the prehistory of Britain.

Case Study: Institutions and Disciplinary Identity in the Mid-Nineteenth Century

This analysis of the early years of the British Archaeological Association and the Royal Archaeological Institute should be read in conjunction with the entry, "Royal Archaeological Institute," by Martin Millett in this encyclopedia. Here, the reasons for their foundation with regard to

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out against hybridity of the races, an article of faith in the polygenist camp. Finally, he contended, civilization was for given races only. The data of archaeology, to Davis's mind at least, formed an important basis from which to mount an argument against the reality of monogenism, despite the arguments of James Cowles Prichard and others: “It is scarcely necessary to allude to the most extraordinary doctrine that the discovery of stone weapons and implements in every quarter of the globe, is a valid evidence that the very same race, a nation of workers in stone, has been spread over all these vastly separated countries. Such incredible hypothesis is by no means necessary to account for this fact” (Davis 1856, 324).

Instead of the monogenist hypothesis, Davis offered the fact that, within very broad bounds, humans have similar physical structures and bodily needs. Yet notwithstanding these similarities, the use of stone occurred during different periods and to different extents. On this basis Davis considered the term *stone-period* or *stone-age* to be incorrect (an objection frequently voiced by Rhind and others but not necessarily for the same reasons). Davis's conclusion was that archaeology had to become ethnology and contribute to the debates that were conducted under its aegis. The first step toward a useful contribution was for archaeologists to do more ethnology, particularly within the British Isles, where racial differences were thought to be marked.

Narrative: 1860-1900

During the forty years between the acceptance of high human antiquity (in 1859) and the end of the nineteenth century, British prehistoric archaeology became widely accepted as a science. By that most delicate of measures-the passage of legislation to protect ancient monuments, which limited the private rights of individuals and established government agencies to bring that legislation into effect (see Murray 1990)-the science of prehistoric archaeology had gained popular and scholarly recognition as an important Victorian scientific and cultural endeavor. As mentioned, serious debate had taken place before this period about the nature of prehistoric archaeology, and the issues raised by Davis and others mentioned in the case study continued to plague practitioners until the 1870s. It is important to note that the fights between the proponents of ethnology, anthropology, archaic anthropology, and prehistoric archaeology (which were just some of the many diverse positions taken up by people with an interest in the prehistory of Britain) were primarily waged at the level of institutions and societies. Although relationships between the British Archaeological Association and the Royal Archaeological Institute were far from cordial, they had nothing of the viciousness that characterized the exchanges between the Ethnological and Anthropological Societies of London and between the members of the British Association for the Advancement of Science (see Stocking 1971).

Despite the significance of the application of the three-age system to British prehistoric archaeology after Thomsen's and Worsaae's works were translated, it was the discovery of high human antiquity that seized the imagination of the scientific world. D.K. Grayson (1983) and A. Bowdoin Van Riper (1996) have discussed this history in considerable detail, and much has also been written about the role played by Sir John Lubbock (and his *Prehistoric Times* [1865]) and E.B. Tylor (and his *Researches into the Early History of Man* [1865] and *Primitive Culture* [1870]) in the creation of what Trigger called “evolutionary archaeology.” But the dominance of evolutionary theory in British prehistoric archaeology was always tempered by the needs of history-particularly the racial history of the British Isles. Attempts to square British history with the three-age system would be made by generations of barrow diggers such as Canon Greenwell, John Thurnam, Charles Roach Smith, and Thomas Bateman (who was among the first to apply the principles of the system in Britain in his *Vestiges of the Antiquities of Derbyshire* [1848]).Yet there was never universal approbation of that concept or of the idea that the British past could unproblematically serve Lubbock's or Tylor's universal models of human history. Certainly, the

canny observer Daniel Wilson well understood the difference and forswore the more serious of Lubbock's overgeneralizations. But again, although much of the period after 1860 was devoted to an elaboration of the

three-age system and its subdivisions (both in Britain and in France), such elaborations inevitably led to an appreciation of difference and variety, as well as change, in both prehistoric Britain and its Continental neighbors.

This recognition of variety (and of the reality of history) became all the more obvious as truly systematic attempts to describe the artifacts of British prehistory increasingly came to the fore, an outcome that also rested on the gradual improvement in excavation strategy and techniques that had been fostered at Brixham Cave but greatly enhanced by the work of Pitt Rivers, especially at Cranborne Chase (1887). Building on the traditions of Fausett, Roach Smith, and others, Sir John Evans, in two remarkable books (*Ancient Stone Implements: Weapons and Ornaments of Great Britain* [1872] and *Ancient Bronze Implements* [1881]), developed the typology of such artifacts to the level at which the patterns of chronology and distribution raised significant historical questions. Although British prehistory was devoid of an absolute chronology for all but the later phases of the Iron Age, sufficient information existed for Boyd Dawkins and other workers to set the British Paleolithic within a Continental sequence (a task also completed by gabriel de mortillet in France) and for oscar montelius's European chronology to be applied to Britain. The essence of that chronology and of those sequences was that British prehistory was a kind of afterthought to the great forces of moving populations and changing climates that characterized Europe. But there were always bits that failed to fit, as arthur evans was able to demonstrate in his celebrated analysis of the cemetery at Aylesford in Kent (1890). The task of comprehending the prehistory of Britain as a problem in itself was to occupy archaeologists for the next half century, as the dual inheritances of evolutionary universalist archaeology and the historicism of the three-age system played themselves out in what was later proven to be an illusory temporal environment. The absence of absolute chronology and the essentially circular interpretive logic that flowed from the relative chronologies of Montelius and de Mortillet would heighten the concentration on simple historicist explanations for cultural change at the very time when prehistoric archaeology (certainly as espoused by Gordon Childe) required more.

Evans was, of course, quite right about the significance of the evidence from Aylesford. What British prehistoric archaeologists urgently needed to do was to write history, to make the classifications of Montelius and others relate in real historical terms to the patterns being noted in the field. But prehistoric archaeology (as a part of anthropology) was far from alone in this concern with history and historicism. Although from the 1880s onward perceptions of human diversity made a forceful return to the ranks of anthropological theory, this diversity was clearly to be located in ethnic and cultural, rather than purely physical, differences. The explanations for diversity and similarity would increasingly be sought in cultural-historical factors, instead of the doctrine of independent inventions and the psychic unity of humankind. Real historical forces acting on real (different) groups of people, past and present, could explain the peculiar differences between human beings far more convincingly than generalized uniformitarian forces. Anthropology and prehistoric archaeology, previously focused on providing evidence of the evolution of human beings and their societies and cultures, now became more firmly linked to a less encompassing task-writing the ethnic histories of European nations.

Narrative: 1901-1960

Often described in histories of British archaeology as the phase of culture-history in which archaeologists further honed their excavation skills and used their abilities in artifact analysis and the creation of typologies to create histories of British prehistoric "cultures," the first sixty years of the twentieth century saw both continuity and change. There was continuity in the sense that the typological studies and Continental prehistories of Montelius, de Mortillet, and others provided an essential starting point. And there was change also in the sense that serious debate about the relationships between archaeological

and anthropological knowledge tended

of the Mesolithic that were being developed by J.G.D. Clark.

Clearly, Childe and Clark had widely differing views about politics, but in emphasizing these differences, scholars have tended to gloss over more significant similarities in theories and goals. Beginning with *The Mesolithic Age in Britain* (1932) and culminating in his highly influential work at the site of Star Carr (published in 1954) and in *Prehistoric Europe: The Economic Basis* (1952), Clark elaborated an archaeology that required its practitioners to extend their competence to contextual factors. He reminded British prehistorians of the basic disciplinary commitment to understanding *how* prehistoric societies actually functioned, rather than just contenting themselves with charting the distributions of artifact types and culture areas. In this focus on the need to understand society, he was closer to Childe than many others of his time.

Childe's and Clark's advocacy of the principles of social archaeology would bear fruit in coming decades. There is little doubt that the crowning theoretical achievement of British prehistoric archaeology during the first sixty years of the twentieth century (despite most practitioners' lack of interest in this field) was a broadening and deepening of the relationships between history, archaeology, and anthropology. For the majority of archaeologists who focused on issues of typology and chronology, the world was about to change, and social archaeology was to provide a new reason for being.

Narrative: 1961 to the Present

Renfrew (1972) has rightly observed that the cracks in the interpretive consensus of culture-history and typology (brought about by the economic prehistory of J.G.D. Clark) were greatly enlarged by the application of radiocarbon dating to British prehistory. Radiocarbon dates first became available in the late 1950s, and it was soon clear that there were serious disparities between the dates arrived at through conventional typological study (previously the mainstay of British prehistoric archaeology, no matter the period) and those being produced by radiometric means. The first significant impact was on the Neolithic period-famously at the site of Durrington Walls, where the radiocarbon dates were much older than those established by the excavator stuart piggott (then the doyen of British Neolithic studies) on the basis of typological analysis. From this point on no part of British prehistory was immune, although it is fair to say that the major impacts were felt by archaeologists working in the Neolithic, Bronze, and Iron Ages. Renfrew (1972) neatly summarized this history as not just being about dates but as fostering a fundamental shift in the direction of European prehistory as well. For example, new dates from Wessex and other places made it clear that cultural elements such as megalithic tombs (once thought to have been diffused from the south of the European landmass) could now be argued to have had a local origin.

It has become clear that no-one is seriously arguing for strong and significant Aegean influence upon the early bronze age of Britain, whether or not there may have been some contacts between the two regions. No-one today would *explain* the developments of the British early bronze age in these terms…. The Wessex-Mycenae link is no longer regarded, as it was by Evans and Childe, as a lynch-pin for British chronology, nor are the accompanying diffusionist arguments accepted any longer (Renfrew 1974, 33).

Archaeologists had to find new models of British prehistory to account for what now seemed better understood by exploring the internal dynamics of prehistoric societies and seeking explanations for change that emphasized cultural processes, in addition to diffusion through invasion and migration. But there was a significant sense of continuity here as well, as previous work on environmental reconstruction and prehistoric human ecology played an important part in J.G.D. Clark's demolition of the invasion hypothesis in 1966. It is always risky to point to specific dates as watersheds, but Renfrew's assessment of the importance of radiometric dating in the development of British prehistoric archaeology after 1966 was very close to the mark.

Although Clark had essentially “created” world prehistory in 1961 by applying radiometric-dating technologies on a global scale, the

in fostering discussion and debate in an increasingly diverse discipline.

Conclusion

One goal of this all too brief discussion of the history of British prehistoric archaeology was to determine whether the great diversity of the discipline's past and its contemporary practice could be effectively synthesized through the identification of overarching themes and issues. This synthesis (and others, such as Renfrew 1974) has been only partially successful, primarily because there is still so much that we do not know about the specifics of that history. Certainly, in those areas in which detailed research has been carried out, a complex and frequently counterintuitive history has been revealed. Given the fact that British prehistoric archaeologists have long had considerable impact on practices outside of Britain (particularly in the Anglo-Saxon world), a deeper understanding of the discipline's social and cultural history is important for archaeologists across the globe.

Tim Murray

See also

Britain, Classical Archaeology; Britain, Roman Historiography; Layard, Sir Austen Henry

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Britain, Roman

The study of Roman Britain has its origins in the very earliest stages of archaeology in Great Britain. The people who were interested in the past in the sixteenth and seventeenth centuries invariably had a classical education, so there was a tendency to seek physical monuments illustrative of the classical texts that mentioned Roman

PREV NEXT

British Museum

Founded by act of the British Parliament in 1753, the British Museum is widely regarded as having one of the greatest collection of antiquities anywhere in the world. As is true for many great museums, such as the ashmolean in Oxford and the louvre in Paris, the British Museum was founded on the private collections of individuals, in this case Sir Hans Sloane and Sir Robert Bruce Cotton. In its early years, the British Museum was favored by monarchy. In 1757, King George II presented the Royal Library to the museum, and the library of George III was transferred there in 1828.

Notwithstanding the very great importance of the British Museum as a library, the fortunes of its collections of antiquities are of perhaps greater importance. These were also supplemented by royal patronage. For example, George III presented the Rosetta Stone after its capture from the French in Egypt (1799). Parliament has also been a benefactor, especially in the celebrated case of the Parthenon marbles purchased from lord elgin in 1816.

The British Museum has since acquired antiquities from all parts of the world, but it is especially strong in British antiquities and those derived from Egypt, western Asia, Greece, and Rome. Major pieces such as the material from nimrud, nineveh, and Khorsabad (building on the collections and excavations of sir austen henry layard), the magnificent artifacts excavated by sir leonard woolley at ur, and elements of the mausoleum of Halicarnassus and the Temple of Artemis at ephesus were acquired through the efforts of private collectors. The egypt exploration society was also a major source of Egyptian antiquities from the late-nineteenth century until the beginning of the World War II.

Notwithstanding the mechanics of assembling such great collections, the British Museum has also played a major role in pure archaeological research. Throughout the twentieth century, research by British Museum staff members has added considerably to our knowledge of archaeology on the global scale.

Tim Murray

See also

Belzoni, Giovanni Battista; Egypt, Dynastic; Hamilton, William; Mesopotamia

Brixham Cave

Located on the Devonshire coast of England, Brixham Cave was discovered in 1858. The story of its excavation and the role the discoveries made there played in the history of archaeology is an enduring one. Owing to the great skills and energy of early archaeologists hugh falconer and william pengelly, it was possible to raise funds and the support of some of the most eminent British scientists of the day (such as charles lyell, Richard Owen, and joseph prestwich) to undertake a systematic excavation of the cave. Falconer understood clearly that maintaining tight stratigraphic control was crucial to securing plausible evidence of the coexistence of ancient human beings and extinct animals, and such control was achieved thanks to innovations in excavation techniques made by Pengelly and Prestwich.

The site was excavated between 1858 and 1859, and a body of evidence was produced that, although initially convincing only Falconer and Pengelly (along with a few others), when viewed along with the evidence from French archaeologist jacques boucher de perthes's excavations in the Somme Valley became the first widely accepted evidence of an even greater human antiquity.

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of the International Quaternary Association and the international union of prehistoric and protohistoric sciences (UISPP).

Brodar was the first trained Paleolithic archaeologist in Slovenia. He began his archaeological career in 1928 with the excavation of the Upper Paleolithic cave site of potočka zijalka in the Karavanke mountains in northern Slovenia. The results of his research on this site greatly influenced the interpretation of the process of Wurm glaciation in alpine areas. Prior to the outbreak of World War II, Brodar discovered five new Paleolithic sites in Slovenia and demonstrated the connection between the Paleolithic cultures of the eastern alpine region with Paleolithic settlements on the Slovenian Pannonian Plain and in northwestern Italy.

After the war, Brodar's research focused on the Karst area of southwestern Slovenia, especially on the multiperiod Paleolithic and prehistoric site of Betalov Spodmol near Postojna. Brodar also discovered the first Mesolithic settlements in Slovenia, such as the Spehovka cave. He substantially contributed to the development of Paleolithic studies in the other republics of the former Yugoslavia, especially in Serbia and Bosnia and Herzegovina.

Drasko Josipovic

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Brześć Kujawski

The site of Brześć Kujawski, located in the Polish province of Wloclawek, comprises a group of settlements and inhumation cemeteries located in the black-earth region of Kuiavia in central poland. The site belongs either to the Brześć Kujawski group of the Lengyel culture, according to Konrad Jazdzewski s classification (Jazdzewski 1938, 6), or to the late Band Pottery culture, according to the cl assification of Lech Czerniak (Czerniak 1994, 66). The best known site, site 4, is a large settlement site with fifty-one trapezoidal long houses from a few phases of occupation along with outbuildings, objects, and human graves. On the basis of this material, the Brześć Kujawski group of the Lengyel culture was distinguished.

From 700 pits, 1,800 postholes, fifty-five human graves, and twenty hearths were excavated. Trapezoidal houses, up to forty meters in length and not smaller than thirteen meters, were also located. The long axis of the houses was oriented north and south with a slight northwest tilt. The interior of these houses was divided into three parts. The external pillars, which were construction elements of the walls, were situated in ditches. The walls were constructed from both whole tree trunks and logs split lengthways. The split logs were set upright in the trench, alternating with the flat side facing outward so that the interior and exterior walls were smooth. The houses were associated with a variety of features found in the immediate area. Adult burials have been found in storage pits near the long houses, and other burials have been found in graves and pits in the settlement. Some of the graves are typical inhumation graves mainly containing dress ornaments and copper grave goods. The settlement and the graves are contemporary, but the majority of the graves date from the late phase of the settlement.

The settlement is situated on the bank of a lake. During the occupation of the site, which lasted more than 200 years, the houses were destroyed and rebuilt many times, and some estimates suggest that

houses were rebuilt eleven times. The many phases of occupation are indicated by overlapping house plans. The causes of the frequent rebuilding are thought to be the result of a rotational system or as a consequence of natural destruction, such as fire. The settlement usually consisted of forty-nine long houses, and household cluster was the archaeological manifestation of a fundamental socioeconomic unit of the Brześć Kujawski group. The settlement is related to a set of smaller camps in the neighborhood.

The settlement of Brześć Kujawski was excavated before World War II. The initiators of the excavation were Konrad Jazdzewski and Stanislaw Madajski, who carried out large-scale excavations

of settlements of cultures of southern origin in the Brześć Kujawski region from 1934 to 1939. The excavations in Brześć Kujawski were carried out later by Maria Chmielewski and Waldemar Chmielewski in the 1950s and by Ryszard Grygiel and Peter I. Bogucki in the 1970s and 1980s.

Plan of Brześć Kujawski

Arkadiusz Marciniak

Buckland, William

(1784-1856)

English geologist, Anglican priest, and professor of mineralogy at Oxford University, William Buckland believed that universal catastrophes had wiped out species and that God had created new ones to take their place. Buckland studied the chronology and stratigraphy of caves, and along with the French geologist Georges Cuvier explored the association between fossil humans and the remains of extinct animals. Evidence of the increasing complexity of plant and animal life in successive geological strata was viewed by Buckland as the result of separate and individual acts of creation and not as a developmental sequence. He believed that God and not the natural world was responsible for evolution.

In 1823 Buckland published his *Reliquiae diluvianae,* listing all the then-known finds of fossil human and faunal remains. He concluded that human bones were not as old as the animal bones with which they were found because they were intrusions, the result of geological processes, faults, or tectonic movements. For over twenty years his views dominated the scientific establishment, until those of geologist charles lyell, and the antiquaries and archaeologists who had burgeoning evidence of human antiquity, superseded them.

Tim Murray

See also

Boucher de Perthes, J.; Britain, Prehistoric; Prestwich, J.

Bulgaria

For objective historical reasons, the beginning of Bulgarian archaeology has been traced back no earlier than the last decades of the nineteenth century. During the sixteenth to the nineteenth centuries, many European travelers who passed through the Ottoman Empire described various antiquities in Bulgarian lands. Thus, in 1868, the French scholar A. Dumont traveled in southern Bulgaria, then under Ottoman rule, and later published his reports (Dumont 1892). However, it would be some years after Bulgaria was emancipated in 1878 before the pioneers of Bulgarian archaeology started excavating sites and studying diverse ancient and mediaeval artifacts. The pioneers were usually Bulgarian enthusiasts whose experience in archaeology was acquired in the course of their work; therefore, it was the Czech scholars C. Jireček, V. Dobrusky, and H. and K. Škorpil who initiated real archaeology in Bulgaria and published the first archaeological studies (Dobrusky 1896, 1897; Jireček 1877, 1881; H. Škorpil 1894; H. Škorpil and K. Škorpil 1896).

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von Bunsen, Christian Karl Josias

(1791-1860)

Educated at various German universities in modern, ancient, and original languages; theology; and law, Bunsen joined his mentor Barthold Niebuhr in Rome during the early nineteenth century where Niebuhr was Prussian minister to the Vatican. Bunsen succeeded to this post in 1824 and, with his English wife, made their residence the center of a German cultural milieu in Rome.

Bunsen was also interested in archaeology and art, and during his years in Rome his residence also became a meeting place for artists, archaeologists, and scholars from every country. The sculptor Thorwaldsen, the philosopher Chateaubriand, jean-françois champollion, and Leopardi were visitors. Archaeologists such as F.G. Welcker, professor at Bonn and one of the most renowned philologists of the time, Heinrich Panofka, and Eduard Gerhard congregated around Bunsen.

Gerhard was to become the lifetime administrator of the Instituto di Corrispondenza Archeologica (which later became the deutsches archäologisches institut). The institute was Bunsen's initiative, conceived as an international organization, whose main task was to improve the knowledge of antiquities among archaeologists and art historians. There was so much being discovered about the past at this time that the institute was responsible for producing a formidable range of regular publications on notable archaeological discoveries. Scholars, collectors, and archaeologists contributed to its publications in the areas of method (academic philology); aesthetics, in the style of johann joachim winckelmann; and the discoveries of the Grand Tour. These publications created a kind of living encyclopedia of archaeology covering all categories and specialties, such as museum catalogues, topographic description, epigraphy, ceramic studies, and iconography.

Bunsen left Rome in 1838. He was Prussian minister to Switzerland until 1841 and then he was minister to England, the most important diplomatic post at the time. He worked hard to improve international relations between Prussia and England, which were strained by the Schleswig-Holstein issue. He also tried to bring Prussia into the alliance against Russia during the Crimean War, and as a result of this he was recalled to Prussia in 1854.

Tim Murray

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German Classical Archaeology

Bure, Johan

(1568-1652)

The son of a pastor in Uppsala, sweden, Bure received a strict classical education. In addition to learning Greek and Latin, Bure taught himself Hebrew. In 1602 he became tutor to Crown Prince Gustavus Adolphus, future king of Sweden, who was one of the great politicians and military leaders of the seventeenth century.

The interest in the antiquities of Rome and Greece that occurred in the more southern parts of Europe and England was matched by an interest in Nordic monuments and antiquities in those countries further to the north. In these countries the history of antiquarianism and that of nationalism are difficult to separate. In the seventeenth century Sweden/Norway and Denmark/Finland were political rivals each with two double monarchies. They were determined to justify their ambitions in Europe by recalling the triumphs of their past. At about the same time antiquaries throughout Europe began to systematically record the monuments and antiquities of their countries and regions and nowhere was this more advanced than in Scandinavia. The decipherment of runes allowed for the reading of the earliest records of the northern kingdoms, and the extensive field surveys revealed monuments that were quickly interpreted as being something to be proud of.

At the court Bure began to decipher Nordic

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runes, a script used on the monuments, memorial stones, and artifacts throughout northern Europe, and he was one of the first to collect and systematically analyze these ancient inscriptions. He established a runic alphabet and transcription rules, he proposed a dating system, and he began a collection of Swedish inscriptions. From 1599 Bure and two assistants went on topographic and archaeological surveys, carefully recording and illustrating monuments and ancient examples of runic epigraphy. Bure transformed the antiquarian tour into a systematic study, completing the first professional archaeological survey. He is regarded as one of the founders of landscape archaeology.

Bure's travels and collections were strongly supported by the king of Sweden and in 1630 Gustav Adolphus published a statute protecting Swedish antiquities. Sweden was the first state in the world to not only endow an archaeological service but also to legislate to protect its heritage. As important, for the first time here was evidence and proof of a past that was neither Roman nor Greek and that was recognized as being worthy of protection and study in its own right.

Tim Murray

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Bylany

See Czech Republic

C

Cambodia

The spectacular ruin of Angkor Wat is an enduring icon of Cambodian archaeology and a powerful symbol of national identity. Europeans "discovered" this ruin in the mid-nineteenth century and ultimately attributed it to the ancestors of ethnic Khmers who live in Cambodia today. Cambodia was part of an area historically known as Indochina, a colonial entity controlled by the French from the mid-nineteenth to mid-twentieth centuries. Since French colonial archaeologists who worked in Cambodia also worked in other areas of Indochina, understanding the history of Cambodian archaeology requires some knowledge of the history of archaeology throughout Indochina, including work in the neighboring countries of Vietnam and Laos.

Indochinese archaeology began in earnest during the mid-nineteenth century and reached its apex in the first half of the twentieth century. During this time archaeology was a distinctly colonialist endeavor that was embedded in a broader *mission civilisatrice* (civilizing mission). Archaeology, epigraphy, and art history were undertaken by a host of colonial officials and administrators who believed that research on the cultures and history of this new French colony served as one means of gaining-and maintaining-colonial control over the region.

Since 1850 Cambodian archaeology has been characterized by two parallel archaeological traditions: one rooted in the humanities and the other in the natural sciences. The historical tradition focuses on the ancient civilizations of the region and combines architectural, art-historical, and epigraphic approaches with archaeological methods to study developments since the beginning of the Roman Empire (ca. 500 b.c.-a.d. 1432). The prehistoric tradition, drawing extensively from a geological background, studies the period before about 500 b.c. and has focused most of its attention on Holocene developments that culminated in the Bronze Age.

The Indochinese peninsula, which would ultimately become Vietnam, Cambodia, and Laos, attracted French commercial and missionary interests by the mid-nineteenth century. Despite great resistance by the Vietnamese, the French raised its flags in the southern and northern capitals (Saigon and Hanoi, respectively) by 1873. Cambodia, under a weak sovereign, acceded to the French in 1864, and the feuding kingdoms of Laos were unified between 1885 and 1899. Through military power and fueled by commercial interest, French Indochina was born.

The Impact of Nineteenth-Century Expeditions on European Knowledge of Cambodia's Past

Several important expeditions were undertaken through the new French Indochina during the mid- and late nineteenth centuries to chart its territory, document the resources of the region, and seek potential trade routes to link the colony with markets in southern China. From 1858 to 1861 the French explorer and naturalist Henri Mouhot undertook three natural history expeditions that covered regions of Thailand, Laos, and Cambodia. Mouhot described the customs of the peoples he met during these travels, and in his January 1860 visit to northwestern Cambodia, he encountered the crumbling ruins of Angkor Wat. Mouhot died of a fever near Luang Prabang, Laos, in 1861. Two years later his

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of Mouhot, de Lagrée, and Pavie that images of a glorious and vanished Cambodian past were lodged in the minds of Europeans, whose countries were then colonizing most of Southeast Asia.

Cambodian Archaeology through-Nineteenth-Century Research

Investigations also began at archaeological sites throughout the colony during this period. The earliest of these endeavors were carried out by army and naval officers, administrators, and missionaries who lacked formal training in archaeology. They concentrated their efforts in Vietnam (particularly in the north) and in northwestern Cambodia and studied art history, epigraphy, and archaeology. Most work focused on the period that began with the Roman Empire and ended in the European Middle Ages; in Indochina this period is characterized by monumental Khmer and Cham architecture. From 1879 to 1885 Etienne Aymonier undertook his exhaustive study of archaeological sites and Khmer inscriptions throughout Cambodia. Visits to the Cambodian site of Samrong Sen, together with archaeological work conducted there by several notables (e.g., Noulet, Fuchs, Moura, emile cartailhac), yielded bronze weapons and tools and established the notion of an Indochinese Bronze Age. In 1886 Gustave Dumoutier and Paul Bert arrived in Hanoi and launched the first systematic archaeological and historical research in Vietnam.

The end of the nineteenth century witnessed a turning point in colonial research on Indochina's archaeological past. This shift was marked by Gen. Paul Doumer's establishment, on December 15, 1898, of a permanent archaeological mission in Indochina. This institution was to be under the control of the Académie des Inscriptions et Belles-Lettres, and its mission was to coordinate all historical, epigraphical, art-historical, and archaeological research in the region. The governor-general then created the Geological Service of Indochina in 1899, headed by Henri Mansuy and M. Lantenois. Most prehistoric archaeological research during the colonial period was done through this institution. In 1901 Louis Finot was appointed the first director of the permanent archaeological mission, which was then renamed the École Française d' Extrême Orient (EFEO).

Louis Finot earned degrees in law and literature before he began his research on Sanskrit and assumed the directorship of EFEO, the institution that would become the premier organization to focus on Indochina's cultural heritage for the rest of the colonial period. Interestingly, few of the early and important EFEO archaeologists had technical training in the field: Lunet de Lajonquière was a military officer, Henri Mansuy had no formal college degree, Louis Bezacier and Henri Parmentier were architects, and Louis Malleret went to Indochina as a language teacher. The field of Southeast Asian studies was so underdeveloped in Europe at the time that even those with professional training (such as Victor Goloubew, whose background lay in art history) had little familiarity with the region before their arrival.

EFEO's explicit goal was to conserve and restore the ruined Khmer and Cham monuments of Indochina; safeguarding monuments that would otherwise be destroyed involved not only their study but also their restoration or conservation. In 1907 France signed a treaty with Siam (Thailand) that assured the return of three western provinces of Cambodia containing Angkor and its associated monuments. In 1908 EFEO launched its systematic program to conserve and restore the monuments of Khmer (and, to a far lesser extent, Cham). EFEO founding directors Louis Finot and Alfred Foucher also established the Service Archéologique as one arm of the institution.

Understanding the history of archaeological research in Cambodia requires a dual focus on developments in both prehistoric and historical archaeology. Colonial archaeological research in these two realms began in earnest in the second decade of the twentieth century and continued vigorously until the outbreak of World War II. The effective end of EFEO archaeological service occurred in 1945, and

the French withdrawal from Vietnam in 1954 resulted in the transfer of authority from France to the newly independent countries of Cambodia, Vietnam, and Laos. In Cambodia the period before World War II was the

golden age of archaeology; field research ceased altogether by the early 1970s. Archaeological work in Laos also faltered after this time. Vietnam, however, quickly established institutes of archaeology in the north (in Ha Noi) and in the south (in Ho Chi Minh City) and pursued a vigorous program of archaeological research, with a strengthened focus on prehistoric archaeology.

Prehistoric Archaeology in Indochina: 1901-1970

Intellectual influences on prehistoric archaeology derived from the natural sciences, with a strong emphasis on geology and paleontology. The earliest prehistoric archaeological research was undertaken in the late nineteenth century at sites such as Samrong Sen. It was only with the establishment of the Geological Service of Indochina that technical experts (Henri Mansuy, Madeleine Colani, Etienne Patte, Max de Pirey, J. Fromaget, Edmond Saurin) began to grapple with the region's prehistory. The first and most important of these scholars was Mansuy, who helped establish the Geological Service in 1899. His archaeological work at Samrong Sen and Long Prao comprised a small part of his impressive corpus of field research on Pleistocene and Holocene sites in Cambodia, Upper Laos, and northern Vietnam.

In the next three decades prehistoric archaeologists visited and excavated sites throughout Indochina whose occupational period ran from the Paleolithic (Pleistocene) to the Iron Age. The early to middle Holocene was one of the first periods to receive systematic archaeological attention. In the 1920s Madeleine Colani's reconnaissance of caves and rock shelters in northern Vietnam identified a Mesolithic-like tool tradition of early-Holocene age. Named after Hoa Binh Province (in Vietnam) where these sites were originally found, Hoabinhian sites were found in Upper Laos and northern Vietnam. From 1966 to 1968 Roland and Cecile Mourer excavated the Hoabinhian of Laang Spean in northwestern Cambodia in what represents the most systematic prehistoric archaeological work in Cambodia yet published. Vietnamese research on the Hoabinhian since 1960 is too voluminous to report here.

Work by Henri Mansuy in the caves of northern Vietnam, particularly in the mountain range of Bac Son, recovered stone tools and human remains from a late-Hoabinhian/early-Neolithic cultural manifestation that is now called the Bacsonian tradition. The general paucity of “Neolithic” research in Cambodia remains problematic. Bernard-Philippe Groslier's excavations in 1959 at four monuments in the Angkor region uncovered “Neolithic” adzes but did not investigate this time period. During the 1950s and 1960s both Louis Malleret and Groslier worked in eastern Cambodia (in Kompong Cham Province) at circular earthwork sites; work in the 1990s at these sites has produced dates that begin-but do not terminate-in the Neolithic period (i.e., ca. 4000 b.p.).

The next breakthrough in Indochina's prehistoric archaeology focused first on the Iron Age and then on the Bronze Age. In 1909 M. Vinet published the first report of earthenware jar burials in the region of Sa Huynh. Fifteen years later Henri Parmentier published results of archaeological work that included illustrations of jar burials containing cremations, beads, and iron tools recovered from the site of Sa Huynh (in Quang Ngai Province, central Vietnam). In 1934, using results of excavations in the region, Madeleine Colani proposed the term *Sa Huynh culture* for one manifestation of Indochina's Iron Age.

Ancient bronze drums from Southeast Asia were the subject of comparative study by Franz Heger in 1902. In 1924 tax collector L. Pajot reported bronze artifacts that a fisherman found in a riverbank along the Ma River in northern Vietnam. Subsequent EFEO excavations recovered several graves, remains of pile houses, and bronze artifacts, which Victor Goloubew published in 1929. Olov Janse's excavations at Dong Son from 1934 to 1939 recovered bronze drums in stratigraphic context. In 1935 Madeleine Colani reported the recovery of molds for casting bronze tools as part of the megalith culture from Upper Laos, now known as the Plain of Jars.

In Cambodia systematic excavations of Bronze Age sites were restricted to Mansuy's work (published in 1902 and 1921) at Samrong Sen and to

Paul Lévy's work in the late 1930s at three sites in the Mlu Prei region (in Kompong Thom Province). Most bronze objects ascribed to Samrong Sen lack provenance, but Mansuy's work recovered stone adzes, bronze objects, and human remains. Lévy's excavations at Mlu Prei recovered earthenware pottery, bronze tools, and at least one sandstone mold used to cast bronze axes and sickles.

Work by J. Fromaget and Edmond Saurin established the existence of a Paleolithic tradition in the caves and rock shelters of Upper Laos in 1934. Excavations there recovered a middle-Pleistocene animal assemblage and fragments of human bone. That work, together with Saurin's subsequent work on Pleistocene gravel terraces in northeastern Cambodia and Russian archaeologist Pavel Boriskovsky's in northern Vietnam, argued for a Paleolithic “pebble tool” culture in Indochina. The evidence for a Cambodian Paleolithic, offered by Saurin in the mid-1960s, is particularly equivocal, but most archaeologists now believe that humans occupied Indochina during the Pleistocene.

The foregoing summary of prehistoric archaeology in Indochina highlights some of the major developments from 1901 to 1970. A huge number of prehistoric archaeological sites were discovered and excavated during this time. Colonial archaeology made significant contributions, and Vietnamese archaeologists have made great strides in our understanding of Indochina's prehistory. To explain key developments in the prehistoric sequence, colonial archaeologists working throughout Southeast Asia at the time offered a variety of diffusion and migration models, rather than independent invention. It is perhaps intriguing that the adoption of radiocarbon-dating techniques in Indochinese archaeology coincided with the emergence of indigenous archaeologists and the appearance of alternative models that emphasized local development rather than importation from beyond the region.

Historical Archaeology in Indochina: 1901-1970

It might well be said that the history of colonial archaeology in Indochina is the history of Angkorian archaeology. The EFEO's mission was the documentation and protection of archaeological sites, and several scholars made significant contributions to our knowledge of Cham archaeology, notably Henri Parmentier, J.-Y. Claeys, and Louis Bezacier. Nonetheless, Angkor occupied the heart and soul of EFEO, and much of that organization's research focused on the Angkorian and pre-Angkorian periods. The abundance of EFEO research cannot be summarized here; sections that follow use selected examples of archaeological work to illustrate general trends.

The collection of monuments that is often glossed as “Angkor” is found immediately north of the Tonle Sap Lake in northwestern Cambodia. The primary goal of work at Angkor was the conservation of the monuments, and the Conservation d'Angkor was created in 1908 after Siam returned Cambodia's three western provinces. In Phnom Penh, Georges Groslier established the Musée Albert Sarraut in 1920, under the patronage of King Sisowat and (French) Résident Supérior Baudoin. Renamed the National Museum of Cambodia, the institution serves as the repository for Khmer sculptures, inscriptions, and other Cambodian antiquities. The Archaeological Park of Angkor was established in 1926. Henri Marchal and Maurice Glaize, two of Angkor's conservators between 1916 and 1953, introduced the method called “anastylosis” from Dutch conservators in Java. EFEO conservation involved more than engineering and consolidation: it also involved epigraphic research to assign ages to the monuments, compiling archaeological maps (using ground and aerial techniques) to study the construction sequence in different areas, and archaeological work in connection with restoration.

Archaeological research was also undertaken through EFEO activities that involved the location, mapping, and dating of monuments. One aspect of the organization's early mission-documentation-involved a general reconnaissance of archaeological sites to supplement earlier reconnaissance by Etienne Aymonier. Lunet de Lajonquière undertook an archaeological survey from

1900 to 1908 that identified the geographic limits of the Khmer Empire. At its peak the empire extended west into central and

at Oc Eo. From 1952 to 1953 Groslier directed archaeological excavations at the Royal Palace that uncovered a cemetery of cremated remains. In the 1950s both Malleret and Groslier investigated prehistoric circular earthwork sites in eastern Cambodia.

After achieving independence in the 1950s, the three countries of Indochina pursued archaeological work to varying degrees. In Vietnam archaeology served nationalistic interests, and efforts were concentrated on finding the roots of Vietnamese civilization. After 1954 the states of North and South Vietnam established the institutes of archaeology in Hanoi and Ho Chi Minh City, respectively. Archaeological work continued unabated in Vietnam throughout the Vietnam War, although research slowed in both Cambodia and Laos during this time. Conservation activities at Angkor went on, as did the historical and epigraphical research that laid the foundations for archaeological interpretations of the monuments.

Bas relief of an archer, Angkor Wat

(Gamma)

Cambodian Archaeology since 1970

A bleak period in Cambodian archaeology began in 1970 with the onset of civil war in the country. All archaeological research activities ceased, and the next five years were plagued by political instability that ultimately forced the closure of the Conservation d'Angkor in 1972, the end of its work in 1973, and the departure of its staff. The Khmer Rouge used Angkor to recall former glory and spared the ruins from the destruction that they wrought on Buddhist temples throughout the country. Angkor was completely abandoned until the end of the Pol Pot regime in 1978, and forces of nature undid much of the clearing work that the EFEO had undertaken to protect the monuments from destruction.

Most of Cambodia's trained archaeologists and technical experts perished between 1975 and 1978 as a result of the Khmer Rouge plan to eliminate the educated elements of society. With the entry of Vietnamese soldiers in 1979 as part of Vietnam's occupation of Cambodia, Angkor's antiquities were pillaged, and Angkorian artifacts (sculpture, architectural elements, other artifacts) flooded the international antiquities market. Only one international team, from India, dared return to Angkor Wat soon after 1979, when fighting between the Vietnamese and the Khmer Rouge continued in the region.

With the Vietnamese withdrawal and the process of reconstruction after 1989, Cambodian

and possibly prehistoric sites in the region and to document the growth of urban settlement there. Several studies have challenged Groslier's hydraulic city model by analyzing the nature and availability of arable and irrigable land with respect to the giant reservoirs (*baray*) that Bernard-Philippe Groslier believed were used to channel water to fields.

A number of important conservation and restoration projects have begun or resumed at Angkor since 1989. Foremost among the countries sponsoring such efforts is Japan; its United Nations Educational, Scientific, and Cultural Organization (UNESCO) Japanese Trust Fund (Japanese Government Team for Safeguarding Angkor, orJSA) is supporting work at Angkor Wat and Angkor Thom. In addition, Sophia University is conducting research at Banteay Kdei, and EFEO has resumed its work in Angkor Thom after a twenty-year hiatus. Other ongoing projects around Angkor include those sponsored by Hungary, Indonesia, Italy, and the United States (World Monuments Fund). The governmental organization Autorité pour la Protection du Site et l'Aménagement de la Région d'Angkor (APSARA) was created in 1995 to assume responsibility for managing the Angkor area.

Angkor Wat-and Cambodia's archaeological sites in general-are sources of pride, and Cambodians support efforts to study and protect their ancient heritage. Perhaps the most distinctive features of the archaeological work pursued in Cambodia since 1989, be it research or conservation, are its collaborative nature and its commitment to training future generations of Khmer archaeologists. From the late nineteenth century to the mid-twentieth century, colonial-period archaeologists made impressive contributions to our understanding of Indochina's archaeological past. With classroom, field, and professional training programs now in place, the history of Cambodian archaeology in the next century promises to include many contributions by indigenous archaeologists who are studying their own archaeological heritage.

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Camden, William

(1551-1623)

Born in London the son of a painter, William Camden attended St. Paul's School, where he received an excellent classical training, and then proceeded to Oxford. In 1575, he became a master at Westminster School in London, where he taught for the rest of his life.

Camden was the founder of antiquarian studies in England through his immensely influential book *Britannia,* which was first published in 1586, and he brought a wide range of skills to the elucidation of the remote past of his country. Well read in Greek and Roman literature, he was familiar with all the references to Britain made by the ancient historians, geographers, and poets. He was an eminent topographer and had a pronounced interest in coins and inscriptions. He was expert in genealogies and the history

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of significant families and knowledgeable about the office and ceremonies of state. He became the historian of his own age, writing an important account of the reigns of Elizabeth I and James I, so that by the end of his own life he was not only the master of British antiquity but also the interpreter of the modern political scene.

William Camden

(Hulton Getty)

Britannia broke with the mythologies of British history by taking advantage of the existence of a wide range of well-edited classical texts, the product of a century of humanist scholarship. Camden was persuaded that the people who occupied Britain at the time of the Roman invasions were closely related to the Gauls, whom he was able to identify as a Celtic people. He also examined the origins of the Picts and the Scots. To solve problems of origins and relationships, Camden employed etymology. Already proficient in Greek and Latin, he learned Welsh and studied Anglo-Saxon. He was also particularly attentive to the coinage of the Britons in the first century a.d. But it was the relating of history to landscape that was the permanent achievement of *Britiannia.* The body of the book took the form of a "perambulation" through the counties of Britain, with Camden offering a many-layered account of each particular region. Camden made a number of field trips to examine monuments and to gather information-he saw more of Britain at first hand than any previous observer.

Six editions of *Britannia* were published between 1586 and 1607, an English translation appeared in 1610 and 1637, and another Latin edition was published in Frankfurt in 1590. The appearance of *Britannia* in 1586 might well have prompted the formation of the society of antiquaries of london, which began to meet in that year. It certainly encouraged the growth of antiquarian studies in provincial centers by stimulating local curiosity about the regional past.

Camden enjoyed the friendship of a wide circle of European humanist scholars, such as Scaliger, Ortelius, Lipsius, Hondius, Casaubon, Peiresc, Hotman, and de Thou. Largely through his contacts, English antiquaries of the Jacobean age were linked to their European counterparts.

Graham Parry

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Canada

The border between Canada and the United States slices arbitrarily across North America, and European colonization began north of the border almost as early as to the south. Yet, for climatic and geological reasons, European settlement progressed more slowly in Canada, and the bulk of the country's population remained concentrated near the border. The surface area of Canada is larger than that of the United States, but Canada is only about one-tenth as populous. Because of this and related political factors, archaeology has developed in Canada more slowly and somewhat differently than it has in the United States.

Antiquarian Beginnings

It is recorded that Indian stone tools were dug up in the course of construction work in southern quebec at various times during the seventeenth century. In 1700, workmen unearthed some magnificent ground slate projectile points at Bécancour. These finds, now known to date from the Archaic period (3000-2000 b.c.), were preserved at the Ursuline convent in nearby Trois-Rivières and constitute Canada's oldest archaeological collection.

In the first half of the nineteenth century, farmers and other interested British colonists in southern Ontario and the Maritimes began to assemble private collections of Indian artifacts. Relic hunters also pillaged Indian burial sites to recover such materials. Only brief accounts of these activities were recorded in local newspapers and British journals.

The most sustained archaeological work of this period was initiated by two Jesuit priests soon after members of that order returned to Quebec in 1842. Father Jean-Pierre Chazelle identified the stone ruins of two seventeenth-century Jesuit missions in southern Ontario, and following in his footsteps, first Father Felix Martin and then Professor Joseph-Charles Tache of the University of Laval explored the Huron Indian sites around these missions. Apart from this work, there was little concern with archaeology in French-speaking Quebec. Unlike English Canadian farmers, French Canadian ones were uninterested in the artifacts they unearthed in the course of their farming operations.

After 1853, two leading Canadian scholars studied and wrote about archaeology. daniel wilson, a Scottish archaeologist who eventually became president of the University of Toronto, and John William Dawson, a Nova Scotian geologist who was principal of McGill University in Montreal. Both did archaeological work in Canada in the 1850s and early 1860s, and Wilson asserted that his ambition was to become “a Canadian antiquary.” Yet both men's interests soon became more broadly anthropological. Despite their many anthropological publications that incorporated archaeological data, neither of these eminent scholars made a tangible contribution to the development of archaeology in Canada.

Throughout the nineteenth century, Canadians remained largely preoccupied with practical matters, and it was expected that gifted individuals would apply their talents to public life. Pursuits such as archaeology were not viewed as suitable full-time occupations for men of ability. Academics were few in number and so deeply involved in political and religious controversies that they had little time for archaeology.

Even so, in the second half of the nineteenth century, natural history, literary, and historical societies were founded, or became more active, in Montreal, Toronto, Halifax, and St. John, New Brunswick. These societies played a major role in drawing their members' attention to archaeological developments in Europe and the United States, and their journals made possible the publication of archaeological research. In 1863, members of the Nova Scotian Institute of Natural Science were inspired to excavate local shell mounds by the Swiss archaeologist Adolf Morlot's report of Danish shell-mound investigations published in the widely distributed *Annual Report of the Smithsonian Institution* for 1860. In 1884, the Natural History Society of New Brunswick published George Matthew's account of a stratified shell midden at Bocabec, New Brunswick; the best excavation carried out by a Canadian in the nineteenth century. Although numerous studies of the archaeology of the Maritime Provinces were published locally in the late nineteenth century, no specifically archaeological positions were established in universities or museums in that part of Canada. In Quebec, only a small number of archaeological studies were published, mainly by English-speaking residents of Montreal. A few brief notes on archaeological finds appeared in *Le Naturaliste Canadien* in the 1880s.

Developments of more lasting importance for Canadian archaeology centered on the Canadian Institute (later the Royal Canadian Institute) founded in Toronto in 1849 by provincial land surveyors and other professionals wishing to promote the advancement of the natural sciences and the arts. In 1852, the institute issued a circular drafted by Sandford Fleming, civil engineer and future inventor of standard time, urging the reporting of Indian sites that

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American opinions about the Mound Builders. Farther west, archaeological material was collected in the 1890s by geologists and surveyors from eastern Canada, many of them working for the Geological Survey of Canada. At this time, resident amateur archaeologists also began to study the Indian burials, middens, and the rock art of British Columbia.

Canadian archaeologists generally viewed Indians in the same way U.S. evolutionary anthropologists did: as peoples whose cultures were very primitive and therefore prehistorically must have been similar to what they were like at the time of European discovery. As a result, these archaeologists saw no need to try to work out elaborate chronologies. In Canada, the successful government efforts, after the Indians ceased to be useful allies against the United States, to move them as quietly as possible onto reserves or to more remote parts of the country meant that Indians did not loom large in the experience or imagination of most Euro-Canadians. In the United States, as prolonged and violent confrontations with aboriginal peoples came to an end, Indians were appropriated by their conquerors as romantic symbols of republican freedom, a theme that had little appeal for Canadians. As a result of these developments, there was far less pressure on governments in Canada than there was in the United States to devote public funds to prehistoric archaeological research.

The little interest that Canadians had in prehistoric archaeology waned in the early twentieth century. It was virtually extinct in the Maritimes by 1919, partly as a consequence of the economic decline of that region, and there was also diminishing interest in Manitoba, British Columbia, and Ontario as the broader concern to study Canada's past that had arisen following confederation in 1867 subsided. No provincial government provided the means for training archaeologists or employment for them. Even the position of provincial archaeologist in Ontario lapsed after Boyle's mediocre successor died in 1933.

In 1897, the Jesup North Pacific Expedition of the American Museum of Natural History began archaeological work in coastal British Columbia. This was the first of many foreign (mainly U.S. and Scandinavian) expeditions that carried out archaeological research in Canada, and in particular, they added to an understanding of Arctic prehistory. Although some of these expeditions provided Canadian archaeologists with opportunities to do fieldwork, others contributed nothing to the institutional development of Canadian archaeology and even retarded it by removing artifacts from Canada. Although such incursions into southern Canada had largely ceased the end of the century foreign expeditions continue to be authorized in northern Canada.

The Belated Development of Prehistoric Archaeology

A new phase in Canadian archaeology began in 1910 when the Geological Survey of Canada established an Anthropology Division. For many years, scientists attached to the survey had been collecting archaeological and ethnological material in western Canada, and pressure from a small number of Canadian amateur anthropologists and from the British Association for the Advancement of Science finally resulted in the allocation of government funds to this unit. Its first director was Edward Sapir, a young U.S. linguistic anthropologist who had studied with Franz Boas at Columbia University in New York City. Within two years, Sapir had hired Harlan Smith, a middle-aged U.S. archaeologist who had worked for the Jesup Expedition in British Columbia, and William Wintemberg, an amateur archaeologist from Ontario who had assisted Boyle. Working together in Ontario and Nova Scotia, Smith taught Wintemberg how to excavate and write site reports, with an emphasis on the functional interpretation of artifacts. Thereafter, despite frail health, Wintemberg carried out surveys and excavations in Newfoundland (not yet part of Canada), New Brunswick, and on the prairies while Smith continued to concentrate on British Columbia.

Wintemberg's most important research was done in southern Ontario, where he worked out a rough

chronology of Iroquoian cultural development. Yet, so great was his isolation from mainstream U.S. archaeology, it was only

in the Old Crow region of the Yukon and in other studies, no satisfactory resolution of this problem has been achieved.

As chronologies for more recent periods were better understood, archaeologists began to seek a more detailed understanding of the factors that accounted for change over time. In some fields, such as the study of Iroquoian prehistory, where Canadian archaeologists initiated extensive site surveys and began to excavate entire habitation sites, both the scale and the quality of archaeological research came to surpass what was being done in adjacent parts of the United States.

A survey carried out by Roy Carlson in 1973 indicated that the most widely shared interest of archaeologists working in Canada was the study of cultural history, and an analysis of the *Canadian Journal of Archaeology* reveals that 67 percent of the articles published in that journal between 1988 and 1992 dealt with culture history while about 40 percent exhibited an interest in ecology. The preoccupation with recovering primary data and building cultural chronologies tended to insulate Canadian archaeology from the impact that processual archaeology had in the United States during the 1960s. Most U.S. archaeologists who found employment in Canada and Canadians who had studied in the United States had received their training prior to the rise of processual archaeology, and some were inclined to be hostile or indifferent to the new movement; others embraced it.

In general, however, the demands of archaeological research in Canada and the agenda set by the National Museum tended to dilute the impact of the movement. Many Canadian archaeologists became genuinely interested in the ecological approaches advocated by processual archaeology, but most of them rejected its antihistoricism, extreme positivism, and privileging of a deductive methodology. This espousal of an eclectic, middle-of-the-road approach appears to have been more than a result of the late development of archaeological research in Canada or of the proverbial Canadian penchant for compromise. Theorists such as Gordon Lowther, Alison Wylie, Marsha Hanen, Jane Kelley, and Bruce Trigger have formulated philosophical underpinnings for such an approach that involve a blend of relativism and empiricism, which appears to be increasingly marketable abroad as postmodern trends impact on archaeology everywhere.

A major challenge confronting archaeologists working in Canada today is to establish effective working relations with indigenous peoples, who are increasingly determined to control their cultural heritage and securing the legal right to do so. Many native people object on religious grounds to the excavation of burial sites and places where their ancestors lived. Others see archaeology as enhancing an understanding of aboriginal history and culture. The Canadian Archaeological Association is seeking to develop cooperative agreements and principles of conduct to govern relations between archaeologists and the indigenous peoples. On the whole, such discussions have been productive, although it is clear that archaeology is going to have to change to address issues of major concern to aboriginal people. These issues generally relate to the recent past and favor a combination of archaeology, ethnology, and oral history that recent generations of ecologically inclined archaeologists have tended to ignore. A more contentious legal issue is whether public ownership of the archaeological record is vested in the government or belongs to native peoples.

Historical Archaeology

Historical archaeology, which is concerned primarily with sites relating to European settlement in Canada, began in the 1890s when Chazelle relocated the two Jesuit mission sites in southern Ontario. For a long time there was little more than an interest in identifying the locations of buildings and major events associated with the early colonization of eastern Canada. In 1919, the federal government created the Historic Sites and Monuments Board, which commemorated but did not have the power to

protect such sites. The first scientific excavation of a historical site was carried out between 1941 and l943 by Kenneth Kidd of the Royal Ontario Museum at the larger and earlier of the Jesuit mission sites that Chazelle had identified. The excavation of this site was completed between

1947 and 1951 by Wilfrid Jury, after which Sainte-Marie Among the Hurons was reconstructed as a tourist attraction by the Ontario government. Kidd's monograph on that site was a milestone in the early development of historical archaeology in North America.

Historical archaeology tended to interest the Canadian public more than prehistoric archaeology, and governments viewed the reconstruction of historical sites as a way to encourage tourism, especially in poorer areas of the country. In 1961, the federal government established the Canadian Historic Sites Service (now the Archaeology Division of the Canadian Parks Service) with John Rick as senior archaeologist. This service was intended to encourage the excavation of historic sites as well as their reconstruction for historical and recreational purposes. Among the numerous projects that provided cultural images for Euro-Canadians were the excavation and rebuilding of the French fortress of Louisbourg in Nova Scotia and the Viking settlement at L'Anse aux Meadows in Newfoundland. Between 1962 and 1966, six research positions were added to the service and large amounts of contract funding were made available by the federal government. In more recent years, there has also been growing interest in industrial archaeology, which is supported by conservation groups.

For a long time, the Historic Sites Service and the Archaeological Survey of Canada tended to divide the work according to whether sites dated from the historical or prehistoric periods. Because of the specialized skills required to carry out historical archaeology, many of the original archaeologists attached to the Historic Sites Service were recruited from abroad. They had little interest in prehistoric archaeology and initially had few connections with the existing archaeological community. After the merger with Parks Canada, a growing number of Historic Sites Service archaeologists were knowledgeable about prehistoric as well as historical archaeology. The archaeology departments at Calgary and Simon Fraser Universities were generally more willing to train historical archaeologists than were anthropology departments, which remained focused on prehistoric archaeology, but Canada still does not have a major center for educating historical archaeologists. Individuals who were trained in prehistoric archaeology but have done major work on historical sites include the late Walter Kenyon of the Royal Ontario Museum and James Tuck at Memorial University of Newfoundland. The Canadian Parks Service issues its own publications dealing with historical archaeology, and relatively few articles on this subject appear in the *Canadian Journal of Archaeology*.

Heritage Management

The oldest heritage legislation in Canada is the British Columbia Historic Objects Preservation Act of 1925, which was designed primarily to prohibit the removal of rock carvings and other aboriginal artifacts from that province. Between 1954 and 1980, expanding provincial government bureaucracies, following the examples of other countries, passed heritage acts to provide legal protection for cultural resources and allocated funds to conserve and manage them. The powers granted to regulatory bodies included requiring assessments of archaeological potential in advance of land use, licensing archaeological activities, and the obligatory reporting of the findings of archaeological research. The implementation of the legislation varied according to the strength of the provincial legislation, the will of the provincial governments to enforce it, and the highly variable resources of the different provinces.

Federal antiquities legislation, though not integrated in a single body of law applying to all contexts, is incorporated within several acts, the principal ones being the Canada Environmental Assessment Act and the Canadian Cultural Property Export and Import Act. The drafting of comprehensive legislation has been impeded by interdepartmental jurisdictional disputes and by the refusal of some aboriginal peoples to acknowledge government ownership of archaeological remains.

The growth of archaeological resource management provided two new categories of employment for

archaeologists. A significant number of civil service posts were created within government departments to deal with a mixture

of administrative and salvage activities. Much of the fieldwork and report writing associated with resource management now is done through contracting, which has led archaeologists to establish private consulting firms for this purpose. Since the early 1980s, as employment in universities, museums, and governments has become hard to find, these firms have provided most of the jobs available to young archaeologists. At present, cultural resource archaeologists generally are better funded and are carrying out more excavations in Canada than are university and museum archaeologists.

Archaeology Abroad

Early in the twentieth century, a few Canadians began to do archaeological work abroad. The most famous was the Peking-based physician Davidson Black, who in 1927 identified *Sinanthropus pekinensis* (Peking Man) and was involved in the excavations at Zhoukoudien until his death in 1934. The Canadian School of Prehistoric Research, a privately funded institution founded in 1925 by the geologist Henry Ami, carried out Paleolithic excavations in France into the 1930s. Amice Calverley, who began to work for the egypt exploration society in 1927, copied the reliefs of the Temple of Seti I at Abydos and published them between 1933 and 1959.

The person who had the greatest impact on Canadian archaeology done abroad was Charles Currelley, who excavated in Egypt for the Egypt Exploration Fund from 1902 to 1907, originally as an assistant to w. m. f. petrie, before becoming the first director of the Royal Ontario Museum of Archaeology when it was established in Toronto in 1912. This museum, which absorbed the old Ontario Provincial Museum, was to become a major center for archaeological research both within Ontario and outside Canada. Homer Thompson, who held appointments at both the University of Toronto and the Royal Ontario Museum beginning in 1933, was a key member of the american school of classical studies' project to excavate and restore the Agora in Athens. A.D. Tushingham, who moved from Queen's University to the Royal Ontario Museum in 1955, remains active in biblical archaeology.

Since 1945, archaeologists employed at the Royal Ontario Museum have excavated in iran, Iraq, greece, Egypt, the Sudan, belize, and other countries. Some of the excavations have been carried out in collaboration with other institutions, and Royal Ontario Museum archaeologists have participated in research organized by other groups. Often work has continued at the same site or in the same region for many years. This research, together with studies of the vast Chinese collections assembled during Currelley's directorship, has made the Royal Ontario Museum Canada's most important center for archaeology abroad. It has also played an important role in encouraging the development of classical, Near Eastern, and Egyptian archaeology at the University of Toronto.

Since 1960, a substantial number of archaeologists who do research abroad have found employment across Canada in university departments of anthropology, archaeology, classics, history, Near Eastern studies, art history, and religion. By the mid-1970s, these archaeologists outnumbered university-based archaeologists studying Canada by more than two to one. In 1961, the federal government supplied funding for a Canadian expedition, led by Philip Smith, that carried out prehistoric research as part of the UNESCO Campaign to Save the Monuments of nubia. Since then, research abroad has been greatly facilitated by federal government funds supplied through the Canada Council and the Social Sciences and Humanities Research Council of Canada. This peer-reviewed funding, which takes the form of major grants extending over a number of years, is available for projects both inside and outside Canada and has supported archaeological research in many parts of the world.

Important archaeological projects have been carried out by classical archaeologists from the University of Toronto, the University of Alberta, McMaster University, McGill University, the University of British Columbia, and the University of Laval. Egyptian archaeology has been vigorously pursued by

archaeologists from the University of Toronto, while the University of Calgary has become a center for African archaeology. Possibly the most publicized Canadian

work done abroad is Donald Redford's excavations in Egypt at Karnak East in connection with the Akhenaton Temple Project. The Canadian Archaeological Institute at Athens and the Canadian Academic Centre in Italy were both established in 1978, and the Canadian Institute in Egypt was founded two years later. All three institutes facilitate archaeological research in these countries under the aegis of the Canadian Mediterranean Institute. At present, the future of this institute, and of all Canadian archaeology done abroad, is seriously threatened by continuing cutbacks in federal funding.

Despite shared methodological interests, there are few professional contacts between Canadian archaeologists excavating inside Canada and those working abroad, except at the Royal Ontario Museum or in university archaeology or anthropology departments. There is also little interaction among archaeologists studying different parts of the world. The Canadian Society for Archaeology Abroad, founded in 1969 to represent the interests of these archaeologists, has ceased to exist. Archaeologists researching abroad who do maintain contacts with archaeologists working inside Canada frequently share an anthropological interest in ecological studies and in reconstructing social life while those with a more humanistic orientation tend to avoid such contacts. This situation reinforces a division between anthropological and humanistic archaeologists, who in Canada, as in the United States, remain psychologically as well as disciplinarily isolated from one another. One bridge between these two groups is the multifaceted, Toronto-centered Dakhla Oasis Project, which has brought together both sorts of archaeologists to study the culture history of that region of Egypt from prehistoric times to the Christian period.

Conclusion

In Canada, archaeology does not constitute a single discipline or even a shared approach to studying the past. Prehistoric archaeology, as it relates both to North America and to the rest of the world, is generally located in the anthropology or archaeology departments of universities. The two Canadian archaeology departments were founded by anthropological archaeologists, and the departments share an anthropological orientation. Historical archaeology is generally taught in archaeology departments; yet, despite its importance as a practice, its institutionalization in Canadian universities remains weak. The archaeology of the literate civilizations of the Mediterranean world and the Near East is more likely to be studied in departments of classics and Near Eastern studies.

In museums, the situation is quite different. Most of them employ only archaeologists who study the history and prehistory of Canada. The one important exception is the Royal Ontario Museum, which has a large staff representing in its various departments and cross-appointments with the University of Toronto all the branches of archaeology. This is the only archaeological unit in Canada in which both the anthropological and the humanistic traditions of archaeology are substantially represented. There is no society or journal in Canada that embraces the work of all archaeologists. Proposals for formal cooperation between Canadian anthropological and humanistic archaeologists have elicited no positive response.

The relations between prehistoric archaeology and anthropology are looser in Canada than in the United States. There is no over-all anthropological association, as the Canadian Anthropology Society is a grouping of social anthropologists. Archaeologists working in anthropology departments have long complained that the numerical domination of these departments by social anthropologists has kept the number of prehistoric archaeologists employed in universities low. It has also hindered the hiring of archaeologists who specialize in technical analysis, which in turn has lowered the quality of archaeological training in such departments. Even so, most prehistoric archaeologists remain unwilling to abandon their ties with anthropology, and even those who work in archaeology departments see their main interests and orientation as being anthropological. Yet a growing number of archaeologists who

have found employment in cultural resource archaeology, and therefore tend to be interested exclusively in Canadian archaeology,

Caribbean

In 1963, French West Indian archaeologists initiated a series of biennial meetings called the International Congress for the Study of Pre-Columbian Cultures of the Lesser Antilles (Map 1). Over the next decades, so many specialists in the prehistory of the rest of the West Indies, Venezuela, and the Guianas began to attend these meetings that the name was changed to the Congress for Caribbean Archaeology.

The term *Caribbean* is not used in this context to the refer to the entire Caribbean basin but to a culture area that existed in the eastern half of the basin during pre-Columbian times (Willey 1971, 360-393). The western half of the basin formed a separate intermediate area, called that because it lay between the centers of civilization in mexico and peru (Map 2). Few intermediate-area specialists come to the Caribbean congresses; they have little incentive to participate because the problems they study differ from those in the eastern half of the basin.

During prehistoric times, the two areas constituted separate interaction spheres (Caldwell 1966, 338), kept apart because the people living there were unable to travel back and forth across the Caribbean Sea. The inhabitants of the two spheres developed differently because they were unable to exchange artifacts, customs, and beliefs. Christopher Columbus's introduction of European ships, capable of traveling on the high seas, remedied this difficulty and made possible a single circum-Caribbean sphere, with its own set of problems.

This article focuses on the Caribbean sphere and its problems, but it is not entirely limited to pre-Columbian times. It also covers the disappearance of the native peoples as they came into contact with European, African, and Asian immigrants. It thus includes the indigenous side of the so-called Columbian exchange of cultural, linguistic, and biological traits that took place in the circum-Caribbean sphere (Crosby 1972).

Research within these limits has progressed through a sequence of four stages, during which the participants expanded to increasingly high levels of abstraction, each made possible by the results achieved on the previous levels. The initial stage may be called that of artifactual research because it was marked by the discovery, collection, and interpretation of structures and manufactures. In the second stage, chronological research, Caribbeanists began to organize their finds into systems of areas, periods, and ages. In the ensuing stage of culture-historical research, they used those systems to differentiate human populations or peoples, each with its own distinctive culture, and to investigate the peoples' ancestries, that is, their cultural heritages. In the final stage of sociocultural research, they focused on the societies into which the population groups organized themselves and studied the ways in which these social groups used and modified both their cultural and their natural heritages (Rouse 1986, Fig. 30).

Artifactual Research

Archaeology began in the Caribbean area, as elsewhere, with the discovery, description, and identification of buildings, tools, and other artifacts-and with their removal to private homes and public museums. At first, these items of material culture were collected individually; later, they were excavated in the form of assemblages from the sites where they had been deposited.

So far as is known, the first European settlers did not undertake archaeological research. It was not until 1740 that an explorer named Nicolas Hortsmann reported the discovery of petroglyphs (rock carvings) in the present country of Guyana (Osgood 1946, 21). In 1749, Father Juan de Talamanco, a Spanish historian and archaeologist, made a pioneer study of four carved stone figures of Taino Indian deities *(zemis)* that had been sent to him from the northern part of the Dominican Republic, and in 1775, Pedro del Prado, a Cuban, wrote about a stool *(dujo)* of the Tainos that had been found in the eastern part of

his country (Ortiz 1935, 71-72).

The first known exhibition of artifacts took place in Puerto Rico in 1854. It featured the collection of Jorge Latimer, a local merchant, that was eventually acquired by the Museum of Natural History of the smithsonian institution, Washington, D.C. (Coll y Toste 1907, 30- 31). In 1867, the government of British Guiana (now Guyana) established a museum to house items obtained from the local Indians and their sites. This museum, which bears the name of Walter Roth, a longtime director, includes natural as well as cultural objects. Its holdings in the former field are dominant, as is the collection in the Smithsonian's Museum of Natural History (Osgood 1946, 40-41).

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Chronological Research

By the 1920s, professional archaeologists had accumulated enough assemblages to use as the basis for setting up sequences of local periods, and by the 1930s, they had formed sufficient sequences to begin synthesizing them into regional charts or chronologies. As in other parts of the world (see, e.g., Willey and Phillips 1958), they placed the local periods whose assemblages were most alike at the same heights in the charts on the assumption that the inhabitants who were able to mutually influence each other would have produced the most similar assemblages. They checked their results by hypothesizing the existence of horizons, that is, local complexes of cultural traits presumed to have been contemporaneous, and by determining whether these "time markers" actually did have a horizontal distribution on their charts. If they did not, the charts and hypotheses were reconciled in an effort to produce the most accurate and most practicable systems of local periods within which to organize the assemblages.

Gudmund Hatt, a professor at the University of Copenhagen, pioneered the new approach. In 1924, he undertook excavations in the formerly Danish part of the Virgin Islands, which the United States had just purchased from his country. He classified his finds into three successive groups and named each group after sites from which he had obtained typical assemblages: (1) Krum Bay, (2) Coral Bay-Longford, and (3) Magens Bay-Salt River. He placed (1) at the beginning of his sequence because it lacked ceramics and put (2) before (3) because, wherever the two occurred in the same site, the assemblages belonging to (2) underlay those in (3). He also noted that (2) was characterized by white-on-red-painted pottery, which had not previously been found in the Greater Antilles, whereas the modeled-incised pottery of (3) resembled that of the Taino Indians, who occupied the Greater Antilles in Columbus's time (Hatt 1924; Birgit F. Morse, personal communication).

In 1935, Cornelius Osgood, professor and curator of anthropology at Yale University, established a Caribbean anthropological program with the intention of tracing the spread of cultural traits from South, Middle, and North America into and out of the West Indies. He sent Froelich G. Rainey and irving rouse, his first two graduate students, to the West Indies with this aim in mind. Like Hatt, they realized that they would first have to do chronological research. Rainey, assisted by Rouse, set up a sequence of local periods in Haiti, which, like Hatt's, consisted of a preceramic period followed by two ceramic periods. The first of the two was marked by local pottery, and the second by pottery in the Taino style resembling that encountered by Hatt in the Virgin Islands. Rainey then went to Puerto Rico where he was able to distinguish two ceramic periods comparable to those Hatt had found in the Virgin Islands (Rainey 1940, 1941).

Rainey named the two ceramic periods in his Haitian sequence after typical sites, as Hatt had done in the Virgin Islands, but preferred to call the two Puerto Rican periods *Crab* and *Shell* in recognition of the fact that such food remains were dominant in their respective assemblages. He was ahead of his time in calling attention to this shift in the local diet, but Rouse found when he continued the Puerto Rican research that ecofacts such as food remains do not provide an adequate basis for chronological research because their presence in archaeological assemblages depends upon their availability and crabs and edible shellfish are limited to the coasts of large islands such as Puerto Rico. In his doctoral dissertation, therefore, Rouse (1939) substituted the names of typical sites for *Crab* and *Shell,* following the example of Hatt in the Virgin Islands and Rainey in Haiti.

Rouse also synthesized the three established sequences into a regional chronology and continues to refine and expand this chronology as new information becomes available, adding other local sequences to his charts as they have been formulated (Fig. 2).

the use of chronological charts as many Caribbeanists assumed that the newly developed techniques of measurement rendered the charts obsolete. Experience has shown, however, that neither is sufficient by itself. The results of the two procedures need to be checked against each other in order to identify and eliminate invalid dates and to improve the accuracy of the charts.

The charts and dates have been called measures of absolute time because their temporal values remain the same throughout the regions covered. Caribbeanists also work with measures of relative time known as *ages*, which vary from place to place. Five ages are distinguished: lithic, which is marked by stone chipping; archaic, by the addition of stone grinding; ceramic, by the first appearance of pottery; formative, by the development of ball and dance courts; and historic, by the introduction of writing. These ages have an irregular distribution when inserted in the chronological charts because the innovations that define them took place at different times in different places (Fig. 2).

Culture-Historical Research

Chronological charts, dates, and ages play a number of roles in research on the final two levels of interpretation. They may be used at the start of a project to identify sites, artifacts, and other information pertinent to the problem under study and to retrieve these data from the ground or from storage. To assist in doing the latter, the Yale Peabody Museum, which is now computerizing its Caribbean collections, is adding the name of the local period when each item was produced to the information already recorded about the nature of the item and the locality from which it came (Hill and Rouse 1994).

More important, the chronological systems have added a new dimension to the study of the history of cultural traits envisaged by Osgood when he founded the Yale Caribbean program. They have made it possible to reconstruct the trajectories of traits as they spread from period to period as well as from area to area and to study the changes that took place en route. For example, prior to the construction of chronological charts and the advent of radiometric dating, it was assumed that the custom of building ball and dance courts had diffused from Mexico to the Greater Antilles because there are superficial similarities between the courts in the two regions. Thanks to chronological research, local archaeologists have been able to show that the Antillean courts originated in Puerto Rico during the latter part of the first millennium a.d. and spread east and west from there without ever reaching Jamaica or central and western Cuba, the parts of the Antilles closest to Mexico. The courts became simpler as they spread (González Colón 1984; Rouse 1992, 112-116).

West Indian scholars originally assumed that all their finds had been produced by the ethnic groups who inhabited the area in the time of Columbus, that is, by the Guanahatabeys (also known as Ciboneys), Igneris, Tainos, and Island-Caribs (Map 3). For example, Heye attributed all of the Lesser Antillean artifacts in his Museum of the American Indian to the Island-Caribs. And when the Swedish archeologist Sven Lovén wrote his scholarly summary of West Indian archaeology and ethnology in the 1930s, he began it with a statement that all four ethnic groups had come full-blown from either North or South America (Lovén 1935, 2). That assumption relieved him of the necessity of studying the evolution of the groups' cultures, since that would have taken place before they reached the islands. He only needed to concern himself with the histories of individual traits.

Lovén's assumption soon began to be contradicted by the results of chronological research. Some sequences of local periods in the Greater Antilles have now been extended back to ca. 4000 b.c. (Rouse 1992, Fig. 14), and the ethnic groups encountered by Columbus could hardly have retained their separate identities over such a long period of time. Consequently, we must distinguish the historic ethnic groups from their prehistoric ancestors and predecessors.

Ethnic groups are defined in terms of sociocultural criteria, which are difficult to infer from prehistoric remains-hence the position of sociocultural research at the end of the sequence of stages under discussion here. In the absence of adequate knowledge of sociocultural criteria, Caribbeanists have formulated prehistoric

The descendants of the British, Danish, Dutch, and French colonists who settled alongside the Spaniards in the northern part of the West Indies are less interested in their Taino predecessors because the latter had disappeared before they arrived. These people prefer to study the remains of their own ancestors. In Jamaica, where the present population is almost entirely African-American, much work is being done on the slave quarters on sugar plantations and on the dwelling sites of escaped slaves.

Conditions are different in the Windward Islands, which are closer to South America. For several centuries after the extinction of the Tainos, the Island-Caribs continued to live there on islands not yet colonized by Europeans. So far, attempts to locate their remains have been unsuccessful.

While conserving the ruins of the first European settlement in South America, at Nueva Cadiz on Cubagua Island, Venezuela, Cruxent identified and excavated the quarter occupied by Indian slaves the Spaniards had brought there to dive for pearls (Rouse and Cruxent 1963, 134-138). The Indian quarters in the mission sites of Martinique, Trinidad, and Venezuela have received less attention. The subject does not greatly interest the modern inhabitants of those places because they do not trace their descent from the aborigines.

Sociocultural Research

On the final level of interpretation, Caribbeanists have shifted their attention from the peoples who produced the local cultures to the societies who used them (Watters 1976, 6). In doing so, they have focused on the societies' activities.

These scholars have been attracted to the study of societies by the presence of chiefdoms among the Tainos in the Greater Antilles and the Caquetios in western Venezuela (Spencer and Redmond 1992; Wilson 1990). Indeed, the term *chief* comes from the Taino language. The remains of the Tainos and their ancestors provide an opportunity to examine the rise of chiefdoms in isolation, uninfluenced by direct contact with previously developed chiefdoms or states.

Bernardo Vega (1980) once tried to trace the boundaries of the Taino chiefdoms by correlating them with the limits of the latest archaeologically defined peoples and cultures in Hispaniola, but he had little success. The two kinds of units appear to have had different distributions and to equate them is like treating apples as oranges.

Better results have been achieved by using the direct historical method, that is, by deriving models of the Taino chiefdoms from the ethnohistoric evidence and projecting the models back into prehistory along the Tainos' ancestral line. The historic chiefdoms consisted of relatively large groups of villages, each with its own chief, that owed allegiance to hierarchies of district and regional chiefs (Wilson 1990). The historic chiefdoms were also marked by ceremonial centers (i.e., clusters of ball and dance courts), elaborate burials, special types of ornaments, and intensive trade. Study of the spatial and temporal distribution of these criteria in the Greater Antilles during prehistoric time indicates that the local chiefdoms began to evolve during the late ceramic age and reached maturity in the formative age (Fig. 2).

Citing archaeological evidence that Bahamian villages were divided into halves, Keegan and Maclachlan (1989, 615-616) have theorized that if and when these halves split apart and became separate villages, they may have retained their affiliations and, as a result, have come to be ruled by district chiefs. The two scholars note that the Spaniards encountered such an incipient chiefdom on Aklin Island in the southern Bahamas and hypothesize that continued evolution farther south in Hispaniola would have led to the emergence there of regional chiefs and, hence, of the full chiefdoms encountered by Columbus.

The probability that their conclusions are correct is heightened by the fact that they obtained them by

working within the direct line of ancestry of the Tainos as established on the previous, culture-historical level of interpretation. Without knowledge of this ancestry, the sociocultural researchers would have been prone to error. For example, in a separate study Keegan (1992, 17-18) assumed that the Dominican Republic sequence of Musiepedro (also known as

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Cartailhac, Emile (Edouard Phillipe)

(1845-1921)

Emile (Edouard Phillipe) Cartailhac was born in Marseilles, France. He became a geologist and worked with Edouard and Henri Filhol at the Musée d'Histoire Naturelle in Toulouse, and it was those two men who encouraged his interest in prehistory. In 1866, Cartailhac moved to Paris where he was influenced by French prehistorians gabriel de mortillet and henri breuil. Cartailhac and Mortillet were the founders

of the International Congress of Anthropology and Prehistoric Archaeology, which held its first meeting in Neuchâtel, Switzerland, in 1866. In 1869, Cartailhac bought the journal founded by Mortillet, *Materiaux pour l'histoire naturelle et primitive de l'homme,* an important publication for promoting prehistory and anthropology. Cartailhac edited and published the journal until 1890 when it was amalgamated with the *Revues d'Anthropologie and d'Ethnologie* to form *L'Anthropologie.*

Cartailhac is most famous for his role in the authentication of Paleolithic cave art. In the late nineteenth century quantities of moveable Paleolithic pieces of art, engravings, and sculptures on bone, ivory, and antler wood were exhumed from prehistoric sites along with animal and human bones and stone tools. These cave sites were occasionally decorated with engravings and representations on their walls and ceilings, and the idea that early prehistoric humans could create art as well as stone tools was rejected by Cartailhac and many other archaeologists, who argued that this cave art was neither old nor authentic. By the beginning of the twentieth century, however, this view began to be debated as more discoveries of carvings and cave paintings were made at sites that were clearly from the Upper Paleolithic period. The study of ethnology had grown, and there was now evidence of this kind of art, some of it contemporary, all over the world.

In 1902, Cartailhac and Breuil rediscovered and explored the magnificent cave of altamira in Spain. First found in 1879 by a local landowner and his daughter, the cave had been considered a forgery, rejected as an example of prehistoric art, and neglected. Visiting it certainly changed Cartailhac's mind-perhaps the

cave's vastness, the fact that it was so obviously and beautifully painted, or the fact that the animals it portrayed were so identifiably extinct-had such force that he wrote “Mea Culpa of a Skeptic” that same year in which he apologized and recognized the authenticity of Paleolithic cave art. Breuil and Cartailhac went on to explore the cave of Niaux in the Ariège in 1906.

Tim Murray

See also

Rock Art

Carter, Howard (1874-1939)

Born in London, the son of a talented painter and illustrator, Carter grew up in Norfolk. At the age of fifteen he first visited the country home of Baron Amherst of Hackney, whose important collection of Egyptian antiquities were to influence and inspire Carter's interest in archaeology. Baron Amherst was a supporter of the Egyptian Exploration Fund and it was via this connection that Howard Carter was hired

as a draftsman and copyist by the Archaeological Survey of Egypt. He received some training in Egyptology and hieroglyphics at the british museum before leaving for Egypt in 1891.

Howard Carter (left) at the entrance of Tutankhamun's tomb in Luxor, 1922

(Ann Ronan Picture Library)

Carter proved his worth as a competent and committed archaeological draftsman, going on to join sir flinders petrie at excavations at El-Amarna in 1892. Here Carter received training as an excavator from the best Egyptologist of his time. Carter's rapidly growing proficiency as an excavator and site manager, as well as an illustrator and photographer, was recognized when he was appointed to the post of chief inspector of antiquities in Upper Egypt and nubia in 1900. During the four years he spent in this position Carter undertook important conservation work but was left little time to excavate. However he was able to carry out detailed surveys of the Valley of the Kings, eventually locating the tombs of Thutmosis I and Queen Hatshepsut.

In 1904 Carter became chief inspector of Lower Egypt, but due to a diplomatic row he left the antiquities service and supported himself as an archaeological illustrator and draftsman, buying and selling in the antiquities trade and acting as a guide for wealthy visitors to the Valley of the Kings. In 1909 Carter was hired as expert assistant by Lord Carnarvon, who had decided he would like to try excavating in the Valley of the Kings. The two excavated other sites in Egypt for five years before they were allowed to work in the Valley of the Kings from 1914. World War I put their project on hold; then from 1918 to 1922 they searched the valley for a promising site. By this time Carnarvon had become disenchanted, and by 1922 he had decided this would be their last year. In November Carter telegraphed him in Britain to return: “At last have made wonderful discovery… a magnificent tomb with seals intact…”

Carter's long training in the practical business of excavating tombs, as well as his skill in recording their contents, made him an ideal person to undertake the task of clearing and documenting the tomb of tutankhamun. But his lack of formal education, his uneasiness about his social position, his obstinacy, and his lack of diplomacy were problematic. Tutankhamun's tomb transformed him from being an unknown journeyman excavator to a great archaeological discoverer. Clearing and cataloguing the finds changed archaeology in Egypt forever, and strife between Carter and the Antiquities Department lasted for decades. Carter's greatest gift to Egyptology and posterity was not a monumental scholarly work or new insights into the nature of ancient Egyptian life, but the eight years he spent organizing and supervising the work of a large team of photographers, conservators, and illustrators who patiently catalogued and recorded the contents of the tomb of this minor Pharaoh.

When work on the tomb finally finished in 1932 Carter spent much of his time in Luxor dreaming of discovering the tomb of Alexander the Great, or in London going about his business in the antiquities trade. He received few academic and public honors. He died in London in 1939.

Tim Murray

See also

Egypt, Dynastic; Egypt Exploration Society

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Casa Grande

Casa Grande, located on the Gila River between Phoenix and Tuscon, Arizona, is a large Hohokam Classic-period ruin. Casa Grande is Spanish for Great House, and this structure is part of a large site with numerous compounds. Prehistoric occupation of the Southwest spans 12,000 years, and Casa Grande is the type-site (an exemplary site; the best example of a type of site) for the Hohokam Classic Period, a.d. 1100 to 1300. Named the first federal reservation for a prehistoric ruin in the United States, Casa Grande Ruins National Monument, the site includes a great house, ball court, and many compounds. No other great houses have been found, although two others may have been built between the Salt and Gila rivers.

The archaeology of Arizona has a long, complex history of exploration and excavation by amateurs and professionals. During the time of discovery in Arizona, research was aided by private funding, the creation of national monuments, and university research institutions. In

1935 several prominent publications were started across the United States: *american antiquity*, the *Journal of the Society for American Archaeology,* and *The Kiva.* Casa Grande Compound A was excavated in the early 1900s by Jesse Walter Fewkes of the newly formed Bureau of American Ethnology. Organized archaeological research began in 1927 with harold s. gladwin's expedition to Casa Grande to conduct stratigraphic excavation, which revealed evidence of two peoples and two potteries on the site. Gladwin founded the Gila Pueblo Archaeological Foundation, which is credited with consolidating the Hohokam research to a definite culture. In 1930 Emil W. Haury became Gladwin's assistant director, and his subsequent report on the Snaketown site defined Hohokam culture.

The particular housing style of Casa Grande is distinctive for the Hohokam Classic period. Casa Grande walls were built of piled-up adobe that was then dried and sometimes smoothed, polished, and plastered. The roof was made of juniper, pine, fir, and mesquite wood. The house had a lower story that was filled in, creating a mound, second and third stories with five rooms, and a top story with a single tower-like room. A compound was created by building walls surrounding the house.

Research on the Hohokam period reveals dramatic changes in architecture, pottery, and funeral customs. Changes have been attributed to causes as varied as drought, culture collapse, and migration. As in most southwestern sites, control of water is essential to survival. Casa Grande's location is a key to its function. Located at the end of an irrigation canal, it may be that the farmers controlled the water from the canal.

Danielle Greene

See also

United States of America, Prehistoric

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Çatal Huyük

See Turkey

Catherwood, Frederick (1799-1854)

Frederick Catherwood and john lloyd stephens brought the great indigenous American civilizations of Central America to the attention of the world in the 1840s. Not only were Catherwood's detailed drawings evidence of this great unknown culture, but they also remain valuable sources for details of Maya glyphs.

Catherwood was born in London, trained as an architect, and became an accomplished artist and architectural draftsman. He spent many years traveling in Greece and the Near East studying archaeological sites and drawing ruins. He and the antiquarian Robert Hay worked together on one of

the first attempts to record Egyptian temples and monuments.

Catherwood returned to England, where the exhibition of his Near Eastern drawings brought him to the attention of the American adventurer John Lloyd Stephens, who had himself spent many years touring the archaeological sites of Greece, the Near East, and Egypt. The two developed a friendship based on their shared interest in archaeological exploration. It was Catherwood who alerted Stephen to two small books on the ruins of Central America, and together they began to plan an expedition to this unexplored region. Catherwood joined Stephens in New York where he had established a successful architectural practice. In the meantime Stephens wrote and published *Incidents of Travel in Arabia Petraea* in 1839 and another book about Greece, Turkey, Russia, and Poland, both of which became best-sellers and made him the fortune that was to finance an archaeological expedition to Central America.

The exotic ruined temples in the steamy jungles of Central America had, by this time, been noted by French explorers and artists such as Guillermo Dupaix and Jean Frederic Waldeck, and had provoked some interest in New York and Europe. In 1839, after Stephens managed to secure a useful presidential appointment as a diplomatic minister in Central America, the pair traveled to belize. The physical difficulties

1935 several prominent publications were started across the United States: *american antiquity*, the *Journal of the Society for American Archaeology,* and *The Kiva.* Casa Grande Compound A was excavated in the early 1900s by Jesse Walter Fewkes of the newly formed Bureau of American Ethnology. Organized archaeological research began in 1927 with harold s. gladwin's expedition to Casa Grande to conduct stratigraphic excavation, which revealed evidence of two peoples and two potteries on the site. Gladwin founded the Gila Pueblo Archaeological Foundation, which is credited with consolidating the Hohokam research to a definite culture. In 1930 Emil W. Haury became Gladwin's assistant director, and his subsequent report on the Snaketown site defined Hohokam culture.

The particular housing style of Casa Grande is distinctive for the Hohokam Classic period. Casa Grande walls were built of piled-up adobe that was then dried and sometimes smoothed, polished, and plastered. The roof was made of juniper, pine, fir, and mesquite wood. The house had a lower story that was filled in, creating a mound, second and third stories with five rooms, and a top story with a single tower-like room. A compound was created by building walls surrounding the house.

Research on the Hohokam period reveals dramatic changes in architecture, pottery, and funeral customs. Changes have been attributed to causes as varied as drought, culture collapse, and migration. As in most southwestern sites, control of water is essential to survival. Casa Grande's location is a key to its function. Located at the end of an irrigation canal, it may be that the farmers controlled the water from the canal.

Danielle Greene

See also

United States of America, Prehistoric

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Çatal Huyük

See Turkey

Catherwood, Frederick (1799-1854)

Frederick Catherwood and john lloyd stephens brought the great indigenous American civilizations of Central America to the attention of the world in the 1840s. Not only were Catherwood's detailed drawings evidence of this great unknown culture, but they also remain valuable sources for details of Maya glyphs.

Catherwood was born in London, trained as an architect, and became an accomplished artist and architectural draftsman. He spent many years traveling in Greece and the Near East studying archaeological sites and drawing ruins. He and the antiquarian Robert Hay worked together on one of

the first attempts to record Egyptian temples and monuments.

Catherwood returned to England, where the exhibition of his Near Eastern drawings brought him to the attention of the American adventurer John Lloyd Stephens, who had himself spent many years touring the archaeological sites of Greece, the Near East, and Egypt. The two developed a friendship based on their shared interest in archaeological exploration. It was Catherwood who alerted Stephen to two small books on the ruins of Central America, and together they began to plan an expedition to this unexplored region. Catherwood joined Stephens in New York where he had established a successful architectural practice. In the meantime Stephens wrote and published *Incidents of Travel in Arabia Petraea* in 1839 and another book about Greece, Turkey, Russia, and Poland, both of which became best-sellers and made him the fortune that was to finance an archaeological expedition to Central America.

The exotic ruined temples in the steamy jungles of Central America had, by this time, been noted by French explorers and artists such as Guillermo Dupaix and Jean Frederic Waldeck, and had provoked some interest in New York and Europe. In 1839, after Stephens managed to secure a useful presidential appointment as a diplomatic minister in Central America, the pair traveled to belize. The physical difficulties

success. It also marked the end of their involvement with the Maya. Both Catherwood and Stephens pursued their careers in other directions, either alone or as partners, such as in the Panama railroad project in 1849.

Stephens died in 1852, his life shortened by the complications of various tropical diseases. Catherwood died in 1854, one of three hundred passengers to go down with the S.S. *Arctic* in the middle of the Atlantic Ocean.

Tim Murray

See also

Guatemala; Maya Civilization

Caton-Thompson, Gertrude

(1888-1985)

Born in London and educated in Eastbourne, Caton-Thompson was from an upper-middle-class family, and the early death of her father made her financially independent for the whole of her life. Until World War I she enjoyed an active social life in London and the country, and she traveled, describing her trips to Italy and Egypt during this time as the source of her later interest in archaeology.

Gertrude Caton-Thompson

(Hulton Getty)

In 1917 she was employed by the Ministry of Shipping and promoted to a senior secretarial post in which she attended the Paris Peace Conference. She declined a permanent appointment in the civil service and in 1921, aged 33, began her archaeological studies under Margaret Murray, Dorothea Bate and Sir w. m. flinders petrie at University College London. Caton-Thompson joined Petrie's excavations at abydos in Upper Egypt in 1921 and Murray's excavations in Malta in 1922. She spent the next year at Newnham College, Cambridge, attending courses in prehistory, geology, and anthropology.

In 1924 she returned to Egypt to work with Petrie and Brunton at Qau. While they investigated the cemetery, Caton-Thompson excavated the predynastic settlement site at Hemamieh and discovered the Badarian civilization. With Guy Brunton she wrote *The Badarian Civilization* (1928).

In 1925, accompanied by the Oxford geologist Elinor Gardner, Caton-Thompson began the Archaeological and Geological Survey of the northern Fayum, one of the first interdisciplinary surveys on settlement patterns and sequences in Egypt. Between 1927 and 1928 she excavated and worked with Gardner in northwestern Egypt on the desert margins of Lake Fayum, discovering two unknown Neolithic cultures that were later proven to be part of the Khartoum Neolithic. Their findings were published in *The Desert Fayum* (1934).

In 1929 Caton-Thompson was invited by the British Association for the Advancement of Science to investigate the great monumental ruins at great zimbabwe in southern Africa. She confirmed that these ruins belonged to an indigenous African culture and dated them to the eighth or ninth centuries a.d., producing evidence of Zimbabwe's links with Indian Ocean trade. One of her assistants on this project was the young Oxford graduate kathleen kenyon. Caton-Thompson's conclusions were published in *The*

Zimbabwe Culture (1931). In 1930 she and Elinor Gardner collaborated again on excavations of prehistoric sites at the Kharga Oasis. These were the first Saharan oasis sites to be excavated, and the first in a large research program on the investigation of the Paleolithic of

North Africa, culminating in the book *Kharga Oasis in Pre-history* (1952).

Caton-Thompson's last excavations in 1937 were of the fourth and fifth centuries b.c. Moon temple and tombs at Hureidha in the Hadhramaut of southern Arabia (now Yemen). These were the first scientific excavations in southern Arabia, and she was accompanied on this trip by Elinor Gardner and Dame Freya Stark. Their findings were written up in *The Tombs and Moon Temple of Hureidha, Hadramaut* in 1944.

Between 1940 and 1946 Caton-Thompson was president of the Prehistoric Society, the only woman to hold this position. In 1944 she was elected a fellow of the British Academy and became a fellow of University College, London. She retired from field work after World War II, but continued to research and visit excavations in East Africa. In 1946 she was awarded the Huxley Medal of the Royal Anthropological Institute, and in 1954 the Burton Medal from the Royal Asiatic Society. In 1954 she was made an honorary fellow of Newnham College Cambridge, and received an honorary Litt.D. from Cambridge University. Between 1946 and 1960 she was a governor of the School of Oriental and African Studies in London. In 1961 she became a founding member of the British School of History and Archaeology in East Africa (later the British Institute in East Africa) and served on its council for ten years, becoming an honorary member. Although Caton-Thompson was widely regarded as being an archaeologist of formidable skill and determination, she never sought a position in a museum or a university. It has been rumored that she was once offered the prestigious Disney chair of archaeology at the University of Cambridge and that she refused it. It is true that her personal wealth allowed Caton-Thompson the freedom to work outside the constraints of an institution, and there can be no doubt that she used this advantage to make highly significant contributions to the archaeology of Africa and Arabia.

Tim Murray

See also

Africa, South, Prehistory; Egypt: Predynastic

Caylus, Comte de

(1692-1765)

Anne-Claude-Philippe de Tubières-Grimord, Comte de Caylus, was an antiquary and dilettante of the early-eighteenth century who traveled widely engaging in excavation (especially in Asia Minor) and observation. French art historian Alain Schnapp (1996, 238-242) has noted that Caylus, through an extensive system of contacts built up through patronage and a common interest in the ancient past, was able to conceive of the goals of the antiquary more broadly than others before him.

Committed to publication (especially his seven-volume *Recueil d'antiquités égyptiennes, étrusques, greques, et romaines* published between 1752 and 1757) and careful illustration and observation, Caylus developed a rational basis for the description and classification of the large number of objects in his collection, and in doing so, he influenced the course of French antiquarian studies in the eighteenth century.

Tim Murray

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Celeia

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PREV NEXT

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PREV NEXT

Antonini) bear witness to the location of the town on the *Aquileia-Emona-Poetovio* road. The Roman town name is recorded on over a hundred inscriptions and on numerous milestones.

The town covered an area of about sixty-five hectares and had about 10,000 inhabitants at its peak during the second and third centuries when, to a large extent, it retained its Celtic character. The autochthonous component was reflected in onomastic material, the worship of Celtic divinities such as Epona, Noreia, Celeia, etc., and in the archaeological remains. Celeia did not exhibit a regular insular layout, because it developed out of a pre-existing settlement. Houses were located along roads, some of which were paved in the town's center and, in some sections, lined with colonnades. Excavations have revealed houses that were adorned with mosaics and frescos, dated from the first to the fourth century. A second-century Roman temple was located on the southern edge of the town. The forum, as yet not excavated, was probably situated in the southwestern part of the town.

Cemeteries were located in the western, southern, and northern parts of the town, along roads leading to emona, Neviodunum, and Poetovio. Marble vaults for some of the local eminent politicians can also be found some fifteen kilometers west of Celeia, where their estates were situated. The town wall was built after the great flood of the river Savinja at the end of the third century. The town was the seat of a diocese in the Early Christian period (fifth and early sixth centuries a.d.). A church decorated with richly colored mosaics, donatorial inscriptions, and a baptisterium were recorded, dating from this period. After the fall of the Roman Empire, the town was abandoned and its former inhabitants sought refuge in isolated upland settlements.

The first reports of the collection and protection of Roman monuments in Celje date from the end of the fifteenth century. Some of the monuments were incorporated into buildings and churches during the sixteenth through the eighteenth centuries. The foundation of the Municipal Museum (*Mestni muzej*) in 1882 helped to protect extant monuments and led to the first organized archaeological excavations of the site in 1889.

Irena Lazar

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Celts

Ancient Sources

The name *Keltoi* (Celts), probably a corruption of another Greek word, *Galatoi*, was first used by Greek writers in possibly the early sixth century b.c. Avienus, in his *Ora maritima* written in the fourth century a.d., claimed to be using sources dating from the sixth century b.c., including a sailing manual known as the *Massiliot periplus.* Avienus referred to Great Britain as Albion and Ireland as Iernè, and he also mentioned Ligurians in southern France being pushed southward into Iberia by Celts.

Around 500 b.c., Hecataeus of Miletus, writing on the Phocaean Greek settlement at Massalia (Marseilles), placed it in the land of the Ligurians while identifying nearby Narbo (Narbonne) as Celtic. In 480 b.c., Herodotus, with a rather jumbled geographical sense, recorded that *Keltoi* were to be found at the headwaters of the Danube, near the city of Pyrene on the Turkish coast, and west of the Pillars of Hercules (Gibraltar). By this period, there is archaeological evidence of goods traded by Greeks to peoples in france and by Etruscans (as exemplified by a wealthy woman's grave of the late sixth century found at Vix on the river Saône in central France), so first-hand information from Greek

travelers would have been available. Although it seems highly doubtful that any one term was applied universally to the indigenous peoples of Europe north of the Alps, it seems only sensible to use two names almost interchangeably, following Julius Caesar, who wrote in the mid-first century b.c. of the inhabitants of what is now central France that the Romans called them Gauls, but they called themselves Celts.

In the mid-sixth century b.c., Greek exchange links with “barbarian” centers north of

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In the mid-sixth century b.c., Greek exchange links with “barbarian” centers north of

In 279 b.c., groups of Celts invaded Greece and attacked the sanctuary of Apollo at Delphi, and may even have sacked it, but they were driven out. Some settled in the Balkans, where the Celtic capitol of Tylis was established somewhere in what is now Bulgaria, while others crossed into Anatolia (now central Turkey), where they were known as Galatae, or Galatians. They proved to be destabilizing intruders until they were defeated in about 233 b.c. by Antigonos I, and later by his son Eumenes II, who in thanks dedicated a sanctuary to Athene Nikephoros where the famous statues of the *Dying Gaul* and the *Gaul Killing Himself and His Wife* were first displayed. Known now only from Roman copies made in the second century a.d., these statues originally formed part of a victory complex incorporating, on the temple's balustrade, a frieze of military trophies that showed weapons and armor that were comparable to those of contemporary central and western Europe.

The Renaissance and After

Many Greek and Roman sources refer to Celts, and some of them are not just geographical descriptions but also refer to physical appearance, social customs, and traits such as boastfulness. Many of these sources were lost in the upheavals of the fifth century a.d. and later following the collapse of the Roman Empire. It was not until the Renaissance and the fifteenth century a.d. that many of these sources once again became available in western and central Europe and were once again widely used by scholars.

An elaborate Battersea shield made in bronze in the first century b.c. by Celts and discovered in London

(The Art Archive/British Museum)

In Britain, this “rediscovery” of past societies led to the recognition of “ancient Britons” in the writings of antiquarians such as that of the first state archaeologist, william camden in *Britannia* 1586, and a century later, john aubrey's great but never published work, *Monumenta Britannica,* begun in 1663. It was observed that classical writers, in writing about Britain, had mentioned, not Celts, but “Pretanni.” In 1723, william stukeley (1687-1765), who helped found the society of antiquaries of london in 1717, entitled his unpublished draft of a study of the great Neolithic stone circle of avebury “The History of the Temples of the Ancient Celts.” Stukeley was both the great recorder of prehistoric antiquities, such as Avebury and Stonehenge, and also the ancestor of modern Druidism and “Celtomania.” edward lhwyd (1660-1709), assistant keeper and later keeper of the ashmolean museum in Oxford, England, the oldest public museum in Europe, identified Welsh, Irish Gaelic, Scottish Gaelic, and Gaulish as different variants of Celtic languages deriving from invaders. This was a brave claim even for its day since the question of the origins and subsequent insular developments of Celtic remains a fraught topic.

There are no surviving pre-Roman texts since presumed Continental early Celtic speakers, although aware of writing, chose to pass wisdom orally, and writing that does exist from northern Italy, Spain, and southern Gaul is restricted

to inscriptions. The earliest of these are in what is called a Lepontic script and dates to about 600 b.c. There is, in fact, much uncertainty as to whether there is, for example, any real evidence for the introduction of Celtic into the British Isles before the sixth century b.c., and there is absolutely no evidence of where or when Celtic speakers first reached Ireland.

Another problem concerns the traces of what have been claimed to be the Celtic or, following Pliny, the Celt-Iberian culture of central Spain. Arguments are divided between a settlement of the region from, and a much more complex admixture of various introduced elements with, the autochthonous population of the high Mesetas. Clearly, the Greek colonial settlements from the mid-first millennium played an important role, as can be seen in both metal types and pottery, although it is noticeable that objects typical of the late Hallstatt and la tène phases in central and western Europe are almost totally absent. By the third century, the Celt-Iberians had developed their own script.

In Continental Europe, pioneering Celtic studies were very much the product of the emerging democracies that accompanied the American and French Revolutions in the last quarter of the eighteenth century when there was a universal search for national roots. Rediscovery of the Celts, archaeologically speaking, took place at the time of the creation of romanticism, which was itself a child of new nationalisms. The Europe formerly divided by class changed to a Europe divided by ethnic solidarity and focused on the nation state while making obeisance to the rights of the masses. Among these romantic manifestations were the “translations” in 1762-1763 by James Macpherson of poems attributed to a completely fictitious third-century-b.c. poet, Ossian, which took Europe by storm. This bogus mythology was welcomed as the true “Celtic twilight” by painters such as Angelika Kaufmann and Jean-Auguste Dominique Ingres, who in 1812-1813 painted the *Dream of Ossian.* A little earlier, in 1802, Anne-Louis Girodet de Roussy Triosson, in his massive work presented to Emperor Napoleon, depicted Ossian welcoming into Valhalla the dead French heroes of the war of liberty against the Prussians.

Muddled mythologies apart, the beginning of a serious interest in folk music reflected in the number of “Scottish” compositions by composers such as Haydn, Beethoven, and Mendelssohn also point to the re-creation of the Scottish Celts as a symbol of the new Europe of “the age of the democratic revolution.” Within Britain, the rediscovery of this mythical Celtic past coincided with the destruction of the Scottish highlands after the 1745 Jacobite rebellion and its brutal repression by the Duke of Cumberland-and the end at that time of Scottish aspirations to independence. “Celts” or “Scots” could be enclosed between book covers or presented in genteel concert halls just as nature, no longer a threat in a period of urbanization and industrialization, could be domesticated and hung on walls as landscape painting.

In 1816, Danish archaeologist christian jürgensen thomsen published his three-age system of stone, bronze, and iron, and between 1846 and 1865, Johann Georg Ramsauer, surveyor of the imperial salt mines at Hallstatt in upper Austria, discovered a rich cemetery of about 1,000 graves associated with one phase of the prehistoric mines, dating from the seventh to fifth centuries b.c. Ramsauer claimed that the graves were Celtic, a matter still disputed although Hallstatt became the name generally applied to temperate Europe until the first half of the Iron Age. Because of the preservative effects of salt, much fabric, leather, and worked wood were also found in Hallstatt's three major areas of prehistoric mining. The mining techniques seem to have been borrowed from those used much earlier in mining the copper of the eastern Alps, with shafts extending up to 350 meters below the surface, and it was clearly a hazardous occupation. Although much of this material was discovered accidentally in the course of more recent mining activities, a major examination of the ancient mining system has been carried out by Fritz Eckart Barth, and Roy Hodson has applied modern statistical analyses to the contents of the cemetery.

Old Wealth, Modern Discoveries

The Hallstatt Iron Age is generally distinguished by its rich barrow burials, usually comprising

and while there was continuing debate as to whether these were relics of the Romans or of local Teutonic tribes, the presence in the graves of imports from the Mediterranean was recognized as being significant.

La Tène and the Rise of a New Power North of the Alps

During the fifth century b.c., the Hallstatt centers of power gradually waned, and there are signs that there was unrest: rich barrow burials were robbed, and princely centers, such as at Heuneburg, were destroyed. The old centers were apparently replaced in status by centers of power to the north and west, in the Champagne-Ardennes region of northern France and Belgium, in the iron-rich Hunsrück-Eifel region between the Rhine and the Mosel Rivers, and in Bohemia. The burial mounds of this period are smaller, there are fewer southern imports (and those are mostly Etruscan), and the types and styles of weapons and ornaments change. Lost wax casting was replaced by bivalve molds for bronze ware and the hammering and stamping of sheet gold. The style of decoration changed, too, from simple rectangular incised designs to the creation of fantastic beasts or ambiguous human heads on fibulae, neck and arm rings, belt hooks, horse harnesses, and chariot fittings in the fifth century b.c. This period lasted until the expansion of the Roman Empire over territories from Britain to Romania and from Italy to Jutland during the period from the late second century b.c. to the later first century a.d.

The first attempt to establish a relative chronology for the Iron Age was made by the Swede hans hildebrand in 1872. He was followed by the great French archaeologist gabriel de mortillet in 1875 and then by Otto Tischler in 1881, whose scheme was in turn refined by the Bavarian paul reinecke in a number of papers beginning in 1902. As a result, La Tène is still generally divided into early, middle, and late (or I, II, and III) in France, Italy, and Switzerland and into A, B (=I), C (=II), and D (=III) in Austria, Germany, the czech republic, and the rest of central and eastern Europe. Although this chronology, which is largely based on the analysis of cemetery evidence in southern Germany and western Switzerland, has undoubtedly been applied too readily to very different bodies of material, with the exception of the British Isles, it has not been superseded or challenged.

The site of La Tène is on the northernmost tip of Lake Neuchâtel in western Switzerland. The collector Hansli Kopp began gathering material from the lake in 1857, and the artificial lowering of the Jura Lakes system between 1868 and 1900 led to systematic excavation by Émile Vouga, beginning in 1885, and his son, Paul Vouga, commencing in 1906. After 1872, the site's name became accepted as designating the second phase of the Iron Age. Most of what was found in the Vougas' excavations was iron, wood, and wickerwork, including the piles of a collapsed bridge, iron swords, decorated scabbards, spearheads, shield bosses, fibulae, belt hooks, axes, knives, and shears. There were few or no female objects and virtually no pottery, glass, or bronze, but there was a considerable amount of cattle and horse bones and some human skeletal remains, including skulls with clear cut marks. With the exception of coins and iron swords and their scabbards, the bulk of material from La Tène remains scientifically unstudied, and the site is now largely assigned to the period of maximum Celtic expansion, with the La Tène C (III) tree-ring dating of wooden shields giving a date of 229 b.c. There is still disagreement as to whether it was a ritual site or a trading post.

From the earlier La Tène phase (ca. 500-300 b.c.), high-status graves provide evidence of long-distance trade, particularly in coral, amber, cowrie shells from the eastern Mediterranean, and even silk, but imports were fewer and generally comprised bronze Etruscan situlae (containers), with the importance of Etruria north of the Alps first being recognized by Herman Gunthe in 1871. The drinking service was still part of the funerary rite, but it now consisted of Etruscan bronze *stamnoi* (double-handled wine-mixing jars and bronze spouted flagons) and either imported or locally made Celtic imitations. One of these, with a close affinity to one discovered in a chariot grave at the salt-mining

complex at Dürrnberg-bei-Hallein

wealth and source of precious metal, as exemplified by the gold from the late-third-century Waldalgesheim chariot grave, increasingly-and of particular value to the archaeologist-coin types indicate local tribal areas, although with the expansion of trading between centers, coins of high value became distributed far beyond their point of origin.

Certain features of the *oppida,* which evolved in the course of the second century b.c. as tribal centers supported by open settlements and individual farmsteads, point to the evolution of urbanization for the first time north of the Alps. The degree to which this development may have been influenced by the nature of the town planning of contemporary Mediterranean society is a matter of debate, but it is clear from modern excavations of 200 or so sites in Hungary, the Czech and Slovak republics, Switzerland, Luxembourg, and France that there are considerably more variations than Caesar's general description might lead one to expect. Even so, the similarities in the association of the *oppida* and their attendant open sites with such activities as large-scale pottery making, smelting and the forging of iron, glass production, and the minting of coins remain as valid today as when first noted by French proto-historian joseph déchelette.

Déchelette excavated Mont Beuvray and was struck by the similarity in material from the French site and material obtained, largely unsystematically, at Stradonice in Bohemia and published in 1903 by Josef Píc, the head of the Archaeology Department of the National Museum in Prague. Déchelette translated Píc's excavation report and elaborated his own views in his massive *Manuel d'archéologie préhistorique, celtique et gallo-romain,* which was first published between 1908 and 1914 but in many ways has never been superseded.

Modern Research and the Case of the Vanishing Celts

A long series of excavation campaigns at Manching near the Bavarian town of Ingolstadt that commenced in 1938 marks the most thorough examination of an *oppidum,* although to date, only a fraction of the 380-hectare site with its roughly circular 7-meter-long *murus gallicus* (Gallic wall) has been examined. The site, a center of the Vindelici, the dominant tribe of the region until subjugated by Rome in 15 b.c., evolved from a series of settlements with their attendant cemeteries in the third century b.c. to the main enclosure, which evolved over a couple of generations during which time signs of burning indicate the strength of local rivalries. Inside the enclosure, regular habitation areas and industrial zones repeat patterns discovered elsewhere. Long-range trade and perhaps intermarriage are indicated by the occasional discovery of forms of female ornaments originating in the alpine region. Even more striking is the discovery of a model tree with ivy leaves made of gold-foil-covered wood whose parallels are with Italo-Greek gold work. The existence of a tree cult was recorded by classical historians.

Other evidence of later La Tène cult practices come from the vicinity of a number of square- or rectangular-banked enclosures, several with deep well shafts and square internal structures. At least some of the latter have been interpreted as temples, and among finds that seem to support their ritual use are the striking heraldic wooden animal figures from a well at Fellbach-Schmiden outside Stuttgart, which date to the late second or early first century b.c., and the somewhat older stone head of a Celt accidentally discovered in several pieces in a pit just outside a rectangular enclosure, which may have had a ritual purpose, at Ms˘ecké Zehrovice west of Prague.

In the nineteenth century, only in France was it possible to combine both Gauls and Romans in a construct of national identity-the Franks, who had given their name to the country, vanished below the horizon of popular interest. In other parts of Europe, however, the Celts, unlike Germans, Slavs, and Hungarians, were not associated with national governments nor, except in Ireland, with aspirations to separate nationhood. Since World War II, the Celts, with their widespread historical presence across

Europe, Turkey, and North Africa, have been seen as an antidote to the type of essential or genetically based racism that caused the Holocaust. As the precursors of national states, they seem to offer

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Cesnola, Luigi Palma di

(1832-1904)

General Luigi Palma di Cesnola typifies the rapacious style of mid-nineteenth-century "archaeological" activity in the eastern Mediterranean. He had a varied and adventurous life, which included service in the American Civil War. Later, while resident in cyprus between 1865 and 1875 (and accredited as both the U.S. and the Russian consul), he arranged excavations at numerous sites and opened many thousands of Bronze and Iron Age tombs in the search for antiquities. The bulk of his vast collection of was eventually acquired by the Metropolitan Museum in New York City, and in return, Cesnola was appointed director of the museum in 1879. His methods both in the field and at the museum led to much criticism, especially regarding his practice of reconstructing statues from scattered pieces.

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Chaco Canyon

Chaco Canyon is a natural canyon with thirteen major Native American ruins, which was named a National Historical Park in 1907. The park is located in the northwest quadrant of New Mexico. Chaco Canyon's abandonment by the Western Anasazi people remains one of the great mysteries of Southwestern prehistory. The abandoned sites contain large multistoried ruins along the Chaco River, a tributary to the San Juan River. The canyon sustained 1,500 years of prehistory and over a century of

scholarly research.

Chaco Canyon was first described by Gregg in 1844. Archaeological work was begun by Adolf Bandelier, then nels nelson (1914), edgar lee hewett (1906), Judd (1922), alfred kidder (1915), and Mera (1935). Work was later continued by Hayes (1975) and Judge (1976). Over the years, the major research questions considered (1) the origins of specific culture traits in modern Eastern Pueblos, (2) cause for abandonment before European contact, and (3) the role of environment in social organization for people who depend on agriculture.

Studies of change over time in Chaco Canyon are observed through changes in ceramic styles, architectural details, settlement patterns, migration, and social interaction. The semi-arid climate with unpredictable rainfall is a major component as well, and may have contributed to the abandonment of Chaco Canyon after crop failures. Climate study has been an essential part of research on Chaco Canyon. Modern patterns have been compared to ancient patterns through tree-ring dating, or dendroclimatological reconstruction. Fossil pollen (palynological) studies and temperature studies also contributed to reconstructing dwelling and growing cycles. Tree-ring data for Chaco Canyon during a.d. 650-1150 show more-than-average rainfall and then a drier-than-average time afterward. At that time the former adaptations to drought may no longer have been effective.

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Although he was to gain lasting fame as the person most responsible for the decipherment of Egyptian hieroglyphics, Champollion was famous long before Egypt. By the age of 16 he could speak and read six ancient oriental languages, in addition to Latin and Greek, and at 19 he became a professor of history at the university in Grenoble in France.

Jean-François Champollion

(Ann Ronan Picture Library)

The initial breakthrough in understanding ancient Egyptian hieroglyphics was the result of a study of the Rosetta Stone by a young English physicist, Thomas Young. The stone had been seized from the defeated French army in Egypt and presented by George III to the british museum. It was Young who realized that the stone was engraved with three versions of the same text-one in Greek, one in demotic Egyptian, and the last in ancient Egyptian hieroglyphs.

Champollion built on Young's work and took it further still, establishing an entire list of hieroglyphic signs and their Greek equivalents. Champollion recognized that some of the hieroglyphs were alphabetic, some were syllabic, and some were determinative, i.e., standing for a whole idea or object previously expressed. While his theories were bitterly disputed by other scholars at the time, this fundamental classification proved to be the key to understanding and translating this ancient writing system and contributed to the recognition of the study of linguistics as a scientific discipline.

Champollion became curator of the Egyptian collection at the louvre in 1826, conducting an archaeological expedition to Egypt in 1828. In 1831 the chair of Egyptian Antiquities was created especially for him at the College de France. In addition to an Egyptian grammar (1836- 1841) and an Egyptian dictionary (1842-1843), his works included *Précis du système hiéroglyphique* in 1824 and *Panthéon égyptien ou collection des personnages mythologiques de l'ancienne Egypt* in 1823-1825.

Tim Murray

See also

Egypt: Dynastic; French Archaeology in Egypt and the Middle East

Chan Chan

Chan Chan, the capital of the Chimú state, is located in the Moche Valley of peru near the modern city

of Trujillo. Excavation of Chan Chan was begun in 1969 by Michael Moseley and Carol J. Mackey and continues under the Peruvian Instituto Nacional de Cultura. The site is believed to have been established around a.d. 850 and to have continued to flourish until the Inca conquest in about 1470. It grew prodigiously during its 600-year history, spreading to over twenty square kilometers. Unfortunately, Chan Chan has been badly affected by looting.

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Chang, Kwang-chi

(1931-2001)

Born in Beijing, china, Kwang-chi Chang was the second child of Chang Wojun, a well-known Taiwanese historian. During his childhood years, Chang witnessed the corruption of the government, the suffering of ordinary people, and the invasion of the Japanese; he was also influenced by leftist ideology. Chang left Beijing for Taiwan with his family in 1946 when Taiwan was returned to China after its Japanese occupation. His experience in Beijing led him to develop a strong nationalist consciousness and sympathy for socialist beliefs, which later caused him to be jailed for a year as a political prisoner in Taiwan when he was eighteen. This experience apparently had a great impact on his decision to become an anthropologist in order to understand "why humans are the way they are" (Chang 1998, 75).

Chang was always a top student throughout his school years and was the favorite student of li chi (known as the father of Chinese archaeology for his contribution to the excavations at anyang) in the Department of Anthropology at Taiwan University. In 1955, Chang started his graduate studies in the Department of Anthropology at Harvard University, working with H. Movius, Jr., C. Kluckhohn, gordon r. willey, and L. Ward. After receiving a Ph.D. in 1960, he taught for many years at Yale University, where he established himself as a first-rate scholar in the discipline. In 1977 he returned to Harvard as the John E. Hudson Professor of Archaeology. He then became a member of the National Academy of Sciences in the United States and also served as vice-president of Academia Sinica in Taipei in the mid-1990s.

For decades, Chang's major contributions have bridged the gap between eastern and western archaeologists by presenting Chinese archaeology to anthropological circles in the western world. He, however, did not limit his interests to Chinese archaeology. During the 1960s and 1970s he stood at the forefront of U.S. anthropology with regard to archaeological theory and was a leader in general methodological debates in archaeology and in the study of settlement patterns. As a native of Taiwan, he was a major player in establishing the field of Taiwanese archaeology. From the 1980s, in addition to academic pursuits, he made a tremendous effort to build collaborative relationships with archaeologists in the People's Republic of China. In the 1990s, he overcame all political and administrative barriers to initiating the first Sino-American collaborative field project in China since the World War II. This project in Shangqiu, Henan, is dedicated to searching for the origins of the Shang dynasty, which has been a long-standing question haunting several generations of Chinese archaeologists (Ferrie 1995).

Over the years, Chang published numerous articles and monographs in English and Chinese, and the list of his publications is forty-one pages long (Murowchick 1999). His scholarly masterpieces include four editions of *Archaeology of Ancient China* (1963, 1968, 1977, 1986), *Shang Civilization* (1980), and *Art, Myth, and Ritual* (1983). These have been the most comprehensive and authoritative accounts of Chinese archaeology available in the English language for several decades, and they have been translated into many languages. His publications in Chinese have been equally influential. Presenting many fresh views of Chinese civilization, his *Six Lectures in Archaeology* (1986) and *The Bronze Age of China* (1983), both published in Beijing, have especially enlightened archaeologists in China.

In addition to archaeology, Chang had broad interests in many fields including art history, cultural anthropology, history, paleography, the anthropology of food, and sport. For four decades he "brought up" several generations of East and Southeast Asian archaeologists, and his former students are now spread over many parts of the world including North America, Europe, Asia, and Australia. Known to his colleagues, friends, and students as "K. C.," Chang was a kind, warm, sympathetic, hardworking, and charismatic man with great wisdom and an excellent sense of humor. His extraordinary

determination to overcome any difficulties in life is evident in his struggle with a devastating illness, which eventually claimed him in January 2001.

Li Liu

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Chavín

Chavín is thought to have been a dominant culture in ancient peru between about 900 and 200 b.c. It was comprehensively defined by julio tello in the 1930s, but the nature and extent of the Chavín culture continues to be hotly debated. Although the core of Chavín culture can be discussed without difficulty at the type site of Chavín de Huantar, it now seems likely that Chavín art styles (particularly textiles) and larger-scale urban sites (found in the initial period and early-horizon deposits of sites in the northern highlands and the coastal areas of Peru) may have developed prior to the foundation of Chavín de Huantar. Thus, Tello's original conception of Chavín as being the progenitor culture of civilization in the Andes is now questionable.

Tim Murray

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Chichén Itzá

Chichén Itzá, one of the largest and most important of the Maya ruins, is located on the low, broad plain that forms the northern part of mexico's Yucatán Peninsula. This peninsula is composed of limestone (it is an ancient, shallow seafloor), and there is little surface water in the region: the rain soaks through the thin soil and forms caves below the surface. If the roofs of these caves collapse, sinkholes (*cenotes* in Spanish, from the Maya word *tz'onot*) are formed. Chichén Itzá has several of these sinkholes within the confines of the site. The term *Chichén Itzá,* which means “the mouth of the well of Itza,” is derived from the name of the largest of these sinkholes-the so-called Sacred Well. Chichén Itzá has been the source of considerable controversy over the years, largely involving the ethnic identity of the “Itza” and the two rather distinct architectural and art styles that exist at the site. Even the chronology of the site has long been in dispute. Traditionally, Chichén Itzá's history has been divided into two major phases. In the earlier phase (ca. a.d. 800-1000) the site was purely Maya, and its buildings were in a regional style called Puuk (Puuc). Then, around a.d. 1000, the site was taken over by a group whom some identified as the “toltecs,” from the site of Tula some 70 kilometers north of Mexico City. The Toltec foreigners (according to this traditional view of Chichén Itzá history) gained control of the site through conquest, and they controlled much of the northern part of the Yucatán Peninsula until shortly after a.d. 1200.

There are several problems with this reconstruction, which is still common in popular literature. For example, the dedication date (carved in Maya hieroglyphs) of the Great Ballcourt at Chichén Itzá was 18 November 864-impossibly early for a building argued to be one of the sites's quintessentially “Toltec” buildings. Additionally, “Maya” architecture and art at Chichén Itzá are not as clearly separated and consistently overlain by “Toltec” architecture and art as was once thought. The current view is that there is considerable overlap between the two styles, although how much overlap is still a source of dispute, as is the absolute chronology of the site. It has been argued by some that Chichén Itzá may represent a kind of “cosmopolitan style” of art and architecture, borrowing freely from several areas for inspiration.

Further, the art and architecture of Chichén Itzá seems to reflect a different order of government at this northern Yucatán site. There are none of the grandiose portraits of individual kings that are the hallmark of the kingdoms to the south. Rather, the hieroglyphs of Chichén Itzá describe a multiplicity of contemporary individuals, and the site's art shows parades of lords: it appears that the site may have been ruled by some sort of council rather than a single succession of kings.

Who were the Itza, the people who are said to have ruled Chichén Itzá? Later descriptions

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Who were the Itza, the people who are said to have ruled Chichén Itzá? Later descriptions

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call the Itza foreigners and tricksters and portray them as “lewd” and unable to speak fluently. This depiction clearly indicates that they were foreigners-but whether they were Toltecs from Tula (the traditional view) or some other group has remained a subject of debate. Much evidence points to the southern Gulf of Mexico region where Mexicanized Maya groups lived and honed their skills as some of Mesoamerica's greatest long-distance traders. More recently, evidence has arisen to indicate that the Itza might have been refugees from the internecine warfare of the southern Maya lowlands in the late-classic period. The name *Itza,* in fact, shows up in classic-period texts from Motul de San José, a site not far from Tikal, so we know that some Itza lived and ruled there. Maya chronicles describe a long series of migrations from the Itza homeland until these people founded and settled in Chichén Itzá.

Dominating the site of Chichén Itzá are the buildings arranged on a huge platform that is 450 by 600 meters in area. Near the center of this platform is the so-called Castillo, or Castle, the tallest temple-pyramid at the site. On the western edge of the platform is the largest ballcourt in Mesoamerica. The Great Ballcourt is richly decorated with imagery symbolizing the Mesoamerican mythology of creation and the sacred charter of government, as well as murals that document the wars of conquest that gave the victors the right to rule.

Chichén Itzá is also famous for its Sacred Well, which was used as a place of ritual offerings by the Maya even after the site was abandoned. The well has been dredged several times, and thousands of archaeological pieces have been recovered. These include huge numbers of carved jade artifacts; wooden objects such as scepters, weapons, and idols; ceramics; balls of resin incense; human bones; and bells, disks, and figurines of gold. Chichén Itzá in general and the Sacred Well in particular were used as places of pilgrimage well into the Spanish colonial period, much to the consternation of the Spanish priests and administrators.

According to legend, the city fell through sorcery and trickery, but almost certainly its demise was due to fighting among rival lineages. Maya chronicles from the Spanish colonial period say that in a.d. 1221, the ruler of Chichén Itzá was defeated by the ruler of the nearby, emergent city of Mayapan and that the Itza were driven from their capital. Today Chichén Itzá is one of the most frequently visited archaeological sites in Mexico. It is a dramatic location, with broad vistas punctuated by some of the most grandiose pyramids and decorated temples in the entire Maya area.

Peter Mathews

See also

Maya Civilization

Childe, Vere Gordon

(1892-1957)

vere gordon childe, the most celebrated archaeological synthesizer and theorist of his generation, was born in North Sydney, Australia, 14 April 1892. He graduated from Sydney University in 1913 with first-class honors in Latin, Greek, and philosophy. At Oxford University in England, his interest in European prehistory was aroused by a desire to locate the homeland of the Indo-Europeans. He returned to Australia in 1916 and became involved in anticonscription and Labour politics, serving from 1919 to 1921 as private secretary to John Storey, the Labour premier of New South Wales.

After the defeat of the Labour government of New South Wales in 1921, Childe returned to the study of European prehistory, paying special attention to the Balkans. In 1925, he published *The Dawn of*

European Civilization, a milestone in the development of culture-historical archaeology. Childe combined the concept of "the archaeological culture," refined by the German archaeologist gustaf kossinna to try to trace the histories of specific peoples in the archaeological record, with the diffusionism of the Swedish archaeologist oscar montelius. Montelius believed that in prehistoric times technological skills had spread to Europe from their place of origin in the Middle East. Like his Oxford mentors, arthur evans and john myres, Childe stressed the creativity with which Europeans had utilized this knowledge.

Childe was the Abercromby Professor of Prehistoric Archaeology at the University of Edinburgh from 1927 to 1946 and professor of European

archaeology and director of the Institute of Archaeology at the University of London from 1946 until he retired in 1956. Throughout these years he carried out numerous archaeological excavations and surveys in Scotland and also visited many excavations in Europe and the Middle East.

Although Childe was primarily a European prehistorian, for the rest of his life he sought a better understanding of cultural change. Beginning with *The Most Ancient East* (1928), he sought to delineate the revolutionary impacts that the development of agriculture and bronze working had on various parts of the Middle East and Europe. Instead of treating technological innovation as an independent variable that brought about cultural change, he sought to trace the reciprocal relations between it and specific environments, economies, and political systems. He saw changes occurring in a multilinear, not a unilinear, fashion.

In 1935, Childe visited the Soviet Union. Although he disapproved of the dogmatism imposed on Soviet archaeologists, he was impressed by the attention being paid to how ordinary people lived in prehistoric times and by Marxist interpretations of cultural evolution. In *Man Makes Himself* (1936) and *What Happened in History* (1942), Childe examined, from an evolutionary perspective, how elites and inflexible belief systems could halt economic and social progress but only at the cost of undermining a society's ability to compete with more progressive neighbors.

After World War II, disillusionment with the declining quality of Soviet archaeology led Childe to acquire a more profound understanding of Marxism as an analytical tool and to try to apply it to the interpretation of archaeological data. He attempted to reconcile the observation that all human behavior is culturally mediated with a materialist view of causality. In *Prehistory of European Society* (1958), he stressed that social and political organization provided the framework within which all archaeological data could most productively be understood.

Troubled by failing health and fearing that incipient senility was preventing him from devising new procedures for inferring social organization from archaeological data, Childe, jumped to his death from a cliff in the Blue Mountains of Australia on 19 October 1957.

Bruce G. Trigger

References

For references, see*Encyclopedia of Archaeology: The Great Archaeologists, Vol. 1,* ed. Tim Murray (Santa Barbara, CA: ABC-CLIO, 1999), pp. 398-399.

Chile

Prescientific Period (1400-1830)

Pre-Columbian society described the past as a series of mythical epochs, and this idea was documented at the time of European contact by the first chroniclers of the sixteenth century. Even today, some ethnic minorities can retell the ancient epic stories about their origins. There are descriptions dating from the sixteenth century of “excavations” of Indian tombs in search of buried treasure or motivated by curiosity abut the rituals of Indian “paganism.” Of great importance for the study of pre-Columbian society are the numerous ethnohistoric documents generated by the Spanish administration during the period of Indian resistance. In fact, from the examination of these records, architectonic, ritual, and material culture traits have been explained and are of prime importance in the reconstitution of archaeological events.

During the sixteenth century, the Spanish encountered colossal ruins in the middle of a living Inca society

that were evidence of a distant past. The invaders' medieval worldview, along with their creationist dogmas and limited biblical chronology, did not stimulate the need to systematically record such ruins. However, some chroniclers proposed that ancient hunters must have carried out the first peopling of the Americas. Others, such as Father Lozano, writing in the early seventeenth century, devoted himself to the study of the origin of the Indians of the New World and West Indies *(Orígen de los indios del Nuevo Mundo e Indias Occidentales).*

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important descriptions that can be linked to archaeological data. We know of several excavations in the Atacameño territory further south; an Inca fortress in Tagua was explored, and between 1851 and 1900 a series of unscientific excavations *(huaqueos)* in search of "mummies" or dehydrated corpses and their associated assemblages took place at a cemetery on the Loa River. The collections recovered from these excavations were shipped to museums in Paris, Madrid, Oslo, and New York.

The written accounts of explorers and scientists proved to be of great value, as they constituted the archaeological and ethnohistoric foundation from which an archaeological discourse could be nurtured. During the 1970s, Jorge Hidalgo presented the first proposal for a scientific Chilean ethnohistory and thus became the pioneer of the discipline of archaeology in Chile.

Prescientific Pioneers (1830-1890)

In Europe in 1836, christian jürgensen thomsen published his classic three-age system and thus inaugurated archaeology as a scientific discipline sustained by Darwinian evolutionism. Thomsen's scheme paralleled the geological concept of sir charles lyell of a greater temporal depth for humanity and was framed within the context of the natural sciences. As a result, two explanatory proposals for human history were postulated. The first propounded the diversity of all living organisms as a consequence of the earth's antiquity in a gradual evolutionary process. The second was a stratigraphic proposition, which defined an "extended chronology" in accordance with the great French anatomist and paleontologist Georges Cuvier's postulates and surpassing the biblical limits of 6,000 years.

In this postcolonial intellectual environment, recently opened up by universal philosophical reason, European scientific currents of thought made an impact on the debates between Chilean liberals and conservatives. They determined the dispute between "progress" and "backwardness."

After the mid-nineteenth century, the endorsement of the new scientific doctrines of evolutionism and positivism constituted the mission statement of the "modern" intellectual vanguard. A pioneer in this movement was Rodolfo A. Phillipi, an Austrian exile in Chile whose academic background in the natural sciences (medicine, botany, and zoology) influenced his archaeological observations as an employee of the Chilean government. Another important participant was Letelier, who was not religious and a firm empiricist. Letelier advocated an end to the "short biblical chronology" in favor of a more "extensive" chronology. He went even further and proposed a "prehistory of America," which would become a reality six years later with the publication of the monumental work of José T. Medina.

Toward the end of the nineteenth century, the French archaeologist jacques boucher de perthes successfully combined paleontology, geology, and archaeology with stratigraphic methods to create the scientific foundations of the discipline of archaeology, which enabled it to leave behind its antiquarian antecedents. Boucher de Perthes's proposals reached the New World via evolutionism, but there was no archaeological evidence akin to the spectacular findings in the Old World. Although Indian "megalithic ruins" were common in the Americas, and these exotic and abandoned ruins motivated a series of notable expeditions during the nineteenth century, Chile remained a far away place with limited archaeological attraction.

The natural sciences were influential in the founding of the important Museum of Natural History in Santiago (1830), a similar one in Valparaiso (1876), and a southern replica at Concepción (1902). These museums, the result of modern European ideas, researched and presented the whole evolutionary-biological circuit from fossils to static displays of Indian artifacts, which were regarded as some sort of more recent fossils.

The first scholar to value the archaeological past of Chile was the historian and bibliographer José T.

Medina. His analysis, although not strictly linked to the naturalism in vogue, covered all of the national territory except for the north of the state, which was the subject of an ongoing dispute with peru and bolivia. He compiled major ethnohistoric sources to make sense of the various indigenous entities of an ethnological and archaeological

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expeditions had revealed a horizontal perspective without systematic prospecting. The construction of a respectable image for the national state of Chile had begun. This state sought an understanding of the vernacular, as an instrument of legitimization and as the new non-Indian national symbol, but with no links to the indigenous populations who lived on the fringes and margins of civilization.

The Scientific Systematic Embryo (1890-1919)

Scholars began to place themselves within a naturalistic and inductive-descriptive theoretical-methodological paradigm based on the principle that all qualities are measurable. Since there was no systematic program of archaeological study, archaeologists were self-taught, with enthusiasm and French romanticism making the still largely unknown ethnic and archaeological potential attractive. Expeditions were sponsored by museums of natural sciences, scientific societies, incipient universities, etc. A series of excavations and ethnographic and ethnolinguistic salvage projects were organized under the banner of different evolutionary perspectives (autochthonous versus diffusionist), resulting in the first cultural taxonomies and physical anthropology measurements. During this time, to satisfy the taxonomic obsession of researchers, Indians were forced to live out their lives in museums, thus guaranteeing access to their remains once they died.

Interest in ethnography and physical anthropology increased with the founding of the German Scientific Society directed by Phillipi and the Scientific Society of Chile, of French ideological inclination, directed by A. Obrecht and with the establishment of such institutions as the national museums of natural history and the incipient University of Chile. Thus, an embryo of anthropological studies that would hierarchically structure the intellectual life of Santiago, Valparaiso, and Concepción became apparent.

The evolutionary-positivist paradigm of the natural and empirical sciences initially caused the development of archaeology as a scientific discipline. However, in Europe, this paradigm confronted the metaphysical idealism of the German philosopher Wilhelm Friedrich Hegel, from which the materialist thesis would emerge, which would eventually have an impact in Chile. The so-called early-twentieth-century cultural history and the North American cultural relativist schools emerged as reactions on the part of Euro-American idealists to late-nineteenth-century positivism.

The debate centered on evolutionists versus anti-evolutionists, between the followers of Lamarck and Charles Lyell and the supporters of Georges Cuvier and Alexander von Humboldt. The former were adherents of chrono-stratigraphic reconstructions and their relationship to anthropological vestiges; the latter were followers of a creationist school that lacked sequential profundity. Argentinean evolutionists like Ambrosetti, Debenedetti, Outes, and Lehmann-Nitsche were frequently cited in Chile by the first systematic scholars such as Latcham and max uhle. The same was not the case for the works of Moreno, Bormeidter, and others, which lacked the properly documented, or chronologically arranged, data that were essential for the comparative method, which was in vogue at the beginning of the twentieth century.

However, orthodox Argentinean evolutionists led by the Ameghino brothers were unaware of the precise nature of the Paleolithic artifacts embedded in Miocene strata. During the International Congress of Americanists in Buenos Aires in 1895, ales hrdlicka shattered the largely autochthonous and hyperevolutionist Ameghinian thesis that had dated Argentinean artifacts and human fossil remains back to the Tertiary period. As a consequence, the antiquity of human occupation in Chile would be substantially reduced during this period, to shorter chronologies that remained impervious to substantial changes.

Another trans-Andean debate characteristic of this period was related to the northern Andean regions of

argentina and Chile. Monuments are conspicuous in these regions, and the Inca presence was well documented in the preceding period. The debate concerned the nature of the Inca as civilizing agents. Under the banner of pseudonationalism, “Peruvian” influence was denied, particularly in those territories that

school of Vienna, which was characterized by religious anti-evolutionist and overtly racist views. The group's work was also inspired by the translations of Oyarzún (Orellana 1979), the writings of Koppera and Schmidt and other classics by Ratzel Frobenius and fritz graebner, culminating in the Argentinean studies of Imbelloni, Bórmida, and Menghin.

Adherence to the culturalist current by Chilean intellectuals at the beginning of the twentieth century becomes understandable because in Argentina at the same time the opposite Ameghinist thesis was in vogue. During this period in Chile, all work that legitimized the superiority of certain peoples and races over others was very popular.

During the first decade of the twentieth century, while those scholars who closely adhered to the cultural-history school produced descriptive and speculative studies, other scholars made systematic contributions to the production of a documented database. Between 1900 and 1938 there was a methodological crisis caused by the abandonment of stratigraphic-naturalistic principles in favor of the hasty excavations of Indian tombs with the sole purpose of recovering artifacts to fill state museums. It has been acknowledged that these excavations were unsystematic and that no refined methods were applied to clarify cultural history in terms of pre-Inca sequences and developments in regional diversity. At the same time, from at least 1911 on, scholars in other countries were using stratigraphic methods, but the application of these methods was not popular in Chile where, with the exception of the northern and southern confines of the country, chronological frameworks were not thought to provide reliable sequences and contexts.

In this milieu, Uhle and Latcham made major contributions to the discipline. These two archaeologists were the products of German and British academic environments, which they would later incorporate with Euro-American influences. Max Uhle based his research in Chile (from 1911 to 1919) on the cultural-history paradigm. His pan-Andean archaeological perspective and his cutting-edge methods, synthesized into the Euro-American stance, enabled him to carry out contextualized excavations that made him the forerunner of modern empiricists. He enhanced the chronological, sequential, and distributive adjustments between peripheral and core cultures, based on the extension of the Tiwanaku and Inca guiding horizons, and as a result he wrote the first pre-Columbian cultural history, with its very own methods. Uhle's results remained in use until their harmonious integration into the modern investigations of junius bouton bird (1943) and even more recent investigations (Schaedel 1957).

During the first two decades of the twentieth century, then, various distant events had an impact in Chile. The first systematic physical anthropology studies began under Ales Hrdlicka, and the peopling of the Americas was established as a post-Pleistocene event (w. h. holmes). However “ancient” Paleolithic stations were recorded at Taltal in northern Chile, which helped to continue the debate on the earlier origins of humans in the Americas. The first stratigraphic excavations were carried out, and Max Uhle began to work in South America, where he was regarded as the father of Andean archaeology.

The Ameghinian School had been discredited to the point of oblivion by the application of stratigraphy, the discovery of rock art, the excavation of cemeteries, and the recovery of surface collections from ancient workshops. Initial excavations were in the desert, where monumental sites were more visible and profuse, in order to supply collections for state museums and private collectors. These excavations were undertaken with ethnohistoric sources rather than archaeological field-recording methods in mind. The scholars were erudite bibliographers who witnessed the erosion of any great antiquity for humans in the Americas, and in this context, Uhle's innovative role was decisive for the success of Chilean archaeology.

Transitional Interface (1919-1961)

Uhle's theories and practice were followed by the majority of Chilean senior researchers such as Ricardo Latcham (1928, 1938), who adopted his chronological sequence in spite of the fact

the work of Bird and Uhle through the use of a modern chronological, ecological, and adaptive analysis in the northern half of the country. Meanwhile, W. Mulloy's proposals about Easter Island drew Chile even closer to North American methodologies, and in this context, the Center of Anthropological Studies became the generator of scientific groundwork groups in Chile led by Carlos Munizaga, Francisco Reyes, Alberto Medina, Jorge Kaltwasser, Bernardo Berdichewsky, Ximena Bunster, Mario Orellana, Gonzalo Figueroa, and Juan Muziaga, the founder of scientific physical anthropology in Chile. Although Osvaldo Menghin's visit to this center clarified matters and methods related to issues of parietal (rock and cave) art, the Patagonian sequence, and his exploration in the south-central part of the country, his cultural-history proposals did not become popular.

A scientific movement originating in the provinces linked up with the scientific circle of the capital. This movement had its antecedents in the foundation of museums in Valparaiso, Viña del Mar, Angol, Punta Arenas, and La Serena, of which the Museum of Archaeology of La Serena constituted the most prestigious center of research and periodical publications. Like the museum in La Serena, the Museum of Viña del Mar was a front-line research center when it began using the excavation methods of "contextual cross-sections" and "determination of original floors" in 1955. In 1957, R.P. Le Paige founded the Archaeological Museum at the Casa Parroquial de San Pedro Atacama, and in 1959, Percy Dauelsberg founded the Regional Museum of Arica. During the following period, a process of regionalization took place in Chilean archaeology.

North American diffusionist explanations had ceased to be satisfactory explanations for the peopling of the Americas before 1961. The idea that all forms of progress and civilization were dispersed to marginal areas from Mesoamerican and Andean heartlands came under serious critical scrutiny. Psychological explanations of the past became inadequate, and the hierarchical ordering of differences began to compete with the search for regularities. This was a response to an inductivist approach that led more to descriptivism per se and resulted in a growing awareness that a dialectic deductive-inductive approach was needed, which would move closer to theories that would provide the next generation of archaeologists with better research objectives for sites and collections.

Professional Scientific Development (1961-)

The American ethnologist and archaeologist julian steward had an enormous influence on the generation of the 1950s and 1960s through the publication of his book the *Handbook of South American Indians*, but there were also other major influences. Carlos Ponce, working with a team of national colleagues, was applying stratigraphic excavation methods at Tiwanaku; Luis Lumbreras excavated Chavín and proposed a critical reading of the North American-Andean literature; Stig Rydén finished his monograph on Chile and Bolivia; and in Argentina, Alberto Rex González published his chrono-stratigraphic work. These young scholars, who kept in permanent contact with each other, were the authors of publications that became compulsory reading for the archaeological generation of the 1950s and 1960s. Many new technical and methodological strategies would emerge from this interrelationship, such as Childean evolutionism and a reevaluation of "garbage collections" as opposed to *belles pieces*, or great art objects. Most important, the chronological archaeology that would set this generation apart began, and the first modern and reliable synthesis of regional sequences emerged.

During the first decade of the twentieth century, reactions against unilineal evolutionism were channeled through the diffusionist school, which was inclined toward the hierarchical transmission of change rather than conservative social structures. The important issue for this school was the determination of cultural "emission" and "reception," which denied local creativity or the existence of autochthonous evolutionary developments mature enough to assimilate and internally process change. There was a growing need to look for more pluralist theses, which would complement Boasian ideas that firmly opposed the idea of

the biological inferiority of the American Indian and the evolutionary

of the preceding years had to be dealt with. There was a need for more locally based theoretical paradigms and for the optimization of the formation of academic groups. Various theoretical approaches, such as the cognitive, historicist, structuralist, neopositivist, symbolist, materialist, and postprocessualist approaches, have been helpful and will continue to be useful in maximizing the interpretative options of past events. In this context, the changing perspectives of the present range from a genetic neodiffusionism to a static deductive localism, from morphological discourse to the legitimization of computerized verification per se, and from an aversion to globalizing materialistic views to sterile descriptivism.

Some analytical models have recently surfaced in Chile that offer unequivocal signs of theoretical and methodological advancements. For example, the fact that the peopling of the coast of the country took place at such an early date (10,000 years ago) has reopened the relevant issue related to the articulation of two synchronic socio-adaptive processes: the Andeanization and maritimization of Chilean society.

Aside from the reconstitution of the general and specific behavior patterns and the ideological perceptions of the human phenomenon, there were also utopian aspirations to attract the younger generations of investigators to the quest for a vision of the society of the future. The aspirations of the newest generations of archaeologists are geared toward finding jobs and toward more specialized knowledge but with less alienating theory. In this sense, their propositions are perceived as consistent and well documented. Thus, it is now necessary to employ postgraduate archaeologists and to generate a museological (museum studies) policy that will contribute to a new educational strategy.

Epilogue

We should expect the emergence of “other” archaeologies later on, related to the 500 years of recent existence: colonial, industrial, subaquatic, urban, and forensic archaeology. The last is of particular importance as can be seen by detailed expert assessments made public during the judicial processes surrounding the “disappearances” that occurred during the military regime.

Another expected outcome would be the optimization of current knowledge about the original inter-American cultural processes, through the 30,000 to 12,000 years of human occupation, making it more difficult to divide it into two areas of study: prehistory and history. In a similar vein, it would be appropriate to find an approach with the discipline of history based on theories, methods, and techniques proper to archaeology in order to elucidate a reconstitution of the greater history of the Latin American peoples both before and after the linkage to the history of the west. In this context, we should strive to advance toward an appropriate paradigmatic synthesis, which would integrate the best of the proposals on particularities and regularities, in an explicit discourse directed toward those peoples who, until now, have received only the official and elitist histories.

I am describing an archaeology incorporated into a scientific and multidisciplinary history of the peoples of the Americas, a history that would go beyond its “intellectual” orientations, not forgetting its social meaning and its objectivity, to a proper understanding of the complexity of past and present human behavior. In today's world, when many people proclaim that history is defunct, archaeologists and their “extended chronologies” are the best equipped to attempt to change this apathy to a historic utopia, one that ascends from the depth of human nature and aspires to the sustainability of human society in search of the ideal of transformations that are more just and ecumenical.

A. Lautaro Núñez;

translated by Armando Anaya Hernández

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The birth of modern Chinese archaeology in the early twentieth century was a product of the introduction of western scientific methods, the rise of nationalism, and the search for the cultural origins of the nation. These three factors have had a continuing influence on the development of the discipline, with the consequence that archaeology in China has been firmly placed in the general field of history. Its research orientations and interpretations have been significantly affected by the different political agendas of the nation-especially the ever-changing concept of nationalism in particular eras.

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of the late Shang dynasty, at Xiaotun in anyang, Henan Province. This was the first state-sponsored archaeological project in China, and fifteen seasons of excavation took place between 1928 and 1937 (when the Sino-Japanese War broke out). This series of excavations at Anyang was not a random occurrence but was preceded by several lines of cultural, political, and technological development, which served as the foundation for the establishment of archaeology as a new discipline.

Archaeological Sites in China

Historical Context of Chinese Archaeology

There has been a tradition of interest in antiquarianism throughout Chinese history. Many antiquities were thought to possess a divine nature, and some bronze vessels were regarded as symbols of power and authority. This tradition encouraged the collecting and recording of ancient artifacts and, at the end of the nineteenth century, led directly to the discovery and decipherment of oracle bone inscriptions of the Shang dynasty. The discovery of the original

Beginning of Modern Chinese Archaeology

Although the scientific field methods used by the western archaeologists enlightened Chinese scholars, the general western research orientations were not considered satisfactory. Paleolithic and Neolithic remains were thought by Chinese scholars to be too remote to be connected directly to early Chinese history (Li 1968). Andersson's proposal, which traced the origins of the Yangshao culture to the Near East, was even less appealing. As one scholar complained, “the foreign archaeologists in China do not pay any attention to the material which represents indigenous Chinese culture, but are only interested in the remains which indicate cultural connections between China and the West” (Fu 1996, 191).

Excavations in Anyang

During the 1920s, a group of Chinese scholars who had received training in modern archaeology at western universities returned to their homeland embued with a great nationalist spirit. The first was li chi, a Ph.D. trained in physical anthropology at Harvard University, and he, with others, launched a series of archaeological research projects in 1926. Excavations in anyang from 1928 to 1937, organized by Li Chi in his position at the Institute of History and Philology, Academia Sinica, were the first attempts to search for indigenous Chinese cultural origins through archaeology.

The excavations in Anyang yielded numerous material remains, including hundreds of bronze objects, nearly 25,000 pieces of inscribed oracle bones, bronze workshops, palace and temple foundations, and large royal tombs. These discoveries proved the site to be a capital city of the late Shang dynasty and for the first time provided archaeological evidence confirming the existence of an ancient indigenous Chinese culture (Li 1977).

The excavations in Anyang not only marked the beginning of modern field archaeology conducted by Chinese scholars in China but also became a field station where many leading Chinese archaeologists were trained. Most associates of Li Chi who worked in Anyang (such as Tung Tso-pin, Kao Ch'ü-hsun, Shih Chang-ju, Liang Siyong, Guo Baojun, Yin Da, and xia nai) became the first generation of Chinese archaeologists and dominated the field for decades on both sides of the Taiwan Strait (Chang 1986b).

In spite of the success of the archaeological work in Anyang, there was still a gap in the evidence of material cultures between the historical Shang dynasty and the Neolithic Yangshao, as the latter was then regarded as a cultural diffusion from the Near East. Chinese scholars were still dissatisfied with the general notion that predynastic cultures in China were derived from ripples of influence extending from the West. Fu Sinian (1934) made the objection that the study of Chinese history by foreigners was mainly focused on Sino-foreign relationships, which was only a “semi-Chinese” *(ban Han)* endeavor. However, he continued, the more important issues to be studied were those “completely Chinese” *(quan Han),* that is, concerned with building the basic structure of Chinese history.

Discovery of the Longshan Culture

The cultural disconnection between Yangshao and Anyang encouraged archaeologists to search for the direct progenitor of the Shang, and the general consensus among archaeologists and historians was that the most likely area was in eastern China. After work at Anyang was halted around 1930 owing to civil war, the excavation team moved its operations to Chengziyai in Longshan township, Shandong Province, where Wu Jinding's previous preliminary surveys revealed potential archaeological discoveries (Fu 1934; Li 1990).

The excavations at Chengziyai were more fruitful than the excavators had expected. Distinctive from the Yangshao painted pottery, the black pottery from Chengziyai was similar to the Neolithic remains found at Hougang in Anyang, which lay directly beneath the Shang cultural remains. Uninscribed oracle bones

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Excavations at Doujitai in Shaanxi Province

While the Academia Sinica headed by Li Chi was working in Henan and Shandong, the National Beiping Academy, led by Xu Xusheng, carried out excavations at Doujitai in Shaanxi Province in 1934-1937. The intention was to search for the prehistoric origins of the Zhou dynasty. su bingqi, who later became the paramount senior archaeologist in China, participated in this project and established his first research achievement on ceramic typology, focusing on changing forms of the *li* vessels (Falkenhausen 1999a; Su 1948). Su regarded *li* as a vessel form that was a diagnostic for ethnic affiliations and Chinese civilization. His approach turned into a model in an archaeological methodology for several generations of Chinese students to follow.

Western Origin, Dual Origins, and Indigenous Origin of Chinese Civilization

The origins of Chinese culture have been a most sensitive issue in Chinese archaeology. Upon his discovery of the Yangshao culture, Andersson determined to find the route of eastward cultural diffusion in northwestern China. Based on his findings in the Gansu region, Andersson established a sequence of ceramic cultures that perfectly supported his hypothesis. According to this sequence, the Yangshao culture was preceded by the indigenous Qijia culture in western China, so the western origin of Yangshao pottery became logical.

The discovery of the Longshan culture in the 1930s changed the paradigm of the solely western origin for Chinese civilization inferred from Yangshao painted pottery. The Longshan culture, which was characterized by black pottery, was thought to represent the indigenous Chinese culture, which arose in eastern China and was contemporary with, but independent of, the Yangshao culture in western China. As a result, a new concept for the dual origins of Chinese civilization was put forward: while the Yangshao culture diffused from west to east, the Longshan culture moved from east to west. The two traditions were thought to have encountered one another and mixed, and later became the progenitor of the Shang civilization (Chang 1999a; Chen 1997, 217-227, 276-281; Liang 1959). This proposition dominated archaeological circles until the 1950s.

During the Sino-Japanese War (1937-1945) and the subsequent civil war (1945-1949), major archaeological projects were halted although some fieldwork was still occasionally carried out in peripheral regions. Xia Nai participated in the Academia Sinica's expedition in the northwestern part of the country, where his excavations yielded stratigraphic evidence indicating that the Qijia culture was in fact later than the Yangshao culture. This conclusion challenged Andersson's sequence of prehistoric cultures in western China and therefore his theory on the western origin of the Yangshao culture. Xia Nai's victory over Andersson on this issue became legendary and inspired Chinese archaeologists for decades.

During this formative period of the discipline, Chinese archaeologists struggled to achieve two primary objectives: to defend their belief in the indigenous origins of Chinese culture against foreign diffusionism and to reconstruct a reliable cultural history based on material remains in order to clear up the uncertainties in textual records that had been attacked by historical revisionists known as "the doubters of antiquity." These objectives, in turn, determined the nature of archaeology as an enterprise closely aligned to the ethnic nationalism that was centered on the Han Chinese.

Development of Archaeology in the People's Republic of China

When the Communist Party took over China in 1949, the archaeologists in the Institute of History and Philology at the Academia Sinica were split into two groups. Li Chi and several of his colleagues moved to Taiwan while Xia Nai and

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Liang Siyong stayed on the mainland. Xia Nai was the one who eventually gained the most international recognition in the discipline (Falkenhausen 1999b). For the rest of the twentieth century, archaeological fieldwork, research, and training developed rapidly, but dramatic fluctuations occurred as a result of various political waves. Archaeological activities can be divided into three periods: before, during, and after the Cultural Revolution (1966-1977).

Archaeology before the Cultural Revolution (1950-1965)

Soon after the founding of the People's Republic of China in the 1950s and early 1960s, archaeologists were in great demand by the state as the country underwent tremendous construction. In 1950, the Institute of Archaeology, led primarily by Xia Nai, was established under the Academia Sinica (AS), which changed its name to the Chinese Academy of Social Sciences (CASS) in 1977. The Archaeology Program, headed by Su Bingqi, was set up in 1952 under the Department of History at Beijing University. These two institutions were the leading forces at that time in conducting archaeological research and in training young archaeologists. Many provinces also set up archaeological institutes or management of cultural relics bureaus, which were primarily involved in salvage archaeology.

In addition to Beijing University, two other universities (Northwestern and Sichuan) also started archaeology programs to train students, and the number of professional archaeologists multiplied from a mere handful before 1949 to more than 200 by 1965. The first C-14 laboratory was set up in 1965 at the Institute of Archaeology, and it was soon followed by a second one at Beijing University. The first archaeological journals, the so-called three great journals-*Kaogu* [Archaeology], *Kaogu xuebao* [Acta Archaeologica Sinica], and *Wenwu* [Cultural Relics]-were established in Beijing.

Paleolithic Archaeology

paleolithic archaeology was carried out by the Institute of Vertebrate Paleontology and Paleoanthropology at the Academia Sinica. The number of excavated Paleolithic sites increased from three locations before 1949 to more than a dozen distributed in many parts of the country. Excavations at Zhoukoudian were resumed after the 1950s, and to date, that site has yielded hominid fossils of more than forty individuals dating from 550,000 to 250,000 years ago, more than 100,000 stone artifacts, and a large number of mammalian fossils. In addition, cranial remains of *Homo erectus* dating to 700,000 years ago were discovered in Lantian, Shaanxi Province, and two incisors of *Homo erectus* dating to 1.7 million years ago were found in Yuanmou, Yunnan Province. Homonid fossils and stone implements belonging to archaic *Homo sapiens* and *Homo sapiens sapiens* have been found in many locations over northern and southern China (Chen 1999b; Wu and Olsen 1985).

Neolithic Archaeology

Most fieldwork projects in the 1950s were carried out in the Yellow River valley in connection with hydraulic construction in the region. The excavations at Miaodigou in Shanxian, Henan Province, were a breakthrough and completely changed the proposition of dual origins for Chinese civilization. Archaeologists identified a ceramic assemblage, named the Miaodigou Phase II, that represented a transitional culture between Yangshao and Longshan (Institute of Archaeology, Academia Sinica 1959). This discovery clarified the relationship between the Yangshao and Longshan cultures as successive rather than contemporaneous. Chinese civilization, therefore, seems to have been derived from a single source-the Yangshao culture, which originated in the central plains region (Chang 1963; Chen 1999c).

It should be noted that the first attempt to interpret ancient Chinese history with a Marxist model of social evolution can be traced back to guo moruo's *A Study of Ancient Chinese Society* (1930). Under the Communist regime, and influenced by Soviet archaeology, many Chinese archaeologists wanted to

employ the Morgan-Engels evolutionary theory in archaeological practice, and this Marxist interpretation of Chinese history was then seen as a new mission for the discipline in addition to the search for Chinese cultural origins. The most successful application

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Soon after the founding of the People's Republic of China in the 1950s and early 1960s, archaeologists were in great demand by the state as the country underwent tremendous construction. In 1950, the Institute of Archaeology, led primarily by Xia Nai, was established under the Academia Sinica (AS), which changed its name to the Chinese Academy of Social Sciences (CASS) in 1977. The Archaeology Program, headed by Su Bingqi, was set up in 1952 under the Department of History at Beijing University. These two institutions were the leading forces at that time in conducting archaeological research and in training young archaeologists. Many provinces also set up archaeological institutes or management of cultural relics bureaus, which were primarily involved in salvage archaeology.

In addition to Beijing University, two other universities (Northwestern and Sichuan) also started archaeology programs to train students, and the number of professional archaeologists multiplied from a mere handful before 1949 to more than 200 by 1965. The first C-14 laboratory was set up in 1965 at the Institute of Archaeology, and it was soon followed by a second one at Beijing University. The first archaeological journals, the so-called three great journals-*Kaogu* [Archaeology], *Kaogu xuebao* [Acta Archaeologica Sinica], and *Wenwu* [Cultural Relics]-were established in Beijing.

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Neolithic Archaeology

Most fieldwork projects in the 1950s were carried out in the Yellow River valley in connection with hydraulic construction in the region. The excavations at Miaodigou in Shanxian, Henan Province, were a breakthrough and completely changed the proposition of dual origins for Chinese civilization. Archaeologists identified a ceramic assemblage, named the Miaodigou Phase II, that represented a transitional culture between Yangshao and Longshan (Institute of Archaeology, Academia Sinica 1959). This discovery clarified the relationship between the Yangshao and Longshan cultures as successive rather than contemporaneous. Chinese civilization, therefore, seems to have been derived from a single source-the Yangshao culture, which originated in the central plains region (Chang 1963; Chen 1999c).

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of this evolutionary scheme in archaeology was the analysis of a Yangshao site at Banpo near Xi'an, Shaanxi Province. The excavations, led by Shi Xingbang, revealed a large portion of a Yangshao settlement. Based on burials and residential patterns, the Banpo Neolithic village was described as a matrilineal society in which women enjoyed high social status and in which “pairing marriage” was practiced (Institute of Archaeology, Academia Sinica 1963). Such statements soon became standard in many interpretations of Neolithic sites dating to the Yangshao period, and the classic evolutionary model was commonly accepted among Chinese archaeologists.

Archaeology of the Three Dynasties: Zia, Shang, and Zhou

Shang archaeology was still a focus of research. Anyang resumed its importance as a center of archaeological excavations and yielded royal tombs, sacrificial pits, craft workshops, and inscribed oracle bones. These finds enriched the understanding of the spatial organization of the site (Institute of Archaeology, Chinese Academy of Social Sciences 1994). In the early 1950s, Shang material remains that could be dated to a period earlier than Anyang were first recognized at Erligang, near Zhengzhou, Henan Province. A fortified Shang city belonging to the Erligang phase was then found at Zhengzhou. The enormous size of the rammed-earth enclosure (300 hectares in area) and abundant remains found at the site (craft workshops, palace foundations, and elite burials) indicated that it may have been a capital city before Anyang (Henan Bureau of Cultural Relics 1959). This discovery encouraged archaeologists to search for the earliest remains of the Xia and Shang dynasties.

Inspired by ancient textual records, Xu Xusheng led a survey team in western Henan Province to explore the remains of the Xia dynasty. His endeavor soon proved fruitful when the team discovered a large Bronze Age site at Erlitou in Yanshi (Xu 1959). The Erlitou site was dated earlier than the Erligang phase, and subsequent excavations yielded a large palatial foundation, indicating the high rank of the site. The site was then designated as the type site of the Erlitou culture, which preceded the Erligang phase of the Shang (Institute of Archaeology, Chinese Academy of Social Sciences 1999).

The discovery of Erligang and Erlitou generated considerable debate on many issues: whether Erlitou was a capital city of the Xia or the Shang, which phases of the Erlitou culture belong to the Xia or the Shang cultures, and which capital cities named in ancient texts corresponded to Erligang and Erlitou. Most arguments were made on the basis of textual records that were written thousand of years after the existence of the Xia and Shang and reinterpreted by many individuals afterward. As people used different textual sources, which frequently contradicted one another to support their opinions, these debates have continued for decades without reaching a consensus (Dong 1999).

Between the mid-1950s and early 1960s, excavations at Fengxi, Chang'an, Shaanxi Province, revealed a large Bronze Age site, and it was determined that the site was the location of the capital cities of the western Zhou: Feng and Hao. These finds established the cultural sequence and chronology of the Zhou archaeological record (Institute of Archaeology, Academia Sinica 1962).

Bronze ritual vessel of the Shang period, twelfth century B.C.

(Image Select)

Archaeological research during this period primarily focused on the central plains of the Yellow River valley, where a clear sequence of cultural development could be traced from the Yangshao to the Longshan to the three dynasties.

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Many Neolithic sites in southern China were also found and excavated, such as Beiyinyangying near Nanjing, Qianshanyang in Zhejiang Province, and Qujialing in Hubei Province. These sites, however, yielded neither a material assemblage as old as the Yangshao culture, which was viewed as the earliest Neolithic culture, nor a continued sequence illustrating a regional cultural development. They were regarded as the peripheries of the central plains with minor significance for Chinese civilization. Such a paradigm of ancient Chinese cultural development was accepted by archaeologists in China and abroad, not only because of the limitations of the archaeological findings, but also because the traditional view of Chinese civilization focused on the central plains.

Archaeology during the Cultural Revolution (1966-1977)

Similar to other disciplines in academic institutions, archaeology stalled during the early part of the Cultural Revolution. Research and teaching were replaced by insurrection, and most junior members of archaeological institutes and students in universities were busy criticizing senior archaeologists and professors. However, excavations never completely stopped as continued construction projects always required salvage archaeology.

It was also soon recognized by the leaders of the Cultural Revolution that archaeology could serve as an instrument of propaganda for political purposes. Sending museum exhibitions of archaeological findings to foreign countries was considered useful in improving China's international relationships and promoting China's image as a great civilization. Moreover, the highly developed material culture from ancient times could reconfirm the Chinese people's national pride, and the wealth discovered from elite burials could be used for the education of the people in terms of class consciousness. Cultural relics unearthed in the People's Republic of China were displayed for the first time in Paris and London in 1973 in order to demonstrate the glory of the Chinese civilization and the achievements of archaeology in the new China (Xia 1973). Elaborately constructed architecture, burials, and artifacts were interpreted as testimony of class repression and exploitation of the poor by the rich.

To meet the new demands, the three major archaeological journals-*Kaogu, Kaogu xuebao,* and *Wenwu,* which were discontinued in 1966-resumed publication in 1972. *Wenwu* turned into a very popular magazine, as most journals with intellectual contents in social sciences had been stopped. Between 1972 and 1977, eight new archaeology programs were established in universities (Shanxi, Jilin, Nanjing, Xiamen, Shandong, Zhengzhou, Zhongshan, and Wuhan) in order to train much needed archaeologists for the rapidly expanded discipline (Chinese Archaeology Association 1984, 227-236).

Excavations of Neolithic sites were carried out in many regions, such as Dawenkou in Shandong Province, Cishan and Honghuatao in Hebei Province, Jiangzhai in Shaanxi Province, Liuwan in Qinghai Province, Daxi in Sichuan Province, Caoxieshan in Jiangsu Province, Hemudu in Zhejiang Province, Sanyuangong in Hunan Province, and Shixia in Guangdong Province. These sites provided rich information for the understanding of prehistoric development in different regions. In addition, by 1977 the radiocarbon laboratories in the Institute of Archaeology and Beijing University had published four sets of C-14 dates, providing some very early absolute dates from Neolithic sites outside the central plains, which revolutionized archaeological research.

The discoveries of several Neolithic sites in southern China were especially important. The Hemudu site in the lower Yangzi (Yangtze) River valley yielded the earliest evidence of rice cultivation in China, as radiocarbon dates pointed to a period as early as the Yangshao culture. The Hemudu culture seems to have been succeeded by a series of Neolithic assemblages, referred to as Majiabang, Songze, and Liangzhu, which formed a continued cultural sequence in the region. These new data seriously challenged the traditional view, which regarded the central plains as the only center for the development of Chinese

civilization. For the first time, the notion of a single origin of Chinese Neolithic culture needed to be reconsidered (Xia 1977) in

light of the fact that southeastern China may have played an important role in the development of Chinese civilization (Su 1978).

The discoveries that made the most newspaper headlines during the Cultural Revolution were elite tombs that had been discovered accidentally (Qian, Chen, and Ru et al. 1981). In 1968, for example, western Han royal tombs belonging to the prince Liu Sheng and his wife Douwan (ca. 113 b.c.) were found in Mancheng, Hebei Province. Among some 4,000 grave goods, two jade burial suits, each made of more than 2,000 jade wafers of different shapes tied with gold thread, were the most astonishing finds (Institute of Archaeology, Chinese Academy of Social Sciences, and Hebei 1980).

In 1972, an elaborately furnished western Han burial at Mawangdui in Changsha, Hunan Province, was unearthed. After removing many layers of clay, charcoal, wooden chambers, coffins, and silk garments, a corpse, nearly 2,000 years old, of the lady Dai, was revealed. The body was in perfect condition with no sign of decomposition, and the 138.5 melon seeds preserved in her esophagus, stomach, and intestines indicated the lady's last meal shortly before her death (Hunan Provincial Museum and Institute of Archaeology 1973).

In 1976, archaeologists excavated a very well-preserved Shang royal burial, tomb number five, in Anyang. Based on bronze inscriptions found in the burial, the tomb was determined to have belonged to one Fuhao, who was referred to as a consort of King Wuding in oracle-bone inscriptions. In addition to the large number of bronze and jade artifacts unearthed from the tomb, this discovery was significant because, for the first time, a named individual in oracle-bone inscriptions was identifiable in an archaeological context (Institute of Archaeology, Chinese Academy of Social Sciences 1980).

The discovery that attracted the most international attention was the underground terracotta army found in 1974 at the mausoleum of the first emperor of the Qin dynasty (221-206 b.c.), Qinshihuangdi, at Lishan, Lintong, Shaanxi Province. Deposits located to the east of the mausoleum include four large pits, three of which contain more than 7,000 life-sized terracotta warriors and horses. In the same year as the discovery, pit number one, the largest of four, which measures 12,600 square meters in area and 4.5-6.5 meters in depth (Shaanxi Institute of Archaeology 1988) was excavated. Five years later, the first on-site museum was built over the pit so that visitors could look down over railings at the rows of clay warriors and horses as well as at the processes of excavation of the site. Excavations have continued ever since, and three pits have been covered by on-site museums, attracting millions of visitors from all over the world. The mausoleum was listed as a World Heritage Site by the United Nations Educational, Scientific, and Cultural Organization in 1987.

In spite of numerous new discoveries, archaeological theoretical interpretations during the Cultural Revolution were dry and dogmatic, an inevitable consequence of the political climate of the era. Tightly controlled foreign policies eliminated the exchange of information between China and western countries, and the only theoretical frameworks applicable at the time were Marxism and Maoism. Mortuary and settlement data obtained from many Neolithic sites were commonly used to support Morgan-Engels or Marxist-Leninist propositions such as the emergence of private property, class differentiation, the practice of matrilineal or patrilineal social organizations, and the formation of the state as the result of class conflict. In some publications, which were purely data descriptions, Marxist and Maoist slogans were routinely inserted into the contents but appeared superficial and far-fetched. The lack of fresh theoretical approaches prevented archaeologists from engaging in critical discussions, and the rapid accumulation of archaeological data also forced scholars to become preoccupied with constructing the sequence of material culture rather than with theoretical thinking about it. Chinese archaeology, therefore, largely remained artifact oriented.

Archaeology in the Post-Cultural Revolution Era (1978-)

After the Cultural Revolution, the relatively relaxed political atmosphere and the practice of

economic reform promoted new developments on all fronts of Chinese archaeology. Salvage excavations conducted by regional archaeological institutes have been the most in demand, as a decentralized economic system stimulated construction projects across the country. Support from the central government has been shrinking, and most provincial institutes have become financially dependent on salvage archaeology. By 1978, a total of eleven universities had developed archaeology programs, training hundreds of archaeologists each year. These new graduates soon became the backbone of local archaeological institutes. The number of archaeological periodicals had multiplied from “the great journals” to a list of some 140 periodicals on archaeology-related subjects by 1991, most of which are published on a local level (Falkenhausen 1992). As a result, provincial archaeological institutions became increasingly independent of control by the Institute of Archaeology in Beijing with regard to administrative, academic, and financial aspects (Falkenhausen 1995).

Policies of economic reform have also opened China's doors to the world. Scholarly exchange between China and western countries has been encouraged, and western archaeological methods and theories have been brought in. Archaeologists in China found themselves facing new challenges from the outside world. During the 1980s and 1990s, as Deng Xiaoping was searching for a way for China to become a Chinese-style socialist country, archaeologists were struggling to find a way to make an archaeology with Chinese characteristics. There have been some increased nationalist feelings among many Chinese intellectuals, partially in reaction to the rapidly changing relationships between China and the rest of the world, and archaeology in this era has been strongly influenced by new concepts of nationalism.

As an enormous amount of archaeological data on all periods has been accumulated since the end of the Cultural Revolution, and three major topics have become the focal points of Chinese archaeology: the origins of early humans, the origins of agriculture, and the origins of civilization.

Paleolithic Archaeology and the Multiregional Model of Human Evolution

By the 1990s, more than sixty sites containing human fossils had been recorded as well as many more sites that have yielded Paleolithic artifacts. As world Paleolithic archaeology has been engaged in the debate between “the out-of-Africa” and “the multiregional-development” schools, evidence from China has become crucial. The majority of Chinese archaeologists and paleontologists support the multiregional development model, arguing for an independent system of evolution from *Homo erectus* to *Homo sapiens* in East Asia (e.g., Wu 1995). Some have gone even further and attempted to find evidence of the earliest hominids in China. The argument for indigenous evolution in east Asia is primarily based on two factors. First, similar to Weidenreich's observation, paleontologists continue to find morphological characteristics that are shared by hominid fossils and modern populations in the same region. Second, archaeologists have defined regional lithic traditions throughout the Paleolithic period in China that appear to be distinct from those in Africa and Europe (Chen 1999b).

The driving force for archaeologists has been to find evidence of the earliest hominid remains and the missing links in the developmental progress of modern humans in China. New evidence remains promising for the current evaluation and debate about human evolution. In 1984, for instance, a nearly complete skeleton of archaic *Homo sapiens* was found at Jinniushan (Gold Ox Hill) in Liaoning Province in 1984. The fossils were dated to 310,000-160,000 years ago, making the skeleton one of the earliest examples of this taxonomic group. Some typical morphological features of the skull are observable in earlier hominids and modern populations in the region, which seems to fit a model of local evolution (Chen, Yang, and Wu 1994).

It should be noted, however, that some recent claims about the early hominids might be problematic and lack credibility in light of the data; it has been suggested that some archaeologists have been too eager to

find the first man-made stone tool in China (Lü 2000). In 1985, cranial remains of *Homo erectus* associated with

stone tools were found at Longgupo in Wushan (now belonging to Chongqing), Sichuan Province. The stratum containing the hominid fossils was dated to 2 million years ago, which makes the Longgupo fossils the earliest example of *Homo erectus* in China. The reliability of the dates, however, is open to question (Huang and Ciochonetal 1995).

Even before visiting the Zhoukoudian site, Lewis Binford and Chuan Kun Ho challenged the long-established conclusions that Peking Man controlled fire and that the Zhoukoudian cave was the home of Peking Man (Binford and Ho 1985). Many Chinese archaeologists were outraged, and Jia Lanpo, one of the excavators of Zhoukoudian, defended Peking Man's reputation with great passion (Jia 1991). The strong reaction from the Chinese archaeological community is understandable when the issue is placed in the context of rising nationalism in China. Within the framework of the regional evolutionary model, Peking Man appears to have been regarded as one of the direct, but remote, ancestors of the nation.

The Origins of Food Production

When the Hemudu site (ca. 7000 b.p.) in the lower Yangzi River Valley was excavated in 1974, it was claimed that the large quantity of rice remains found there was the earliest evidence of domesticated rice in the world. However, rice production at Hemudu was in a somewhat advanced stage, and the origin of rice cultivation was still an open question. In the 1980s, rice remains dated to 8000-9000 b.p. were found at Pengtoushan and several other sites in the middle Yangzi River Valley, which was regarded as a possible center for the origins of rice domestication. The great potential of finding the earliest evidence of rice production in southern China attracted both Chinese and western archaeologists, and more excavations employing new methods and techniques-including flotation, phytolith analysis, and isotopic analysis-were carried out in the 1990s. Consequently, rice remains dated to 8000-9000 b.p. or earlier were found at Jiahu in southern Henan Province, Bashidang and Yuchanyan in Hunan Province, and Xianrendong and Diaotonghuan in Jiangxi Province (Chen 1999a; Lu 1999).

Excavations at the cave sites Xianrendong and Diaotonghuan, conducted by a Sino-American collaborative project led by Yan Wenming and Richard MacNeish, yielded long sequences of cultural development, suggesting that rice domestication can be traced back to a period as early as 10,000-11,000 b.p., followed by the earliest pottery making in 9000-10,000 b.p. (MacNeish and Libby 1995; Zhao 1998). The origin and rapid expansion of rice cultivation from the Yangze River Valley may imply the introduction of languages and genes from southern China to broader territories in adjacent regions (Higham and Lu 1998). Southern China may have also been one of the places where the earliest pottery was invented (Chen 1998). These findings have certainly promoted the significant role that China has played in world history.

The Origins of Civilization

The years since 1980 have witnessed a radically changed view of the development of Chinese civilization in archaeology, with a shift from the concept of a central-plains-centered tradition to that of a multicentered parallel development. This change was not simply a product of political propaganda, and it did not happen overnight. It has gradually emerged and crystallized as the result of a complex interplay of several factors. These include voluminous new archaeological discoveries made in areas outside the central plains, traditionally regarded as the core area of Chinese civilization; the recognition of diversified regional cultural traditions based on these new findings; a changing view of nationalism in recent years; and increased confidence in the credibility of the textual record.

New Archaeological Discoveries

Since the end of the Cultural Revolution numerous archaeological discoveries have been made-most of them in areas outside the central plains. In southern China, new evidence indicates that this region not only had its own indigenous origins of Neolithic traditions (earliest rice and pottery) but that it evolved into complex societies at same time as, if not earlier than,

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the central plains. Southern China also witnessed highly developed Bronze Age cultures with characteristics distinctive from those of the central plains. Several Neolithic walled settlements have been found in the middle and upper Yangzi River Valley, and one found at Chengtoushan in Hunan Province (ca. 4000 b.c.) is the earliest example of a walled settlement in China.

Distinctive elite tombs filled with large quantities of jade objects on artificially made earth mounds have been discovered in the Liangzhu culture in the lower Yangzi River Valley, and the high level of craftsmanship reflected in jade manufacture and the construction of large burial mounds have led some archaeologists to argue for the existence of early states in the Liangzhu culture (ca. 3200-2000 b.c.). Sacrificial pits containing large numbers of bronze figurines, life size or bigger, have been discovered at Sanxingdui in Sichuan Province in the upper Yangzi River Valley, revealing a previously unknown kingdom with a highly developed bronze culture contemporary with the Xia and Shang dynasties. A large tomb filled with hundreds of bronze and jade objects was found at Dayangzhou in Jiangxi Province in the middle Yangzi River Valley, which indicates the existence of an advanced bronze culture with strong indigenous characteristics along with influences from the central plains.

In northeastern China, the Neolithic tradition now can be traced back to the Xinglongwa culture (6100-5300 b.c.) in Liaoning and Inner Mongolia, which may have demonstrated a fully developed agricultural society. Complex societies seem to have evolved around 3500 b.c. in this region, as is indicated by the construction of a large public edifices in the late Hongshan culture, especially at the Niuheliang site, which yielded stone monuments with well-furnished elite burials and remains of a large architectural foundation associated with life-size female figurines (known as the Goddess Temple). This broad region later became the homeland of pastoralism and nomads whose interaction with agricultural populations dominated the political arena in the following millennia. These astonishing discoveries changed the traditional view, which regarded peoples outside the central plains as barbaric and uncivilized.

In eastern China, including Shandong and northern Jiangsu Provinces, archaeologists discovered the earliest Neolithic assemblage at Houli in Shandong Province (ca. 6200-5600 b.c.), which was followed by the Beixin, Dawenkou, and Longshan cultures, forming another regional tradition of cultural development. Many elaborately furnished elite burials and more than a dozen walled settlements dated to the Dawenkou and Longshan periods (ca. 4100-2000 b.c.) have also been found, generating more claims for the emergence of state-level societies in the Neolithic period in this region.

In the central plains, primarily including the middle Yellow River, the Fen River, and the Wei River Valleys and regarded as the center of Chinese civilization, archaeological discoveries seem to demonstrate a cultural tradition that may not have been much more advanced than those on “the peripheries” during the Neolithic period. As in other regions, the Neolithic traditions of the central plains can be traced to the Peiligang culture 7000 b.c., which was followed by a continued development of the Yangshao and Longshan cultures. Although rich elite burials dated to the Longshan period have been discovered at Taosi in Shaanxi Province and walled settlements belonging to the late Yangshao and Longshan have been found in Henan Province, these features are not unique and are certainly not earlier than those in other regions (for brief information on the major discoveries in the Neolithic period and the three dynasties, see Ren and Wu 1999; Wang 1999). Diversified regional cultural traditions are easily observable based on these new data, which have encouraged new interpretations concerning the origins of civilization.

Multiregional Development of Civilization in China

Initiated by Su Bingqi, a research model known as *quxi leixing*-the regional systems and local cultural

series-was proposed in the early 1980s (Su and Yin 1981; for a review of Su's framework see Wang 1997). The model is based mainly on ceramic assemblages, with an emphasis on the independent development of and interaction among different regional cultural traditions. The *quxi leixing* concept was intended to provide a methodological framework for the reconstruction

of Chinese prehistory, as it shifted away from the center-periphery model to a multiregional approach to the development of Chinese civilization.

As stated by Su Bingqi (1991), after 10,000 b.p., six relatively stable regional divisions *(quxi)* formed within the area embraced by historical China. The six regional cultures are further divided into a number of local phases *(leixing).* Each of these regions, according to Su, had its own cultural origins and developments and interacted with the others in the developmental processes of Chinese civilization. Yan Wenming suggested a similar model as "the unity and variability of Chinese prehistoric culture," seeing the central plains as the center of the flower and cultural traditions and the surrounding areas as layers of petals (Yan 1987). Instead of giving equal weight to all regional cultures implied in Su's hypothesis, Yan's model emphasizes the leading role of the central plains in the movement toward civilization while acknowledging the existence of elements of civilization in the peripheries in prehistory.

The general trend shifting from a monocentered to a multicentered development of Chinese civilization, as Lothar von Falkenhausen (1995, 198-199) observed, is also reflected in the four editions of the *Archaeology of Ancient China* by kwang-chih chang, which have been the most comprehensive and authoritative sources of Chinese archaeology in English for decades. In the first three editions, published in 1963, 1968, and 1977, the central plains was seen as the nucleus from which complex society and dynastic civilization rose. In the fourth edition, published in 1986, this view was replaced by the concept of "a Chinese interaction sphere," covering a geographic dimension much broader than the central plains, which formed the foundation for the development of the three dynasties (Chang 1986b, 234-242). Such a change of paradigm in Chinese archaeology seems to integrate very well with a new perspective in the reconstruction of national history.

Nationalism, National History, Legends, and Origins of Civilization in Archaeology

Since its birth, Chinese archaeology has had one clear objective: to reconstruct national history. The concept of nation, and thus of national history, however, has changed over time, as the tasks of reconstruction have been inevitably affected by new perspectives of national history.

As the state has attempted to bring China's multi-ethnic population into a viable political entity since the1950s, the concept of the Chinese nation has become equivalent to that of the state, best described by Fei Xiaotong (1989) as a single entity with multiple components *(duoyuan yiti).* According to Fei, China as a nation (a substance without self-consciousness) has gradually come into existence through thousands of years. This formative process was amalgamative, with a dominant core constituted first by the Huaxia and then by the Han people. However, the cultural interaction between the Huaxia-Han and other groups was not a one-way diffusion but a mutual influence. This national entity now, according to Fei, includes all nationalities (more than fifty) and covers the entire territory of modern China. It seems that this new concept of nationalism fits relatively well with the archaeological *quxi leixing* paradigm and, in particular, with "the unity and variability" hypothesis. Evidently, the archaeological and sociological models mutually support each other in constructing national history.

With increased knowledge of regional archaeological cultures, scholars have developed a strong willingness to construct cultural history based on archaeological material remains and the historical record. There has been a tendency to identify archaeological cultures and phases, sites, and even artifacts directly with specific ancient groups of people or places named in legends or historical literature. The continuing debates on the cultural identification of several Bronze Age cities-such as Erlitou, Erligang, and, most recently discovered, Yanshi Shang city near Yanshi and Xiaoshuangqiao near Zhengzhou-best exemplify this attempt. By doing so, archaeological assemblages (mainly pottery typology) become historically meaningful, although the logical connections between the two sets of

information-ceramic typology and ethnic affiliation-have not been made explicit.

The phrase “five-thousand-year history of civilization” has been commonly used in China

to summarize national history, and archaeology is pledged to trace the origins and to demonstrate the processes of this history. Since recorded dynastic history did not begin until about 2000 b.c., much effort has been made to connect regional Neolithic cultural developments with the activities of predynastic legendary kings and sages in order to fill the time gap of 1,000 years. Attempts have also been made to link certain cultural achievements with the dawn of civilization, such as the manufacture of jade objects and the construction of large ceremonial monuments, which are traceable to the Neolithic period.

As a consequence, not only are legends read as reliable history and used to interpret Neolithic archaeology, but the origins of Chinese civilization are pushed back 1,000 or more years to match counterparts in mesopotamia and Egypt (Su 1988, 1997). In the early twentieth century, when the *yigupai* questioned traditional texts, they hoped that archaeologists would uncover reliable ancient history from the field. For many archaeologists today, these legendary accounts are like blueprints for reconstructing prehistory, and the *yigupai* have become the target of criticism (Li 1994).

A state-directed project in the 1990s pushed this endeavor to its peak. In a visit to Egypt, Song Jian, the state counselor *(guowu weiyuan),* was introduced to a detailed chronological record of dynastic Egypt that started from 3100 b.c. Dissatisfied with the Chinese dynastic chronology, which is not only 1,000 years later but also less precise than that of Egypt, Song Jian called for a project to reconstruct an accurate chronology of the three dynasties so that Chinese civilization would be comparable to Egypt's (Song 1996). This project, known as the Xia-Shang-Zhou Chronology Project, was officially launched in 1996. For nearly four years, some 170 experts in history, archaeology, astronomy, and radiocarbon-dating technology were involved in the project, focusing on nine primary research topics, which were further divided into thirty-six subtopics. The budget was about 17 million yuan (US$2.1 million), and archaeology certainly benefited from such a generous financial commitment from the state, which supported some major excavations. The project achieved four objectives (Jiang 1999):

1. 1. to provide accurate dates for a time period from the conquest of the Shang by the Zhou to the beginning of recorded chronology in 841 b.c.
2. 2. to determine relatively accurate chronology for the late Shang period
3. 3. to define a relatively detailed time frame for the early Shang period
4. 4. to outline a basic time frame for the Xia dynasty

The chronology of the three dynasties has indeed become more precise and detailed than before, but the project has not made Chinese civilization temporally comparable with some older civilizations in other parts of the world.

Encouraged by the achievement of the Xia-Shang-Zhou Chronology Project, a new research organization, the Center for the Study of Civilization, was recently established in the Department of Archaeology at Beijing University. Archaeologists are now determined to find the ultimate origins of Chinese civilization, which ought to be embedded in the Neolithic cultures (Center for the Study of Ancient Civilization, Beijing University 1999).

International Collaborative Research in China

Since the 1980s, scholarly exchange between China and foreign countries has increased dramatically. It has also moved on from exchanging ideas at international conferences to conducting field research. In 1991, the Chinese National Bureau of Cultural Relics released a document on policies for Sino-foreign

collaborative research in archaeology (National Bureau of Cultural Relics 1992), which, after more than forty years, reopened the door to foreign archaeologists wanting to working on Chinese archaeology.

Many collaborative projects have been carried out in recent years in regions across the country, international scholarly exchange has introduced western theories to China, and these theories have, to some extent, enriched research orientations and interpretations. New methods and technologies have been introduced in fieldwork and laboratory analyses, including, to name a few, the use of the flotation method in recovering macrofaunal and macrofloral remains;

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Christy, Henry

(1810-1865)

Born in London into a wealthy stockbroking Quaker family, Christy became such a successful banker that by 1850 he was able to spend more time pursuing his antiquarian interests and traveling. His trips to Scandinavia in 1852 and 1853 visiting museums provoked his interest in prehistory.

In 1856 his interest in ethnology took him to North America and mexico, where he befriended and traveled with anthropologist edward tylor (1832-1917). Together they visited and studied the ruins of teotihuacán, Xochichalco, and Cholula.

In 1862 Christy began funding and working with French paleontologist édouard lartet (1801-1871) exploring the caves of Vezere in southwestern France. They discovered the sites of Gorge d'Enfer, laugerie haute, la madeleine, le moustier, and les Eyzies, all of which had an enormous impact on contemporary understanding of the French Paleolithic. From evidence at Le Moustier, the Mammoth and Great Cave Bear periods were recognized as contemporaneous. From evidence at La Madeleine,

the Reindeer age was better understood. Christy also funded work with Lartet in the Perigord (Dordogne) region that provided evidence for the existence of Paleolithic cave art. Much of the material found became part of the Musée des Antiquites Nationales at Saint Germain-en-Laye. Lartet (one of the giants of the history of prehistoric archaeology) was immensely fortunate in his association with Christy and their partnership made a fundamental contribution of the first rank to our understanding of human prehistory.

Christy was editing a volume of their results when he died. *Reliquiae Aquitanicae* (1875), a classic in European Paleolithic archaeology, was completed at the expense of Christy's estate by geologist Thomas Jones.

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See also

France; Paleolithic Archaeology

Clark, Sir Grahame

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Grahame Clark is by general consent the only British prehistorian of the twentieth century whose importance rivaled that of vere gordon childe. His career spanned almost the whole century as well as the emergence of modern archaeology. His first book was published in 1932, and his last appeared in 1992. Clark went

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up to Peterhouse College, Cambridge, in 1926 completed his Ph.D. in 1930. His dissertation was later published as *The Mesolithic Age in Britain* (1932). Miles Burkitt supervised Clark's doctorate, but it was probably dorothy garrod, an active excavator, who had a greater influence on him. Clark lectured in Cambridge from 1935 to 1952 when he became Disney Professor of Archaeology. He retired from the chair in 1974 but actively wrote and researched until his death. The list of his publications is phenomenal.

While Disney Professor, he employed eric higgs and david clarke and created an exciting environment for students from Britain and other parts of the world at Cambridge University. These contacts and a significant program of overseas excavations were the result of Clark's interest in world prehistory.

Clark's long career covered more ground that that of almost any other archaeologist of the twentieth century. He is not identified with the analysis of one kind of archaeological material, nor indeed with an interest that is restricted to one aspect of prehistory. Clark has been universally linked with the Mesolithic site of Star Carr in Yorkshire in England. However, even that work should be viewed in the larger context of Clark's overall career, for it was but one element on a broad canvas, prepared over the decade before excavation and retouched and developed many years later. Clark frequently switched his focus and interest; he would introduce ideas and study topics and then move on.

Although Clark was not regarded as a founder of “the new archaeology,” at least some of its concepts were present in his writings during the 1950s. He did not carry the radiocarbon revolution to its conclusion, although he had used early radiocarbon results to demonstrate that the northern and western European Neolithic was far older than previously supposed. Clark moved on to consider hunter-gatherer landscape use and suggested the hierarchical taxonomy of human groupings in the Paleolithic northern European plain. It was left to others to identify these as biologically based mating networks, and meanwhile, Clark was engaged in the investigation of cultural diversity. His last book, *Space, Time and Man* (1992), discussed the human ability to conceive of and organize time and space in ways that other species cannot.

Peter Rowley-Conwy

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Clark, J. Desmond

(1916-)

John Desmond Clark is preeminent among twentieth-century archaeologists working in Africa. More than any other individual he has shaped African prehistory, and his visions have established or structured almost all of the prehistoric research now under way on that continent. Desmond Clark was born in London and attended Christ's College, Cambridge, where he studied archaeology and anthropology under Miles Burkitt and grahame clark, who taught him the importance of the paleoenvironment in archaeology and how changes in that environment might influence human behavior.

In 1937, Clark went to work in Northern Rhodesia (now Zambia) as secretary of the Rhodes-Livingstone Institute in Lusaka and as curator of the Rhodes-Livingstone Memorial Museum in Livingstone. He reorganized the museum, created thematic exhibits of both archaeological and ethnological materials, and wrote an accompanying handbook. The museum proved to be popular with local people and schoolchildren and after World War II attracted foreign tourists visiting nearby Victoria

Falls. Later the museum was to be the site of Clark's annual Winter School in Archaeology. Clark also established the National Monuments Commission to protect archaeological sites in Northern Rhodesia.

During the 1930s, Clark was one of the few professional archaeologists in southern Africa. He began his fieldwork with the geologist Basil Cook from Johannesburg, and his study of the stone tools and fossils of the Old Terrace gravels of the Zambezi River in Northern Rhodesia resulted in his first publication in 1939. He obtained a research grant to do additional excavations at Mumbwa, and a 1942 report recorded a sequence of Stillbay, Rhodesian Wilton, and

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Fred Wendorf

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(1936-1976)

David Leonard Clarke, a British archaeologist, never directed a major excavation but was noted for his outstanding contributions to theoretical archaeology. He studied the ceramic vessels of the Beaker assemblage of the third millennium b.c. in Europe and gained his accreditation as an archaeologist more in the Continental museum tradition than in the British excavation mode. Clarke remained in Cambridge, England, all his professional life, and his career spanned only ten years from the completion of his Ph.D. to his sudden death in 1976.

He is famous for radicalizing British archaeology, and in *Analytical Archaeology* (1968), Clarke argued that archaeology must become a science by developing an explicitly archaeological theory based on general systems theory. Clarke argued that the variability in cultural assemblages required attention. Cultural assemblages varied-there were no discrete cultures, only overlapping suits of slightly different collections of items-and the artifacts varied as well. Concentrating on the special but calling it typical, in the sense of the unique and supposedly diagnostic, could lead to conclusions quite different from those reached when looking at the most common or typical forms. The variability in specific types of objects was a fascinating insight into the obvious. Variability of form suggested to Clarke a past of unceasing fluctuation. He believed that what was possible for biology should be feasible for culture, with variability lodged within a taxonomic frame for ordering the allocation of entities to classes, not directed to a systematic operational concern with the causes and effects of variability.

His second profound contribution to archaeological theory was the recognition of the critical importance of scale in our understanding of the past and the different scales of phenomena within it. If archaeology was to be systematic, as Clarke wished, it was not difficult to envisage that the established rigor and precision should be extended to include precise statements about magnitude and variability. Clarke's great insight was that by extension, the rigor of acquiring data should also be applied to its interpretation.

Clarke wanted to find the taxonomic system that meshed all archaeological phenomena together, coinciding, by accident or intent, with “natural” categories of culture, and doing for archaeology what the sixteenth-century Swedish biologist Carolus Linnaeus had done for biology. Even without a high-level theory, a system of classification that coincided with a natural taxon would allow coherent research propositions, just as it did for biology before the modern synthesis. The addition of variation to the description of archaeological entities should lead toward a proper theory of culture. In this respect, Clarke had something in common with “the new archaeologists” in the United States. The correct procedure, whether based on Hempellian logic in the U.S. scheme or taxonomy in Clarke's scheme, was intended to produce good and appropriate theories.

The quandary at the core of Clarke's agenda is the absence of a systematic high-level theory about what matters-an explanation of the nature of human behavior. This weakness was common to the entire

program of the new archaeology, and it still is a fundamental limitation of archaeological theory. No current paradigmatic position in archaeology has overcome this quandary.

Roland Fletcher

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data requires its subdivision into groups before any other analytical or interpretive procedures can be undertaken. In archaeology, this has been true in the case both of artifacts and of cultures. As a result, archaeological classification has a long history, and in the broadest sense it probably dates back to the beginnings of archaeology itself. Beginning in the early nineteenth century, scientific classification developed hand in hand with scientific archaeology.

Preliminary Considerations and Definitions

If classification is the most fundamental of interpretive activities in archaeology, it is also one of the most complex and one of the most controversial. There are, to begin with, two quite different kinds of archaeological classifications, respectively, of artifactual finds and of "cultures" (variously also designated as horizons, patterns, aspects, etc.). The procedures involved are so different for both cases, and the characteristics of the classifications themselves so different, that their histories must be considered separately. There are, in addition, classifications of such things as house types, burial types, and decorative styles that fall somewhere between artifact classifications and culture classifications. They are classifications of abstractions rather than of concrete things, but they are confined in each case to one particular kind of abstraction while culture classifications are based on a whole range of abstractions involving different kinds of evidence.

Culture classifications are akin to, and in some sense derived from, the historian's traditional practice of periodizing the past-as, for example, into successive phases that are called Tudor, Jacobean, and Restoration. In archaeology, however, culture classifications attempt to encompass and to summarize both the spatial and the temporal variability of archaeological remains, creating units of analysis that are believed to represent the normative culture of a certain specific region during a specific interval of time. The Fort Ancient Culture of the Ohio River Valley and the Tripolye Culture of Neolithic Eastern Europe are examples of culture classification. Very frequently these schemes have a genetic character akin to that in language classification; that is, they recognize "parent" and "daughter" cultures in a chronological sequence.

Artifact classifications are usually nongenetic. They are however enormously variable, depending partly on the nature of the material being classified. The two most common kinds of artifact classifications are those of pottery and lithics (especially projectile points), but the salient features that are considered in the two cases are quite different. Pottery classifications are usually designed for use with small fragments; as a result, they place emphasis on stylistic and componential features rather than on overall form, which often cannot be determined. Projectile point classifications, on the other hand, are designed for use on whole specimens or large fragments and are based largely on criteria of form. The variables to be considered in classification also depend on what characteristics have been found to be temporally or chronologically significant; for example, color in the case of most pottery classifications but not in most lithic classifications.

However, the most important differences among artifact classifications depend on the purposes for which they were developed. A major distinction can be made between basic or essentialist classifications, which are designed to yield information about the material being classified, and instrumentalist classifications, in which the classified material is used for some purpose external to the material itself, such as the dating of archaeological sites. Essentialist classifications are often developed for the instruction of a wider public, for example, through museum displays and popular books, while instrumentalist classifications are developed only for "in-house" use among archaeologists and find expression chiefly in technical monographs. There are also purely ad hoc classifications whose only purpose is convenience: very often, to permit the description of a large and diverse mass of material in a limited number of monograph pages (see Adams and Adams 1991, 157-168). Most archaeological

bead classifications seem to fall into this last category.

Many, but not all, artifact classifications are typologies-here defined as classifications that have been made for the specific purpose of sorting

entities into discrete categories for purposes of statistical treatment. In such a system, the categories must be mutually exclusive and not overlap, so that each individual artifact or shard is assigned to one and only one category. Moreover, the set of categories must be comprehensive so that there is “a pigeonhole for every pigeon.” These features are not necessary in a classification that is made only for communication purposes; such a system may consist of a set of norms that overlap at the boundaries (see Adams and Adams 1991, 76-90). Typological classification is a relatively recent feature of scientific archaeology and is important chiefly when typological data are to be used quantitatively, or statistically. Consequently, it is a feature of artifact classifications rather than of culture classifications.

Reconstructing vases at the British Museum

(Gamma)

Many but not all classifications, both of artifacts and of cultures, have a hierarchical feature; that is, the smallest classificatory units are grouped into larger and more inclusive units in the same way that biological species are grouped into genera. This feature is especially prevalent in pottery classifications like the “type-variety system” that has been widely used in North and Central America (Smith, Willey, and Gifford 1960; Wheat, Gifford, and Wasley 1958). Such hierarchical classifications will be here designated as taxonomies.

Renaissance and Enlightenment Foundations

The archaeology of today is an outgrowth of what was earlier called antiquarianism. It is usually said to have had its beginnings in the Renaissance period, fifteenth to sixteenth centuries, when royal and noble patrons paid for field excavations in Italy and Greece that would yield objets d'art for their private collections. Before long, the antiquarian fever spread to England, where its focus shifted from classical antiquity to the megalithic remains of late prehistory. The objects recovered from these early diggings were displayed in “cabinets of curiosities”-often a whole room or several rooms in a nobleman's palace might be devoted to such displays. Later, a great many of the collections found their way into museums; indeed, they formed the original nuclei of some of Europe's earliest museums.

Every collector developed his or her own system for displaying the collected antiquities, as, a little later, did the museums that inherited them. Although none of these systems have survived, we may assume that at least some of them involved primitive, ad hoc classifications, perhaps according to the materials employed, artistic similarities, or places of finding. This type of ad hoc classification, while it has been partially superseded by other and purportedly more scientific systems, has by no means disappeared from archaeology. For example, it is still a common practice to divide up the total assemblage of material to be described in an archaeological monograph according to the material employed, so that there are separate chapters on pottery, objects of stone, objects of bone, and the like.

If the Renaissance was preeminently an era of discovery and collecting, the Enlightenment-essentially coeval with the eighteenth century-was above all an era of systematization. The dominant concern during the Enlightenment was to bring order and system to the mass of materials and facts that had been collected, not only in the natural world but in the social and political spheres as well. This effort resulted in a proliferation of botanical, zoological, and geological classifications, best exemplified by the "system of nature" developed by the Swedish botanist Carolus Linnaeus in the eighteenth century (Linnaeus 1735). At the same time, the moral philosophers, especially in France and in Scotland, developed logically coherent social and political schemata, including what came to be known as the three-stage schema of prehistory. This framework envisioned successive hunter-gatherer, pastoral, and agricultural stages in human development and was proposed almost simultaneously by Turgot in France and by Ferguson and Millar in Scotland (Meek 1976).

In the broadest sense, the classificatory methods of Linnaeus and other naturalists provided a methodological foundation for the later development of artifact classification while the three-stage schema of the moral philosophers was equally basic, at least conceptually, to the subsequent development of culture classification. However, the real development of classification as an essential, rather than merely an incidental, feature of archaeology had to wait for the beginnings of scientific archaeology, which came about only when the true antiquity of the human race began to be recognized. That recognition was one of the signal achievements of the nineteenth century.

The Beginnings of Scientific Archaeology

Scientific archaeology arose from the recognition that material remains from the past can be sources of information as well as of aesthetic enjoyment. Once that happened, scientific classification followed more or less inevitably. Artifacts began to be classified first and foremost with an eye to the information they could yield, information about themselves and about their makers and their times.

Scientific advances in archaeology have often begun in areas where the archaeological record was scantiest; where, in other words, careful and precise investigation was required to extract any information from the little that has survived from the past. This was undoubtedly the reason why European scientific archaeology, including classification, had its beginnings in Scandinavia, a region that was outside the realm both of classical antiquity and of the prehistoric megalith builders. Scandinavians at the outset of the nineteenth century were gripped by the same spirit of nationalism that affected nearly all European peoples, and like many of the others, they began to regard prehistory as an essential part of their national heritage. Without major architectural monuments or conspicuous objets d'art, however, they had a much more difficult job recovering that heritage than their neighbors in the more southern countries. It was in that context that scientific archaeology had its beginnings, mostly in denmark.

The Danes pioneered in the development of both culture classification and artifact classification. In the beginning, the two went hand in hand, but with the dominant concern always on the classification of cultures, since that was an essential step in the reconstruction of national prehistory. Artifact classification

was ancillary, or instrumental; that is, it was undertaken, not to learn about the artifacts themselves, but to

define the artifact types that were diagnostic attributes of each particular culture. There was a special interest in those types that could be recognized as "index markers" for particular cultural periods, akin to the "index fossils" of the geologist and the paleontologist. This instrumentalist function remains an important consideration in artifact classification to the present day, particularly in the Old World.

The Development of Culture Classification in the Old World

As far back as 1776, Scandinavian scholars had recognized that in their countries there were some archaeological sites that yielded only stone-cutting tools, others had both stone and copper, and still others had stone, copper, and iron (Daniel 1967, 90). In the early nineteenth century, Vedel Simonsen wrote specifically of a Stone Age, a Copper Age, and an Iron Age as stages in the prehistory of Scandinavia (Simonsen 1816-1819). It was christian thomsen, however, who first gave wide publicity to what has come to be called the three-age system when he arranged all of the prehistoric collections in the newly opened Danish National Museum into separate Stone Age, Bronze Age, and Iron Age assemblages in 1819. In order to achieve this comprehensive separation, he studied not only the cutting tools but also all of the different prehistoric remains at his disposal, including such things as pottery and ornaments, classifying them as Stone, Bronze, or Iron Age according to the contexts in which they occurred. The three-age system was thus from the beginning both a culture classification and a kind of artifact classification.

Thomsen's contribution to the three-age system was basically museum oriented, and it was left to several colleagues, most notably jens jacob worsaae, to give it wider recognition through published works (especially Worsaae 1843). For some time, however, there was resistance to the scheme in other countries, where scholars tended to regard it as a strictly Scandinavian phenomenon. In the competitive nationalist spirit of the times, they were perhaps hoping to discover uniquely different cultural sequences for their own countries. Still, by the 1850s, discoveries in England, Ireland, and Switzerland had convinced at least some scholars that the scheme had a wider validity. A little later it was found to accord perfectly with the worldwide schemata of cultural evolution proposed by sociologist Herbert Spencer (1855), ethnologist John Lubbock (lord avebury)(1865), anthropologist Lewis Henry Morgan (1877), and other pioneer evolutionists, and its acceptance became universal. Indeed, it has remained at the foundation of nearly all cultural classification systems in Europe and the Near East to the present day.

The three-age system could be regarded as a mere periodization, exemplifying a procedure that had long been common among historians. However, it was also the first archaeological culture classification insofar as it created a set of mutually exclusive categories to which both sites and artifacts were to be assigned.

French prehistorians, working in the middle of the nineteenth century, made an important addition to the three-age system when they recognized the existence of two stone ages: an earlier period characterized by the exclusive use of chipped stone tools and a later period having also ground and polished tools. In *Pre-historic Times,* first published in 1865, the English prehistorian John Lubbock gave these phases the formal names by which they are still known: Paleolithic, or Old Stone Age, and Neolithic, or New Stone Age.

It was also the French prehistorians of the later nineteenth century who first revealed the great variety of Stone Age cultures and the very long time span that they had occupied. édouard lartet, excavator of many Paleolithic sites in the Dordogne and Vezere regions of France, offered a four-stage periodization based on the kinds of mammal bones that were found in the sites: first aurochs and bison, then reindeer, then mammoth and woolly rhinoceros, and finally, cave bear. However, this periodization was soon superseded by the more comprehensive Stone Age classification of gabriel de mortillet, which, like the

earlier classificatory systems of Thomsen and Lubbock, was based on the internal evidence of distinctive artifact types rather than on the external evidence of paleontology.

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to suggest an overall periodization into which they would all fit. His periodization encompassed four stages for the Neolithic and five stages for the Bronze Age (Montelius 1903). Other scholars working at about the same time subdivided the prehistoric Iron Age into two phases. The Montelius scheme combined and elaborated upon the features of the Thomsen and de Mortillet classifications in that culture periods were defined both by the materials employed in tool manufacture and by diagnostic characteristics of the tools themselves. In effect, the new method substituted diagnostic assemblages for individual diagnostic tool types as the basis for the definition of cultures and culture periods. This approach, which Montelius called "the typological method," has since been widely employed by European prehistorians although it has come in for substantial criticism in the recent past.

Although the cultural chronologies of Montelius and his colleagues, like those of Thomsen and de Mortillet, were based on the recognition of supposed continent-wide similarities, those similarities were attributed for the first time to cultural diffusion rather than to evolutionary processes. This new perspective went hand in hand with the general adoption of the concept of culture among both ethnologists and prehistorians at the end of the nineteenth century. Different prehistoric assemblages were now seen as representing the work of ethnically distinct peoples who had continually borrowed ideas from one another. At least in the Neolithic and Bronze Ages, widespread cultural similarities were now seen mostly as the result of those borrowings.

The Montelius chronology of roman-numbered Neolithic (I-IV) and Bronze Age (I-V) stages is still occasionally employed by European prehistorians insofar as it provides a handy set of typological-chronological pigeonholes into which particular cultures can be placed. However, modified versions of the scheme have a much more basic role in the classification of Aegean and Near Eastern cultures, where scholars still routinely assign sites and cultures to the Early, Middle, or Late Bronze Age and to numbered subdivisions of these periods.

Although the general typological method of Montelius has remained in use among European prehistorians to the present day, no one since Montelius himself has proposed an overall, formal schema for the classification or periodization of European and Near Eastern prehistory. The nearest thing to overall synthesis is found in the works of English archeologists gordon childe (1925) and grahame clark (1952), but both of those scholars made use of the culture classifications already in use rather than proposing new ones.

A new and highly formal methodology for the development of culture classifications was proposed in 1968 by david clarke (1968, 187-398). In the broadest sense, it represented a refinement of the typological method in which artifacts were to be clustered into types, types into assemblages, and assemblages into cultures using highly rigorous criteria of inclusion at each level. However, this discussion was purely programmatic. Clarke did not go on to propose an actual classification based on his system, nor did the Soviet prehistorians who discussed and debated the methods of culture classification in rather similar terms during the same period (Klejn 1982). The time/space grid of European prehistory that remains in actual everyday use among prehistorians is still very largely an extension of the ones created initially by Christian Thomsen, de Mortillet, and Montelius, and it is based on their typological methodology.

The underlying conceptual model for Old World Paleolithic classification has always been chronological and evolutionary while the underlying model for Neolithic and Bronze Age classification has been mostly geographical and diffusionist. It may be noted that the same is generally true in the classifications of African Paleolithic and Neolithic cultures, which have been undertaken almost entirely by European-trained scholars (Trigger 1989, 135-138).

Culture Classification in the New World

Although the classification of prehistoric cultures in Europe and the Near East was always overshadowed by a concern for chronology and a belief in evolutionary progress, these factors

akin to the European three-age system, though paying more attention to ecological factors. This schema has proved useful for the evolutionary pigeonholing of specific prehistoric cultures, but it makes no effort to express historical relationships among them, as the Gladwin and McKern systems are intended to do.

The Gladwin and McKern systems remain almost the only efforts to introduce anything like formal or rigorous systematics into the classification of New World cultures, and neither has come into general use. Insofar as formal methods have been employed, they have largely been devoted to the differentiation of sequential phases within the same culture (e.g., Pueblo I-V) rather than to the differentiation of spatially distinct cultures. Overall, archaeological culture classification in the Americas remains mostly an ad hoc process, guided by no rigorous rules, and the same is true for Europe and Africa. There is a continuing, largely unexamined premise that preceramic cultures are defined most importantly by projectile point types and ceramic cultures, by pottery types. The establishment and acceptance of a particular culture, and of its successive phases, is still very much a matter of dialogue among the relevant specialists, resulting eventually in a general agreement on norms and boundaries.

Although there has been a great deal of highly sophisticated debate about the epistemology as well as the methodology and the utility of artifact classification, there has been relatively little debate concerning culture classification. There is, rather, a general recognition that archaeological cultures are for the convenience of the archaeologist so that the question of their “reality” does not arise.

The Development of Artifact Classification

Scientific artifact classification developed initially as an adjunct to culture classification. The early prehistorians, like Thomsen and de Mortillet, were not really interested in tools and pots as evidence of activities, technologies, or thought patterns but only as identifiers of chronological horizons. The objective in artifact classification was to identify those types that could be associated specifically with the Stone, Bronze, or Iron Age and could help in the allocation of sites to one or another of those periods. Individual types were of course defined on the basis of formal characteristics, but they were then grouped together on the basis of chronological contexts rather than the internal evidence of form or function.

So long as they were undertaken for purposes of culture definition and of site attribution, artifact classifications were dominated by the concept of “the index fossil.” That is, primary attention was given to those artifact types that were found to be diagnostic of specific periods. On the other hand, artifact types that were considered nondiagnostic were often ignored. Thus, for example, Mediterranean archaeologists gave names and definition to a few pottery types, like Minyan Ware, that had a high degree of historical significance, but a great many other and more ubiquitous pottery wares went unnamed. In the same way, North American prehistorians developed comprehensive and highly detailed classifications of projectile points, but nothing comparable was done for the more generalized stone tools like scrapers and choppers.

A long step forward was taken when Montelius introduced the typological method in the latter part of the nineteenth century. Using this procedure, cultures and chronological horizons were defined on the basis of total assemblages rather than of a few diagnostic types, and as a result, artifact classifications became more comprehensive. There was not, however, any attempt to introduce formal systematics into the classifications.

Not all nineteenth-century artifact classifications were instrumentalist. The problem confronting the museum curator was fundamentally different from that of the field archaeologist, since a museum's mission is to inform or entertain the public rather than to answer culture-historical questions. Moreover, a

great many museum collections had been donated by amateurs, with little or no accompanying provenience information. This was especially true in the case of arrowhead collections, which have always had a special fascination for Americans. As a result,

other scientific propositions, should be regarded as propositions to be tested (Hill and Evans 1972). As a result, there was a renewed emphasis on formal systematics, exemplified especially in the work of David Clarke (1968, 187-229), Robert Dunnell (1971), and Dwight Read (1974).

The renewed emphasis on formality and rigor led to an important methodological innovation: the use of statistics and the definition of types by attribute clustering rather than by object clustering (Spaulding 1953). The archaeologists' traditional procedure of partitioning a body of collected material into types through visual inspection and the observation of similarities was now thought to be too intuitive. Instead, a list was to be made of all the attributes of size, shape, color, and so on that were exhibited by all the objects in a collection individually. Types were then to be defined by clusters of attributes that occurred together with a frequency greater than chance, as revealed through the use of accepted statistical measures. Such a procedure would, in theory, result in "finding the joints in nature" and would eliminate all subjective judgment and all historical interpretation from the process of classification. The attribute-clustering approach carne to be known as "agglomerative" in contrast to the older method of partitioning, which was called "divisive."

In the beginning, the major difficulty in statistically based classification lay in the enormous number of separate calculations that had to be made in order to determine the randomness or nonrandomness of a nearly infinite number of attribute combinations. That difficulty was overcome in the 1970s, however, through the use of computers. There followed a decade of experimentation with computerized systems of classification, which, it was hoped, would finally achieve the elusive goal of automatic classification (see especially Whallon and Brown 1982). Before long, the search for automatic and absolutely "natural" classification became an end in itself, rather than a means to an end, and as such it considerably outlived the new archaeology paradigm that had given it birth.

It was eventually realized, however, that the goal of automatic classification was not practically attainable. The coding of more and more variables simply resulted in the generation of more and more types; far more than were useful for any practical purpose. Indeed, the ultimate logical outcome of computerized classification was a series of classifications in which every object constituted a separate type. In the end, there was a general, though not universal, acknowledgment that types that were not produced for any specific purpose were also not useful for any specific purpose.

As a result there has been, since the early 1980s, a considerable loss of faith in the possibilities of computerized classification and, with it, a loss of interest in the subject of classification in general. The postmodern fashion of the 1990s represented in many ways a reversion to the perspective of the 1940s, once again condemning formal typological constructs precisely because they had been made to serve the archaeologists' own purposes.

The successive changes of direction and of interest that have taken place since 1940 have resulted in far more theoretical and programmatic literature than actual, in-use classifications. The concern of most authors has been to propose new methods of classification rather than to develop actual classifications based on those methods. Insofar as the new methods have been put to practical use, it has been almost entirely at the level of individual assemblages. There has been, as a result, a proliferation of ad hoc classifications, each archaeologist developing his or her own system as a way of dealing with, and publishing, his or her own finds. For the most part, these individual systems have not proved capable of generative use and have not passed into what might be called the public domain. The archaeological type concepts and typological systems that remain in general, region-wide use are still very largely those that were developed, chiefly for the instrumentalist purpose of culture classification, more than half a century ago.

Other Archaeological Classifications

Although the vast majority of archaeological classifications are concerned either with cultures or with artifacts, there are also classifications

of house and building types, of burial types, of petroglyph and pictograph types, and of artistic styles. Some of these classifications, like some of the artifact classifications, predate the beginnings of scientific archaeology. As far back as the 1750s, william stukeley devised a classification of British earth mounds and megalithic monuments. A generation later, richard colt hoare and william cunnington proposed a fivefold classification of English barrow types. In North America, antiquaries caleb atwater in 1820 and Squier and Davis in 1848 proposed classifications of earth mound types.

The classification of houses and of burials has always gone hand in hand with culture classification, much as did the classification of artifacts before the 1930s. Indeed, the various monument types designated by Stukeley, Colt and Cunnington, and Atwater were initially regarded as the primary diagnostics for the recognition of different cultural periods. Later, house types took their place along with pottery and projectile points as defining characteristics of the various Neolithic cultures of the Old World, as well as of prehistoric American cultures. The importance of house types in culture classification is particularly evident in the U.S. Southwest, where each of the major cultures (Anasazi, Hohokam, Mogollon, and Hakatayan) is characterized by its own distinctive form of dwelling, as are the different developmental phases in some of the cultures. Burial types on the other hand have played an especially important role in defining the early cultures of the Nile Valley, where evidence of housing is largely lacking. In nubia, at the beginning of the twentieth century, george a. reisner recognized and differentiated a whole succession of previously unfamiliar ancient cultures on the basis of burial types alone (Reisner 1909).

Unlike artifact classifications, the classifications of house types and burial types have never really been decoupled from the larger objective of culture classification. Although prehistoric dwellings have been extensively studied from the standpoint of function and of ecology, their formal partitioning into types still serves mainly for the identification of cultures and of horizons. The case is somewhat different, however, in the classification of petroglyphs and pictographs, since many of these cannot be associated with specific peoples or time horizons. Classifications of rock art therefore tend to be more strictly formal and essentialist, based strictly on the exhibited characteristics of the drawings. There is not, however, any one generally accepted classification, or system of classification, of rock art. Every region has its own scheme based on its own distinctive body of material.

Theory versus Practice: The Typological Debate

As long as the basic aim in artifact classification was to define cultures and sequences, the actual procedures involved in the classification were generally regarded as nonproblematical. Artifact types were accepted or rejected on the grounds of their recognizability and their utility or nonutility for the reconstruction of culture history, and the question of their objective reality or meaningfulness to their makers did not arise. Debate often occurred over the legitimacy or the utility of individual types, but it did not touch upon the general methods or the purposes of classification itself.

However, the major shifts of interest that occurred after 1940 gave rise not only to new approaches to classification but also to an extensive and often heated dialogue about the nature and the meaning of classification itself. In one form or another, this discussion persists down to the present day, particularly in North America, where it has been given the name, “the typological debate.” The accumulated body of theoretical and programmatic literature is enormous, yet it bears surprisingly little relationship to what goes on in the practical domain, and it must therefore be discussed independent of actual field practice.

The most fundamental issue that has been debated concerns the “naturalness” or “artificiality” of types, which was raised initially in the context of the “functional revolution” in the 1940s but in one guise or another continues to be debated down to the present day. There is general agreement that “artificial” (i.e., instrumentalist) types can be created that are useful

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Claustra Alpium Iuliarum

Claustra Alpium Iuliarum is a late Roman defensive system in western slovenia, northwestern Croatia, and northeastern italy. The term *Claustra Alpium Iuliarum* was first found in the texts of the Roman officer and historian Ammianus Marcelinus, who wrote in the fourth century a.d., and it was frequently used by many other ancient writers. The name Julian Alps was used in ancient times for the mountainous ridge extending from the Gail River valley (Carynthia in southern Austria) in the north to the mountain of Ucka (Istria in northwestern Croatia) in the south. Today, the name Claustra Alpium Iuliarum is normally applied to the remains of partially explored walls and fortifications in this region.

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When constructing the defensive system, the Romans took advantage of the difficult terrain between the Roman towns of Tarsatica (Rijeka in northwestern Croatia), Tergeste (Trieste in northeastern Italy), Emona (Ljubljana in central Slovenia), and Forum Iulii (Cividale in northeastern Italy). The defensive system aimed at controlling all land routes and passages from the Balkans to Italy, and it consisted of a series of barrier walls in valleys and signal towers, small fortifications, and *castella,* or forts, which were built using prehistoric and early Roman constructions. As an organized military system, it belongs to the third and fourth century a.d., but some parts were used later as well.

Bojan Djuric

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Colombia

Among the most important sources for modern Colombian archaeologists are the writings of the Spanish conquistadores. The documents left by these soldiers, priests, administrators, and specially appointed chroniclers of the Indies of the sixteenth and seventeenth centuries are used in various ways: to complement the later periods of local or regional archaeological sequences, as a tool for interpreting the function or significance of archaeological sites or aspects of culture, and, finally, in conjunction with twentieth-century ethnographic studies used to build evolutionary type classifications of cultures. Perhaps that is why the sixteenth century is taken as a starting point by some of the authors who have dealt at length with the history of the discipline (Duque 1965, 1967, 1970; Burcher 1985; Londoño 1989; Uribe 1979; Jaramillo 1994). The works of these authors are the main sources for this entry.

A number of the sixteenth- and seventeenth-century writers-the priest Juan de Castellanos in his *Elegies of Illustrious Men of the Indies,* Friar Pedro Simón in his *Historical Notices of the Conquests of Terra Firme in the West Indies,* and Lucas Fernández de Piedrahita, author of the *General History of the New Kingdom of Granada*-had antiquarian interests. Their writings included discussions of the peopling of the new continent and of related factors such as changes in sea level. The importance of their work, however, is somewhat diluted by the unavoidable biblical frame of reference, for some of them were convinced that American Indians were the descendants of the Lost Tribes of Israel. (Unless otherwise stated, Spanish is the original language of the publications and journals mentioned in this entry; full bibliographical details can be found in Bernal [1970], Enciso and Therrien [1996], and Bermeo [1990]).

The systematic looting of Indian tombs was one way in which the Spaniards obtained the gold that they coveted and that was the driving force behind the conquest. Means of recognizing tombs by marks on the surface and ways of distinguishing rich graves from poorer ones were frequently described; in his *Historical Compilation,* for example, Friar Pedro de Aguado described the rich tombs of the lower Sinú River basin as well as those of the Muisca area, in the upland plateau of the Eastern Cordillera (a mountain range).

Early on, the Spanish crown issued laws to ensure its share of the profits from the looting of shrines and tombs, and lawsuits and quarrels between crown and church over the possession of gold idols obtained in these places were not infrequent. Regrettably tomb looters remained a step ahead of antiquaries and later archaeologists during the centuries that followed. This was the case with San Agustín in the upper reaches of the Magdalena River, the country's most famous archaeological region, through which the Spaniards passed in the sixteenth century. At that point monolithic sculpture was already a feature of the

past, and the statues, within artificial mounds, were not visible. By the eighteenth century, when Friar Juan de Santa Gertrudis visited the region, looting had started. His *Marvels of Nature* was the first written account of the region, although he described monuments as images of Catholic religious dignitaries "sculpted by the devil." He traveled extensively in the southwestern part of New Granada (as the country was known by that time) and wrote about the ancient burials of various parts of it.

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Colonial Williamsburg

See Williamsburg

Colt Hoare, Sir Richard

(1758-1838)

Born into an aristocratic banking family, Colt Hoare was financially independent and thus able to pursue a career of leisure. After the premature death of his wife he assuaged his grief by traveling around Europe for two years, a journey that stimulated his interest in monuments and antiquities. He returned to Britain to become Baron Hoare in 1787, then continued his European travels, visiting archaeological sites and drawing them for the next three years, until the French Revolution made it impossible to remain on the continent.

It was this impasse that caused him to visit Wales, England, and Ireland, drawing the monuments of his own country. Between 1812 and 1821 he illustrated and published the two-volume *Ancient History of North and South Wiltshire* and the *History of Ancient Wiltshire.* These contained accounts of Stonehenge and avebury, of Roman roads and sites, and of hundreds of barrows that he had explored with his protégé william cunnington. These books can be seen as the first attempts at recording the archaeology of a particular region.

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Colt Hoare saw himself as a historian, with his arguments based on facts and not on speculation, as were those of william stukeley. He was one of the first of the new generation of Romantic aristocratic gentlemen who were travelers, adventurers, artists, and journalist-writer-historians who were also keen barrow diggers. Such antiquaries featured strongly in the pursuit of the understanding of the past during last years of the eighteenth and the early nineteenth centuries, their position both chronologically and ideologically somewhere in between the antiquarians of the Enlightenment, and the professional archaeologists of the mid-nineteenth century.

Tim Murray

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Britain, Prehistoric Archaeology

Computer Applications in Archaeology

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this trend, for example, the annual Computer Applications and Quantitative Methods in Archaeology Conference, which, after more than twenty-five years, attracts a growing number of archaeologists from around the world.

This trend has been characterized as a step forward to the ultimate full-fledged embracing of IT by archaeologists. In an evolutionary scheme akin to the Danish archaeologist c. j. thomsen's three-age system, the evolution of computer applications in archaeology can be considered as follows: the 1960s were the age of exploration; the 1970s, the age of implementation; the 1980s, the age of exploitation; and the 1990s, the age of information.

Quantitative Applications

In the 1960s, the age of exploration, statistics represented the main practical application of computers to archaeology. The facts that the statistical packages used were developed for mainframe computers and that archaeologists interested in this type of analysis had to have certain knowledge of the programming languages limited the generalized adoption of computers to a certain extent. Nevertheless, toward the second half of the 1970s, there was a noticeable shift in how archaeologists approached their data.

Archaeologists became aware of the need to present and analyze their data in a numerical form, and this shift was fostered by the development of radiocarbon dating, on the one hand, and the development of easier programming languages-e.g., Fortran-on the other. Although statistical applications experienced a decline in the mid-1980s, perhaps as a reaction against the alleged scientism of processual archaeology on the part of postprocessual archaeologists, the development of commercial statistical packages for the personal computer (PC), along with the impact of multivariate statistics, provoked a resurgence of this approach in the 1990s. Overall, it can be said that statistics has remained a favored computer-based application in archaeology throughout time.

Equally favored since the 1970s has been the use of computers in database management. Originally designed to keep museum and site inventories on mainframe computers, the development of PC-based programs (e.g., Dbase, Access) has sparked interest in this application. Currently, the development of metadata (i.e., data that documents information about datasets while allowing the expedient transfer and sharing of data between users) has opened the possibility of having access to the enormous resources contained in museum collections and site reports from other research institutions.

Artificial Intelligence and Expert Systems

The 1980s witnessed the emergence of what was presaged as being a revolutionary approach to archaeological problem solving: artificial intelligence (AI) and expert systems. Simply described, AI is a system by which computers are programmed to process data following a rationale similar to that of the human brain. In other words, the goal was to teach computers how to “think” like people. An outcome of AI was the development of expert systems, or programs that can replicate the combined knowledge of human experts addressing a specific problem in order to solve it. By mimicking the advice-giving capabilities of human experts, expert systems can offer intelligent advice or make an intelligent decision about how to solve a problem.

The proponents of this new methodology believed the multidisciplinary nature of the archaeological issues provided the ideal environment in which expert systems could thrive. However, despite the initial clamor and success stories in other disciplines, expert systems have not been fully embraced by archaeologists. Its critics argued that despite the expedient access to expert knowledge that expert systems offered, their main drawback lay in their limited or nonexistent ability to reproduce the uniquely human capabilities of common sense, creativity, and learning. Furthermore, some archaeologists

expressed concern that an overreliance on expert systems could be detrimental to the development of archaeological theory.

Attempts to overcome some of the limitations were undertaken, but apparently the momentum was lost. Expert systems gained a moderate level of popularity in archaeology toward the latter part of the 1980s but eventually lost favor and have been practically abandoned,

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although this by no means implies that they are completely defunct, and it would not be surprising to see them reemerge.

Computer Graphics

It is apparent that the increasingly accessible prices of hardware and the development of more user-friendly software have greatly promoted the use of computers by archaeologists to address all sorts of issues. It is owing to this availability that we have witnessed a dramatic adoption in the application of computer graphics and virtual reality (VR) techniques for the display and analysis of archaeological data. Computers have long offered obvious advantages to archaeological documentation in the recording of excavation plans, artifact illustration, and the processing and presentation of results from scientific analysis, and these advantages are augmented by the ability to apply computer-generated graphics in reconstructive models of archaeological sites and structures. In this field, VR has had a considerable impact on how archaeological data is displayed.

Reconstruction of a man's face from the skull using digital technology

(Gamma)

The basic components of VR have been developed since the early 1960s, but the limitations of the available hardware at that time made its use prohibitive, except for those institutions that could afford it, like the military. Nonetheless, the ongoing developments of computer technology and decreasing prices have allowed a more widespread access to this technique. However, the embracement of VR has not been an easy process. The complexity of the graphics needed to reproduce the real world hindered its full acceptance for some time. The first attempts at VR renderings ended up being a disappointing imitation of reality, and the initial hype it created soon simmered down. As a response to this early rejection, current VR systems are more likely to attempt to “simulate” rather than imitate reality, which means that VR graphics will represent models of reality, not reality itself. There is a qualitative difference in this conception since simulated objects are ideal mathematical constructs that are displayed outside reality; consequently, the need for fully immersive systems is removed.

Another initial problem of VR graphics was that performance was dependent on the type of computer platform being used and the level of technical expertise of the user. To cope with these limitations, more-accessible programming languages have been developed since the mid 1990s-such as Virtual Reality Modeling Language (VRML) and Quick Time Virtual Reality (QTVR)-which are intended to become the standard languages for interactive simulations on the worldwide web.

Despite the simplification of the programming language, the production of computer-generated graphics is still a complex process comprising two stages: the modeling and the rendering. In the former, the geometric characteristics of the objects to be created are specified. In the latter, the model created is converted into pictures of the objects, which are then displayed from different perspectives. Simple objects can be created using “primitives,” simple predefined geometric shapes, e.g., cubes, spheres, cones, and cylinders. More-complex objects like landscapes or complex buildings cannot be properly modeled with primitives, and in these cases, the simplest building block used is a face of a polygon, and thousands of individual faces may be required.

The results thus obtained can indeed be impressive,

but the ongoing issue is whether archaeologists using this technology are merely obtaining pretty pictures or whether these graphic renderings will be of any assistance in the process of deriving better interpretations of the data. That computer-generated graphics can offer much more to archaeology than just pretty pictures is a position that has been adopted by various enthusiasts of these techniques. The insight that can be gained in terms of the social and political relationships reflected in the use of space, and even the construction of detailed models of the actual excavation process of archaeological sites for educational and analytical purposes, have been highlighted as obvious advantages.

What is immediately apparent is that computer graphics can increase public attention with regard to archaeology. The models represent a powerful and persuasive means of conveying to a much wider public the ideas and interpretations that the archaeologist distills from the data. For museums, computer graphics offer the possibility to enhance the way in which collections are presented to the public, for computer-generated graphics can allow the visitor to view the site from various perspectives-a bird's-eye view, walk around it, walk inside it-and thus obtain a more comprehensive impression of how the site may have been seen by its original users. Equally important, three-dimensional documentation of heritage structures can offer great advantages for the referencing and archiving undertaken by government agencies in charge of managing cultural resources.

Computers and Archaeological Knowledge

Although the creation of impressive images and the expeditious and effective manipulation of huge databases are without doubt of great appeal, archaeologists who embrace this technology should proceed with caution. They have to be aware that the sophisticated presentation of data may blind the uncritical eye to the fact that only a minuscule part of the whole may have been captured-and that it may represent our own subjective perception of that reality.

The very nature of the interpretative illustrations of archaeological sites and monuments generated by computer graphics has sparked an increasing amount of discussion. These discussions have centered mainly on the implicit assumption that the images are an all-inclusive, accurate interpretation of the past while, in fact, they may lack a rigorous scientific basis and perhaps represent more of the artist's impression.

It is undeniable that information technology is making groundbreaking contributions to archaeology, but it is not known how exactly this “new” technology impacts archaeological theory and what the consequences will be in terms of production and the dissemination of knowledge. Since the first incorporation of the computer as an analytical tool, in the midst of the paradigmatic shift that the processual archaeology was generating, there was an awareness on the part of some people of the growing need to have dual and simultaneous advances in method and theory.

The relationship between technological development and theory development is akin to what has been identified by some scholars as the interaction between tools and problems. Archaeologists now have access to a revolutionary tool that can handle enormous quantities of data, the computer, but tools can acquire a life of their own, computers in the information age may even come to dominate an entire period of thought. Throughout the history of science we see instances in which the solution to specific problems was delayed by the lack of appropriate tools to address the relevant issues. On the other hand, the availability of certain tools has allowed us to perceive problems, and formulate questions, that otherwise might have remained unidentified. This improved perception can lead to the formulation of new questions that may have a considerable impact on the development of our theoretical underpinnings.

The challenge of this age of information according to its proponents is the “democratization” of

knowledge. In other words, not only will the information age facilitate communication among scholars, but it is hoped that it will actually promote international cooperation in archaeological issues.

The democratization of knowledge is an issue that looms large in the minds of those archaeologists who are fully engaged in bringing archaeology up to speed in the information age. It has

been noted that since its insertion in the social sciences in the nineteenth century, archaeology has been part of a paternalistic civilizing process. In this sense, the Internet offers the great possibility of radical changes in the hierarchical structure of archaeological knowledge. In the view of these specialists, the growing accessibility to the Internet poses new possibilities in the dissemination and creation of new knowledge, thus making it more difficult for the academy (those professionals inside of universities) to have exclusive control of it.

Armando Anaya Hernández

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Costa Rica and Nicaragua

In her history of Central American archaeology, doris stone observed that "early archaeology in lower Central America was primarily a part of exploration; sites and surface finds were discovered and described by observant travellers, engineers (and) art historians" (1984, 13). It is true that in the earlier days of exploration and initial investigation-the early and mid-twentieth century-Central American archaeologists were widely traveled and conversant with the prehistoric sites and artifacts of more than one, and frequently all, of the Central American countries. For example, Harvard archaeologist Samuel Lothrop worked in guatemala, el salvador, Nicaragua, Costa Rica, and panama, and one of his final publications was a synthesis of lower Central America. Harvard ethnologist Herbert Spinden worked in El Salvador and mexico, but also wrote extensively about Costa Rica and Nicaragua. Harvard student Doris Stone worked in Costa Rica and Honduras, but has also published widely about the prehistory of other countries in the isthmus.

Of present-day researchers, perhaps only Payson Sheets, who excavated in Panama, Costa Rica, and El Salvador and conducted survey activities in Nicaragua, or Ronald L. Bishop, who conducted extensive analytical programs with jade and ceramic data from Panama, Costa Rica, Nicaragua, Honduras, El Salvador, and Guatemala, approach this breadth of coverage.

Beginning in the early twentieth century, regional syntheses included Costa Rica and Nicaragua (*see* Joyce 1916; Spinden 1917; Lothrop 1966; Baudez 1970; Willey 1971; Stone 1972, 1977; Ferrero 1977). Joyce's synthesis was based on museum collections, while Lothrop, Baudez, gordon willey, Stone, and Ferrero reflected the gradual growth of the archaeological database; their regional syntheses became increasingly data-based through time.

A number of summary volumes on research in the area have appeared since 1980 (*see* Lange and Stone 1984; Lange 1984; Lange, Sheets, Martinez, and Abel-Vidor 1992; Lange 1992; Graham 1993). In addition to regional overviews, the publications have more complete bibliographic resources for Costa Rican and Nicaraguan archaeology. An annotated bibliography of Central American archaeology and pre-Columbian art is in preparation.

Improved transportation and logistical conditions, as well as changes in archaeological paradigms,

methodologies, and analytical possibilities, have affected Nicaraguan and Costa Rican archaeology, just as they have elsewhere. Where entire regions were once available only by horse, mule, on foot, or by dug-out canoe, there are now paved roads. Expanding populations and new communities provide communications and other support in what were once vast empty spaces. Where the dating of ceramic types, or entire sites, was once dependent on cross-association with the better-studied adjacent areas on the southern and eastern frontier of the Maya lowlands, radiocarbon dating has provided a firm chronological basis.

This entry places the history of Costa Rican and Nicaraguan archaeology within the broad outlines established for American archaeology (Willey and Sabloff 1993). However, archaeologists who are nationals of Central American

countries often see the development of Latin American archaeology as having its roots in the intellectual history of that region. As Fonseca (1992, 13-15) noted (translation mine):

The archaeological tradition that has most influenced Latin America, and therefore Costa Rica, is that of North America.... [A]s inheritors of European ethnocentrism, the colonizers of North America reserved the concept of history to the study of their own origins, and the related origins of those peoples who influenced the development of their culture (in this case Native Americans).… The history of archaeology has acquired different characteristics from country to country, and from region to region. In Costa Rica, archaeologists recently began to explain our ancient history.

This tendency to identify with "our" native ancestors, and to see their remains as the roots of the national heritage, persists even though the Spanish eliminated as much as 95 percent of the indigenous population.

Furthermore, the contrasting histories of the national political systems in Nicaragua and Costa Rica have greatly impacted the development of archaeology. With longer-term stability in the university and museum systems (reflecting stability in the broader political, social, economic, and cultural dimensions of society) Costa Rica has a larger and more mature corps of archaeologists (and auxiliary museum and collaborative specialists such as botanists, chemists, etc.) than does Nicaragua.

Nicaragua

Archaeologically, this is by far the least known of the Central American republics. While there was a great deal of nineteenth century interest, and detailed summaries (Lange et al. 1992; Arellano 1993) have been written, Nicaragua is still little known, particularly in the north and east (see map).

Central American Archaeological Survey Areas

The Non-Scientific/Speculative Period, 1492-1840

Numerous early accounts by Spanish chroniclers contain limited descriptions of gold- working, settlement patterns, subsistence practices, and religious activities. These reports were utilized by late-nineteenth and early-twentieth-century researchers to speculate about external cultural contacts and influences, which were presumed to have been primarily Mesoamerican. These same data, and more recent historical overviews and secondary sources (*see* Radell 1969; MacCloed 1973; Newson 1987; Incer 1990) are being utilized by contemporary researchers to test models of social organization, to supplement archaeological data in the development of cultural-historical sequences, and to define patterns of localized development and regional interaction.

Scientific Research, 1840-Present

Classificatory and Descriptive Period, 1840-1914.

Ephraim G. Squier, who had been educated as an engineer, was the United States charge d'affaires to the republics of Central America during the mid-nineteenth century. He published (1852) still-important baseline data on the stone statuary and petroglyphs of Isla Zapatera and other islands in Lake Nicaragua.

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The archaeological tradition that has most influenced Latin America, and therefore Costa Rica, is that of North America.... [A]s inheritors of European ethnocentrism, the colonizers of North America reserved the concept of history to the study of their own origins, and the related origins of those peoples who influenced the development of their culture (in this case Native Americans).… The history of archaeology has acquired different characteristics from country to country, and from region to region. In Costa Rica, archaeologists recently began to explain our ancient history.

This tendency to identify with "our" native ancestors, and to see their remains as the roots of the national heritage, persists even though the Spanish eliminated as much as 95 percent of the indigenous population.

Furthermore, the contrasting histories of the national political systems in Nicaragua and Costa Rica have greatly impacted the development of archaeology. With longer-term stability in the university and museum systems (reflecting stability in the broader political, social, economic, and cultural dimensions of society) Costa Rica has a larger and more mature corps of archaeologists (and auxiliary museum and collaborative specialists such as botanists, chemists, etc.) than does Nicaragua.

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Archaeologically, this is by far the least known of the Central American republics. While there was a great deal of nineteenth century interest, and detailed summaries (Lange et al. 1992; Arellano 1993) have been written, Nicaragua is still little known, particularly in the north and east (see map).

Central American Archaeological Survey Areas

The Non-Scientific/Speculative Period, 1492-1840

Numerous early accounts by Spanish chroniclers contain limited descriptions of gold- working, settlement patterns, subsistence practices, and religious activities. These reports were utilized by late-nineteenth and early-twentieth-century researchers to speculate about external cultural contacts and influences, which were presumed to have been primarily Mesoamerican. These same data, and more recent historical overviews and secondary sources (*see* Radell 1969; MacCloed 1973; Newson 1987; Incer 1990) are being utilized by contemporary researchers to test models of social organization, to supplement archaeological data in the development of cultural-historical sequences, and to define patterns of localized development and regional interaction.

Scientific Research, 1840-Present

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As Doris Stone (1984, 17) noted: “Spinden… broadened Lehmann's concept of the archaeological culture center to include three provinces of lower Central America (a) northern Honduras east of La Ceiba and eastern Nicaragua north of Rivas and west of the forest zone; (b) southern Nicaragua; and (c) northern Costa Rica, subdivided into six sections.” While based on linguistic data that were not universally accepted at the time, Spinden's model was the first careful attempt to divide prehistoric Nicaragua and Costa Rica into cultural/geographical areas.

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In the development of Nicaraguan archaeology, the concerns with context and function of the preceding period were combined with the first efforts at explanation. In addition to their chronology building efforts, Haberland and Schmidt also contributed to the explanation of certain aspects of the archaeological record including shamanism and specialized site use, such as the Concepcion volcano site, El Respiradero.

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Lydia Wyckoff continued chronology building on the Pacific Coast, while Richard Magnus initiated the first survey and stratigraphic testing on the Atlantic watershed and produced the first chronological sequence for that region. He also searched for data to explain coastal adaptation and to interpret possible connections with other cultural areas. Magnus was instrumental in bringing Nicaraguan nationals such as Silvia Montealegre Osorio, Anibal Martinez, and Franzella Wilson into active participation in archaeological research. In 1973 and 1974, Neil Hughes salvaged mortuary remains and related ceramic and ecological data from a sewer installation in downtown Managua.

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Healy (1980) analyzed part of the collections from Willey and Norweb's efforts and significantly refined the typology and sequence from the Rivas area of Nicaragua. Nonetheless, the gap between the time of excavation and the time of analysis and publication clearly transcends the era of emphasis on chronological sequence and local/regional cultural histories and the era of more expansive, if somewhat less precise, model building and systematic explanation.

The first intensive effort to train Nicaraguan nationals in archaeology occurred during the first years of the revolutionary Sandinista government (1979-1985). Most of the archaeologists currently working for the National Museum of Nicaragua received their first opportunities during this era. Various rescue projects were conducted at different sites, primarily on the Pacific Coast by Rigoberto Navarro, Anibal Martinez, Edgar Espinoza, Ronaldo Salgado, Rafael Gonzalez, and Jorge Zambrana. The initial development of a national park system also provided brief protection for important sites such as Isla el Muerto, Isla Zapatera, and Isla Ometepe in Lake Nicaragua. A group from the Milwaukee Public Museum recorded the important petroglpyhs from Isla el Muerto. Much of this research was motivated by the interest and dedication of Amelia Barahona, then director of cultural patrimony.

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Mission under the auspices of CEMCA (Centre d' Études Mexicaines et Centramericaines), headquartered in Mexico City. Beginning in 1984, Dominique Rigat and Franck Gorin worked first in the Chontales area east of Lake Nicaragua, and later in the Lake Managua basin in the north central part of the country. These projects contributed to the goal of a national inventory of archaeological sites that is being supported by the Organization of American States, and in Chontales they recovered stone statuary from a dateable context. The research also contributed significantly to our understanding of differences in regional settlement patterns, and in the distribution of imported obsidian, locally available lithic materials, southern Mesoamerican ceramics, and Greater Nicoya ceramics.

Navarro (1993) and Espinosa (1993) have provided brief reviews of some of the projects from the 1980s and the early 1990s.

Recent Developments, 1990s.

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Silvia Salgado, a Costa Rican graduate student at SUNY-Albany, obtained dissertation funding from the National Science Foundation to initiate a project at the Ayala site, near Granada. While she was also able to refine the early part of the regional sequence, her main emphasis was on site hierarchies and internal site organization. She also recovered southern Honduran ceramics that further blurred the poorly defined boundaries between the northern edge of “Greater Nicoya” and the southern “frontier” of Mesoamerica.

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None of the universities in Nicaragua currently offers a degree in archaeology and there are no university-employed archaeologists. The National Museum of Nicaragua employs four archaeologists, all of whom have been trained “on the job” working with foreign archaeological projects; none of the four has a degree in anthropology/archaeology. Of similar concern is the lack of a national archaeological journal (such as *Vinculos,* published by the National Museum of Costa Rica) to provide a local outlet in Spanish of Nicaraguan research, and to educate the government and the public about the importance of protecting and studying the nation's cultural heritage. Despite this somewhat gloomy reality some progress is being made by dedicated archaeologists, working under difficult circumstances.

Costa Rica

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been completed in Costa Rica. Various authors (*see* Arias 1982; Corrales 1987; Fonseca 1992) have examined the development of archaeology in Costa Rica, and in this section their approaches are merged with the Willey and Sabloff framework. For example, Arias (1982, 4; translation mine) observed that:

Mission under the auspices of CEMCA (Centre d' Études Mexicaines et Centramericaines), headquartered in Mexico City. Beginning in 1984, Dominique Rigat and Franck Gorin worked first in the Chontales area east of Lake Nicaragua, and later in the Lake Managua basin in the north central part of the country. These projects contributed to the goal of a national inventory of archaeological sites that is being supported by the Organization of American States, and in Chontales they recovered stone statuary from a dateable context. The research also contributed significantly to our understanding of differences in regional settlement patterns, and in the distribution of imported obsidian, locally available lithic materials, southern Mesoamerican ceramics, and Greater Nicoya ceramics.

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Beginning of the Explanatory Period, 1960s.

Arias (1982, 4) described Kennedy's developed sequence for the Reventazon Valley and Aguilar's sequence for the Guayabo de Turrialba region as the beginnings of the concern with chronology. Matthew W. Stirling also contributed important chronological information to our knowledge of the Atlantic watershed.

In 1969, Lange conducted research in northwestern Costa Rica and broadened the application of the Coe and Baudez chronological sequence. Assuming more of a cultural and ecological approach, he focused on relationships of riverine and coastal adaptation and challenged the long-held assumption that there had been strong Mesoamerican influence in this region.

Explanatory Period: New Data and Interpretations, 1960s and 1970s.

Fonseca (1992, 15) designated the period between 1960 and 1975 a “Period of Descriptive Chronology,” an accurate representation of local developments in Costa Rica. He also observed (1992, 16) that this was the period in which the diachronic concept of cultures and societies was finally accepted. At the same time Aguilar and Snarskis developed chronological sequences for the Central Valley and Atlantic watershed, and Sweeney completed analysis of some of Coe's earlier work in northwestern Costa Rica. All of these efforts resulted in there being at least a broad chronological framework for the entire country.

Explanatory Period: Continuing Methodological and Theoretical Innovations, 1970s-1980s.

Arias (1992, 5) classified this explanatory period as still part of the process of consolidation and as principally characterized by the concern for the explanation of sociocultural processes, with an emphasis on human ecology. Citing Binford, Arias commented that regional studies were the most appropriate means of studying social processes and cultural change, while also noting that it was necessary to continue to develop chronological sequences as an aspect of, but not the principal objective of, research. She also noted the important transition from speculating about to explaining Costa Rica's past. This transition still largely remains uninitiated, and local newspapers still give credence to wildly speculative explanations about particular sites and cultural historical relationships.

For Fonseca (1992, 15) this was the “Period of Diachronic Explanatory Models.” Inspired by the administration of Costa Rican President Daniel Oduber (1974-1978) and National Museum of Costa Rica director Luis Diego Gomez, the first two major site surveys and hypothesis testing projects were initiated. The Bay of Culebra project focused on the development of coastal adaptation in northwestern Costa Rica, and the Guanacaste-San Carlos Project was designed to study the relationships between the Pacific and Atlantic watersheds. Michael J. Snarskis continued with testing and mapping numerous large architectural sites on the Atlantic.

Hector Gamboa was head of the department of anthropology and history at the National Museum of Costa Rica during this period. His understanding of Costa Rican prehistory and his great diplomatic skills, which helped to blend the interests of foreign and national researchers, were essential to the growth in research in Costa Rica during this time.

Oscar Fonseca obtained his M.A. in anthropology from the University of Pittsburgh in 1977 and returned to Costa Rica to assume a pivotal role in the further development of the anthropology and archaeology teaching program at the University of Costa Rica. The University of Costa Rica also began

an intensive reevaluation of the site of Guayabo de Turrialba, and used this to support the field training of a whole generation of young Costa Rican students. During this time, Oscar Fonseca, Luis Hurtado de Mendoza, Michael Snarskis, and to a lesser extent Lange supported a significant increase in archaeological training at the university. Unfortunately, the number of available jobs quickly was outpaced by the number of students graduating from the university. Costa Rica has been slow to see the advantages of adding archaeologists to the staffs of the Ministry of Tourism, the National Park Service, the Ministry of Housing, and the like.

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Arias (1992, 5) classified this explanatory period as still part of the process of consolidation and as principally characterized by the concern for the explanation of sociocultural processes, with an emphasis on human ecology. Citing Binford, Arias commented that regional studies were the most appropriate means of studying social processes and cultural change, while also noting that it was necessary to continue to develop chronological sequences as an aspect of, but not the principal objective of, research. She also noted the important transition from speculating about to explaining Costa Rica's past. This transition still largely remains uninitiated, and local newspapers still give credence to wildly speculative explanations about particular sites and cultural historical relationships.

For Fonseca (1992, 15) this was the “Period of Diachronic Explanatory Models.” Inspired by the administration of Costa Rican President Daniel Oduber (1974-1978) and National Museum of Costa Rica director Luis Diego Gomez, the first two major site surveys and hypothesis testing projects were initiated. The Bay of Culebra project focused on the development of coastal adaptation in northwestern Costa Rica, and the Guanacaste-San Carlos Project was designed to study the relationships between the Pacific and Atlantic watersheds. Michael J. Snarskis continued with testing and mapping numerous large architectural sites on the Atlantic.

Hector Gamboa was head of the department of anthropology and history at the National Museum of Costa Rica during this period. His understanding of Costa Rican prehistory and his great diplomatic skills, which helped to blend the interests of foreign and national researchers, were essential to the growth in research in Costa Rica during this time.

Oscar Fonseca obtained his M.A. in anthropology from the University of Pittsburgh in 1977 and returned to Costa Rica to assume a pivotal role in the further development of the anthropology and archaeology teaching program at the University of Costa Rica. The University of Costa Rica also began

an intensive reevaluation of the site of Guayabo de Turrialba, and used this to support the field training of a whole generation of young Costa Rican students. During this time, Oscar Fonseca, Luis Hurtado de Mendoza, Michael Snarskis, and to a lesser extent Lange supported a significant increase in archaeological training at the university. Unfortunately, the number of available jobs quickly was outpaced by the number of students graduating from the university. Costa Rica has been slow to see the advantages of adding archaeologists to the staffs of the Ministry of Tourism, the National Park Service, the Ministry of Housing, and the like.

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chronological knowledge of southern Costa Rica, and the close and across-the-border relationship of this area to western Panama.

Beginning of the Explanatory Period, 1960s.

Arias (1982, 4) described Kennedy's developed sequence for the Reventazon Valley and Aguilar's sequence for the Guayabo de Turrialba region as the beginnings of the concern with chronology. Matthew W. Stirling also contributed important chronological information to our knowledge of the Atlantic watershed.

In 1969, Lange conducted research in northwestern Costa Rica and broadened the application of the Coe and Baudez chronological sequence. Assuming more of a cultural and ecological approach, he focused on relationships of riverine and coastal adaptation and challenged the long-held assumption that there had been strong Mesoamerican influence in this region.

Explanatory Period: New Data and Interpretations, 1960s and 1970s.

Fonseca (1992, 15) designated the period between 1960 and 1975 a “Period of Descriptive Chronology,” an accurate representation of local developments in Costa Rica. He also observed (1992, 16) that this was the period in which the diachronic concept of cultures and societies was finally accepted. At the same time Aguilar and Snarskis developed chronological sequences for the Central Valley and Atlantic watershed, and Sweeney completed analysis of some of Coe's earlier work in northwestern Costa Rica. All of these efforts resulted in there being at least a broad chronological framework for the entire country.

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In 1977, Costa Rican author Luis Ferrero published the first detailed summary of Costa Rican prehistory. In conjunction with the beginning of the publication of the journal *Vinculos* by the National Museum of Costa Rica in 1975, Ferrero's volume complemented the important function of placing essential data, in Spanish, about Costa Rican prehistory in the hands of Costa Rican students and public.

In the early 1980s Robert Drolet initiated the Boruca Dam-Rio Terraba project in southern Costa Rica, and research on the Bay of Culebra continued under a cooperative arrangement between the National Museum of Costa Rica and the University of California, Los Angeles. Payson Sheets initiated the Lake Arena project in the cordillera of Guanacaste and demonstrated the utility of applying remote sensing technology to Costa Rican archaeology. Winifred Creamer conducted an extensive survey and testing program on the Gulf of Nicoya.

The late 1970s and 1980s saw the definitive transition to vesting principal research responsibilities with Costa Rican archaeologists at the University of Costa Rica and at the National Museum of Costa Rica. Aida Blanco conducted research at the site of Ochomogo in the central highlands, and collaborated with Maritza Gutierrez and Silvia Salgado in the rescue archaeology of the Cenada market site in the metropolitan San Jose area. Magdalena Leon focused on the archaeology of the metropolitan area. Ricardo Vazquez conducted research at the central highland site of Agua Caliente. Sergio Chavez, Ana Cecilia Arias, Maureen Sanchez, Myrna Rojas, Carlos Valdesperras, and Floria Arrea conducted research at central valley sites. Francisco Corrales and Ifigenia Quintanilla developed long-term research in the Central Pacific region, and Olman Solis conducted microsettlement research at one of the sites in the area. Blanco and Juan Vicente Guerrero conducted extensive rescue operations at the La Ceiba in Guanacaste. Marlin Calvo, Leidy Bonilla, and Silvia Salgado mapped and tested a salt production site on the south shore of the Bay of Culebra.

Some of these projects were rescue oriented, while some were pure research in orientation (*see* Lange and Norr 1986). Corrales (1987) has discussed this transition in more detail. Of particular importance were the expansion of research efforts into the Central Pacific coastal region and greatly increased efforts in the Central Valley.

Recent Developments, 1990s.

The construction on the Bay of Culebra tourist project began, and research directed by Ellen Hardy was conducted under a contract between the Ministry of Tourism and the National Museum of Costa Rica. There were also signs that the long waiting Boruca Dam impoundment was under reconsideration. Jeffrey Quilter has continued Drolet's research in the Rio Grande de Terraba region, and Aida Blanco is both conducting research and directing a regional museum in the San Isidro region.

In addition, Ifigenia Quintanilla is developing a greatly expanded contextual database for one of Costa Rica's best known prehistoric enigmas, the stone balls of the Diquis region. The French team of Claude Baudez, Sophie Laligant, Natcha Borgnino, and Valerie Lauthel conducted stratigraphic research in the Diquis area that helped to refine the sequences developed by Lothrop and Haberland. John Hoopes has initiated long-term research in the Golfito area.

In an ongoing collaboration between rescue and academic archaeology, the National Museum is also involved in a massive salvage project in the area of the Cañas-Liberia irrigation project in the northwestern region. Research by University of Costa Rica archaeologists is largely restricted to the Central Valley, and the teaching program at the university has been weakened by the departure of some key professors and by a shift in emphasis by the social science division of the university. While not an archaeologist, Adolfo Constenla is making important linguistic contributions (1991) to our understanding

of the period immediately preceding the Spanish invasion.

The 1990s saw the first steps toward collaboration between the archaeologists of Costa Rica and Nicaragua. In 1993 they participated in a National Science Foundation-sponsored workshop to discuss the future of research in

Greater Nicoya and in the first training course for young archaeologists to be sponsored in Central America by the Organization of American States.

Conclusion

In this entry, Costa Rica and Nicaragua have been dealt with as two separate entities. In terms of the history of archaeology as it has been practiced in the two countries, this is perhaps the best method. However, in terms of reflecting the prehistory of the two countries, it creates artificial barriers. Nicaragua and Costa Rica share prehistoric cultural communalities along both the Pacific and Atlantic coasts, and Costa Rica has communalities with Panama in the south; Nicaragua with Honduras and El Salvador in the north.

These communalities were recognized by some of the more observant early explorers and archaeologists. These have more recently been concretely demonstrated by instrumental analyses of jade and ceramics conducted by Ronald L. Bishop of the Conservation Analytical Laboratory of the Smithsonian Institution, and obsidian analyses conducted by Fred Stross and Frank Asaro of the Lawrence Berkeley Laboratory at the University of California.

Not only in reviewing the history of Costa Rican and Nicaraguan archaeology but also in foreseeing its future we see the long-term need for balance between cultural and historical studies and the testing of systems and models. There are still vastly unknown areas of Central America (the Nicaraguan and Costa Rican segment of the map is reproduced on page 374) for which we still need the most basic cultural and historical data with which to formulate problems of broader and more general interest.

The history of Nicaraguan and Costa Rican archaeology began with the explorations of early travelers, developed with the assistance of foreign archaeologists, and is gradually becoming the primary responsibility of country nationals. The late 1970s and the early 1980s were a golden age for the development of national archaeology in both countries. In Costa Rica this momentum has been maintained, while in Nicaragua it has stalled temporarily.

Nicaragua and Costa Rica are on the verge of developing the basis for collaboration that is essential for regional studies and for approaching many of the cultural and historical problems that need to be researched. It is hoped that when the next history of the archaeology of these two countries is written, a heightened level of cooperation between the universities, museums, and professional communities will be one of the highlighted themes.

Frederick W. Lange

See also

Rouse, Irving

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Cotter, John L.

(1911-1999)

One of the pioneers in establishing historical archaeology in North America, John L. Cotter had an earlier career in prehistoric studies. As a graduate student, he helped excavate the famous Paleo-Indian site of Lindenmeier in Colorado (1934-1936) and the Clovis typesite at Blackwater Draw, New Mexico (1936-1937). After receiving his master's degree in anthropology from the University of Denver in 1935, he worked extensively in the southeastern United States, especially in Kentucky and along the Natchez Trace Parkway in Mississippi. Administratively, he also had experience in southwestern prehistory, serving during the 1940s as the National Park Service supervisor for the Tuzigoot National Monument in Arizona.

Cotter's primary contribution was helping to establish historical archaeology in North America. In 1953, he was assigned by the National Park Service to jamestown, virginia (the first permanent English settlement in America in 1607), and there he directed-with the help of Edward B. Jelks, Louis Caywood, Joel

Shiner, and Paul Hudson-three seasons (from 1954 to 1956) of extensive fieldwork. In 1958, this project and the earlier pioneering excavations on the site by j. c. harrington (1936- 1941) were described and published in Cotter's classic work, *Archaeological Excavations at Jamestown, Virginia.*

After working at Jamestown, Cotter returned to Philadelphia, where he had previously done graduate work at the University of Pennsylvania (1936-1937), and completed his doctorate in anthropology there in 1959. Although almost fifty years old, he set out to use the city and its institutions to build his newly adopted specialization. His primary employment was as the northeast regional archaeologist (1957-1970) for the National Park Service office in the city, but it was his secondary affiliations with the University of Pennsylvania and its University Museum that gave him a broader base for building American historical archaeology. Cotter worked in three different but equally constructive settings: as an educator, as an active field archaeologist, and as a professional organizer for the discipline.

In 1960, at the invitation of the new Department of American Civilization at the University of Pennsylvania, Cotter taught a class entitled “Problems and Methods of Historical American Archaeology,” the first academic class anywhere in the United States and elsewhere to carry the designation, “historical archaeology.” For almost twenty years he taught a series of courses that introduced students to this new subject, and because the city itself was the site explored, he helped to create urban historical archaeology in America. In 1992, he coauthored with Daniel G. Roberts and Michael Parrington *The Buried Past: An Archaeological History of Philadelphia,* the first such synthesis for a major U.S. city.

Much earlier, in January 1967, he was one of a small group of established scholars who assembled in Dallas, Texas, and founded the Society for Historical Archaeology. Cotter served as the society's first president (1967) and coedited the initial volume of its journal, *Historical Archaeology.* Twice he invited the new society to meet in Philadelphia, first to celebrate the county's bicentennial (1976) and six years later to mark the city's three-hundredth anniversary (1682-1982).

Shortly before his death, the Society for Historical Archaeology created the John L. Cotter Award in Historical Archaeology to honor his memory and to recognize the achievements of researchers (including students) at the start of their professional careers.

Robert L. Schuyler

See also

Historical Archaeology

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Cotter, John L., Daniel G. Roberts, and Michael Parrington. 1992. *The Buried Past: An Archaeological History of Philadelphia.* Philadelphia: University of Pennsylvania Press.

Crawford, O.G.S.

(1886-1957)

O. G.S. Crawford was born in India and grew up with aunts in England. He took an Oxford degree in

geography, and the subject of his short thesis was a field survey of archaeology in the Andover district of England. He went to the Sudan to excavate with the Wellcome expedition until World War I began; then he served in the Royal Flying Corps as an observer, was shot down, and became a prisoner of war.

After supplying archaeological details to correct revised editions of Ordnance Survey maps, Crawford was appointed in 1920 as the survey's first archaeological officer, a post he held until his retirement in 1946. Visible monuments and earthworks had been recorded since the survey's first mapping of Britain early in the nineteenth century, but Crawford extended and developed this work into a much fuller record of the nation's visible archaeology, drawing on both scattered or systematic records in other institutions and new field surveys. As well as providing better archaeological notice in the ordinary maps, he surveyed for and drew up a remarkable series of period maps, beginning with *Roman Britain* (1924), the best being, in Crawford's own view, the two sheets of *Britain in the Dark Ages* (1935).

"What I want is simple, clear-minded stuff that any intelligent fool can understand.") This approach is not usually theoretical in a self-consciously explicit way, but still it is not unsystematic.

Contemporaries saw Crawford as a distinctive individualist with a strong and independent spirit. Wheeler told with relish the scandal that echoed around archaeological Wales when Crawford received Welsh archaeologists visiting his excavation wearing *shorts*-"Thereafter for thirty seven years he was one of my closest friends, and his boyish glee in calling the bluff of convention never left him." Crawford's autobiography is full of tales of conflict between his free spirit and the bureaucratic systems of the Ordnance Survey.

Crawford's later work *Archaeology in the Field* (1953) shows him drifting away from his early principles, and his last work, *The Eye Goddess* (1957), is alarmingly lacking in that robust good sense and clear attention to good chronology that before had been the Crawford style. In 1955, however, Crawford wrote a good autobiography, *Said and Done.*

Christopher Chippindale

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Cunningham, Alexander

(1814-1893)

Alexander Cunningham went to India from England as an army engineer in 1833 and fell, as a young man, under the influence of james prinsep, who had undertaken the task of reorienting the research interests of the members of the Asiatic Society of Bengal founded in 1784. The society was the focal point of European research activities in India, and under Prinsep's secretaryship these interests veered from mere literary speculations to field investigations.

By the mid-1830s, Cunningham was assisting Prinsep with his research, in particular with the study of Kharosthi, the principal ancient script of the Indian northwest. Until 1842, as his publications show, Cunningham was interested principally in the study of coins and seals-some of them Roman-that were then being found in profusion in the northwestern part of India. He never lost this early interest in scripts

and coins, and his publications, such as *Inscriptions of Asoka* (1877), *Coins of Ancient India from the Earliest Times down to the Seventh Century a.d.* (1891), and *Coins of Mediaeval India from the Seventh Century down to the Muhammadan Conquests* (1894), are eloquent testimony to its persistence in his life.

Another major line of investigation pursued by Cunningham was in the area of ancient Indian architecture. He published a detailed study of ancient temples in Kashmir in the *Journal of the Asiatic Society of Bengal* in 1848 and followed that work with *The Bhilsa Topes,* a study of the Buddhist stupas at Sanchi and in its neighborhood (1854); *The Stupa of Bharhut* (1879); and *Mahabodhi, or the Great Buddhist Temple under the Bodhi Tree at Bodh-Gava* (1892).

Cunningham also contributed a great deal to the elucidation of various historical problems related to ancient India, and his analyses of dynastic issues in his Archaeological Survey of India Reports constitute the primary evidence of this contribution. Another of his abiding interests was the study of ancient Indian historical geography based on both archaeological surveys and textual material. This study culminated in the publication of *The Ancient Geography of India* (1871).

However, it is for his Archaeological Survey of India Reports that Cunningham maintains a

permanent place in the history of Indian archaeology. Of the twenty-three volumes published in this series between 1862 and 1887, twelve were written by Cunningham himself, two were written by him in collaboration with an assistant, and the rest were written by his three assistants in the Archaeological Survey of India-J. D. Beglar, A.C.L. Carlleyle, and H.W. Garrick. As far as the archaeology of the area between the northwestern hills and Bengal is concerned, these reports constitute a major source of information even today.

The Archaeological Survey of India was established by the government of India in 1861 mainly owing to Cunningham's persuasion. He became its first director-general/director on his retirement from military service. After four years the survey was disbanded to be reestablished in 1870-1871, with Cunningham again in charge. He retired from this duty in 1885. His main interest in archaeology was topographical, and he followed the routes traveled by Alexander the Great and two famous Chinese pilgrims, Hiuen Tsang (seventh century a.d.) and Fa-Hian (fifth century a.d.), and identified and described ancient sites along the way. Some of the most important ancient city sites of India owe their identifications to him. He was not much of an excavator, but he mapped out sites on a scale that has not yet been equaled in India.

Dilip Chakrabati

See also

South Asia

Cunnington, William

(1754-1810)

A middle-class cloth merchant who, like his wealthy patron, sir richard colt hoare, developed a passion for excavating English barrows and graves. He lead Colt Hoare's archaeology team, and with draftsman Philip Crocker surveyed a huge part of Wiltshire, locating ancient sites and earthworks. It was Cunnington who supervised the excavation of some 379 barrows and who ensured that observations were recorded accurately and carefully. He also divided barrows into five types and used stratigraphy to identify primary and secondary burials. While coins were used to date some barrows, Cunnington argued that it was possible that graves with only stone artifacts in them might be earlier than those that contained metal ones. Notwithstanding these advances in fieldwork methods and in the analysis of artifacts neither Cunnington nor his patron Colt Hoare was able to convincingly demonstrate a relative chronology for these English monuments.

Tim Murray

See also

Britain, Prehistoric Archaeology

Curtius, Ernst

(1814-1896)

Curtius was born in Lubeck and studied philology and philosophy in Bonn, Gottingen, and Berlin. In 1837 he traveled to newly independent greece and visited the site of Olympia, the excavation of which was to become his lifelong work. He returned to Germany and obtained his doctorate in Halle in 1841. In 1844 he was appointed tutor to the German Crown Prince, the future Emperor Friedrich III, and professor of classical philology in Berlin. In the same year he published his most important work, a

two-volume description of the Peloponnese, which was the result of his travels in the 1830s.

In 1856 Curtius returned to Gottingen as professor of classical philology and archaeology. He published *Griechische Geschichte,* which became the most widely read Greek history written in German, republished five more times. In 1868 he moved to Berlin as professor of classical archaeology. heinrich schliemann's successes at Troy led to German government support of Curtius's long-planned excavation of Olympia. In 1874 he signed an agreement with the Greek government that not only allowed German scholars exclusive rights to excavate Olympia, but also provided for the exhibition of finds at the site. This was the first government-supported excavation in Greece, and it became a model for other countries who wished to work there and respect Greek antiquities and the right of the Greek government to keep them. Curtius also helped to found the German Archaeological Institute (deutsches archäologisches institut) in Athens.

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two-volume description of the Peloponnese, which was the result of his travels in the 1830s.

In 1856 Curtius returned to Gottingen as professor of classical philology and archaeology. He published *Griechische Geschichte,* which became the most widely read Greek history written in German, republished five more times. In 1868 he moved to Berlin as professor of classical archaeology. heinrich schliemann's successes at Troy led to German government support of Curtius's long-planned excavation of Olympia. In 1874 he signed an agreement with the Greek government that not only allowed German scholars exclusive rights to excavate Olympia, but also provided for the exhibition of finds at the site. This was the first government-supported excavation in Greece, and it became a model for other countries who wished to work there and respect Greek antiquities and the right of the Greek government to keep them. Curtius also helped to found the German Archaeological Institute (deutsches archäologisches institut) in Athens.

Olympia was excavated between 1875 and 1881 (and again from 1936 to 1941 and since

1952). Excavations revealed the layout of Greece's most important and largest religious shrine, locating the temple of Hera, the great altar of Zeus, and the Olympic stadium. The only major surviving sculpture by Praxiteles, “Hermes carrying the infant Dionysus,” was also unearthed at the site. Model techniques of excavation and stratigraphy were employed at the site, and the amount of valuable sculptural, numismatic, and epigraphic material found was very great. The results were edited by Curtius in five volumes. While Curtius's primary achievement was his organization and editing of the excavations at Olympia, he also inspired many scholars with his love of Greece and its past.

Tim Murray

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German Classical Archaeology

Cushing, Frank Hamilton

(1857-1900)

Cushing was born in Pennsylvania and grew up near Albion in New York State. His poor health as a child resulted in a circumscribed but intense education in the fields and woods of his immediate environment. It was during his explorations that Cushing was to find the Indian arrowhead that stimulated his lifelong interest in ethnology. At eighteen he studied natural science at Cornell University and wrote an article about the natural history of his neighborhood in New York. This was published by the smithsonian institution, whose staff were so impressed that they offered him a job.

In 1879 Cushing was appointed to the new Bureau of American Ethnology, which was closely connected to the Smithsonian Institution. Under the directorship of geologist and explorer john wesley powell (1834-1902) the Bureau became the center for anthropological research in North America. While its mandate was to study the ethnography and linguistics of Native American people so as to better administer Indian affairs, the bureau also had a considerable impact on the development of North American archaeology.

The bureau maintained the view that there there was no real difference between indigenous American peoples in the nineteenth century and their prehistoric ancestors. In an environment that denied indigenous American peoples their histories, archaeologists gained insights into the past by working closely with ethnologists and modern native people. In this way prehistoric archaeology was defined as a branch of anthropology.

Cushing and his Bureau colleague J.W. Fewkes (1850-1930) pioneered this approach, known as the direct historical method. They used ethnographic parallels to interpret, by analogy, the activities of prehistoric people. Cushing was so interested in the processes by which the artifacts he found were made that he became a master of indigenous technologies, arts, and crafts.

His outstanding achievements include his studies of the Zuni Pueblo Indians, made over the five years that he lived with them, his explorations of ancient pueblos in the Salt River Valley in Arizona, and his investigations of the ancient inhabitants of Key Marco, Florida. His *Zuni Creation Myths* (1896) and *Zuni Breadstuff* (1920 republished) remain ethnological classics.

Tim Murray

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United States of America, Prehistoric Archaeology

Cyprus

The history of archaeology on the Mediterranean island of Cyprus exemplifies issues common to many areas. Several intertwined themes are discussed in this entry-largely within a general chronicle of discovery and research with a concentration on the prehistoric periods-including issues of nationalism, colonialism, and gender alongside academic traditions in constructing local archaeological practice and styles. The impact of specific political events and other factors provides a significant background, structuring both attitudes and developments. The influence of individual researchers is also especially marked in the archaeology of so small an area.

In the middle of the nineteenth century, many foreign officials resident in Cyprus began

PREV NEXT

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The Czech Republic lies in central Europe and since the sixth century a.d. has been inhabited by Czechs who speak a Slavic language but whose culture has been more Western European in style since the Middle Ages. At that time the territory, almost identical with its present frontiers, formed the Kingdom of Bohemia, part of the Holy Roman Empire of the Middle Ages. Later it was integrated into the Austrian Empire, and in 1918 it gained new independence under the name of Czechoslovakia. It became an island of western-type democracy in the 1930s, when all the surrounding countries were ruled by authoritarian or fascist regimes. In an act of appeasement Czechoslovakia was given to Adolf Hitler by the west European powers in 1938. It was occupied by Germany in 1939, and at the end of World War II the Great Powers decided at Yalta that Czechoslovakia should belong to the Russians after the war. It remained formally independent, becoming a Soviet satellite state. After a short period of liberalization in the 1960s it was occupied by the Soviet army in 1968 to stop what seemed to be a development toward democracy. It regained full independence in

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1989 during the process of the disintegration of the Soviet empire, and it is now striving to revitalize contacts with western democracies that were severed in 1938. The eastern part of Czechoslovakia, Slovakia, chose independence in 1992, so what remained is the Czech Republic. From the geographic point of view and also historically, the Czech Republic has been divided into two parts: the west is called Bohemia, the east, Moravia.

The archaeological record of both Bohemia and Moravia began in the early Paleolithic period. It was richly structured into settlement sites, cemeteries (both "flat" and those with surviving barrows), hoards, fortifications, ritual monuments, and so forth. The number of sites runs to the thousands, and most of them are polycultural. Settlement sites, whose mutual distance is from 1 to 3 kilometers in many instances, mostly consist of underground features filled with cultural deposits full of shards (since the Neolithic period), animal bones, and other finds, but there are few superimposed layers. "Pagan" graves preceding the ninth century a.d. usually contain grave goods (pottery, stone, bronze, and/or iron artifacts). In consequence of the rich artifactual record, most of the post-Mesolithic sites can be classified with the accuracy of plus or minus 100 years. All these circumstances create very good conditions for detailed archaeological research.

The Beginnings of Archaeological Interest

The Czech chronicler Kosmas, who died in a.d. 1125, mentioned a barrow near Prague where a lege ndary Czech military leader of the ninth century should have been buried. This is an early example of the interpretation of an archaeological monument. Similarly, Václav Hájek of Libočany, writing in 1541, believed that the Marcomanian king Marobuduus (first century a.d.) had his seat at Závist near Prague, a place that is now known as a late-la tène period oppidum (fortified town). His interpretation was nearly correct from the chronological point of view, which may have been a matter of chance, but it should be kept in mind that Hájek was unusually good at inventing details when historical evidence failed him; apparently he had a good model of the past.

The first exact field observation was that of Karel Škréta, a painter who in 1668 made a drawing of the siege of Libice, an early medieval stronghold in Bohemia. Although he placed the historically attested battle of the tenth century into the eastern part of the site (with a gothic church, etc.), he also faithfully recorded the empty western part, consisting of bare fields surrounded by a simple rampart. One flat place in the fields has been described by Škréta as "ruins"; this is exactly where excavations of the 1950s unearthed the ground plan of a tenth-century church lying in the center of the original stronghold. All this is not very surprising to those who know that peasants of the late-medieval period (and much earlier times) correctly identified long-deserted earthworks as ancient forts and barrows as ancient graves. Many Iron Age hill-forts carry the name *Hradiště*, which means hill-fort in Czech; this also applies to cases where the ramparts are barely visible.

The first recorded collection containing archaeological objects was that of the Bohemian King Rudolph II, who was also a Roman emperor. It was kept in the royal palace in Prague and enriched by the king himself by means of excavations of a Bronze Age cemetery in Silesia, which in Rudolf's time belonged to the Kingdom of Bohemia. The excavation took place in 1577, and Rudolph unearthed one of the vessels with his own royal hands.

The Romantic Period

As in most European countries, archaeological activities in Bohemia and Moravia greatly increased in the romantic period from the end of the eighteenth century onward. The main idea was the belief that prehistory as recovered by archaeology was a backward projection of history, with the same "nations"

and the same habits as recorded in the earliest written documents. There was no knowledge of the great antiquity of the human race; in fact, very few people ever considered the question of what preceded the Celtic, Germanic, and Slavic “nations” in central Europe. Therefore, the romantic query did not demand any systematic handling of the archaeological finds, which were simply believed to be illustrations of ancient history.

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The romantic paradigm of archaeology faced a crisis when it became clear that it was unable to answer its own questions, in spite of the fact that the number of finds substantially increased. This development, however, did not take place in a vacuum: it was stimulated by changing ideologies reflecting changing social structure. It is often believed that the rise of the middle class and the beginning of the industrialization of the country can be held responsible for the development. Details of the complicated processes that took place within the society of the nineteenth century have not yet been sufficiently studied.

The Beginning of Formalism

The beginning of archaeology has often been identified with the creation of the first formal system of archaeological finds (the three-age system). It may not be chance that this attitude toward the "beginning" of archaeology came from modern archaeologists who themselves were proponents of formal (typological) archaeology. The romantic period seemed to them to be unscientific, apparently because it relied so heavily on models derived from outside (from history). There is no obvious reason, however, why the beginning of archaeology should be set as late as the introduction of the three ages.

The three-age system was well known and adopted in Czech lands soon after it was proposed in denmark. J.E. Vocel, the first Prague professor of archaeology, was its partisan, and J.V. Hellich, a custodian of the archaeological collection at the National Museum in Prague, used it in a handbook on Czech archaeology, written in 1943. The opposition of German specialists to the three-age system, however, could not be entirely dismissed and resulted in a conditional adoption of the ideas of the three ages by some Czech archaeologists.

It is worth noting that Vocel tried to subdivide the Bronze Age on the basis of the chemical composition of bronze artifacts. This is an example of how early formal archaeologists were still looking for chronologically sensitive attributes of artifacts before finding them in terms of shape and decoration. The romantic paradigm did not end abruptly with the three-age system, as it was permanently regenerated by the nationalism of the nineteenth century, which was especially active in central Europe. It was only at the end of the century that the national ambitions of at least some nations of the central European states (including those of the Czechs) were satisfied and they became more or less politically stable. This created the necessary conditions for an almost complete (but temporary) abandonment of romantic and nationalist concepts.

Developed Formal Archaeology

The three-age system was not entirely satisfactory, not only because of persisting nationalism but also because some countries had many archaeological finds that showed a good deal of formal variability that could not be explained by means of the three basic periods. By the end of the nineteenth century Bohemian and Moravian archaeology had its basic classificatory framework, going far beyond the three-age system, and this framework did not change substantially afterward.

This achievement was the logical consequence of the greatly enlarged effort of many Czech archaeolo gists in the second half of the nineteenth century who excavated new sites and tried to classify their finds into more detailed subdivisions. The final form of the achievement is connected with the names of Lubor

Niederle, Karel Buchtela, Inocenc L. červinka, and Jaroslav Palliardi (mainly for the Neolithic period). The first two archaeologists based their classification on the monumental collections of the National Museum in Prague, which were greatly enriched by Josef L. Píč and his friends. Píč, an unusually active curator of

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The romantic paradigm of archaeology faced a crisis when it became clear that it was unable to answer its own questions, in spite of the fact that the number of finds substantially increased. This development, however, did not take place in a vacuum: it was stimulated by changing ideologies reflecting changing social structure. It is often believed that the rise of the middle class and the beginning of the industrialization of the country can be held responsible for the development. Details of the complicated processes that took place within the society of the nineteenth century have not yet been sufficiently studied.

The Beginning of Formalism

The beginning of archaeology has often been identified with the creation of the first formal system of archaeological finds (the three-age system). It may not be chance that this attitude toward the "beginning" of archaeology came from modern archaeologists who themselves were proponents of formal (typological) archaeology. The romantic period seemed to them to be unscientific, apparently because it relied so heavily on models derived from outside (from history). There is no obvious reason, however, why the beginning of archaeology should be set as late as the introduction of the three ages.

The three-age system was well known and adopted in Czech lands soon after it was proposed in denmark. J.E. Vocel, the first Prague professor of archaeology, was its partisan, and J.V. Hellich, a custodian of the archaeological collection at the National Museum in Prague, used it in a handbook on Czech archaeology, written in 1943. The opposition of German specialists to the three-age system, however, could not be entirely dismissed and resulted in a conditional adoption of the ideas of the three ages by some Czech archaeologists.

It is worth noting that Vocel tried to subdivide the Bronze Age on the basis of the chemical composition of bronze artifacts. This is an example of how early formal archaeologists were still looking for chronologically sensitive attributes of artifacts before finding them in terms of shape and decoration. The romantic paradigm did not end abruptly with the three-age system, as it was permanently regenerated by the nationalism of the nineteenth century, which was especially active in central Europe. It was only at the end of the century that the national ambitions of at least some nations of the central European states (including those of the Czechs) were satisfied and they became more or less politically stable. This created the necessary conditions for an almost complete (but temporary) abandonment of romantic and nationalist concepts.

Developed Formal Archaeology

The three-age system was not entirely satisfactory, not only because of persisting nationalism but also because some countries had many archaeological finds that showed a good deal of formal variability that could not be explained by means of the three basic periods. By the end of the nineteenth century Bohemian and Moravian archaeology had its basic classificatory framework, going far beyond the three-age system, and this framework did not change substantially afterward.

This achievement was the logical consequence of the greatly enlarged effort of many Czech archaeologists in the second half of the nineteenth century who excavated new sites and tried to classify their finds into more detailed subdivisions. The final form of the achievement is connected with the names

of Lubor Niederle, Karel Buchtela, Inocenc L. červinka, and Jaroslav Palliardi (mainly for the Neolithic period). The first two archaeologists based their classification on the monumental collections of the National Museum in Prague, which were greatly enriched by Josef L. Píč and his friends. Píč, an unusually active curator of

the National Museum, promptly published his finds, which enabled his opponents to use them to discredit his arguments. Although he tried to work independently in creating a nonformal and more or less romantic paradigm of his own, Niederle (then already a professor of prehistoric archaeology at Charles University in Prague) was well aware of the parallel work being done elsewhere in Europe, which, however, he and Buchtela did not accept unconditionally. With the exception of some supposedly romantic points primarily concerning several assumed migrations, their paradigm was formal, that is, based on shape, decoration, and similar characteristics, as observed on individual artifacts. červinka, working in Moravia and closely following Niederle and Buchtela, based his views on the collections of a number of local archaeologists, and Palliardi built on excavations of his own.

In spite of the fact that there were romantic elements in the works published around the turn of the twentieth century, such works were basically not nationalist, for their main problems were connected not with the "nations" known in central Europe at the beginning of written history but with the formal aspects of the archaeological record.

These achievements, however, were not isolated in Europe, and they were not the first of their kind. By the 1870s many archaeologists in other parts of Europe (oscar montelius in Sweden was the most prominent representative of the current) began to look for finer divisions of the archaeological record, inspired, directly or indirectly, by Charles Darwin's evolutionary theories (which, however, explained the variability of nature). Their work was unusually successful, leading to detailed chronological schemes, one part of which (for the Bronze Age and the beginning of the Iron Age) is still used. The studies were undertaken mainly in Scandinavia and later in Germany in the period from 1890 through 1910. They are generally known under the name *typology*, as the chronological schemes were constructed on the basis of the "evolution" of archaeological types (usually a parallel evolution of several types for each period).

The contribution of Czech lands to these schemes has already been mentioned. Czech archaeologists not only created typological sequences for their own regions but also supplied important parts of the evidence on which other specialists could build. An important Czech contribution to the typological endeavor, which deserves to be mentioned in more detail, was achieved by the Moravian archaeologist Jaroslav Palliardi, who proposed a detailed chronology (with twelve phases) of the Moravian Neolithic and Eneolithic periods. The conclusions he arrived at by the end of the nineteenth century are still valid; they were, in fact, so much ahead of their time that they were not developed further until the late 1950s. This was partly caused by the fact that their final form only appeared when the views of gustaf kossinna, a prominent German professor of philology, started to occupy the minds of official archaeologists. Although Palliardi demonstrated that the individual Neolithic and Eneolithic cultures represented consecutive chronological phases, Kossinna's adherents considered them to be more or less contemporaneous groups covering different ethnic wholes. However, it clearly followed from Palliardi's chronology that "Nordic elements," such as the funnel beakers, appeared very late in the Moravian sequence and therefore could not be considered responsible for the appearance of civilization throughout Europe, as maintained by Kossinna. Palliardi's findings contradicted Kossinna (and even his nonradical followers) to such a degree that almost no archaeologist had the courage to mention them.

The First Half of the Twentieth Century

The three-age system and the recognition of the "diluvial" age of humans that followed had one great nonformal consequence: it became clear that humankind was of great antiquity, and it was to be expected that the "nations" known at the beginning of written history could not account for everything in the past; after all, much history was not mentioned in any written documents. This idea was taken up by a number of archaeologists, first of all by Kossinna, who began to look for ancient Indo-Europeans and their origins in the archaeological record. Formal archaeology was so successful in drawing

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that could be used by everybody, and the newly founded State Archaeological Institute promised to become a center for heritage management. As will be explained shortly, these undeniable achievements were lost in the postwar socialist period.

The Socialist Period

Ideologically, the socialist period began just after World War II as nationalist propaganda stressed the allegedly close relationship between Czechs and Russians. This propaganda found immediate reflection in archaeology: archaeology was expected to demonstrate the eastern connections of the Czech nation, proving that the "Slavs" arrived very early from the east. This point was directed against the Germans, with whom the Czechs have, in fact, more in common than with the Russians. Most archaeologists did not recognize the ideological background of these views and actively participated in the officially supported boom of "Slavic archaeology" especially if no explicit ideological statements were required, and there were no direct nationalist implications. This period ended in 1968; thereafter anything "Slavic" became ideologically untenable because it was a reminder of the Russian military invasion. There was a subperiod just after the mid-1960s, preceding the liberalization of 1968, when achievements of Czech scientists in general were evaluated on the basis of references in the West: the regime recognized that it could not rely on reports put out by the party bureaucracy that ruled the institutes.

Contrary to the expectations of many western archaeologists, Marxism never became a widespread topic in Czech archaeology. However, statements on theory running against Marxist ideology would have been punished, something that automatically put an end to all discussions of major theoretical issues. Any theoretical debate had to have the usual dogmatic form, full of quotations from Karl Marx (see Neustupný 1967), but there were not many publications of this sort. Marxism was completely dropped after 1968, as some of its ideas apparently seemed dangerous to the communist ruling class; all that remained was the usual Marxist political rhetoric. But the situation in West Germany-where, despite the absence of Marxist ideological pressure, there was no discussion of theory in the 1950s through to the 1980s-makes it uncertain whether theoretical issues would have been raised by Czech archaeologists of that period if there had not been any communist regime. Marxist philosophy, however, had one positive effect in that every university student had to study the works by Marx and Friedrich Engels. Consequently, many students became acquainted with some kind of philosophy and a sort of anthropology, although a part of the related reading was purely political (see Neustupný1991).

As real archaeological theory, being ideologically controlled, was dangerous to touch, most archaeologists refused to go near it. It was also dangerous to write positively about anything coming from the West. To proclaim oneself to be a "New Archaeologist," for example, was a risk that nobody took. In this situation many archaeologists preferred nontheoretical topics within the tradition of formal, typological archaeology; the main problems discussed in archaeological writings were chronology and cultural influences, assumed to come predominantly from the southeast. At the same time, the large-scale contemporaneity of prehistoric cultures was taken for granted, and this, of course, opened the door to the equation of archaeological cultures with ethnic units; the assumption of many migrations was a logical result. This kind of archaeology may have been a protest against the communist regime because it was utterly nonideological (see Kuna 1993), or at least not favorable to socialism, whereas an active engagement in communist ideology was otherwise required in any other sphere of life. New Archaeology and the beginnings of postprocessual archaeology were largely missed in this deformed intellectual environment.

In this way it happened that Czech archaeologists became very good at typological chronology (cf. Krumphanzlová 1972), and their detailed schemes created in the 1950s and 1960s are still valid; they became the basis for local sequences all over central Europe. Either

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they were applied directly or they stimulated similar schemes to originate elsewhere as parallels. Czech archaeologists have also achieved positive results in the study of the natural environment and the spatial structure of sites. Problems involving the latter concern ensued not only from theoretical considerations but also from the unusually large rescue excavations that took place, by and large in northwestern Bohemia. This region was the only one to have an effective rescue team (a branch of the Prague Academy Institute) as early as the end of the 1950s; tens of hectares were continuously stripped and covered by rescue excavations in front of open coal mines, leading to the creation of an unusually rich archaeological record (see Neustupný 1994).

In the 1950s and 1960s archaeology was lavishly supported by the state for ideological reasons, and major amounts of money went to large-scale excavations. This, however, was done at the expense of rescue work, museums, and universities, which were allotted very limited funds. Moreover, the large excavations, mostly led by the institutes of the Academy of Sciences, often remained unpublished for decades, so their great informative potential was partly wasted. But in spite of this, these excavations have brought much new knowledge, which has not yet been fully used. The support for excavations substantially diminished in the 1970s when they began to necessite a growth in rescue work paid by the developers.

The Postsocialist Period

The power structures introduced by the communists had a devastating effect on Czech archaeology. In the postsocialist period almost nothing was normal: how could it have been without the imposition of the all-pervasive party control? The party disappeared by 1989, but the institutions created for its maintenance partly remained. At the beginning of the period it seemed that the transition to a normal state would be fast and easy, but such hopes have not been realized, mainly because many individuals succeeded in keeping their microenvironments unchanged. The previous system has been replaced by liberal mechanisms of self-rule in the field of research. As Czech society as a whole is successfully and rapidly moving toward a market economy based on private property and toward western-type democracy, the state of Czech archaeology is likely to change in the future.

The "Prehistories" of the Czech Republic

There are many summary works on Bohemian, Moravian, and Czechoslovak prehistory, far more than in other countries. The likely reason for this is that Bohemia and Moravia are geographically well defined by mountains, having no or sparse archaeological finds in border areas; thus, it is not necessary to draw artificial limiting lines along modern frontiers while compiling archaeological evidence.

Leaving aside the purely antiquarian lists of monuments, the first summary books are those by J.E. Vocel (1845, 1853, 1866). They were followed by a series of books, beginning with the works of Buchtela and Niederle (Buchtela 1899; Niederle and Buchtela 1910) and leading to those of Schránil (1928), Böhm (1941), Neustupný (1946), Filip (1948), and Neustupný (1968). All these writings are based on similar methodological and theoretical grounds (formal typological approach, interest in influences and limited migrations, little interest in economy and social relations). The last-named book, however, was concerned with ecological evidence and issues.

New principles were introduced by Evžen and Jiří Neustupný in 1961. The influences and migrations were kept to a minimum, and economic and social questions were discussed on an unprecedented scale. In this sense their work went far beyond the typological paradigm. Bohemian archaeology was influenced by the two preceding books (especially by their systematic discussions of prehistoric economy and society and their summaries of the environmental evidence), but otherwise it remained

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The Organization of Archaeological Research

The first type of organization in which archaeology was performed on a professional or semiprofessional level was the museum. The National Museum in Prague (originally the Museum of the Kingdom of Bohemia) and the Moravian Museum in Brno, both founded in 1818, were followed by Olomouc (in northern Moravia) and other smaller museums that became centers of archaeological research, and they continued to be so during the second half of the nineteenth century. In addition to the large museums many local museums were opened in which amateur archaeologists were especially active at the end of the nineteenth and in the first half of the twentieth centuries.

The second centers of archaeological research were the universities. The Charles University in Prague, founded in 1348, has had a chair of Bohemian antiquities since 1850. Jan Erazim Vocel, a partisan of the three-age system who compiled a book on Bohemian antiquities (Starožitnosti země české, 1866), was its first professor of archaeology. In 1898 Lubor Niederle was appointed the first professor of prehistoric archaeology, and since that time the chair has been occupied permanently (except during World War II, when Czech universities were closed by the Germans). Yet though Charles University educated several professional archaeologists, most of them in the second half of the twentieth century, it never became the center of Czech archaeology. It did not perform any major excavations, and its staff was always limited to a very few persons. Nonetheless, it produced a number of outstanding professional archaeologists on a high level. The Brno University in Moravia has had a chair of prehistoric archaeology since 1933, and in many respects it has been more active archaeologically than Charles University in Prague. At present archaeology is also taught at a number of smaller universities, but none of them has a chair of archaeology.

The network of museums and universities was supplemented by the State Archaeological Institute in 1919 (with a Brno branch in 1941). Originally, the institute was a small body occupied mainly with fieldwork. It became the core of the Archaeological Institute of the Czechoslovak Academy of Sciences, founded in accordance with the Russian template in 1953. As a result of that move any hopes of Czechoslovakia getting an institution to take over the care of archaeological monuments and rescue excavations vanished.

The foundation of the Czechoslovak Academy of Sciences was a part of the program to unify the Soviet empire by building comparable structures everywhere; the goal in creating this institute was to easily control the sphere of science and humanities from one communist party center. This meant an incredible degree of centralization, with more than half of all Czech archaeologists directly attached to this institute (others were attached indirectly). The Prague Archaeological Institute had some 200 employees in 1989, and there was another but smaller institute in Brno. Museums and universities were not allowed to grow in this phase, and in the first twenty years there was no body responsible for rescue excavations (later, this responsibility was partly assumed by the Academy Institutes). All theoretical activities were supposed to be done by the academy, whose leading position in the field of science was embodied in law. Directors of the institute became the rulers of Czech archaeology.

The socialist regime fostered people of mediocre intellect in general, and most of those in archaeology were not exceptions to this rule. To achieve anything after the Russian invasion of Czechoslovakia, one had to be a member of the Communist Party or a secret police agent. Individuals in both these categories were active in archaeology. For the most part only children of reliable party members were allowed to study “ideological” subjects, and archaeology was considered to be one of them. In view of these facts it is surprising that a fair number of talented people escaped the attention of the party and became good archaeologists. This often happened at the cost of them joining the party. After the “capitalist revolution” in 1989, several groups of archaeologists, doing mostly rescue work, separated

from the Institutes of the Academy in 1993. But otherwise the situation had

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Daniel, Glyn

(1914-1986)

Glyn Daniel grew up in the Vale of Glamorgan in southern Wales, was educated at Barry Grammar School, then went to St. John's College, Cambridge, on a scholarship in 1932. He switched from geography to archaeology and was at St. John's all the rest of his life.

Daniel's first research on the megalithic monuments of the British Isles was later enlarged by studying their cousins in France and across Europe as a whole. His work was published as *The Prehistoric Chamber Tombs of England and Wales* (1950) and *The Prehistoric Chamber Tombs of France* (1960). It was a large task, in the late 1930s, simply to collate knowledge of the chamber tombs and then to relate them to their sister monuments scattered across western Europe.

Working within the "moderate-diffusionist" framework for European prehistory associated particularly with the work and name of vere gordon childe, Daniel devised a scheme (1941) for a dual colonization of western Europe by megalith builders: a passage-grave tradition originating in the eastern Mediterranean and a gallery-grave tradition originating in the western Mediterranean, which between them explained the pattern in northwest Europe, the region where the diffusionist impulse had spread the habit of megalithic building. Like other schemes diligently built to explain European prehistory with slight and ambiguous chronological evidence, this one collapsed in the 1950s when calibrated radiocarbon chronology showed that the northwest European megaliths, especially those in Brittany, were earlier than, or as early as, their supposed ancestors in Mediterranean lands. Instead, Daniel was able to enjoy the role that his native Wales played in originating a style and craft of stone-building through Atlantic Europe that was older than the pyramids of Egypt.

It seems in retrospect that it was not helpful to concentrate research on megaliths as a defined class on their own. The techniques of building with great blocks are much the same everywhere, because the engineering options are few, so similarities of form can only be weak proof of cultural affinity or any direct historic connection. Recent study has instead preferred to integrate examination of the megaliths with evidence from nonmegalithic contexts of the same periods. Even that is still not an easy task because the artifactual evidence that can be used in dating is even now often slight or uncertain; it was certainly impossible to find it a good basis for systematic megalithic study in the prewar and preradiocarbon era.

In 1943, Daniel published *The Three Ages,* a study of the Scandinavian development in the early nineteenth century of a Stone Age/Bronze Age/Iron Age division of early European archaeology, the key insight in ordering the artifacts that made studying prehistory possible in that century. This was the first of many studies by Daniel in the history of archaeology, including *A Hundred Years of Archaeology* (1950), *The Idea of Prehistory* (1962), *The Origins and Growth of Archaeology* (edited, 1967), and *A Short History of Archaeology* (1981), that set out the essentials of the nineteenth-century story especially as they have now come to be generally understood. Implicit in this important part of Daniel's writing, though not unnecessarily emphasized, is the insight that we do not excavate the simple *facts* of

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ancient matters. Archaeological knowledge depends also on the attitudes and values of the inquirer; the advances in the developing history of archaeology came from new opportunities that resulted from changing frames of ideas as well as from new field discoveries.

In 1952, Daniel participated in an archaeological quiz show on British (BBC) television, *Animal, Vegetable, Mineral?* and soon became its chairman. For each show, three experts (of whom sir mortimer wheeler was the regular performer with the best style and panache) would examine mystery objects from a museum collection and try to identify just what they were and where they came from. The program was an unprecedented success in the "strange and heady days" of early British television, and Daniel was voted "Television Personality of the Year" in 1955. Looking now at the few minutes of black-and-white film that survive, it is not easy to see why the program caught the public imagination so. Rather than allowing himself to be pulled further into the television world, Daniel stayed with archaeology and later was much involved in the guidance of the long-running BBC archaeology series *Chronicle*.

In 1955, Daniel began to edit a new series of books for Thames and Hudson, *Ancient People and Places,* which ran to over 100 volumes, and in 1957, he succeeded o. g. s. crawford as editor of the journal *antiquity*. As a journal and book editor, knowledgeable in the ways of television and with a lively sense of what was new and exciting, Daniel had great importance (not always visible) from the 1950s onward; in the modern phrase, he was a great "networker." Knowing everyone, always interested in the gossip as to who had found what and said what, he had an influential hand in many useful innovations, and much was done, written, and published that might not have occurred without his cheery and steel-centered encouragement. A long series of his students went on from St. John's to successful careers in archaeology; Glyn was especially proud of 1962 when Barry Cunliffe, Colin Renfrew, and two other members of St. John's all got first-class degrees. Cambridge recognized Daniel's diverse service, in his college as well as in the university, and that his work was much broader than the conventional research of a narrow academic career by electing him Disney Professor of Archaeology in 1974, in succession to sir grahame clark. When Daniel retired in 1981, he was succeeded by his student Lord Renfrew.

Daniel published an excellent fat autobiography, *Some Small Harvest,* which is full of lively and telling stories, in 1986, the year of his retirement after thirty years of editing *Antiquity* and the year of his death. He was survived by his wife, Ruth, production editor for *Antiquity* and the less public partner in a celebrated Cambridge double act for the forty years since their marriage in 1946.

Christopher Chippindale

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Dart, Raymond Arthur

(1893-1988)

Born near Brisbane, Queensland, Australia, Dart graduated from the University of Queensland in 1913 with a science degree. He studied medicine at the University of Sydney and after completing his master's degree in anatomy, and his medical degree in 1917, joined the Australian Medical Corps in France and England from 1918 to 1919. After the war he worked with sir grafton elliot smith, demonstrating anatomy at University College London, and then in 1920 won a Rockefeller Foundation fellowship to the United States. He first studied at the University of Cincinnati but then spent most of his time in the

anatomy department at Washington University in St. Louis, Missouri. In 1922 Dart became professor of anatomy and dean of the medical school at the University of Witwatersrand in south africa, and he built up these institutions until 1943, creating the Raymond Dart Collection of Human Skeletons while teaching there. He retired in 1958 but continued to work as an honorary professorial research fellow at the Bernard Price Institute for Palaeontological Research in Witwatersrand for six months of the year and as professor at the Avery Postgraduate Institute in Philadelphia, U.S.A., for the other six months, until the age of ninety-three. The Institute

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Dasgupta, Paresh Chandra

(1923-1982)

P. C. Dasgupta was primarily an art historian interested in the early historic terracottas and later sculptures of West Bengal before he was made the director of the West Bengal State Directorate of Archaeology and Museums in Calcutta in the early 1960s. His subsequent career is an excellent example of how important a role even amateurs can perform in modern archaeology, especially in the Third World, by their sheer enthusiasm.

Stone Age sites had been known in West Bengal before, but the number of discoveries Dasgupta made in this field far outstripped any significant work done earlier. One of his sites, Susunia, is undoubtedly the only major primary Acheulian site in eastern India, rich in both faunal and lithic remains. Interestingly, his amateurism meant that he was instrumental in preventing the full potential of the site from being realized because he employed a large number of workmen to only pick up artifacts. Neolithic-Chalcolithic sites were well understood in many other parts of India by 1960, but nothing was known of them in West Bengal. Dasgupta soothed regional pride by finding a large number of them over a wide area, and although he did not do justice to the major site he excavated in this context, that of Pandu Rajar Dhibi, his report (Dasgupta 1964) was for many years the only definitive publication on the stratigraphy of such a site in West Bengal.

Dasgupta's department soon built up what was to become the largest archaeological collection from Bengal. The museum that was established after he had retired in the late 1970s reflects his enormous enthusiasm and support for Bengal archaeology, and those who work in the region will always feel indebted to him.

Dilip Chakrabarti

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Dating

Establishing the age of objects, landscapes, or contexts is one of the primary tasks of the archaeologist. It has also proved to be among the most difficult. Archaeology's twin roots in the humanities and in sciences such as geology and paleontology provided two types of answers to the question, how old? Although antiquarians, historians, and philosophers long pondered the history of people before writing, it was only in the nineteenth and twentieth centuries that the discipline of archaeology was able to make great strides in developing reliable means of assigning age and chronological relationship.

From the humanities, particularly through the study of material culture, archaeologists have developed schemes of relative dating based on the close analysis of the forms and functions of artifacts. In this endeavor strong links with classification (taxonomy) and typology were forged that depended on the development of consistent rules for describing artifacts and the contexts in which they were found. The earliest relative chronologies, such as the three-age system, were founded upon description, taxonomy, and the development of typology. But in the absence of a means to establish relative age, such classifications and typologies were, in essence, ahistorical and potentially circular in their logical forms.

Geology and paleontology provided the basis of a solution. The principle of relative dating (that is, establishing that one thing is relatively older or younger than another thing) was based on the notion of

stratigraphy. In this sense it was understood that following the law of superposition (by which what is on the top is assumed to be younger than what is on the bottom), the relative ages of artifacts could be established on the basis of their relative positions within a stratigraphic profile. Advances in the degree to which antiquarians and archaeologists in the nineteenth century understood the principles of stratigraphy (and site formation) were matched by an increasing sophistication in the ways in which they were able to apply them.

The work of Scandinavian archaeologists such as jens jacob worsaae, sophus müller, and oscar montelius and Egyptologists such as w. m. flinders petrie was particularly significant in the development of the relative-dating technique of seriation. These advancements were supported by painstaking research into the

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Dasgupta, Paresh Chandra

(1923-1982)

P. C. Dasgupta was primarily an art historian interested in the early historic terracottas and later sculptures of West Bengal before he was made the director of the West Bengal State Directorate of Archaeology and Museums in Calcutta in the early 1960s. His subsequent career is an excellent example of how important a role even amateurs can perform in modern archaeology, especially in the Third World, by their sheer enthusiasm.

Stone Age sites had been known in West Bengal before, but the number of discoveries Dasgupta made in this field far outstripped any significant work done earlier. One of his sites, Susunia, is undoubtedly the only major primary Acheulian site in eastern India, rich in both faunal and lithic remains. Interestingly, his amateurism meant that he was instrumental in preventing the full potential of the site from being realized because he employed a large number of workmen to only pick up artifacts. Neolithic-Chalcolithic sites were well understood in many other parts of India by 1960, but nothing was known of them in West Bengal. Dasgupta soothed regional pride by finding a large number of them over a wide area, and although he did not do justice to the major site he excavated in this context, that of Pandu Rajar Dhibi, his report (Dasgupta 1964) was for many years the only definitive publication on the stratigraphy of such a site in West Bengal.

Dasgupta's department soon built up what was to become the largest archaeological collection from Bengal. The museum that was established after he had retired in the late 1970s reflects his enormous enthusiasm and support for Bengal archaeology, and those who work in the region will always feel indebted to him.

Dilip Chakrabarti

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Dating

Establishing the age of objects, landscapes, or contexts is one of the primary tasks of the archaeologist. It has also proved to be among the most difficult. Archaeology's twin roots in the humanities and in sciences such as geology and paleontology provided two types of answers to the question, how old? Although antiquarians, historians, and philosophers long pondered the history of people before writing, it was only in the nineteenth and twentieth centuries that the discipline of archaeology was able to make great strides in developing reliable means of assigning age and chronological relationship.

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since its development by willard libby in 1952. Radiocarbon dating has become the most widely used absolute dating technology all over the world. Indeed, one of its very great strengths has been its capacity to create a "world prehistory"-a framework within which archaeologists could compare what was happening in parts of the world that had, at that time, little or no shared history (Bowman 1990). However, virtually from the time the technique was first applied to archaeological contexts, practitioners have recognized and worked to correct limitations in the technology-an effort that has led to the development of a thriving industry in dating research and the education of archaeologists in the business of collecting samples and interpreting dates. After some fifty years of research we now have enhancements of Libby's original technique that can deliver more accurate absolute dates over longer time periods.

Some limitations in radiocarbon dating have been overcome by the development of new technologies such as luminescence dating (Aitken 1985), which themselves have become the subjects of ongoing research. Given that dating is so central to the business of doing archaeology in the early twentieth-first century, any reputable undergraduate archaeology textbook contains exhaustive descriptions of techniques for dating materials as diverse as the enamel on teeth or the products of volcanic eruptions in the very remote human past. The identification of regular decay processes occurring in nature is an ongoing task designed to assist the archaeologist in obtaining absolute dates from seemingly intractable materials and to improve our confidence in the reliability and precision of such dates. Notwithstanding the great success achieved by dating specialists in the twentieth century, we should never forget that although the development and application of the technologies is important, the task of making sense of them remains firmly in the province of the archaeologist.

Tim Murray

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Davis, Edwin Hamilton

(1811-1888)

Davis was born at Hillsboro in southern Ohio, a town surrounded by a number of circular, square, and octagonal earthworks that were the cause of much speculation. From his earliest years Davis was interested in the origins of the mounds and their builders. He graduated from the Cincinnati Medical College in 1837 and settled down to practice medicine in Chillicothe, Ohio, but his interest in the earthworks continued. Davis financed the surveying of 100 of these, and the stratigraphic excavation of others, by newspaper editor-turned-archaeologist Ephraim G. Squier. Consolidating their data with the findings of other researchers on prehistoric earthworks from all over the eastern united states, Davis and Squier co-wrote *Ancient Monuments of the Mississippi Valley* (1847), the smithsonian institution's first publication. It remains an important source of information for archaeologists to this day. Squier and Davis supported caleb atwater's Moundbuilder theory, and while this precluded speculation on the origins of mounds and earthworks, they did speculate on their possible uses.

Davis collected artifacts from the mounds that were regarded as surprisingly advanced artistically. Most of his collection was acquired by the Blackmore Museum in Salisbury, England, while a smaller part is in the American Museum of Natural History in New York City. Davis was professor of medicine at the New York Medical College from 1850 to 1860, and maintained his interest in archaeology, appearing as a regular lecturer on archaeology to various learned societies.

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Dawkins became interested in Paleoanthropology in 1859 when he helped the Rev. J. Williamson explore the Wookey Hole, a cave in the Mendip Hills in southern England, in search of evidence of early humans in England. At the same time william pengelly and hugh falconer were interpreting prehistoric material found at brixham cave in Devonshire to the same end. While in his first book, *Cave Hunting* (1874), Dawkins cautiously supported the idea of early human antiquity, by his second, *Early Man in Britain* (1880), he argued that human antiquity was only as old as the Pleistocene period (10,000 years ago). Dawkins believed that the mammalian extinctions at the close of the Tertiary period would have also included humans-if they had existed at all. Based on the fossil remains in river-drift terraces or cave sites, Dawkins argued that humans first appeared in Europe during the middle Pleistocene period. He criticized French archaeologist gabriel de mortillet for excluding regional variations in early human evidence, and went on to suggest that differences in assemblages might also be the result of tribal or ethnic variations, or of access to raw materials.

Dawkins maintained his position on human antiquity despite subsequent developments in Paleoanthropology, but remained active in scientific debates, including that of the great antiquity of Piltdown man. Despite regarding the arguments for Piltdown as “heresy,” he was to become close friends with Sir Arthur Keith, who at that time was vigorously supporting the finds from Piltdown.

Dawkins became a Fellow of the Geological Society in 1861 and received the Lyell Medal in 1889 and the Prestwich Medal in 1918. He was knighted in 1919.

Tim Murray

See also

Britain, Prehistoric Archaeology; Piltdown Forgery

Dead Sea Scrolls

Widely acknowledged as a highly significant collection of Hebrew and Aramaic manuscripts, the Dead Sea Scrolls were originally discovered in 1946 in a cave near the Dead Sea at Khirbet Qumran in what is now Israel. Further discoveries were made in caves along the northwestern margin of the Dead Sea. The manuscripts have been dated to a period between the last two centuries b.c. and the first century a.d. and represent primarily religious texts. They are still being studied by scholars from all over the world.

A page from the Dead Sea Scrolls

(Gamma)

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Syro-Palestinian and Biblical Archaeology

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Déchelette, Joseph

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to research on a European scale. His career was relatively brief-roughly fifteen years between 1899 when he retired from his manufacturing business and 1914 when he died as a result of action during World War I. Déchelette was a self-taught scholar, never belonging to the academic elite or sharing in its exclusive focus on classical archaeology. He was, both socially and intellectually, above the level of local scholars and amateurs, who were limited to their arrondissement or canton. He was a correspondent of the Institut de France and the Société des Antiquaires, a member of the Comité des Travaux Historiques, a divisional inspector of the Société Française d'Archéologie, and a conservator of the Antiquites et Objets d'Art du Departement de la Loire.

Déchelette's success in the field of protohistoric archaeology was no accident, and in the no-man's-land between history and prehistory he pioneered what innovations were possible at the frontier where different disciplines meet.

Faced with a fragmented discipline in which archaeological remains were interpreted in isolation, Déchelette gathered together scattered records, connected disparate data and defined a relevant method that would work for all the periods covered by archaeology. He acquired an encyclopedic knowledge that enabled him to tackle problems from a synthetic perspective. When the publisher Picard proposed a manual of national archaeology, Déchelette was the obvious person to do it, writing the four volumes of the *Manuel d'archeologie prehistorique, celtique et galloromaine* between 1908 and 1914.

Déchelette was also one of the first archaeologists to examine the structure of empirical archaeological information. His 1904 publication *Les vases ceramiques ornes de la Gaule romaine* probably gives the best account of his method. The analysis of decorative techniques coupled with the identification of categories of vases clarified the apparent chaos of the sherds and indicated the existence of a series of workshops ranked in time and space. It was thus possible to discern the general development of the ceramic industry in the Gallo-Roman era, which coincided with a gradual shift in the centers of production from northern Italy to the banks of the Rhine. On a more detailed level the study of the decorative motifs and the stamped forms allowed archaeologists to identify each workshop by the individual output of its potters. In turn researchers could then trace how techniques and decorative themes were transmitted from workshop to workshop or even from potter to potter. The next step could be an analysis of the changes in the iconographic repertory, thereby moving from a technochronological study of the archaeological materials to questions of economic history or historical anthropology.

Déchelette, the father of French protohistory, was not a creative genius. He was a conscientious worker who applied himself enthusiastically to his archaeological pursuits in his retirement as he had done to his career in manufacturing.

He was awarded the Legion d'Honneur and given an honorary doctorate by the University of Freiburg. He was a foreign member of the Academies of Madrid and Stockholm and a contributing member of the Deutsches Institut and of the Archaeological Societies of London, Edinburgh, Dublin, Copenhagen, Brussels, Prague, and Hamburg.

Laurent Olivier;

translated by Judith Braid

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(1930-2001)

After receiving his B.A. (1957), M.A. (1959), and Ph.D. (1960) from Harvard University, James J. F. Deetz taught at the University of California at Santa Barbara (1960-1978), Harvard University (1965-1966), Brown University (1967-1978), the College of William and Mary (1977-1978), and the University of California, Berkeley (1978-1993). He then became the David A. Harrison Professor of New World Studies at the University of Virginia. Deetz is acclaimed as a masterful teacher who entertains and inspires the students who flock to his ever-popular courses.

The author of over sixty articles and books that are influential in both historical and prehistoric

Dendrochronology

See Archaeometry; Dating; Douglass, Andrew Ellicot

Denmark

Discoveries and Scholars

Although archaeology is a young science, it is rooted in a centuries-old tradition as part of the aristocratic passion for collecting. The princely collections of curios fashionable during the Renaissance also contained prehistoric artifacts. They were few in number, since excavations had not yet begun and treasure hunting was only practiced on a small scale in northern Europe. Objects recognized as archaeological were primarily monuments: grave mounds, dolmens and runic stones, and prehistoric remains were rare in this period. Until the end of the reign of King Christian IV, treasure trove material was regarded as a source of state income and melted down. Not until King Frederik III established his Kunstkammer (Chamber of Arts) in 1663 were treasure troves awarded antiquarian status and placed on exhibition.

This situation changed abruptly after the agrarian reforms of the 1780s, which increased the destruction of burial mounds. Although treasure and hoard finds turned up in newly cultivated areas and were more common, thousands of prehistoric remains were being destroyed. This alarming situation led to the establishment in 1807 of the Royal Commission for Antiquities and a national museum, housed in the loft of the Trinitatis Church in Copenhagen. Questionnaires were sent to all clergy and other interested private citizens to obtain a comprehensive survey of the nation's antiquities, and the results were published, but museum accessions were still few.

christian jürgensen thomsen, a merchant with no academic qualifications, was appointed secretary of the Royal Commission for Antiquities. He systematically rearranged the museum's collections, registered accessions, and in 1819 opened the museum to the public via free, weekly, guided tours that he conducted himself. In a short time the museum became an object of great interest throughout Scandinavia. During the fifty years (up to 1865) that Thomsen was in charge-ending as the director of five museums-the foundations of the collections were laid, and the number of accessions rose steadily (in Thomsen's time there were 540 each year). This led to the acquisition in 1832 of four to five rooms in the Christiansborg Palace and still more in 1838, occasioned by the visit of the Russian czar-prince. Finally, in 1854, the museum was housed in Prinsens Palace, where it is still to be found, having undergone extensive alterations and additions in the 1930s. A major factor in the progress of archaeology was Thomsen's principle that the collections should be open to everyone and that guided tours could instruct people about the past and create an interest in antiquities among all classes of society. Thomsen thus established a practice fundamental to all museums today.

In this period only a few random excavations were carried out. Finds were acquired primarily from the many destroyed burial mounds, and they were cataloged and exhibited. A lack of transportation prevented frequent field trips, and museum work was carried out on a part-time and unpaid basis until jens jacob worsaae received the first royal appointment to the position of inspector for ancient monuments. Great importance was attached to developing contacts with interested collectors and dealers, through the increasing popularity of archaeology at a time of a national economic depression, and the payment of rewards to the finders.

From 1855 onward a growing number of provincial collections were established. With the collecting activity of King Frederik VII as a model, many aristocratic private collections were established in the decades after 1850, and a corresponding number of private citizens' collections were begun in towns.

An expanding market for artifacts developed. In these decades the destruction of burial mounds reached a climax as a result of the new prosperity and the many subsequent advances in agriculture.

Worsaae became a museum curator in 1866 in the midst of this sudden expansion. He rearranged the collections, and the National Museum, having created new positions and received special grants, began a more systematic excavation

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recording and excavation, resulting in the accumulation of essential new knowledge on both detailed and comprehensive levels. The composition of settlement layers was recorded in terms of its archaeology, geology, and botany. Crumbling skeletal remains were exposed in graves with a brush or recorded by means of phosphate analysis. The use of machinery to uncover large surface areas also added to the knowledge of the nature of settlements, since it thereby became possible to expose whole villages. In this way the work of the Settlement Committee (established by the Research Council) was extremely important. Excavation activity also increased with the setting up of the Fortidsmindeforvaltning (Administration of Ancient Monuments), which began the excavation of endangered sites, or rescue archaeology, as laid down in a revision of the Act of Conservation in 1969.

The last two decades of the twentieth century saw the interlinked expansion and development of rescue archaeology and museums. Museums in Denmark took over the practical responsibility of carrying out all rescue archaeology. This initially caused expansion, but since the mid-1980s there has been stagnation. Because so many museums were involved and because a good number of them were small, the demands of modern, large-scale rescue excavations could not be met, and the museums were not helped by legislation, basically unchanged since 1969, that left postexcavation work unfinanced and unpaid for by private developers. (This legislation is about to be revised in accordance with the Malta Convention of the European Parliament.) As a result a large number of young Danish archaeologists migrated to find work in other countries, especially Norway and Sweden. Because rescue archaeology is the motor of the archaeological environment in all industrialized countries, Danish archaeology is now at a watershed. Will it reform legislation and the framework of rescue archaeology and enforce a new dynamic? Or will it remain within the traditional framework of museum archaeology?

Research Objectives and Milieus

Thomsen began a scientific tradition that was as important as his museum work in the development of archaeology in that he created a milieu for archaeological research-a precondition for the development and continuity of every field of study. This goal was reflected in his comprehensive correspondence, in which he shared all his knowledge and experience and thereby decisively influenced the development of museums and archaeology in Scandinavia.

An important figure in the field of scholarship at that time was Thomsen's contemporary C. C. Rafn, who in 1825 was a founding member of the Society of Northern Antiquaries (it became a royal society three years later). Rafn was the prime mover in the society, which was to become the foremost scientific medium for Danish archaeology. Its growing membership, at home and abroad, helped to give Danish archaeology a prominent place during the middle and latter part of the nineteenth century. This was also the time when a special French edition of the society's annual publication was issued (at that time French was the main language of Danish archaeology). The society published Icelandic manuscripts, partly for scholars and partly for the general reader. This effort soon gave the society a sound economic footing, which was further enhanced by the 1837 publication of the international best-seller *Antiquitates Americanae.* The society's scholarly reputation, as well as its capital, increased steadily during the nineteenth century, partly because a growing proportion of its core membership consisted of scientists, heads of state, princes, and other prominent figures from all over the world. From 1832 on archaeology was represented in the periodical *Nordisk Tidsskrift for Oldbyndighed,* retitled *Antiquerisk Tidsskrift* after 1936. These journals were succeeded in 1866 by *Aarbøger for nordisk Oldkyndighed.* During their first few decades, however, they primarily served the study of history and philology. To change this situation required an improvement in the status of archaeology, reflected both in greater activity and in an archaeological objective defined in terms of social and cultural history. This change was brought about by Thomsen's followers in the years after 1850, with Worsaae as the guiding spirit.

The ground had already been prepared in the 1840s when the young Worsaae elegantly refuted

with the establishment of a new research center, have encouraged an expansion in this field. In addition, the computerization of the large national register of monument, sites, and finds during the 1980s led to developments in the application of modern methodological tools such as geographic information systems (GIS) in settlement archaeology. The other area of expansion has resulted from the establishment of two national research centers for settlement studies during the 1990s, which have helped to analyze and publish the results of settlement excavations and projects, such as the Thy project, the Als project, or the Saltbæk Vig project, all based upon international cooperation.

Archaeology in Society

A general and well-known feature of the archaeology of many countries is that, throughout its development, it has been part of national moral rearmament, and Denmark is no exception. The “fateful years” of 1807, 1848, 1864, 1920, and 1940 to 1945 are all reflected in the archaeological activity of the time, and prehistory in these years of crisis was frequently used as a symbol of national identity. After all, it was not only through museums and archaeological books that knowledge of archaeology spread. Most of the population learned about it second- or thirdhand-primarily through the literary tradition but also in an attenuated form through school textbooks, children's books, folk high schools, and so forth. In this way knowledge of prehistory and of the past in general reached a large section of society in a complex process of dissemination, during which it underwent several changes and was used in many disguises. The question is whether it is possible to discern behind these general tendencies any important changes in the social position of archaeology and its ideological affiliations. Was archaeology used? What was it used for and by whom? We can attempt to answer these questions in several ways. The records of the National Museum, for instance, show us the route from finder to museum and the fact that that route changed. The other route, from archaeologists out to different segments of society via literature, popular outlines, and the like, is also informative. Finally, the founding of museums and the active interest shown by people outside the circle of professional archaeologists provide us with more tangible information.

There seems to be no doubt that the Commission for Antiquities was set up as the indirect result of the Romantic movement and the national defeats of the time. There is also no doubt that during its first fifty years, archaeology in Denmark was a leisure pursuit of the educated upper class. So-called popular backing was found only on a small scale. The clergy and local government officials (magistrates and county prefects) played a crucial role by maintaining contact with the Museum of Antiquities during this early period. But it was the payment of rewards that counted among those people who actually made the finds, since their standard of living was miserably low throughout most of the nineteenth century. The educational ideas that were part of the archaeological effort were expressed by archaeologists and the educated upper class of government officials and landowners.

Those who were to become enlightened by the past were not themselves actively involved in this process. The initiatives came from the people at the top. Several attempts were made at the time to set up public archaeological collections in the provinces, often attached to a county library (i.e., as part of the educational effort). But they were only attempts. Both administratively and ideologically, archaeology remained an integral part of the period's autocracy.

In the interwar years between 1850 and 1864, five provincial museums were established in rapid succession: Ribe, Odense, Århus, Viborg, and Alborg. They were founded by the educated upper middle class of the towns and not by the social group with which they were most concerned-the local peasants-at a time when the towns were experiencing rapid population increases and economic expansion. By this point archaeology had won general recognition as an important branch of national history, which was further emphasized by King Frederik VII's active interest in the field. Moreover,

investigations were begun during these years at a number of national monuments, such as Jelling and Danevirke, and in Denmark's relationship

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During the period 1975 to 2000 archaeology in Denmark was professionally consolidated. This effort was mainly linked to the expansion of local and regional museums. After a period of stagnation during the 1950s and 1960s, these institutions became the driving force in local cultural revivals. The modernization of Danish society increased the demand for and interest in local histories and identities, and museums successfully took on the job of meeting those needs. New grassroots movements formed local archives to supplement this development. History since industrialization became a major interest, as it presented a parallel story to the present-day transformations of society and landscape. And since 1985 public interest has increasingly focused on monuments and landscapes as part of a revitilization of local tourism and recreation.

Kristian Kristiansen

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Desor, Edouard

(1811-1882)

Born near Frankfurt, Germany, but of French origin, Edouard Desor played an important role in the development of archaeological research in switzerland after the middle of the nineteenth century. Desor's intellectual path was eventful. While studying law in Germany, his political activities in the liberal movement forced him into exile, first in Paris, then in Bern, Switzerland, where he met and developed a friendship with the naturalist Louis Agassiz, whom he then followed to Neuchâtel, Switzerland.

As the young master's right-hand man, Desor found himself among Agassiz's disciples and became immersed in the intense dynamic of research in what was a “scientific factory,” in the words of his friend Carl Vogt. He studied the natural sciences-geology, paleontology, and above all, glaciology-during some of the group's risky explorations in the Alps. In 1848, he followed Agassiz to the United States, where they fell out. While Agassiz was teaching at Harvard University, Desor undertook different geographical, geological, and zoological tasks and surveys for the U.S. government. Four years later he returned to

Switzerland to teach geology in Neuchâtel.

Desor's curiosity was universal, both in the natural sciences and in prehistoric research, which he only discovered in 1854 following the work of ferdinand keller on the lake dwellers. His easy social nature and his facility of expression, as much as his liking for travel, enabled him to be in constant contact with most Swiss and foreign prehistorians and naturalists. Thus, Desor chaired the first international congress of prehistory ("paleoethnology") in his adoptive town of Neuchâtel in 1866.

He inherited a considerable fortune after his brother died, which gave him financial security while he studied and published. It also allowed him to keep an open house for guests who wished to participate in scientific debates, and this venue became famous in Neuchâtel. He continued to be involved in politics, initially on behalf of the Radical (progressive) Party, which elected him president of the Swiss Federal Assembly.

Desor studied the palafittes, or pole dwellings, of Lake Neuchâtel, but he also studied

those of other lakes, both Swiss and foreign. He even started lake-dwelling research in northern Italy. His studies sought to clarify the differences between Neolithic and Bronze Age sites by defining reference corpora. He was one of the few people to question whether the so-called dwellings on water were warehouses rather than houses. He became interested in the problems of trade, and the relationships between land and lakeside dwellings, but, unlike most of his contemporaries, he always remained cautious about ethnic assimilations and peoples' migrations. Desor worked to familiarize Swiss scientists with Nordic Mesolithic and French Paleolithic research. He closely followed French archeologist gabriel de mortillet's work on the origins of man.

Desor is most famous for his work at the site of la tène in Switzerland, and he excavated several mounds in the Neuchâtel area. He was the first to propose a chronological division of the Iron Age (Desor 1865, 1866, 1868). He argued that the mounds (or tumuli), even without any iron objects, such as those at Favargettes, belonged to the earliest part of the Iron Age, like the Hallstatt sites, whereas the sites of La Tène, Tiefenau (Bern), and alesia (France) represented a second development, or a later Iron Age. Alesia provided a certain chronology, thus joining prehistory to history.

Desor made few detailed studies on precise subjects, but his insatiable curiosity encouraged him to try to find out all the facts he could about archaeology. With his open mind and his great scientific rigor, he considerably widened the field of prehistoric research.

Marc-Antoine Kaeser

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Deutsches Archäologisches Institut (DAI)

The antecedents of the Deutsches Archäologisches Institut (DAI, German Archaeological Institute) lie in the Instituto di Corrispondenza Archeologica, which was founded in Rome in 1829 by a group of antiquarians, artists, and diplomats. The purpose of the institute was the promotion of the study of classical art, epigraphy, and topography. The Prussian crown prince (later King Friedrich Wilhelm IV) was its first patron, and in 1832, when Eduard Gerhard, the person most responsible for the creation of the institute left Rome for Berlin, the organization moved with him.

Beginning in 1859, the links between the institute and first the Prussian and later the German governments became closer until it became a government operation and the name was changed to the Deutsches Archäologisches Institut. Since the turn of the twentieth century, the

DAI has grown from a focus on Italy to encompass a German interest in the archaeology of Greece and the Middle East. As such, it has become a major source of finance and administration for German archaeological activity and is a highly respected publisher of field and laboratory research pursued under its auspices.

Tim Murray

See also

German Contributions to the Archaeology of the Classical World

Dezman, Dragotin

(1821-1889)

The Slovenian archaeologist, natural scientist, and politician Dragotin Dezman (also known as Carl Deschmann) introduced and developed scientific and professional archaeology in slovenia. He first studied medicine, law, and natural sciences at Vienna University; was curator of the Provincial Museum of Carniola (Landes Museum fur Krain) in Ljubljana from 1852 to 1889; and in 1864 was made president of the Museum Society of Carniola and also a member of the Anthropological Society of Vienna.

As a natural scientist, Dezman devoted the first decades of his research and museum work almost entirely to his specialities: zoology, botany, and geology. However, in 1875 he discovered pile dwellings at the site of ljubljansko barje in Slovenia, and from then on he focused most of his work on prehistoric archaeology. From 1875 to 1877 he conducted several excavations of pile dwellings and uncovered some interesting artifacts such as wooden architectural remains, clay figurines, richly ornamented pottery, and the earliest metal finds in Slovenia. He published only short reports and notices of this work.

In the 1880s, he extended his prehistoric research to include the entire province of Carniola, the core province among Slovenian lands in the Austro-Hungarian Empire. He published the first syntheses on the prehistory of this province, “Prahistorische ansiedlungen und Begrabnisstatten” and “Zur Vorgeschichte Krains” in 1880 and 1891, respectively.

Dezman considered prehistoric archaeology to be a natural science founded on empiricist and evolutionist anthropological bases. He tried to follow the development of archaeology in Europe and to apply the best standards of those positivist disciplines to his work. For example, he was able to distinguish the la tène finds in Carniola only a year after the Iron Age was divided into the Hallstatt and La Tène periods. He maintained contacts with many of the most important institutions and scholars in central Europe and even beyond. He integrated the Provincial Museum into the international museum network, and after his important discoveries at Ljubljansko Barje, he organized the First Austrian Congress of Anthropology and Prehistory in Ljubljana in 1879. As an important personality in political and cultural life (mayor of Ljubljana 1871-1873, member of Parliament in Vienna 1873-1879), he succeeded in developing the new Museum Palace, which was officially opened in 1888. On that occasion he published a modern guidebook to the museum's collections, of which the prehistory collection was the most prominent.

Predrag Novakovic

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Dikaios, Porphyrios

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Dolní Vestonice

Excavated by the Czech archaeologist Karel Absolon (1887-1960), Dolní Vestonice is a complex of six open-air sites in Moravia, czech republic, dating from the Upper Palaeolithic period (about 25,000 years ago). The site features an accumulation of bones from over 100 woolly mammoths, hearths, pits, evidence of round dwellings, and a number of burials. Subsequent work in the mid-1980s revealed more burials. The lithic technology (featuring burins, scrapers, and backed blades) is classified as Eastern Gravettian. Perhaps most remarkable of all is the abundance of fired clay, including one complete "Venus" figurine and the remains of two simple kilns, which together are the earliest evidence for pottery anywhere in the world.

Clay "Venus" from Dolní Vestonice, Gravettian, 24,800 b.c.

(Ancient Art and Architecture Collection Ltd.)

Tim Murray

Domestication of Plants and Animals

The domestication of wild plants and animals (which is a characteristic of the Neolithic period in any given region) has been a worldwide phenomenon occurring independently in southwest Asia, parts of North, Central, and South America, china, and Africa. This change in human behavior arose following the trend toward exploration of a more broad-spectrum economy in the Mesolithic period (approximately 12,000 years ago), when people expanded their hunting and fishing repertoire to include previously unexploited species. Between 10,000 and 5,000 years ago, farming, pastoralism, and sedentism were being adopted on a large scale, although by no means universally.

Domestication of wild species results when humans take control of an animal's or a plant's reproductive cycle, causing genetic and phenotypic change. The degree of control people have over their environment can be measured on a continuum, ranging, for example, from herding wild animals to breeding them for specific preselected traits, and it can exist for hundreds of

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Dorpfeld, Wilhelm

(1853-1940)

Dorpfeld was employed as an architectural draftsman at the excavation of Olympia, under the supervision of the great German classical archaeologist ernst curtius. It was Dorpfeld who had shown heinrich schliemann around the site of Olympia in 1876, which Schliemann visited after he had been accused of amateur and unscientific excavation methods. Dorpfeld was familiar with the technical side of the excavations and so impressed Schliemann that he was eventually hired to work at the site of Troy, in Hisarlik in Turkey.

From 1882 to 1890, Dorpfeld was Schleimann's assistant. He began at Troy during Schleimann's third season of excavations, after Schliemann had once again been criticized by journalists and some archaeologists for being a treasure hunter and a fraud-and this despite the friendship of the great German archaeologist rudolf virchow. So Dorpfeld was employed for scholarly credibility, and wisely so as it turned out. He clarified the stratigraphy of the walls and allowed a better understanding of the evolution of the structures on the site. He corrected Schliemann's mistake of attributing the burnt layer to the second rather than the third layer from the bottom. Dorpfeld also discovered that the city continued outside the walls and was present in Hissarlik in March 1890 when the international panel of archaeologists assembled by Schliemann decided that the site was indeed the remains of ancient Troy.

Dorpfeld went on to assist Schliemann at the excavation of the city of Tiryns in the Peloponese from 1884 to 1885. The floor plan of the palace was uncovered and Dorpfeld discerned the floor plans of two buildings similar in structure to that of Temple A at Troy. He identified this architectural form as the Homeric megaron. The other major find at Tiryns were Mycenean wall-paintings. While the site was a disappointment to Schliemann, for Dorpfeld it was a great success, as it was he who located the architectural remains and the wall paintings.

In 1886 Schliemann and Dorpfeld excavated at Levadia, where they searched unsuccessfully for the site of the Oracle of Trophonius. They also returned to Orchomenos, where Dorpfeld cleaned out and drew up a more accurate plan of the tomb. Together they visited Crete to look at the site at Knossos-but Schliemann considered the rights to excavate the site to be too expensive.

Dorpfeld traveled with Schliemann to London to help mount a response to critics of the interpretation of their finds from Tiryns and escorted Schliemann's body from Naples, where he had died, back to Athens, where he was buried.

Succeeding Schliemann, Dorpfeld used more refined excavation methods, identifying nine levels and revising Schliemann's chronology and stratigraphy at Hissarlik, proposing that Troy VI, not Troy II, was the Homeric city. In 1893 and 1894 Dorpfeld confirmed the late Bronze Age date of Troy VI. He subsequently excavated on Levkas, which he identified as Homeric Ithaca, the home of Odysseus.

Tim Murray

Douglass, Andrew Ellicot

(1867-1962)

Born in Windsor, Vermont, and a graduate of Trinity College, Connecticut, in 1889, Douglass joined the Harvard College Observatory, which marked the beginning of a long and eminent career concerned primarily with astronomy. Douglass helped to establish and operate three major astronomical

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Dorpfeld, Wilhelm

(1853-1940)

Dorpfeld was employed as an architectural draftsman at the excavation of Olympia, under the supervision of the great German classical archaeologist ernst curtius. It was Dorpfeld who had shown heinrich schliemann around the site of Olympia in 1876, which Schliemann visited after he had been accused of amateur and unscientific excavation methods. Dorpfeld was familiar with the technical side of the excavations and so impressed Schliemann that he was eventually hired to work at the site of Troy, in Hisarlik in Turkey.

From 1882 to 1890, Dorpfeld was Schleimann's assistant. He began at Troy during Schleimann's third season of excavations, after Schliemann had once again been criticized by journalists and some archaeologists for being a treasure hunter and a fraud-and this despite the friendship of the great German archaeologist rudolf virchow. So Dorpfeld was employed for scholarly credibility, and wisely so as it turned out. He clarified the stratigraphy of the walls and allowed a better understanding of the evolution of the structures on the site. He corrected Schliemann's mistake of attributing the burnt layer to the second rather than the third layer from the bottom. Dorpfeld also discovered that the city continued outside the walls and was present in Hissarlik in March 1890 when the international panel of archaeologists assembled by Schliemann decided that the site was indeed the remains of ancient Troy.

Dorpfeld went on to assist Schliemann at the excavation of the city of Tiryns in the Peloponese from 1884 to 1885. The floor plan of the palace was uncovered and Dorpfeld discerned the floor plans of two buildings similar in structure to that of Temple A at Troy. He identified this architectural form as the Homeric megaron. The other major find at Tiryns were Mycenean wall-paintings. While the site was a disappointment to Schliemann, for Dorpfeld it was a great success, as it was he who located the architectural remains and the wall paintings.

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observatories-the Harvard College Observatory at Arequipa, Peru; the Lowell Observatory in Flagstaff, Arizona; and the Steward Observatory at the University of Arizona in Tucson-before he became involved in archaeology.

Douglass's interest in the effects of sunspots on terrestrial weather led him to investigate the annual growth layers of Arizona pines for variations in tree-ring width. He discovered a relationship between rainfall and tree growth, and between cyclical variations in tree growth and sunspot cycles. Looking for extensive tree-ring records to substantiate his theories, Douglass asked archaeologists in Tucson for pieces of wood from the ruins of a southwestern pueblo. Within a decade he was able to date some of these wooden remains back to a.d. 100, and others to a.d. 700, providing archaeology with a valuable tool for establishing an independent chronology. Douglass went on to develop the study of tree-rings into the science of dendrochronology. Tree-ring dating has made substantial contributions to archaeology in the Arctic, Britain, Central Europe, and the Mediterranean Basin. Douglass also provided dendro-climatic and dendro-environmental reconstructions for archaeology.

He retired from astronomy to found and direct the Laboratory of Tree-ring Research at the University of Arizona, which he helped to establish as the preeminent center for dendrochronological research.

Tim Murray

Dubois, Eugene

(1858-1940)

Born in the netherlands, Dubois studied medicine at the University of Amsterdam until 1884. He worked as an assistant to the Anatomist Max Furbringer from 1881 until 1887, and lectured in anatomy from 1886 to 1887. Inspired by the work of Ernst Haeckel, Dubois resigned from the university and left for the Dutch East Indies (now indonesia) to search for evidence of early human beings. Haeckel had claimed that humankind had descended from a group of apes in Asia, and not in Africa as Darwin had suggested. This argument was based on a few anatomical resemblances between modern humans and the gibbons of island southeast asia.

Supported by the Dutch colonial government, Dubois searched for human ancestral remains in Java and Sumatra from 1888 to 1895. The skullcap, thighbone, and a few teeth of a *Pithecanthropus erectu*s, along with other fossils, were found near the village of Trinil on Java between 1891 and 1893. Dubois believed these remains, known as “Java man,” to be the missing link between apes and humans, and he returned to Europe to convince the scientific community of their importance.

Dubois's fossil finds were the first hominid remains to be accepted as material proof of human evolution, and a significant number of scientists regarded them as proof of a chain of connection between humans and their primitive ancestors. The debate about their significance led to the development of an evolutionary interpretation of extant European Neanderthal remains, leading to further development of the new science of paleoanthropology.

Dubois became professor of crystallography, mineralogy, paleontology, and geology at the University of Amsterdam in 1899 and withdrew from the debate on *Pithecanthropus*. He continued with paleontological and anatomical research, pioneering allometric relations between brain and body size in vertebrates and hominids. This work convinced him that vertebrate evolution had not proceeded in a linear nor a gradual way, but through quantum changes. He maintained that *Pithecanthropus* was the missing link between primates and hominids, and he would not accept that other pithecanthropine finds, made in Java in the 1930s by von Koenigswald, were much closer to *Homo sapiens* that he had

originally argued. He retired in 1929.

Tim Murray

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Duff, Roger Shepherd

(1912-1978)

Roger Duff was born in Invercargill on the south island of New Zealand and attended Otago University and Canterbury University College. Duff was introduced to Pacific ethnology and archaeology by Dr. H. D. Skinner, director of the Otago Museum and a well-known archaeologist. Duff became director of the Dominion Museum (now the National Museum) in Wellington, a position he held from 1948 to 1978.

Duff received a Doctor of Science Degree from the University of New Zealand in 1951 for his most famous work on the Moa-hunter period of Maori culture, which has since been reprinted numerous times. This monograph became the foundation for the integration of modern Maori and Polynesian history based on Duff's archaeological and ethnological understanding of the Pacific. In his analysis of material excavated from burial sites at Wairu Bar, Duff confirmed that the Maori Moa-hunters were truly Polynesian peoples, rather than Melanesian as had formerly been thought. Based on the highly developed stone-adzes Duff was later to describe eastern Polynesian culture as “Neolithic.”

Duff received a number of awards including the Smith Medal from Otago University for anthropological research and the Hector Medal from the Royal Society of New Zealand.

Tim Murray

See also

New Zealand: Prehistoric Archaeology; Papua New Guinea and Melanesia; Polynesia

Dugdale, Sir William

(1605-1686)

The son of a Warwickshire gentleman, Dugdale became a lawyer. His interests in antiquities and local history were encouraged by local antiquarians William Burton, author of the *Description of Leicestershire,* and Sir Simon Archer, the owner of a historic collection relating to Warwickshire. During the 1630s and 1640s Dugdale researched the histories of Warwick county's families, and this brought him to the attention of the well-connected and aristocratic antiquarians of London, Sir Henry Spelman, Sir Christopher Hatton and Thomas, the Earl of Arundel. They invited him to London and eased his way into the world of national antiquarianism. They also encouraged him to research the monastic foundations of England with another antiquarian, Roger Dodsworth of Yorkshire.

Sir William Dugdale

(Hulton Getty)

To this end Dugdale was provided with access to records in the Exchequer and the Tower of London, major depositories of ancient documents dating back to the Middle Ages. The library of Sir Robert Cotton, another antiquarian, was also opened to Dugdale. His patrons recommended that he become a Herald, a position that included lodgings at the Office of Heralds in London and a small income. With the political crisis between Parliament and King James II, Dugdale was dispatched by Sir Christopher Hatton to record as many as possible of the coats of arms, inscriptions with details of kinship lines, and church records on stone, glass, brass, and paper, which the antiquarians knew would be targets for

destruction by the Puritans during the impending civil war.

In 1648, with the collapse of the Royalist cause, Dugdale went to France where he continued his research, but on French records about English monasteries. He returned to England to work with Dodsworth to complete their *Monasticon* and to publish his *History of Warwickshire*.

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Easter Island

Occupied by people from polynesia at the extreme edge of their range in the early centuries a.d., Easter Island was named by a Dutch navigator by the name of Roggeveen during a visit to the island over Easter in 1722. It seems likely that this was one of the few contacts with the outside world that was made over the entire period of occupation of the island. Detailed archaeological research on Easter Island was begun by the Norwegian explorer Thor Heyerdahl in 1955, although the large statues (*moai*), the platforms (*Ahu*), the quarries, and the Rongorongo script had attracted attention earlier. An air of mystery (and some sadness) pervades Easter Island studies, but archaeologists now have a clear understanding of the means by which the famous statues were created and erected, the source of the island's original inhabitants, and the (devastating) environmental history of the island.

An example of the famous Easter Island statues

(Spectrum Colour Library)

Tim Murray

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Ecuador

Pottery in the New World appeared first in the equatorial and subequatorial tropics. It developed next in the subtropics and, finally, in the temperate zones a few centuries before European contact. Archaeological teaching and research developed inversely. The subject was first taught north of the Tropic of Cancer in the United States, then south of the tropic of Capricorn in argentina and chile and, finally, in Ecuador. References to the pre-Columbian past began with reports by the early Spanish chroniclers who accompanied Francisco Pizarro on his voyages from panama to peru. This period of Ecuadorean archaeology, which was mainly ethnohistorical, lasted until the last two decades of the nineteenth century-roughly the same as that in any other area of the New World, corresponding to the speculative period defined by gordon willey and Phillip Phillips for U.S. archaeology.

In the late nineteenth century, Msgr. Federico González Suárez, the archbishop of Quito and a historian, wrote, as an appendix to his *History of Ecuador,* a volume entitled *Archaeological Atlas.* A professor of history at Quito University, he was the first of a generation of historians interested in the aboriginal history of his country. Others, including Carlos Manuel Larrea and Jacinto Jijón y Caamaño, also left their imprint on the archaeology of Ecuador. They conducted research in the Andean intermontane valleys and on the coast of Manabí and Esmeraldas Provinces. However, no serious effort was made to develop professional archaeologists in Ecuador until the 1980s.

During the nineteenth century European naturalists and geographers who visited the New World-such as William Bollaert (from 1860 to 1880), Anatole Bamps (from 1878 to 1888), and Alfons Steuble (from 1875 to 1888)-made the first collections of archaeological artifacts in Ecuador. (The latter's collections were studied by a young max uhle in Dresden from 1889 to 1890 and in 1892.) In the 1890s Marshall Saville from the George Heye Foundation carried out extensive excavations along the Ecuadorean

coast, and George Dorsey collected some Inca artifacts from La Plata Island, 36 kilometers southwest of Manta in Manabí Province, for the Field Columbian Museum during the Fourth Centennial Columbian Exhibition in Chicago. Jijón y Caamaño was later instrumental in bringing the German archaeologist Max Uhle to Ecuador, and he financed Uhle's research for nearly two decades (from 1920 to 1939). Beginning in the 1940s coastal archaeological research started to dominate Ecuadorean culture history. This trend needs to be explained for an understanding of the development of archaeological research in the hub of the northern Andean area.

Although small in size, Ecuador presents a great variety of environments and landforms. The upthrust of the Andes divided it into two lowland regions. The coast, west of the Andes, is separated into a Tertiary uplifted plain, bordered by the Pacific Ocean and ancient volcanic mountains. Between these mountains and the Andes, two large riverine basins began to fill with alluvium around 10,000 b.p., providing a western counterpart to the Amazonian jungle. A mantle of recent alluvium covers the Ecuadorian Upper Amazon, and in some areas it overlays ancient alluvial deposits, laid down before the Andean upthrust. The Ecuadorean Andes are divided into two intermontane valleys by the Cordillera Real. Its western valley reaches altitudes higher that 2,000 meters; the eastern valley averages 900 meters in altitude. The western valley is subdivided into smaller valleys that drain both eastward into the Upper Amazon and westward into the coastal lain and the Pacific Ocean.

Beginning in the Holocene the landscape of Ecuador marked by the Andean and coastal uplifts of the Tertiary period underwent great changes. Rapid deposits of recent alluvium modified the landscape of the Guayas and Amazonian basins. Deposits of lava and volcanic tuft caused by the intense volcanic activity in the northern Ecuadorean Andes also changed the early-Holocene landscape. And during the end of the Pleistocene and the beginning of the Holocene, severe climatic and sea-level shifts dramatically altered the landscape as well. Tropical savannahs changed into forests, and the coastline retreated as it gave way to the rising seas. The great mammals of the Pleistocene, which had lived in the area for nearly a million years, disappeared. These changes occurred 2,000 to 3,000 years after the arrival of the Paleo-Indians.

Active floodplain covers great spaces of the Ecuadorean lowlands, and alluvium is added to the Upper Amazon and to the Guayas basin each year. Meandering rivers churn up the alluvium, redepositing it and its cultural contents in newly created point-bar formations, complicating the stratified deposits in new landforms. The accumulated deposits cover the evidence for early occupation of these bottomlands. An example is the Valdivia II site at Colimes de Balzar (with two C-14 assays of 4770 + 210 b.p. or 3200 b.c. [corrected]). This site, buried under 8.20 meters of alluvium strata, shows interspacing by volcanic-ash deposits and habitation floors from several occupational periods. Late-Pleistocene remnants, dating between 18,000 and 10,000 b.c., should be much deeper.

In the northern Ecuadorean highlands, under a soft volcanic tuft about 3 meters deep, Pleistocene faunal remains can be found. A good example is the Paramo del Angel, north of the Chota Valley in Carchi Province, where the remains of several mastodons have been discovered at the bottom of erosion gullies. In the eastern lowlands, Pedro T. Porras found some chipped stone artifacts at Yasuní, apparently belonging to that period, but he did not report faunal associations of any kind. This lack of conclusive evidence is probably the result of unsystematic investigations in preceramic archaeology.

Some 10,000 years of archaeological evidence is buried in this stage. Grave robbers, antiquarians, and some archaeologists have unearthed shards that testify to a complex social-history process based on the exploitation of a landscape rich in ecological niches that supported some of the most diverse floras and faunas in the world.

The Evolution of Archaeology in Ecuador

In trying to systematize the progression of archaeological research in Ecuador, one may be tempted to use Willey and Phillips's classification

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for New World archaeology, and in general it does fit. Most archaeological research in Ecuador has been conducted by Americans during several periods, representing the tendencies used as period indicators by Willey and Phillips. In a 1982 article entitled “100 Years of Ecuadorian Archaeology,” Donald Collier divided Ecuadorean archaeological research into four periods: the pioneer period, 1878-1899; the developmental period, 1900-1934; the transitional period, 1935-1952; and the florescent period, 1953-1980. Collier's article is chronological in intent and in some ways quantitative-qualitative, and it is useful for showing the increase in archaeological research in Ecuador up to 1980. It does not, however, consider the trends in archaeological research that have dominated Ecuadorean archaeology, and because it was published in the early 1980s, it missed the the recent period in which archaeology in Ecuador attained some degree of maturity.

Archaeology in Ecuador

Archaeological research in Ecuador can be best classified in the following manner. Following is my own thematic version of its development.

The First 350 Years

The initial reports of archaeological monuments in Ecuador appeared in the chronicles of the Spanish priest and soldiers accompanying Pizarro, in the chronicles of the sixteenth century, and in the *Visitas* of the seventeenth century. (Detailed descriptions by naturalists and geographers, who put together the first archaeological collections, came later.) The precursors of Ecuadorean archaeology had appeared. Concomitant with this, the looting of tombs for gold and archaeological materials began with the Spanish conquistadores, settlers, and colonial officials. The first Ecuadorean archaeological and ethnographical materials began to appear in European museums in the 1850s.

1880-1920: The Classificatory Period

This period is best defined by the classification in a museum in Dresden-by young linguist Max Uhle-of the archaeological materials collected by Alfons Steuble and Willhelm Reiss in Ecuador in the 1880s. During this time some local historians (such as Monsignor González Suárez) and foreign residents (such as the linguist Otto von Buchwald) also began to classify their archaeological finds in Ecuador. The collections made by George Dorsey and Marshall Saville in coastal Ecuador for the Field Columbian Museum and for the Museum of the American Indian (George Heye Foundation) were classified and published in the first decade of the twentieth century. About the same time, Paul Rivet and R. Vernau began their Ecuadorean research for the French Academy, and Uhle, who was already acquainted with the Ecuadorean materials collected by Steuble and Reiss in the previous period, arrived in Ecuador from Peru at the invitation of Jacinto Jijón y Caamaño. The two men began a fruitful, twenty-five-year research association that contributed to the development of the first systematic chronology for Ecuadorean archaeology, and together with Carlos Manuel Larrea they carried Ecuadorean archaeology into the culture-historical period.

As Ecuadorean archaeology progressed, grave looters in the southern Ecuadorean Andes began unearthing veritable treasure hoards, which were, for the most part, melted down to be sold as gold from the mines in the area. Saville managed to save a small part of one of the Sigsig/Gualaceo treasures, acquiring it for the Museum of the American Indian from Don Nicol's Ribadeneyra of Guayaquil.

1920-1950: The Culture-Historical Period

Following the momentum of Max Uhle and Jacinto Jijón's archaeological investigations, others individuals, such as G.H.S. Bushnell, Roaul D'Harcourt, and Paul Bergsøe, began conducting research in coastal Ecuador. Two young history and geography teachers, Carlos Zevallos Menéndez and Francisco

Huerta Rendón, followed suit, taking their senior students on archaeological field trips. At the beginning of World War II, Bushnell left Ecuador to fight for England, and U.S. anthropologists from the Andean Institute went to Ecuador to do archaeological work and help with the anti-Nazi war effort. Donald Collier and John V. Murra excavated in Cerro Narrío

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This period is best defined by the classification in a museum in Dresden-by young linguist Max Uhle-of the archaeological materials collected by Alfons Steuble and Willhelm Reiss in Ecuador in the 1880s. During this time some local historians (such as Monsignor González Suárez) and foreign residents (such as the linguist Otto von Buchwald) also began to classify their archaeological finds in Ecuador. The collections made by George Dorsey and Marshall Saville in coastal Ecuador for the Field Columbian Museum and for the Museum of the American Indian (George Heye Foundation) were classified and published in the first decade of the twentieth century. About the same time, Paul Rivet and R. Vernau began their Ecuadorean research for the French Academy, and Uhle, who was already acquainted with the Ecuadorean materials collected by Steuble and Reiss in the previous period, arrived in Ecuador from Peru at the invitation of Jacinto Jijón y Caamaño. The two men began a fruitful, twenty-five-year research association that contributed to the development of the first systematic chronology for Ecuadorean archaeology, and together with Carlos Manuel Larrea they carried Ecuadorean archaeology into the culture-historical period.

As Ecuadorean archaeology progressed, grave looters in the southern Ecuadorean Andes began unearthing veritable treasure hoards, which were, for the most part, melted down to be sold as gold from the mines in the area. Saville managed to save a small part of one of the Sigsig/Gualaceo treasures, acquiring it for the Museum of the American Indian from Don Nicol's Ribadeneyra of Guayaquil.

1920-1950: The Culture-Historical Period

Following the momentum of Max Uhle and Jacinto Jijón's archaeological investigations, others individuals, such as G.H.S. Bushnell, Roaul D'Harcourt, and Paul Bergsøe, began conducting research in coastal Ecuador. Two young history and geography teachers, Carlos Zevallos Menéndez and Francisco

Huerta Rendón, followed suit, taking their senior students on archaeological field trips. At the beginning of World War II, Bushnell left Ecuador to fight for England, and U.S. anthropologists from the Andean Institute went to Ecuador to do archaeological work and help with the anti-Nazi war effort. Donald Collier and John V. Murra excavated in Cerro Narrío

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for New World archaeology, and in general it does fit. Most archaeological research in Ecuador has been conducted by Americans during several periods, representing the tendencies used as period indicators by Willey and Phillips. In a 1982 article entitled “100 Years of Ecuadorian Archaeology,” Donald Collier divided Ecuadorean archaeological research into four periods: the pioneer period, 1878-1899; the developmental period, 1900-1934; the transitional period, 1935-1952; and the florescent period, 1953-1980. Collier's article is chronological in intent and in some ways quantitative-qualitative, and it is useful for showing the increase in archaeological research in Ecuador up to 1980. It does not, however, consider the trends in archaeological research that have dominated Ecuadorean archaeology, and because it was published in the early 1980s, it missed the the recent period in which archaeology in Ecuador attained some degree of maturity.

Archaeology in Ecuador

Archaeological research in Ecuador can be best classified in the following manner. Following is my own thematic version of its development.

The First 350 Years

The initial reports of archaeological monuments in Ecuador appeared in the chronicles of the Spanish priest and soldiers accompanying Pizarro, in the chronicles of the sixteenth century, and in the *Visitas* of the seventeenth century. (Detailed descriptions by naturalists and geographers, who put together the first archaeological collections, came later.) The precursors of Ecuadorean archaeology had appeared. Concomitant with this, the looting of tombs for gold and archaeological materials began with the Spanish conquistadores, settlers, and colonial officials. The first Ecuadorean archaeological and ethnographical materials began to appear in European museums in the 1850s.

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in Cañar Province, and Wendell Bennett conducted research around Cuenca and southern Azuay Province. As World War II came to a close, Hans Dietrich Disselhoff, a former German administrator in occupied Denmark, carried out archaeological research in Manantial de Guangala.

Meanwhile, gold-rich sites continued to be looted, and archaeological gold was melted and formed into ingots. Looters began to keep some of the ceramic and other artifacts, which they sold to a new breed of collectors-those who became interested in local culture-history. A Swiss businessman, Max Konantz, began his collection by buying from looters in the Cuenca area. Local landowners and farmers also started to collect archaeological artifacts.

1950-1965: The Historical Classificatory Period-The Advent of C-14

Bushnell published his coastal chronology in *The Archaeology of the Santa Elena Peninsula in South West Ecuador* (1951), and Collier and Murra published theirs for the cultures of the southern Ecuadorean Andes. However, because stratified materials were not always superimposed, Bushnell, like Jijón y Caamaño before him, inverted part of his sequence. However, Willard Libby's discovery of C-14 dating was soon conceived as the panacea that would cure all ailments in archaeological chronologies. Establishing a workable chronology was problematic prior to the application of radiometric (C-14) dating. Both Bushnell's coastal chronology and Collier and Murra's chronology of the Southern Ecuadorian Andes experienced difficulties.

With the advent of C-14 the emphasis on excavating archaeological deposits by their “natural stratigraphy” declined, and simpler means of excavation-artificial stratigraphy, for instance, by metric levels-became widespread, providing more secure archaeological sequences. A Guayaquil businessman turned archaeologist, Emilio Estrada, began to build a new chronology for the Ecuadorean coast. Estrada was later joined by Clifford Evans and Betty J. Meggers from the Smithsonian Institution, and together they built the basic chronology for Ecuador. It still stands today, with some addenda and modifications made by others. The single most important modification has been Betsy Hill's 1972-1974 refinement of the Valdivia from four to eight phases, and the more recent eleven-phase refinement by Marcos and Obelic in 1998. During this period the most significant contribution to the knowledge of the archaeology of the Ecuadorian coast derived from the excavations at San Pablo by Carlos Zevallos and Olaf Holm. Although they published only a preliminary report, their excellent excavation permitted a more comprehensive view of Valdivia society. Zevallos later published an article that correctly postulated the agricultural base for the development of Valdivia society.

Meggers and Evans introduced type frequency seriation into Ecuador. This was a laboratory-analysis method developed by James A. Ford for his excavations in the lower Mississippi, which went hand in hand with the excavation of arbitrary levels. The publication of information on Zevallos and Holm's excavations at San Pablo may well have convinced many archaeologists of the limitations of metric stratigraphy and type frequency seriation (*see* Classification; Dating).

Estrada convinced other aficionados to take part in the archaeological research in coastal Ecuador. Richard Zeller, prompted by Estrada, began a long love affair with Guangala sites in the Jabita River basin, north of the Santa Elena Peninsula. Olaf Holm, cooperating at first with Zevallos at San Pablo, moved to Joa in southern Manabí Province to study evidences of copper metallurgy, and in the eastern lowlands Estrada, Meggers, and Evans began supporting Fr. PedroI. Porras's archaeological research.

During this period archaeologists in Ecuador, following Konantz, began to supplement their excavations with collections, acquiring fortuitous finds from farmers as well as artifacts from merchants who bought from looters, known as *guaqueros*. Zevallos built the gold museum for the Casa de la Cultura de

Guayaquil by such acquisitions; the ceramic and other artifacts came from archaeological excavations he and his associates conducted. Estrada supplemented the collection of the Victor Emilio Estrada Museum, buying both whole

pots and other artifacts from guaqueros from Manabí. Although this method allowed researchers to supplement museum exhibitions with looted material validated by the archaeological data, it also set a trend that, with time, was exacerbated and became disproportionate, ultimately increasing the looting of archaeological sites.

1965-1974: Questioning Type Frequency Seriation

With the appearance in 1965 of the smithsonian institution's publication *The Formative Period of Ecuador: Valdivia and Machalilla Phases,* by Meggers, Evans, and Estrada, some archaeologists (Donald Collier, Jon Müller, Donald Lathrap, and Henning Bischof, among others) began to question the Jomôn origin for Valdivia, as well as the excavation method used and especially type frequency seriation.

Edward P. Lanning and his students from Columbia University began a research project in the Santa Elena Peninsula, contributing to the refinement of all cultural phases proposed by Estrada and in Meggers's *Ecuador*. Lanning's efforts were also directed at rescuing the excellent data published by Bushnell (1951). Zevallos cooperated with Lanning, and after that point he and his students began to use the stylistic seriation developed by John Rowe in his studies in the Ica Valley in Peru.

Toward the end of this period a florescent epoch for Ecuadorean archaeology commenced. José Alcina Franch and his students at the Universidad Complutense de Madrid began a series of research campaigns in Ecuador that would continue into the next period. Alcina made many contributions to the archaeology of Esmeraldas Province and the Inca site of Ingapirca in Cañar. At Cochasquí, north of Quito, a team from the University of Bonn, under the direction of Udo Oberem, restudied the site that had been excavated by Uhle in the 1920s. Karen Stothert, under the direction of Edward Lanning, began her research at the Vegas preceramic site, and Jorge G. Marcos located the Valdivia site of Real Alto and was pursuing his doctorate at the University of Illinois.

Guillermo Pérez Chiriboga-then president of the Central Bank of Ecuador-decided to create a gold museum at the bank when he realized that much of the gold bullion it bought had been archaeological gold. In some of the ingots he was able to see vestiges of the artifacts that had been melted down to form the bars. In creating the gold museum he intended to save archaeological gold from destruction, and he soon decided to broaden the scope of the museum to include all archaeological artifacts. Going beyond the initial concept, the Central Bank created the Museum for the Archaeology of Ecuador.

The museum fund was built on the acquisition of the Konantz Collection and a few other, smaller private collections. As it grew, its directors began to procure exceptional archaeological pieces from some guaqueros, and in time the negative effect of increased looting became apparent.

1974-1978: The Beginning of Explanatory Archaeology in Ecuador

In August 1974 an interdisciplinary team of archaeologists and other specialists from the University of Illinois-led by Donald W. Lathrap and his student Jorge Marcos-arrived in the Santa Elena Peninsula to begin research at Real Alto, the site that Marcos had discovered. This investigation marked the beginning of explanatory archaeology in Ecuador. Up to that time archaeologists had been content to describe their finds or to construct hypotheses based on routes and ways of diffusion. They also postulated possible social organization based only on their site finds and on prejudices about the level of society reached by the ancestors of the present native population in the area. Another form of prejudice was evident in regard to the environment. A heavily deforested area during the second half of the twentieth century was considered by many archaeologists as a model for the ancient environs of the Santa Elena Peninsula. At Real Alto environmental reconstruction, area excavation, biological and forensic studies of skeletal material, geologic studies of the Tablazo formation, quantification and use

patterns in milling stones, and ceramic modal and functional analysis represented a shift in the right direction. The excavation of the Cotocollao site in Quito by Peterson and Villalba, which

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began a few months later, followed, in a smaller way, this new trend.

Formally trained Ecuadorean archaeologists working in European and U.S. universities returned to Ecuador at the end of this period. Their impact would soon be felt in the progress of archaeology in their homeland. Examples of the research they started include the project known as Sacred Isles of Ecuador, during which the existence of long-distance maritime trade networks centered on the coast of Ecuador was discovered, and the excavation of the obsidian mine at Mullumica by Ernesto Salazar.

As archaeology progressed, pothunting and looting accelerated due to the increase in international demand and the market pressure created by the acquisition of looted archaeological art by local museums and collectors. The consequent loss of artifacts and sites through disturbance placed the heritage of Ecuador under great pressure.

1980: Formal Training in Anthropological Archaeology Begins

In 1980 the first formal program to graduate professional archaeologists opened at the Escuela Superior Politecnica del Litoral (ESPOL) in Guayaquil. Although the creation of the Institute of National Heritage (Instituto de Patrimonio Cultural) in 1979 had formalized archaeological research, achieving a national consensus on the importance of archaeology for Ecuador is still a pending assignment.

Historically, most Ecuadoreans, including some university and government officials, did not consider archaeology a scientific effort. It was regarded as an activity worthy of dilettantes, the rich, and a few dreamers. The professional archaeologist was seen as strange sort whose career was considered a hobby by most people of means and a job by the poor farmers who became looters as a means of offsetting the chronic scarcity of agricultural jobs.

Such conceptions are now changing. For a long time, however, there was strife between museum directors and museum research personnel. The former felt that archaeologists pulled only potsherds out of the ground, not the beautiful pieces brought to them by grave robbers. The latter wanted museum funds to be used for archaeological investigations, not the acquisition of archaeological art.

1981-1992: Hoarding Archaeological Art versus Archaeological Research

During the 1980s and early 1990s professional archaeologists, on the one hand, and museum directors and collectors, on the other, waged a war that was partially won by the archaeologists, for the national museums in Ecuador halted all forms of acquisition. However, the huge acquisition budgets were not redirected to research, and research funds continued to be meager. The difficulty lay in the fact that archaeology was and still is considered by the cultural elite to be a business for antiquarians and art merchants, rather than a career worthy of historians or anthropologists. Private and archaeological museum collections, including those of the national museums, have been acquired by purchasing from looters rather than through museum-financed archaeological research. Museum directors and collectors justify their actions by saying that they are keeping the archaeological pieces from leaving the country. However, a study made by archaeologists and economists for the Central Bank of Ecuador showed that the internal demand for archaeological art actually finances the looting that yields the small amount of excellent art that is exported clandestinely.

Archaeological research nevertheless grew over this period, thanks to international funding and to some national research funds provided by groups such as Foncultura, or the Social and Cultural Fund of the National Petroleum Company. Studies of the impact of development on archeaological sites were also started, with much of this research carried out by Ecuadorean graduates in archaeology.

1992-2000: Growing Pains-Toward Adulthood and Reproduction

During the last decade of the twentieth century, there was an increase in the number of Ecuadorean archaeologists working in their field, in spite of the economic crisis that affected most cultural and social programs in

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Ecuador. This trend was enhanced by an increase in archaeological impact studies, most of which were conducted by Ecuadorean graduates in anthropology and archaeology. However, although the demand for archaeologists increased, a perverse tendency developed in universities where careers were judged by cost-benefit parameters and archaeology or anthropology was not deemed as attractive to the university council as management or business studies.

A number of medium-sized projects to study Ecuadorian biodiversity and native development are now opening up new opportunities for archaeological research, and as a result there has been an increase in the demand for graduates in archaeology. This situation is a welcome preview of better days ahead at the outset of the third millennium.

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Egypt: Dynastic

Introduction

The archaeology of Pharaonic Egypt spans three millennia (ca. 3100-332 b.c.) and encompasses a diverse body of artifacts, architecture, texts, and organic remains. Museums throughout the

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Egypt: Dynastic

Introduction

The archaeology of Pharaonic Egypt spans three millennia (ca. 3100-332 b.c.) and encompasses a diverse body of artifacts, architecture, texts, and organic remains. Museums throughout the

his colleagues in the 1930s (see Powell 1973, 61, where Pendlebury is said to be part of "a new generation of archaeologists openly disapproving of what they regarded as the amateurish policies of the past").

Napoleon, Champollion, and the Problem of Integrating Textual and Archaeological Data

Just as it is difficult to ascertain the date at which European antiquarianism was superseded by archaeology (see Daniel 1967; Piggott 1989), it is difficult to be precise about the point at which the simple enthusiasm for Egyptian antiquities was transformed into something resembling the modern discipline of Egyptology. Most histories of Egyptian archaeology, however, see the Napoleonic expedition at the beginning of the nineteenth century as the first systematic attempt to record and describe the standing remains of Pharaonic Egypt. The importance of the *Description de l'Egypte,* the multivolume publication that resulted from the expedition, lay not only in its high standards of draftsmanship and accuracy but also in the fact that it constituted a continuous and internally consistent appraisal by a single group of scholars, thus providing the first real assessment of ancient Egypt in its totality.

However, the beginning of Egyptology as a complete historical discipline, comprising the study of both texts and archaeology, was made possible by the more deskbound endeavors of the French linguist jean-françois champollion. His decipherment of Egyptian hieroglyphs in 1822, closely followed by Thomas Young's decipherment of the demotic script in the late 1820s, transformed Egyptology almost overnight from prehistory into history. The translation of a whole range of documents, containing such information as the names of gods and kings as well as the details of religious rituals and economic transactions, soon enabled the field of Egyptology to take its place alongside the study of the classical civilizations. Champollion's discovery, however, had also set in motion an inexorable process of academic divergence between linguists and excavators, between historians and anthropologists.

From the moment that hieroglyphs, both hieratic and demotic, began to be translated, Egyptology was characterized by a constant struggle to reconcile the kinds of general socioeconomic evidence preserved in the archaeological record with the more specific historical information contained in ancient texts. Although the newly discovered knowledge of the texts had the potential to revive the very thoughts and emotions of the ancient Egyptians, it also introduced the temptation to assume that the answers to questions about Egyptian civilization could be found in the written word rather than in the archaeologist's trench. The purely archaeological view of Egyptian culture, as preserved in the form of buried walls, artifacts, and organic remains, would henceforth have to be seen in the context of a richly detailed corpus of texts written on stone and papyrus. The absence of written records in prehistoric archaeology may be frustrating, but it has undoubtedly allowed prehistoric archaeologists greater freedom to evolve new theories and hypotheses that are based purely on the surviving material culture. In Egyptian archaeology, as in other historical disciplines, the written word, with all its potential for subjectivity and persuasion, has a paradoxical tendency to obscure, and sometimes eclipse, the archaeological evidence (see Kemp 1984).

It is interesting, from the point of view of the dichotomy between texts and archaeology, to compare the history of Egyptian archaeology with that of Mayan studies, given that Mayanists appear to have experienced the reverse situation: their discipline was predominantly anthropological and archaeological until Mayan glyphs began to be deciphered in the 1980s, producing a sudden flood of texts that have significantly altered the perception of the Mayan culture. In some respects, the suspicion with which Mayan archaeologists initially regarded the historical information provided by their philological colleagues (see Coe 1992, 270-274; Schele and Miller 1986) is a mirror image of the reaction of many traditional text-based Egyptologists to the increasingly science-based and anthropological analyses of Pharaonic

Egypt produced by archaeologists in recent years. Both Mayanists and

Egyptologists are struggling to come to terms with the basic fact that writing tends to be the product of elite members of society whereas the bulk of archaeological data derives from the illiterate majority of the population. The solution lies in the successful integration of both types of evidence to produce a view of society as a whole.

A related problem in modern Egyptian archaeology is the increasing dislocation between the processes of change in the material culture and the traditional chronological system of dynasties, kingdoms, and "intermediate periods," which may now be approaching the end of its usefulness. The dynastic conventions have become firmly embedded in the literature, but many modern scholars would now question the historic validity of a distinction between Sixth or Seventh Dynasty or between "third intermediate period" and "late period." Excavations since the 1960s have gradually produced a rival and more archaeologically relevant chronological system based simply on changes in material culture and supported by a framework of stratigraphic analysis and radiometric dates (see, for instance, O'Connor 1974; Trigger, Kemp, O'Connor, and Lloyd 1985). Future chronologies of the pharaonic period will need to integrate political change with the socioeconomic and art-historical fluctuations observable in the archaeological record.

Wilkinson, Lepsius, and Mariette: Exploration and Conservation

The Napoleonic expedition was complemented both by the Franco-Tuscan expedition of 1828-1829 (led by Ippolito Rosellini and Champollion) and by the more piecemeal work of a growing number of European travelers in the late eighteenth and early nineteenth centuries. The British Egyptologist Sir John Gardner Wilkinson, for instance, spent twelve years in Egypt and nubia between 1821 and 1833. The publication of *The Manners and Customs of the Ancient Egyptians* in 1837 was to earn him his knighthood, but much of his work, including maps, plans, and drawings of sites that have now been lost or destroyed, remains unpublished. His contemporaries, including English travelers James Burton, Robert Hay, and Edward Lane, also left behind numerous sketches, notebooks, and unpublished manuscripts that have only recently begun to be researched.

The Prussian expedition of the 1840s, led by karl richard lepsius, was the next major step forward in terms of the accumulation of a basic archaeological database for Egypt (Lepsius 1849-1859). In many ways, the Napoleonic and Prussian expeditions set the pattern for Egyptology until well into the twentieth century, essentially initiating a quest for more and more information to be cataloged and assimilated into the frameworks of history and art history. From the point of view of data, Egyptian archaeology has always been something of a victim of its own success. The archaeological remains are so rich, diverse, and well-preserved that most Egyptologists have tended to be immersed in the processes of description and categorization, often at the expense of analysis and interpretation. In addition, much of the earlier work was biased by the fact that nineteenth-century archaeologists in Egypt were almost entirely concerned with the study of temples and tombs since those remains were considered most likely to yield the kinds of artistic and textual materials that most Egyptologists then regarded as the backbone of the discipline.

What is remarkable about the European expeditions to Egypt in the first half of the nineteenth century is the rapid pace with which new information was acquired, digested, and assimilated into the overall picture of the pharaonic period. In 1838, the French architect Hector Horeau published a "panorama" of Egypt that included an illustration showing the principal monuments of Egypt. The painting took the form of an imaginary view of the meandering course of the Nile River, with Alexandria and the Mediterranean coast in the foreground and the Temple of Isis on the island of Philae in the far distance. This pictorial view of Egypt, which incorporated the basic essentials of Egyptian architecture from the pyramids at Giza to the temples of eastern and western Thebes, is a good illustration of the speed with which the

bare bones of Egyptology were assembled. As early as the 1830s, Gardner Wilkinson was able

to present a wide-ranging and detailed view of ancient Egypt in his book on its manners and customs. Certainly there were inaccuracies, misconceptions, and omissions in the publications of the early nineteenth century, but in many respects the fundamentals were already known and the last one and a half centuries have arguably been more concerned with filling in the details than breaking new ground.

Although the greatest individual achievement in the history of Egyptology was undoubtedly the deciphering of hieroglyphs by Champollion, the birth of Egyptian archaeology owes a great deal to the work of another French Egyptologist, auguste mariette. Born and educated in Boulogne-sur-Mer in northern France, Mariette was inspired to take up Egyptology when he examined the papers bequeathed to his family by his cousin Nestor L'Hote, who had served as a draftsman on Champollion's Franco-Tuscan expedition. In 1850, Mariette was sent to Egypt to obtain papyri for the collection of the Louvre, where he had been employed to inventory the Egyptian inscriptions. Once in Egypt, however, he embarked on a career in excavation, beginning with a remarkable discovery of the Serapeum (the burial place of the sacred Apis bulls) at saqqara.

As a result of his prolific archaeological work at many different sites (including Giza, abydos, Thebes, and Elephantine), Mariette was appointed in 1858 to the office of first director of the Egyptian Antiquities Service (now known as the Supreme Council of Antiquities). In this post he was able to reduce the amount of plundering of Egyptian antiquities as well as to create the nucleus of a national archaeological collection (housed initially in a disused warehouse at Bulaq, the port of Cairo, and most recently at the Egyptian Museum in the center of Cairo). During the next twenty years he excavated at some thirty-five different sites and gradually expanded the national museum.

However, despite the efforts of Mariette and his successor Gaston Maspero, the plundering of ancient sites remained a common problem. Such important finds as the Deir el-Bahari cache of royal mummies and the El Amarna archive of cuneiform tablets were initially plundered by local people and only came to scholarly attention when items became available on the art market. Maspero's official discovery of the Deir el-Bahari cache in 1881 involved something of a detective story in which he traced a hieratic papyrus of the Twenty-first Dynasty pharaoh Pinudjem back to the Abd el-Rassul family in the Theban village of Gurna, the family that had first uncovered the mummies ten years earlier.

Flinders Petrie, George Reisner, and the Introduction of Scientific Archaeology

Between the period of organized plundering undertaken by such men as giovanni belzoni and Drovetti in the early nineteenth century and the excavations of French scholars Emile Amelineau and J.L. De Morgan in the 1890s, there was surprisingly little development in the techniques employed by Egyptian archaeologists. As John Wortham puts it in his history of British Egyptology: “Although archaeologists no longer used dynamite to excavate sites, their techniques remained unrefined” (Wortham 1971, 106).

The concept of “clearance,” as opposed to scientific excavation, was arguably one of the most insidious and retrogressive aspects of nineteenth-century archaeology in Egypt. The very word appeared to substantiate the fallacy that the sand simply had to be removed in order to reveal the significant monuments hidden below, thus helping to discourage the proper consideration of stratigraphic excavation and the appreciation of all components of a site such as sand, shards, mud bricks, and towering stone gateways as being equally important and integral elements of the archaeological record. The use of the term *clearance* also encouraged the feeling that the antiquities of Egypt simply needed to be exposed and displayed rather than being analyzed, interpreted, or reconstructed. From the 1880s onward, however, the emergence of more scientific approaches gradually discredited the practice, although it was many years before clearance techniques could be said to have been eradicated.

Two individuals, W.M. Flinders Petrie and george reisner, were primarily responsible for the modernization of archaeology in Egypt in

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from cemetery N7000 have provided modern researchers with an extremely reliable anthropological database.

Although the achievements of Petrie and Reisner are comparatively well documented, there was another phase in the development of Egyptian archaeology that has received less attention. In the period between the two world wars, several field-workers in Egypt began to undertake projects that would now be described as experimental and ethno-archaeological. Reginald Engelbach, for instance, undertook a number of experiments in the study of stone procurement and processing (Engelbach 1923) while Winifred Blackman, the wife of the British Egyptologist A.M. Blackman, published a study of Egyptian peasants (Blackman 1927) that was distinctly innovative in its approach to the links between modern and ancient Egyptian culture. These methodological advances, however, were to be thoroughly eclipsed by the discovery of new spectacular treasures by archaeologists howard carter at Thebes and Pierre Montet at Tanis.

In 1922, Carter's discovery of the tomb of Pharaoh tutankhamun, almost exactly a century after Champollion's decipherment of hieroglyphs, opened the floodgates in terms of public appreciation and exploitation of ancient Egypt. Archaeology as a whole attracts a level of popular interest not usually associated with other, more deskbound disciplines such as physics or mathematics, and the study of ancient Egypt has a particularly strong grip on the popular imagination. Even before the discovery of the tomb of Tutankhamun, nineteenth-century poets and novelists, such as Percy Bysshe Shelley and Sir Rider Haggard, were presenting a romanticized view of Pharaonic Egypt that drew heavily on new information provided by adventurers and archaeologists.

There are no doubt many theses that might be written on the impact of Carter's discovery on the popular culture of Europe and America, but from a purely Egyptological point of view, it might be argued that it was something of a mixed blessing. Although both Petrie and Reisner had made other sensational discoveries at certain points in their careers, their principal achievement had been to establish Egyptology as a rigorous scientific discipline concerned with the pursuit of knowledge rather than objets d'art. Yet in one fell swoop, the discovery of Tutankhamun's tomb restored the popular view of Egypt as a treasure hunters' paradise in which sheer persistence might eventually be richly rewarded (after the initial euphoric days, Carter was to spend much of his life cataloging the funerary equipment he had discovered in the tomb). Egyptologists have since been dogged by a public willing them to find something even more exciting than an intact royal tomb, and they have often found that their scientific agenda is at odds with the popular desire for buried treasure. The other side of the coin, however, is the continued existence of a wide audience for Egyptological research, which helps to maintain a subject that might otherwise be a vulnerable minority discipline.

Settlement Prehistory and the “Nubian Campaign”: New Directions in Egyptian Archaeology

Most of the work accomplished by archaeologists in Egypt between the mid-nineteenth century and World War II was characterized by two distinct trends. First, the early work in particular was marked by a resolutely art-historic, object-oriented approach to the excavated data. Second, fieldwork was dominated by a preference for the study of religious and funerary architecture rather than the artifacts and architecture of daily life. Both of these tendencies effectively inhibited the intellectual development of Egyptian archaeology until the 1960s when two major influences-the study of the prehistory of the Nile Valley and the increased excavation of pharaonic towns-finally began to exert an influence on the subject as a whole.

Certain town sites had already been investigated by the travelers, antiquarians, and pioneering archaeologists of the early nineteenth century such as Sir John Gardner Wilkinson and Robert Hay. In

1826, for example, Wilkinson made a detailed survey of the Greco-Roman port of Berenice on the Red Sea, which had been discovered a few years earlier by Giovanni Belzoni. Both Wilkinson and Erbkam (Lepsius's

Now, however, the long-term excavations at sites such as Elephantine in Upper Egypt and Tell el-Dab'a in the eastern delta have provided a more reliable view of the gradual processes of urbanization by revealing successive strata of settlements spanning many centuries. The published evidence from Elephantine (Kaiser et al. 1988), for instance, charts the growth of the site from an Old Kingdom settlement of some 16,000 square meters to a congested late-period city covering more than 70,000 square meters. The excavations at Tell el-Dab'a (Bietak 1975, 1992) have revealed a detailed local socioeconomic history in which the Egyptian inhabitants of the first intermediate period (ca. 2134-2040 b.c.) were gradually supplanted by Asiatics during the second intermediate period (ca. 1640-1532 b.c.). The results of the scientific investigations at Elephantine, Tell el-Dab'a, and other sites have not only vastly increased the knowledge of Egyptian domestic economy but have also begun to show how Egyptian settlements changed over the course of time. The Egyptian urban database has therefore expanded sufficiently to allow the different chronological phases of urbanization in Egypt to begin to be discerned and studied separately (see Kemp 1977, 1989) so that the idiosyncrasies of individual sites and particular periods of urban growth can be clearly distinguished from overall trends.

The Growth of Science in Egyptology

Eric Peet's inaugural lecture as reader in Egyptology at Oxford University in 1934 concerned the "present state of Egyptological studies." Already acutely conscious of the impact of science on Egyptology, he suggested that "many of the questions, especially those of the origins of materials and the technical processes of the arts and crafts, which have puzzled us for years, will eventually reach definite solution through the resources of chemistry and the other sciences" (Peet 1934). He was no doubt mindful of the fact that only eight years earlier the Cairo-based British chemist Alfred Lucas had published the first edition of *Ancient Egyptian Materials and Industries,* a brilliant summary of the surviving evidence for Egyptian materials and crafts that effectively served as the essential manual for Egyptological science until the 1990s. Lucas had access to much of the material in the Cairo museum, which enabled him to publish data, chemical analyses, and bibliographical references for a great deal of the most important material excavated since the mid-nineteenth century, including the objects from the tomb of Tutankhamun.

Lucas may have been the first scientist to survey the whole range of available data from Egypt, but there were many earlier scholars who pioneered various procedures. The field of bio-anthropology, focusing principally on the study of human and animal remains, has been one of the most active areas of scientific research in Egyptology from the early nineteenth century until the present day (see David 1979, 1986; Davies and Walker 1993). The surgeon Thomas Joseph Pettigrew took part in the unwrapping and dissection of numerous mummies from 1820 onward, and in 1834 he published his *History of Egyptian Mummies* that was to serve as the most reliable volume on the subject until the X-raying work of Grafton Elliot Smith at the beginning of the twentieth century (Elliot Smith 1912). In 1896, the German researcher W. Konig was the first to make radiographs of Egyptian mummies, and two years later, Petrie published radiographs of mummies from his excavations at Deshasheh (Petrie 1898). These photographs are thought to be the earliest instance of the archaeological use of X-rays in Britain, and they were perhaps made by J.N. Collie, who was making pioneering medical X-rays at University College London in the same year. Most of the subsequent work on Egyptian mummies has concentrated on examinations of this type, but some of the most recent research has concentrated on molecular biology and the extraction of DNA (e.g., Goudsmit, Decker, Smit, Kuiken, Geelen, and Perizonius 1993; Nissenbaum 1992).

A growth area in the 1980s and 1990s was the study of human diet in Pharaonic Egypt, based principally on the analysis of surviving fragments of food from both domestic and funerary contexts.

Projects of this type have included studies of Egyptian bread and beer making, wine production, and meat processing. A

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related area of research into Egyptian food technology is the analysis of organic residues in amphorae and other vessels, which is beginning to make a significant contribution to the understanding of trading patterns between Egypt, the Levant, and the Aegean.

Thanks primarily to willard libby's use of Egyptian antiquities as some of his earliest “guinea pigs” in the development of radiocarbon dating, Egyptian archaeologists have been able to take advantage of radiometric methods of dating since the 1950s. In the immediate aftermath of the emergence of dendrochronological curves for the calibration of radiocarbon dates, in the mid-1980s, Egyptology was again one of the yardsticks against which the method was tested (Hassan and Robinson 1987; Shaw 1985). There is broad agreement between the calibrated dates and the conventional pharaonic chronology, but there has never been a concerted attempt to date a wide range of materials from a number of different phases of Pharaonic Egypt (and there are still a small number of disconcerting anomalies, e.g., see Haas, Devine, Wenke, Lehner, and Wolfi 1987). The existing sets of Egyptian radiocarbon dates are too piecemeal (and in many cases too old or too unreliable) to form the basis of an independent radiometric chronological framework for comparison with the conventionally calculated dates.

Another important area of scientific progress in recent years has been the use of geophysical methods of prospecting pharaonic sites, including the use of such techniques as resistivity survey, proton-magnetometer survey, sonic profiling, ground-penetrating radar, and thermal imaging. In the Great Pyramid at Giza, for instance, in 1986-1987 the combined use of microgravimetry (a technique for measuring the relative densities of stone blocks) and the transmission of electromagnetic microwaves revealed the possible presence of hidden chambers behind the stone walls of the so-called king's and queen's burial chambers. On a less sensational level, resistivity surveys at Saqqara, Memphis, and El Amarna, during the 1980s and 1990s have proved particularly suited to Egyptian sites. Resistivity traverses have supplemented conventional survey techniques, which has allowed archaeologists both to select areas showing the greatest potential for excavation and to map major features, such as wells or enclosure walls, without actually having to remove the material under which they are buried (see, for instance, Leclant and Clerc 1988; Mathieson and Tavares 1993).

The processual, multidisciplinary strategies of fieldwork that are now largely taken for granted in Egyptology (and even in some fieldwork at funerary and religious sites, as in the application of Schiffer's “behavioral archaeology” to the excavation of a Theban tomb [see Polz 1987]) have their roots in the archaeology of Egyptian settlements and prehistoric sites. Many sites (e.g., Abydos, Memphis, El Amarna, Elephantine, and Tell el-Dab'a) have been the subject of long-term multidisciplinary research since the late 1970s, thus providing opportunities for the application of numerous innovative scientific approaches to the archaeological remains of the Pharaonic period, including the use of experimental and ethnoarchaeological work (e.g., Guksch 1988; Nicholson 1992).

Theoretical and Practical Problems in Egyptian Archaeology

The sheer consciousness of large amounts of still-unpublished or unexamined data seems to have discouraged archaeologists working in Egypt from experimentation with innovative techniques and fresh theoretical perspectives. Indeed, H.S. Smith sees the apparent theoretical and analytical stagnation of Egyptian archaeology as an inevitable result of the accumulation of vast amounts of relatively unsynthesized data. He argues that the relative lack of explicit method or theory in Egyptology might be an inherent problem for historical archaeologists generally: “Because of the complexity of most of the societies with which they deal, the vast scale of the records and remains known to exist, and the countervailing inadequacy of these to provide a complete cultural picture at any one moment or a complete development through time, historians and historical archaeologists tend to be less analytical in

approach, more catholic and less explicit in their assumptions" (Smith 1972, xi).

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Egypt: Predynastic

The term *Predynastic* denotes Egypt before the historically recorded sequence of kings and dynasties that starts ca. 3050 b.c. (*see* egypt: dynastic). Although there is no official beginning to the Predynastic, in Egyptian archaeology the term usually refers to the period that follows the appearance, ca. 5000 b.c., of a Neolithic food-producing economy in the Egyptian Nile Valley proper (as distinct from the Sahara at large). Evidence for reliance on food production using domesticated plants and animals (principally sheep, goat, pigs, cattle, wheat, and barley) occurs late in the Nile Valley relative to the fertile crescent of the Near East, possibly suggesting that hunting/gathering remained viable for a longer time span in the rich environment of the Nile floodplain. Once adopted, however, food production is linked with a long-term process of population growth, sedentism, and increasing social complexity in Predynastic cultures in the Nile Valley. The study of Predynastic Egypt has primarily been focused on the development of a series of different cultures in both northern and southern Egypt during the course of the two millennia from ca. 5000 to ca. 3000 b.c. The Predynastic period culminated in a process of political and territorial conquest during the second half of the Fourth Millennium b.c. (ca. 3400-3050) that included the expansion of the southern Egyptian cultural tradition over the rest of the country. The emergence of a politically powerful elite, governmental institutions, royal artistic and architectural styles, and the hieroglyphic writing system can be traced during the terminal stages of the Predynastic period, setting the stage for Egypt's transition to the Dynastic period.

The study of Predynastic Egypt differs in certain ways from that of Dynastic Egypt. The lack of writing until the very end of the Predynastic means that archaeology of the Predynastic does not have at its disposal the written evidence that begins to be increasingly important with the transition to the Dynastic period. This difference is, however, not as pronounced as might appear to be the case since during many periods of Egypt's Dynastic history, the volume of written documents and inscriptions is a small and very selective corpus of material. The archaeology of Predynastic Egypt has been, in recent decades, one of the most rapidly changing areas of work in Egypt, with new insights and discoveries continuing to reshape understanding of the early origins of Egyptian civilization.

Although the concept of the Predynastic period fits well with modern ideas of the distinction between prehistory and history, it is important to recognize that the idea of the Predynastic has been rooted to a large degree in the Egyptians' own ideas of their earliest past. One of the central religious and political ideas of ancient Egypt was the concept of the *Sema-Tawy,* or "Unification-of-the-Two-Lands." The Egyptians organized their history into a sequence of royal dynasties (a version of this that was recorded by Manetho, a priest of the Ptolemaic period, being the basis for the Dynastic history we use today). The beginning of these dynasties was the unification (*Sema-Tawy*) of Upper (southern) and Lower (northern) Egypt by a king Menes, ca. 3100 b.c. Menes was the first pharaoh of the First Dynasty and

according to Egyptian tradition founded the capital city of Memphis near the southern apex of the Nile delta so he could live there and rule over this newly unified kingdom.

For many years it was believed that the tradition of the *Sema-Tawy* was a historical reality and scholars frequently followed ancient Egyptian tradition by defining the Predynastic period as Egypt before the unification by Menes. Evidence suggesting that the Egyptian hieroglyphic

was discovered in a deposit at Hierakonpolis by Quibell and Green in 1898. These objects may have originally been set up as dedicatory objects inside the early temple precinct of the god Horus at Hierakonpolis. The slate palettes are often decorated with scenes showing the defeat of chaotic forces, an important role of the pharaoh in Dynastic times. Some have scenes that are historical in nature. The most famous of these objects is the Narmer Palette, which depicts king Narmer defeating northern enemies. The Narmer Palette was long considered a record of the *Sema-Tawy* ("Unification-of-the-Two-Lands") by king Narmer (who thus has often been linked with Menes of Egyptian historical tradition). The majority of scholars now accept it as an object commemorating an important military victory of Narmer but not the actual Unification event. Other significant palettes and maceheads include the "Towns Palette," which bears city hieroglyphs associated with a series of different royal names, the "Scorpion Macehead," which has scenes of a king Scorpion possibly engaging in a foundation ceremony, and the "Narmer Macehead," which has scenes of king Narmer engaging in a royal religious ritual.

One widely discussed aspect of late Predynastic Egypt (Nagada II-III and Dynasty 0) is evidence for interaction with the contemporary culture of southern Mesopotamia. A number of late Predynastic (particularly southern Egyptian) objects display use of distinctively Mesopotamian artistic motifs (such as the Gilgamesh "hero" motif, serpent-headed quadrupeds, and boat scenes). These motifs occur on objects as diverse as the Hierakonpolis painted tomb (Tomb 100), the Narmer palette, and the ivory handle of a flint knife known as the Gebel el-Arak knife. It was long considered that Mesopotamian stimulus may have been a factor in Egypt's developing organization at the end of the Predynastic period. Most archaeologists working on Predynastic Egypt see this evidence as use of foreign artistic motifs by the developing elite of the Nagada III period, but do not see Mesopotamian inspiration as a prime catalyst in Egypt's developing complexity. The motivations behind contact between late Predynastic Egypt and Mesopotamia remain uncertain but may have included the trade for gold that occurred in the desert regions east of southern Egypt.

As archaeological work on Predynastic Egypt continues, in future years we can expect considerable new evidence that will further reshape our understandings of the rise of Egyptian civilization. The field is increasingly benefiting from the use of modern techniques such as remote sensing, physical dating, and analytical techniques. As the amount of evidence builds, the rise of complex civilization in the Egyptian Nile Valley during the crucial two millennia from 5000-3000 b.c. will become ever clearer.

Josef Wegner

See also

Africa, Sahara; Caton-Thompson, Gertrude; French Archaeology in Egypt and the Middle East

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Egypt Exploration Fund

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The Egypt Exploration Society is the principal British archaeological institute involved in excavations in Egypt. Before its founding in 1882, Amelia Edwards, an English novelist, visited Egypt in the winter of 1873-1874 and sailed the length of the Egyptian Nile. At that time, many of the ancient sites and monuments were

was discovered in a deposit at Hierakonpolis by Quibell and Green in 1898. These objects may have originally been set up as dedicatory objects inside the early temple precinct of the god Horus at Hierakonpolis. The slate palettes are often decorated with scenes showing the defeat of chaotic forces, an important role of the pharaoh in Dynastic times. Some have scenes that are historical in nature. The most famous of these objects is the Narmer Palette, which depicts king Narmer defeating northern enemies. The Narmer Palette was long considered a record of the *Sema-Tawy* ("Unification-of-the-Two-Lands") by king Narmer (who thus has often been linked with Menes of Egyptian historical tradition). The majority of scholars now accept it as an object commemorating an important military victory of Narmer but not the actual Unification event. Other significant palettes and maceheads include the "Towns Palette," which bears city hieroglyphs associated with a series of different royal names, the "Scorpion Macehead," which has scenes of a king Scorpion possibly engaging in a foundation ceremony, and the "Narmer Macehead," which has scenes of king Narmer engaging in a royal religious ritual.

One widely discussed aspect of late Predynastic Egypt (Nagada II-III and Dynasty 0) is evidence for interaction with the contemporary culture of southern Mesopotamia. A number of late Predynastic (particularly southern Egyptian) objects display use of distinctively Mesopotamian artistic motifs (such as the Gilgamesh "hero" motif, serpent-headed quadrupeds, and boat scenes). These motifs occur on objects as diverse as the Hierakonpolis painted tomb (Tomb 100), the Narmer palette, and the ivory handle of a flint knife known as the Gebel el-Arak knife. It was long considered that Mesopotamian stimulus may have been a factor in Egypt's developing organization at the end of the Predynastic period. Most archaeologists working on Predynastic Egypt see this evidence as use of foreign artistic motifs by the developing elite of the Nagada III period, but do not see Mesopotamian inspiration as a prime catalyst in Egypt's developing complexity. The motivations behind contact between late Predynastic Egypt and Mesopotamia remain uncertain but may have included the trade for gold that occurred in the desert regions east of southern Egypt.

As archaeological work on Predynastic Egypt continues, in future years we can expect considerable new evidence that will further reshape our understandings of the rise of Egyptian civilization. The field is increasingly benefiting from the use of modern techniques such as remote sensing, physical dating, and analytical techniques. As the amount of evidence builds, the rise of complex civilization in the Egyptian Nile Valley during the crucial two millennia from 5000-3000 b.c. will become ever clearer.

Josef Wegner

See also

Africa, Sahara; Caton-Thompson, Gertrude; French Archaeology in Egypt and the Middle East

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conserving tombs of Memphis officials of the New Kingdom, including the tomb built for tutankhamun's general Horemheb, who later became king himself.

In 1982, the society celebrated its centenary with a special exhibition at the British Museum and by launching a project, directed by David Jeffreys and Lisa Giddy, to survey and investigate the site of the capital city of Memphis. In recent years, a number of smaller-scale projects have been initiated, surveying sites such as the Wadi Abu Had in the eastern desert of Egypt and Gebel el-Haridi in Middle Egypt. In 1992, the society responded promptly to a call from the Egyptian Antiquities Organisation for archaeological assistance in recording sites in northern Sinai that were threatened by the construction of the El-Salaam Canal.

The results of the society's work in Egypt are published in various series of memoirs. The society also publishes the prestigious annual *Journal of Egyptian Archaeology* and, since 1991, a color magazine, *Egyptian Archaeology*, which presents articles on fieldwork and research in a more popular style.

The Egypt Exploration Society has offices and a library in London, and membership in the society is open to anyone with an interest in ancient Egypt. Lectures and social events are held in London and Manchester. In 1992, an office was opened in Cairo to provide support for field expeditions and an increased level of activities for members in Egypt.

Patricia Spencer

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El Amarna

Tell El Amarna was a new city created during the eighteenth dynasty by the heretic pharaoh Akhenaten (1353-1337 b.c.) as a place of worship for the god Aten, and it was abandoned soon after Akhenaten's death. El Amarna was the site of significant excavations by sir william matthew flinders petrie between 1891 and 1892, and apart from a short period immediately prior to World War I, when the site was worked on by German archaeologist Ludwig Borchardt (1911-1914), El Amarna has seen three sustained campaigns by the egypt exploration society.

Akhenaten, the pharaoh who built El Amarna

(Ann Ronan Picture Library)

Tim Murray

See also

Egypt: Dynastic; Egypt: Predynastic

El Salvador

The first descriptions of archaeological sites in El Salvador were by nineteenth-century visitors from North America and Europe. Excavations of architectural centers, including Quelepa, Cihuatan, Tazumal, Campana San Andres, and Los Llanitos, went hand in hand with an interest in defining the spatial distribution of Maya-, Lenca-, and Nahua-speaking Pipil ethnic groups reported from the sixteenth century. Modern research has been concerned with clarifying the relations of the earliest sites with early Mesoamerican cultures, exploring the effects of volcanism and the possibility of migration out of and into the country following major eruptions,

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and technologies of the Zapotitan basin. An unanticipated by-product of the focus on vulcanism was the discovery at Ceren of buildings and fields buried during eruption, preserving fragile organic remains and the relative contextual associations between items. Excavation and analysis of these materials, interrupted by the deepening of civil war in El Salvador in the 1980s, was resumed in the early 1990s.

Contemporary processual archaeology has greatly advanced the goal of establishing basic chronological control (see Sheets 1984). Projects have contributed valuable data on specific sites long noted as important, and they have introduced refined excavation techniques and a variety of specialized technical analyses. But other aspects of archaeology remain undeveloped. A focus on Mesoamerican contacts has limited the amount of attention directed to the eastern part of El Salvador, and data on this region are insufficient to begin to suggest models for interaction with neighboring Central American countries. Even in the better-studied western and central regions of the country, site-centered research and the often unique characteristics of sites limit the interpretation of internal developments.

Salvadoran archaeology continues to suffer from a lack of reliable regional data on settlement for most of the country. In addition to the Zapotitan basin, the Cerron Grande salvage project conducted in the valley of the Lempa River is the only major survey completed to date. The latter project is also notable in that it represents a national initiative following a period during which archaeology was primarily carried out by North Americans. Along with the end of civil war in El Salvador, the development of national archaeological programs may begin to address the existing gaps in Salvadoran archaeology.

Rosemary A. Joyce

See also

Maya Civilization

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Elgin, Lord

(1766-1841)

Bruce Thomas Elgin was born into the line of the earls of Elgin and Kincardine in 1766, attended Harrow and Westminster schools, and studied at St Andrew's University in Scotland, and then in Paris. In 1771 he succeeded as earl on the death of his elder brother, and was a representative peer of Scotland from 1790 to 1807 and from 1820 to 1840.

Lord Elgin

(Hulton Getty)

Elgin's career began in the army in 1785; he became major-general in 1809 and general in 1837. He also became a diplomat. In 1790 he was appointed envoy in Brussels, and in 1795 envoy extraordinary in Berlin. But it was through his appointment in 1799 to the embassy of the Ottoman Porte of Constantinople (now Istanbul), that he was to become famous.

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classes, and for filling the museums of western Europe.

Without the official permission of the Turkish government Elgin began to assemble what is now know as "the Elgin marbles," a collection of pedimental sculptures from the Parthenon and from the Athenian temple of Nike Aperos and various antiquities from mainland Greece and Asia Minor. Part of this collection was sent to England and shipwrecked in transit, taking three years and great expense to salvage. Other pieces continued to be smuggled out of Greece from 1803, when Elgin left his position in Constantinople, until at least 1812, when it is recorded that eighty cases of antiquities arrived in England.

Elgin displayed his collection initially in his London residence and later at Burlington House, where its acclaim by artists and scholars tended to overcome any qualms about its provenance. The English nation was gripped with a fervor for Greek art, which was soon to be replaced by a similar one for everything Egyptian, even though this time the French got there first. Initially criticized for the dubious methods of its procurement, the collection was soon deemed to be of such significance that the House of Commons recognized Elgin's ownership and purchased his marbles, at a greatly undervalued price, for the british museum, where they remain to this day-notwithstanding continued requests by the Greek government that they be repatriated.

Tim Murray

Emery, Walter Bryan (1903-1971)

Born in Liverpool, England, Emery was apprenticed to a firm of marine engineers when he decided instead to study Egyptology at the Institute of Archaeology in London (1921- 1923). Between 1923 and 1924 he joined the egypt exploration society's excavations at el amarna. In 1924 he was appointed director of the Liverpool expedition to clear up and restore the New Kingdom tomb of Ramose and the tombs of other nobles in the necropolis at Thebes. It was during this task that Emery was able to visit the tomb of tutankhamun while it was being excavated.

In 1924, once more employed by the Egypt Exploration Society, he participated in the excavation of the Buchis bulls at Armant. In 1928 he was appointed by the Egyptian Antiquities Service to direct the Second Archaeological Survey of nubia. For six years he traveled all over southern Egypt excavating sites. These included the particularly rich site of Ballana near the border with Sudan. Here Emery found the fourth- to sixth-century a.d. royal burial mounds that became a significant part of the collections of the Cairo Museum. From 1935 until 1939 when he enlisted in the army, Emery excavated the 1st to 3rd Dynasty tombs at saqqara for the Egyptian government. He stayed in Egypt for the war, eventually becoming a lieutenant-colonel and director of military intelligence. Excavations at Saqqara resumed in 1945 until 1946, but then halted when he accepted a post as first secretary at the British embassy in Cairo.

In 1951 Emery was elected the Edwards Professor of Egyptology at University College, London, and in 1952 he returned to Saqqara with the Egypt Exploration Society once again, this time to complete the excavation of the tombs of the 1st Dynasty. After the Suez Crisis and in 1956, Emery and the Society began to work in the Sudan, excavating the Middle Kingdom fortress town of Buhen, which dated from 1970 b.c. He advised both the Egyptian and Sudanese Antiquities Services throughout the UNESCO campaign to save the monuments of Nubia and arranged for Buhen to be moved to Khartoum.

In 1964 Emery returned to Saqqara when he excavated the sacred animal necropolis of Memphis and its temple site-a rich hoard of animal mummies, bronze figures, temple furniture, and documents from the sixth to the first centuries b.c. He died in 1971 and is buried in Cairo.

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See also

Egypt: Dynastic; Egypt: Predynastic

Emona

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strategic point that controlled the main route from italy to the Balkans. Written sources for the period of the second and first centuries b.c. report that the first people to live there were members of the Celtic tribe Taurisci.

Roman Emona was situated on an important road coming from Aquileia, Poetovio, and Siscia and riverine routes on the river Sava, and the town fully exploited its strategic and commercial position. According to a construction inscription found in Ljubljana, Emona was founded between a.d. 14 and 15. For a long time, Emona was believed to have developed from the Roman legionary camp of the Legio XV Appolinaris, which was stationed in this area until around a.d. 14 when it was transferred to Carnuntum near Vienna. However, recent studies by j.šašel have cast doubts on that thesis. One of the major arguments for the prior existence of the legion's camp is Emona's rectangular town plan. The town's walls measured 523 meters by 425 meters, and they were fortified with twenty-eight towers and four reinforced gates. An important early Christian complex was built in northwestern part of the town in the fourth century a.d.

The beginning of an interest in the antiquities of Emona (mainly epigraphic) can be traced to the fifteenth century. Rich epigraphic monuments and historical studies had long been the main focus of scholars from the seventeenth century and were published by German historian T. Mommsen, who was in charge of the “Limeskommission” set up in 1892 to investigate Roman remains. The establishment of the Provincial Museum in 1821 and the Museum Society in 1839 in Ljubljana gave an important impetus to the historical and archaeological research of the Roman town. In 1879, A. Mullner, the curator of the Provincial Museum, published a monographic study of Emona. In *Archaologische Studien aus Krain* he wrongly located Emona at Ig, a village some 10 kilometers south of Ljubljana. However, in 1898, Mullner started to excavate the Roman cemeteries in Ljubljana.

The first large excavations of the cemeteries began in the period between 1904 and 1907, and after almost 100 years of archaeological research and excavations, the Emona cemeteries are now among the largest excavated in the Roman Empire. Since 1635, when the first grave was reported, there have been more then 3,000 documented Roman graves in cemeteries situated outside the town and along the roads to Aquileia, Siscia, and celeia. Excavations of the settlement were initiated by the Provincial Museum, and between 1909 and 1912, almost one-third of the town was excavated. Walter Smid, the curator of the museum, published his results in *Jahrbuch fur Altertumskunde* in 1913.

The next large excavations were carried out by a city museum in the 1960s and 1970s as a result of extensive city development. The most important result of these excavations was the discovery of the early Christian center, comprising an administrative center, rich residential buildings, and town infrastructure.

Milan Lovenjak

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Enkomi-Ayios Iakovos

Enkomi-Ayios Iakovos on the east coast of cyprus is the largest and most extensively excavated late-Bronze Age site on Cyprus. Early excavations by the british museum (1896) concentrated on the rich tombs, and it was subsequently recognized that they had been constructed within houses and open spaces inside the city walls. Additional work at the cemetery was undertaken by the Cyprus Museum by j. l. myres (1913), R. Gunnis (1927), and the Swedish Cyprus Expedition. Major excavations by porphyrios dikaios (1947-1957) and a French team directed by Claude Schaeffer (1934, 1947-1974) concentrated on the settlement. The Turkish occupation of northern Cyprus has precluded further research at the site since 1974.

Extensive excavations revealed a large walled city laid out on a grid plan. There are numerous

private and public building complexes, fortifications, and sanctuaries, including the Sanctuary of the Horned God and the Sanctuary of the Ingot God. Rich finds from both the settlement and the tombs include many high-status items imported from abroad or influenced by foreign prototypes. The latter include Mycenaean, Levantine, and Egyptian artifacts, as Cyprus was drawn into the international world of the eastern Mediterranean in the second half of the second millennium b.c. Processes of secondary state formation in Cyprus at the beginning of the late Bronze Age saw Enkomi develop as the earliest city on the island, and it maintained its preeminence when other polities developed later in the period.

David Frankel

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Ephesus

Ephesus, an ancient city on the Ionian coast of turkey, was once a major port. It was famed in ancient times for the magnificent (and huge) temple of Artemis, and after the original burned down in 356 b.c., it was replaced by an even more magnificent building, which became one of the Seven Wonders of the World. Because of its importance throughout Hellenistic and Roman times, Ephesus boasted many major buildings and was an important center for sculpture production. Although it continued to be important into the Byzantine era, the site was progressively reduced in size and significance until it was abandoned in the eleventh century a.d.

Temple of Hadrian, Ephesus,Turkey

(Ann Ronan Picture Library)

Archaeological excavation began in Ephesus under John Wood (between 1863 and 1874), and the English had the signal fortune of excavating the Artemision (the temple precinct) in 1904, a feat that involved d. g. hogarth. However, it has been the Austrians who have made the most significant impact on the site. Beginning in 1895, under the auspices of the Austrian Archaeological Institute, they have excavated there for over a century.

Tim Murray

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Etruscan Archaeology

The Etruscans inhabited italy in the region known as Etruria (modern Tuscany, upper Latium, and parts of Umbria), from around 1000-900 b.c. into the first century b.c. Traditionally, Etruscan archaeology has been a multidisciplinary pursuit. Experts in the field seek to unite evidence on Etruscan language, history, society, religion, myth, art, and architecture with more strictly archaeological data concerning topography, settlement patterns, cemeteries, construction techniques, inscriptions, ceramics, and metalwork. The global approach is epitomized in the writings of Massimo Pallottino (d. 1995), who is universally acknowledged as the greatest of all Etruscan scholars.

Scholarship on the Etruscans began in the fifteenth and sixteenth centuries in connection with the pride and curiosity of Italians who were investigating the origins of their cities. They quickly recognized that many towns had Etruscan beginnings, and in some cases, they gave special emphasis to their own Etruscan ancestry-for example, the Medici of Florence (Cipriani 1980). Much of this research on the Etruscans was philological and art historical, drawing on Greek and Roman writers not only for Etruscan history but for such matters as the design of Etruscan temples, described by Vitruvius in the later first century b.c. (*De architectura* 4.7) or the nature of Etruscan terracotta sculpture and small bronzes, noted by Pliny the Elder in the first century a.d. (*Natural History* 33.158; 34.34). Pliny also gave a detailed account of the tomb of Lars Porsenna (*Natural History* 26.91), king of Etruscan Clusium (Chiusi).

Epigraphical evidence was recorded and evaluated in the Renaissance by Sigismondo Tizio of Siena (d. 1528), who compiled the first known Etruscan vocabulary list, and by Annio of Viterbo (d. 1502), who unfortunately was prone to enhance or even completely fabricate inscriptions in his home territory (Weiss 1988). Much more admirable scholarship is found in the report by the Renaissance artist and writer Giorgio Vasari on the discovery of the famed bronze Chimaera in 1553 in his native Arezzo (now in the Archaeological Museum in Florence). He concluded that the statue was Etruscan on the basis of the letters inscribed on its leg and was able to identify the beast through numismatic comparisons.

Some of the early scholars on the Etruscans were not Italians. The French savant Guillaume Postel, in *De Etruria regionis… originibus, institutis, religione, et moribus* (1551), lent his support to some of the more preposterous ideas of Annio, such as the notion that the Etruscans could be traced back to Noah. In the seventeenth century, the German archaeologist and antiquarian Athanasius Kircher visited an Etruscan tomb near Viterbo and left an amazing account of how he was told by a local guide that the stone-carved chambers and beds were actually made for underground cave dwellers. This misinterpretation can be forgiven in light of the scarce knowledge of Etruscan topography at the time.

The most important study of the Etruscans in the seventeenth century, by the Scotsman Thomas Dempster (Haynes 2000), was in fact written with little direct knowledge of archaeological sites. Dempster's famous *De Etruria regali libri septem* (Seven Books on Etruria of the Kings) is based on information from classical sources about the origins, customs, history, cities, and language of the Etruscans. Written for the Medici Cosimo II (d. 1621), the work was not published until over a century later by the English bibliophile Thomas Coke, who purchased the manuscript in Florence. The work appeared in 1726 (though the date of publication is listed as 1723-1724) and contains notes by the Florentine scholar Filippo Buonarroti (Galli 1986) and ninety-three illustrations. Buonarroti's archaeological commentary added immensely to the value of Dempster's work, including, for example, reports on some of his own systematic survey of tombs near Civita Castellana.

The publication of *De Etruria regali* was both a symptom and a cause of an absolute mania for the Etruscans that developed in the eighteenth century (de Grummond 1986, 39-40). On a fairly superficial

level, this mania found its way into decorations of English country houses and provided the name “Etruria” for the neoclassical ceramics factory of Josiah Wedgwood in England. In Italy, a patriotic fervor for this Italian civilization emerged, and the Etruscans were

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archaeologists were pushing their studies back in time, bringing postglacial farming societies within their domain (Van Riper 1993; Grayson 1983; Gräslund 1987).

Although formally united as "prehistoric archaeologists" after 1863, the two groups of researchers still had little in common because of their different temporal foci and methods, and to an extent the division persists to the present day. In the later nineteenth century the jewels in the crowns of the two groups were, on one side, caves, containing complex stratigraphic sequences, stone tools, animal bones, and (if the researchers were lucky) spectacular paintings, and, on the other side, beautiful items of metal and jewelry, much pottery, and many visible monuments.

It is thus understandable that the Mesolithic, being postglacial but preagricultural and producing neither cave paintings nor monuments and metalwork, belonged nowhere and therefore had a difficult birth. Its very existence was denied by scholars such as French archaeologist gabriel de mortillet, whose "hiatus theory" claimed that Europe was unoccupied between the cave painters and the crop planters. This ignored events in denmark, where, as early as 1851, scholars recognized that certain shell heaps were the rubbish middens of a postglacial but preagricultural people (Steenstrup 1851); Havelse Mølle has the distinction of being the first recognized settlement of the period that would later be called Mesolithic.

Despite the repudiation of the hiatus theory, the Mesolithic period did not compare favorably to the Paleolithic and Neolithic periods. This was because of the Victorian evolutionary view that human progress moved through a series of ever higher "levels" of civilization. The hunter-painters of the Paleolithic were considered sufficiently impressive to be precursors to the agricultural barbarians of pre-Roman Europe. By contrast, the Mesolithic, with a simplified and diminutive technology and little or no art, looked like an uninteresting period of cultural retrogression. This view continued well into the twentieth century, not least of all in the dominating works of vere gordon childe. In the first edition of *The Dawn of European Civilization,* Childe wrote that "the contribution of [the mesolithic] to European culture is negligible. The hiatus is only recreated" (1925, 3). In the sixth and final edition of *The Dawn,* he was still writing of "cultures that are termed mesolithic because in time-but only in time-they occupy a place between the latest palaeolithic and the oldest neolithic cultures" (1957, 35).

The rest of this entry will examine the transformation of Mesolithic archaeology from the study of a retrogressive cultural stage into the study of hunter-gatherer adaptations in a diverse and changing landscape. Because of the extent of the change, the Mesolithic is arguably the best arena in which to examine changes in the theory and practice of European archaeology in the twentieth century.

From Hiatus to Behavior

The archetypal artifact of the Mesolithic is the microlith (the word simply means "small stone"). Larger items exist, but most Mesolithic sites contain numerous microliths, and many typological studies have been undertaken. Microliths amount to small blanks that may be mounted in a variety of tools. They are occasionally found as parts of arrowheads, such as the well-known example from Loshult in Sweden that used two, one as tip and one as barb (this item is widely illustrated, see, e.g., J.G.D. Clark 1975, fig. 12). Up to a dozen at a time are found mounted on larger spearheads or daggers (e.g., J.G.D. Clark 1975, fig. 43). None have been found in Europe mounted as sickles or other implements connected with plants, but their potential role in this connection has been stressed (J. G.D. Clarke 1976, fig. 2).

In 1932 Grahame Clark synthesized the British material in *The Mesolithic Age in Britain,* and he extended this to the mainland in *The Mesolithic Settlement of Northern Europe* (1936). He argued that the major Mesolithic event was the spread of the Capsian-derived Tardenoisian culture into a Europe peopled by local groups descended from different Upper Paleolithic cultures. The Mesolithic

cultures were interpreted as peoples, and the history of the Mesolithic was the history of their interactions and developments (J. G.D. Clark 1932, 93 ff.). The axe-using

Maglemosians occupied the lowlands of northern Europe, whereas the Tardenoisians had no axes and occupied sandy and hilly regions; the Maglemosians produced some art and made bone tools, whereas the Tardenoisians did neither (J. G.D. Clark 1936). The behavioral view that has replaced this argument derives from work in two main fields: archaeology and ecological anthropology. These will be examined in turn.

Archaeology

The upland-lowland cultural dichotomy came under strain in Britain during the 1960s. Radley and Mellars (1964) pointed out that microliths in the two zones were very similar and that axes were occasionally found in the uplands. On the mainland similar results were published (Geupel 1973; Newell 1973). Most would now see the differences as reflecting behavior and preservation rather than cultural variation. Acid conditions have destroyed bone at the upland sites. Varying proportions of artifacts are found in both upland and lowland areas, and these are thought to reflect varying activities. The rarity of axe/adzes in the uplands probably reflects the thinner woodland in these regions (J. G.D. Clark 1972, 1973; Jacobi 1978; Mellars 1976a).

A second element in the understanding of the Mesolithic was dating. During the 1970s the radiocarbon revolution reached the Mesolithic, and the mainland Mesolithic was divided into three main technological phases. Phase 1 was characterized by a high proportion of obliquely blunted points among the microliths. This is conventionally thought to have started at the Pleistocene-Holocene boundary at 10,000 b.p. (see further discussion in later passages). Phase 2 began around 8800 b.p. and was typified by smaller microliths, such as triangular and lanceolate forms. Phase 3 began around 7850 b.p. and was marked by artifacts made on broader blades, among which trapeze-shaped microliths were the most numerous. This phase ended with the appearance of the Neolithic period (for major reviews, see Kozlowski 1975, 1976; Rozoy 1978).

Work in Britain identified an early phase corresponding to phase 1 on the mainland, characterized by the same microlithic forms and ending at the same time; the industries are termed “broad blade.” Britain's later phase, termed “narrow blade,” was similar to the mainland phase 2. The blade and trapeze industries of mainland phase 3, however, never reached Britain. By the time this phase appeared on the mainland, Britain had been isolated by the rising postglacial sea, and the narrow gap was apparently sufficient to inhibit the spread of trapeze industries (Jacobi 1973, 1976; Mellars 1974, 1976b; Switsur and Jacobi 1979).

A third strand of relevant archaeological work has been spread over a much longer period and concerns organic remains of various kinds. This strand has been important in countering the early view that the Mesolithic was both technologically and artistically impoverished. The formation of peat bogs has led to superb conditions of preservation in some parts of Europe. The bows that shot the microlith-tipped arrows have turned up at several major settlements, including early-Mesolithic Holmegård in Denmark (illustrated in S.H. Andersen and Nielsen 1982, 22) and late-Mesolithic Ageröd V in sweden (Larsson 1983a, figs. 32, 33). Barbed bone and antler points are common; major concentrations were found at Star Carr in England (nearly 200 points, see J.G.D. Clark 1954, figs. 47-64) and at Mosegården III in Denmark (over 300 points, see K. Andersen 1983). At Mosegården III they were found spread across an area about 1,000 by 300 meters, not directly associated with a settlement but on the bed of a former lake. Nearby settlements contain many fish bones, and some of the Mosegården III examples were found point downward, suggesting they were mounted as leisters and lost during fishing (K. Andersen 1983, 155-173). At Star Carr they were found concentrated in just a few square meters at the edge of the settlement, but the settlement produced no fish bones (J. G.D. Clark 1954, fig. 5); this suggests they were cached and intended for use against land mammals and would therefore have been mounted as

spears (Legge and Rowley-Conwy 1988, 95).

Larger, more complex fish-catching items are also known. The famous seine from Antrea in Karelia was some 30 meters long and 1.5 meters

high (J. G.D. Clark 1975, 223-224). Other nets are known, as well, such as those from Sventoji 2B in lithuania (Rimantiené 1992, fig. 4) and Friesack in Germany (Gramsch 1987, pl. 25-26). Basket fish traps made of wickerwork are also known, for example, from Ageröd V in Sweden (Larsson 1983a, 62-69) and several sites in Denmark (Becker 1941). Larger fish traps made of fixed stakes are known from Tybrind Vig and Lystrup in Denmark (S. H. Andersen 1987a, fig. 155, and 1996, figs. 3 and 4) and Sventoji 1A in Lithuania (Rimantiené 1992, fig. 5). In addition, organic items for use in transport are known; these include canoes, one from Tybrind Vig in Denmark measuring 9.5 meters in length (S. H. Andersen 1987a, 275-276), and a ski fragment from Sarnate in latvia (Zvelebil 1979, 214). Such items have *not* survived from the Upper Paleolithic.

Among the organics are various items with artistic designs and motifs. Visibility of art thus covaries with the degree of organic preservation. Denmark probably has provided more artwork than any other country (J. G.D. Clark 1975; S.H. Andersen 1980). The site of Tybrind Vig must again be mentioned, as its decorated paddle blades are perhaps the finest Mesolithic designs known from Europe (S. H. Andersen 1987a and 1987b, fig. 165). Artistic work did, therefore, clearly continue in the Mesolithic, although not on cave walls-except in eastern spain, where parietal art persisted into the postglacial period (e.g., Sieveking 1979, 193-195).

Ecological Anthropology

In European hunter-gatherer studies there is little effective contact between archaeologists and anthropologists. As a result concepts derived from ecological anthropology have tended to reach Europe via the works of North American scholars. Early influential examples include Meiklejohn (1978) and Price (1981). Such work made use of concepts such as the mating network of about 500 people (Wobst 1976). Price (1981) noted that the areas occupied by stylistically defined archaeological entities are frequently 100 to 200 kilometers in diameter, thus measuring about 8,000 to 31,000 square kilometers. If these represent mating networks of 500 people, they imply population densities of 0.064 to 0.016 people per square kilometer (Price 1981, table 4). This is within the expected range and therefore supports the identification of these stylistic units as closed mating networks. Late-glacial stylistic units covered far larger areas; J.G.D. Clark (1975, 72-73) mentioned a range of 70,000 to 120,000 square kilometers. An area of 100,000 square kilometers would, if occupied by 500 people, imply a population density of 0.005 people per square kilometer-similar to that of some inland groups of caribou hunters in North America.

These concepts, derived from ecological anthropology and listed above, were rapidly adopted in Britain (Jacobi 1979), but it is perhaps accurate to say that they have made less impact in mainland Europe. Although these ideas are clearly very useful, some scholars have argued that more flexibility needs to be employed when applying them to coastal regions (Rowley-Conwy 1986). Price (1981, 227) stated that at normal population densities, Denmark might have contained three mating networks. Coastal productivity very much exceeded that of inland regions, however, and hunter-gatherer populations in favorable regions would have been much larger (Rowley-Conwy 1983; Zvelebil and Rowley-Conwy 1986). Some of the smallest stylistic entities in the European Mesolithic are in Denmark-those identified by Vang Petersen (1984, fig. 15). These are only some 50 kilometers across and are, furthermore, not circular because they are on the coast, so they are far smaller than others in the continental interior. *If* these are interpreted as semicircular mating networks, population density would have been in the order of 0.5 people per square kilometer. Territorial behavior was likely. In any event, favorable coastal regions were likely to have seen higher population densities and group sizes, arguably in conjunction with more complex social organizations (Renouf 1991; Rowley-Conwy 1983; Rowley-Conwy and Zvelebil 1989). This may be why agriculture was relatively slow to penetrate some of these coastal regions (Zvelebil and Rowley-Conwy 1986).

Anthropological concepts have been important in other areas, such as technology. Robin

Torrence demonstrated that technological complexity varied with latitude (1983, figs. 3.1, 3.2). She suggested that economic activities in higher latitudes were more likely to be "time stressed" because resource availability was concentrated into ever more limited periods as latitude and seasonality increased. The shorter the period a resource is available, the more specialized the technology must be to maximize procurement in the brief time available (Torrence 1983). When the Mesolithic is considered in this light, it is evident that a technology *less specialized* than that of the Upper Paleolithic would be expected because conditions changed from arctic to temperate. Arguably, this is what the microlith represents: an unspecialized blank capable of use in a wide variety of tools. Thus, anthropology provides an alternative to the view that the Mesolithic was a period of cultural retrogression: a less specialized technology can be seen as an adaptation to less time-stressed activities.

This section has sought to demonstrate the transition from a cultural to a behavioral perspective by European Mesolithic studies, and recent syntheses do indeed combine archaeology with anthropologically derived concepts (for a good example in the British context, see Smith 1992). The study of hunter-gatherers is perhaps the area of archaeology in which the behavioral perspective is most developed, and the Mesolithic certainly used to be regarded as the most retrogressive period in European prehistory. The changes described earlier therefore amount to probably the biggest shift in views anywhere in European prehistory.

Regional Perspectives

This section will present a discussion of work in various areas of Europe. In no sense can the presentations that follow be considered reviews; space permits the inclusion of only a few aspects of work and a small number of publications. The coverage is intended to emphasize variability.

The Mesolithic is sometimes thought of as a temperate forest phenomenon, but, although southern Scandinavia is indeed in the temperate zone, Iberia is mostly Mediterranean in climate, and the upper reaches of Norway lie far north of the Arctic Circle.

Southern Scandinavia

It is appropriate to begin with the region that has both the earliest work and the most complete record of any in Europe. Good reviews of the Danish and southern Swedish Mesolithic can be found in Brinch Petersen (1973), J.G.D. Clark (1975), and Price (1985).

The earliest phase of the Mesolithic is represented by only a few sites, such as Klosterlund. The second phase, characterized by lanceolate and triangular microliths (see the previous discussion), is the period of the Maglemose culture, falling in the eighth millennium b.p. Most sites lie on the banks of former lakes that have since filled with peat, creating excellent conditions for organic preservation. Many sites were discovered during peat cutting in the early years of the twentieth century, and some of these have been published, including Ulkestrup (K. Andersen, Jørgensen, and Richter 1982), Sværdborg I (Henriksen 1976), and Lundby (Henriksen 1980). The sites are all small, and sometimes they include the preserved bark floors of small dwellings (e.g., at Ulkestrup); the sites might have been occupied only once or multiple times over a certain period and involve material being dumped in the former lakes alongside the huts (Blankholm 1987, 1996; Grøn 1995).

Faunal remains consist of the "big five" land mammals of postglacial Europe, namely, red deer, elk (or moose), roe deer, aurochs, and wild boar. In addition, many fish bones, mainly of pike, are found on some settlements (see the earlier description of the Mosegården III fishing area), and hazelnut shells hint at the wide range of plant foods that must have been exploited. Most of the settlements are believed to have been occupied in summer (as was the similar site of Star Carr in Britain-see Legge and

Rowley-Conwy 1988). The case has been made that a minority were occupied in winter (Grøn 1987), although the faunal evidence argues against this conclusion (Rowley-Conwy 1993; Blankholm 1996). At the time of occupation the sea level was appreciably lower than it is today; it may be that some winter settlements lie below the present sea level, for Maglemosian artifacts have been found by divers at depths of 10 to 15 meters in the now submerged

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area between Denmark and Sweden (Larsson 1983b).

In the earlier part of the third (blade and trapeze) phase of the Mesolithic, the sea was rising rapidly. The Kongemose culture belonging to this period (ca. 6800 to 6300 b.p.) is little known, but the succeeding Ertebølle culture (ca. 6300 to 5200 b.p.) has provided many settlements. In the north and east of Denmark, Ertebølle coasts are above present sea levels; on these raised beaches are the many shell middens for which this culture is renowned (Europe's first recognized Mesolithic settlement, Havelse Mølle, is one of these). Oysters usually predominate among the shellfish, but bones of land and sea mammals, birds, and fish are numerous, and these taxa probably provided most of the diet-the importance of plant foods again being unquantifiable. Analysis of C-13 content in human skeletons indicates that the Ertebølle diet was dominated by marine foods, probably to a greater extent than would be suspected from other lines of evidence, and that this changed abruptly to a terrestrially based diet at the start of the Neolithic period (Tauber 1982).

Many excavations have been published; in Jutland the eponymous site of Ertebølle has been the scene of renewed work (S. H. Andersen and Johansen 1986), and smaller shell middens such as Norsminde (S. H. Andersen 1989) and the inland site at Ringkloster (S. H. Andersen 1975) have also been recently excavated. Farther east oysters played a lesser part in the diet as salinity decreased, but sites were still large; examples include those around Vedbæk Fjord in Denmark (Price and Brinch Petersen 1987) and Segebro in Sweden (Larsson 1982). In southern Denmark the raised beaches run below present sea levels; the site of Tybrind Vig, excavated by divers, testifies to the continuation of the Ertebølle in this region (S. H. Andersen 1987a and 1987b).

Some of the larger shell middens were occupied year-round (Rowley-Conwy 1983). Other sites were seasonally occupied; Ringkloster, in the interior, was a winter-spring site. The sedentism suggested by evidence in the sites has given rise to discussions of possible social complexity (Rowley-Conwy 1983), although it has been stressed that the data are vague (Price 1985). The remarkable early Ertebølle cemeteries at Vedbæk in Denmark (Albrethsen and Brinch Petersen 1976) and Skateholm in Sweden (Larsson 1988) may indicate territorial behavior.

Iberia

Iberia is a large and diverse landmass, ranging from a cool, temperate north to a warm, oceanic southwest and a hot, Mediterranean south and east. Research has inevitably been somewhat patchy in so large an area, but enough has been done to identify Iberia as an area of key interest in the European Mesolithic.

The later Mesolithic of portugal was characterized by groups of substantial shell middens (for recent reviews, see Arnaud 1989, 1990; Lubell and Jackes 1988; Zilhão 1993). These date to around 7000 to 5500 b.p. and lie some way inland from the present seacoast, overlooking post-Mesolithic alluvial deposits. Those on the Muge River (a tributary of the Tagus) are comparatively well known. Moita do Sebastião is a major midden with traces of one or more structures and a large cemetery (Roche 1972a), and Arruda and Amoreira also both have cemeteries (Roche 1972b). Other shell middens lie farther south on the Sado River. Cabeço do Pez and Poças de São Bento are the two largest; these and several others have cemeteries (Arnaud 1989). Finally, a third group lies on or close to the Mira River (Arnaud 1990).

Although these shell middens do not consist of tightly packed oysters like the ones in Denmark, they have a more diffuse content of smaller marine and brackish-water shells and are sometimes a short distance from the contemporary shore. Animal bones are present in quantity in some middens, with those

of red deer and wild boar being the most common. Fish bones tend to be less visible, although many were recovered at Arapouco at the seaward end of the Sado group. The species of fish in question indicate a summer occupation of this site, whereas Cabeço do Pez at the inland end may have been a winter site. This supports the suggestion that there was short-distance seasonal movement within at least the Sado middens, with groups spending summers near the seacoast

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and winters further inland (Arnaud 1989). The role of plant foods is difficult to determine; Arnaud (1989) stressed the potential importance of acorns and pine nuts, both available locally. Unusually for the European Mesolithic, the middens contain grindstones, which could have been used to prepare plant foods. Stable-isotope analysis indicates that Mesolithic populations had more marine foods in their diets than did Neolithic populations, but the break between the two is less abrupt in Iberia than in Denmark (Lubell and Jackes 1988).

The Asturian culture of the northern Spanish coasts has been relatively thoroughly researched (see, e.g., G.A. Clark 1983a; González Morales 1989). Many of the sites are shell middens with limpets as the main component, and some of these are found in caves-a major example being La Riera, where the Asturian midden overlies substantial Paleolithic deposits (Straus and Clark 1986). Among the animal bones those of the red deer predominate (G. A. Clark and Yi 1983). Less is understood of seasonality and settlement patterns in this area. It has been suggested that the Asturian sites may be seasonally complementary to Azilian sites inland, at least during the relatively short period of chronological overlap between the two-but longer-term coast-inland complementarity was likely (G. A. Clark 1983b, 1989).

Other areas of Iberia have received less scrutiny. One particular problem in this connection is the possible appearance of domestic sheep and/or goats and pigs in Mesolithic sites in eastern and southern Spain (Boessneck and von den Driesch 1980; Bernabeu, Aura, and Badal 1993; Ribé, Cruells, and Molist 1997; Zilhão 1993). The appearance of the bones of sheep, goats, and pigs in the data have recently come under criticism from two directions. First, the stratigraphic problems in the caves in question may have been underestimated, with the relevent bones ascribed to the wrong layers (Zilhão 1993); second, the distinction between wild and domestic pigs is problematic and may have been too rigidly applied (Rowley-Conwy 1995a). There are currently no compelling reasons to assume that domestic livestock were present in the Mesolithic of southeastern Spain.

Norway

The sheer size of the Scandinavian peninsula is not always appreciated: the distance from Copenhagen to the most northern cape of Norway equals the distance from Copenhagen to Naples, and most of this span is Norway, which extends to beyond 71° north latitude. In addition, the coastline is deeply indented, giving Norway a total coastal length of over 26,000 kilometers. Much of the country's terrain is steep and difficult, and organic materials usually do not survive in Norway's climate. Given such difficulties, it is a testimony to Norwegian colleagues that so much is known of the Norwegian Mesolithic period, one of the most interesting in Europe.

The central parts of the country are less well researched than the Arctic or southern parts (for a good review, see Nygaard 1989). A consensus is growing that agriculture did not appear at the start of the artifactual Neolithic. The first evidence in southeastern Norway may date to the middle Neolithic (mid-fifth millennium b.p.). Elsewhere it occurred substantially later: in southwestern Norway there is no agricultural evidence until the late Neolithic (Bjørgo, Kristoffersen, and Prescott 1992; Prescott 1991), and near the Arctic Circle stratigraphically early cereal grains from Stiurhelleren have been directly dated to as late as around 3200 b.p. (Johansen 1990). For more recent reviews, see Prescott (1996) and Peter Rowley-Conwy (1995b).

Early-Mesolithic groups are known as the Fosna culture in southern Norway and the Komsa culture in the Arctic (Nygaard 1989). Organic material is rare, and later periods are better known. In the south there was extensive late-Mesolithic/early-Neolithic hunter-gatherer settlement in the deeply dissected coastal zone (see, e.g., Mikkelsen 1978; Bang-Andersen 1996). The major settlement of Kotedalen lay on a strait rich in fish and was probably occupied all year (A. B. Olsen 1992). The large faunal sample

showed a strongly marine orientation, dominated by fish (primarily from the cod family). The most common mammals were seals and otters, followed by red deer and pigs (Hufthammer 1992). Farther inland, in the inner fjord zone, remains at the cave site of Skipshelleren

also contain many fish and seals, but there is a much larger proportion of land mammals (H. Olsen 1976). Whether Skipshelleren was utilized by groups from the outer coast on a seasonal basis remains unclear. Small sites in the Hardanger massif in the interior were probably seasonal reindeer-hunting stands (Bang-Andersen 1996).

Arctic Norway also presents a picture of maritime adaptations. Substantial house structures are known (Engelstad 1989). The best-surveyed area is Varanger Fiord, in the most northeastern part of the country. Substantial faunal remains have been recovered from some settlements there. Earlier models of long-range mobility based on recent ethnography have given way to models of restricted movement or sedentism based on the archaeological material: individual middens on the same site may indicate different seasons, but in all, they suggest year-round occupation (Renouf 1988, 1989).

Eastern Europe

The Mesolithic of eastern Europe is little known in the west, although recent years have seen an upsurge in contacts between east and west, and the coming years will surely see this increase still further. The best review of the whole region is Dolukhanov (1979). Various areas are of major interest.

The northeast Baltic contains many large settlements with excellent organic preservation. Archaeologists with command of the relevant languages have provided information about these (e.g., Zvelebil 1979), and some information about individual settlements, such as Sventoji in Lithuania (Rimantiené 1992), is becoming available. Claims are made for a small number of domestic cattle and pigs in some sites (see Dolukhanov 1979), but detailed zooarchaeological data are not available.

The Iron Gates Gorge, containing the Danube, separates romania from the former Yugoslavia. The gorge contains a number of major Mesolithic sites. The most famous is lepinski vir, which has substantial house remains and monumental sculptures (Sjrejovic 1972), but other sites are also substantial (see, e.g., Prinz 1987; Voytek and Tringham 1989). Fish, mainly catfish and members of the carp family, apparently were a very important resource, accounting for over half the bones recovered from Lepinski Vir (Bökönyi 1970), Padina III (Clason 1980), and Icoana (Bolomey 1973). Faunal reports all conclude that these three settlements were occupied all year.

Continuity from the Later Upper Paleolithic

Historically, the Mesolithic has been described as a separate entity. However, much new work is now being done to bridge the gap between the Upper Paleolithic and the Mesolithic, and not surprisingly, there is substantial continuity. The two periods are now being studied largely by the same researchers, whereas in earlier years the division between Pleistocene and Holocene also formed a research division. This is particularly the case in the North European Plain, where human occupation ceased during the maximum extent of the last glacial period: the later Upper Paleolithic reoccupation is treated together with the Mesolithic as a single unit of study, albeit with recognition of rapid change through time. This renders irrelevant any question of whether we should actually call the postglacial period “Mesolithic” or “Epipaleolithic.”

Climatic warming at the Pleistocene-Holocene boundary appears to have been extremely rapid. As a result, it took some centuries for plant communities to begin to adjust. There is a substantial similarity between the flint technology of this period and the immediately preceding later Upper Paleolithic, both on the mainland (Gob 1991) and in Britain (Barton 1991). Similarity in bone and antler artifacts is also attested (Smith and Bonsall 1991). One interesting recent development is the accelerator dating of a point recovered from the bed of the North Sea at a depth of 39 meters; the date is 11,740±150 b.p. (OxA 1950), which places the point firmly in the later Upper Paleolithic and emphasizes the large areas

that have been submerged since the last glacial.

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It was mentioned earlier that microliths may reflect a less specialized technology, as would be expected when climatic amelioration takes place. Can microlithization therefore be considered

an adaptation to prevailing conditions? Much more work needs to be done on the late-glacial industries before this question can be answered, but some observations can be made at this point. Late-glacial environments are becoming better understood. The last millennium or so was characterized by very cold conditions (the so-called Dryas III, ca. 11,000-10,000 b.p.). Preceding this was a warmer interstadial period (the late-glacial interstadial, sometimes divided into the Bølling and Allerød interstadials, ca. 13,000-11,000 b.p.) in the North European Plain. Before 13,000 b.p. came the major period of last-glacial cold (Barton, Roberts, and Roe 1991, xii).

Microlithization varies with this in what is potentially a most interesting way. Later Upper Paleolithic industries in southern Europe showed a trend toward microliths (Gamble 1986, 220-221), which increased in the Azilian around the Pleistocene-Holocene boundary (Straus 1985). Remarkably, southern france for a time saw a chronological overlap between (1) groups hunting reindeer with Magdalenian technology and (2) groups hunting red deer with Azilian technology (Straus 1996). In northern Europe, the Hamburgian dates to the earlier part of the late-glacial interstadial period and is typified by the heavy, tanged points that were used to kill reindeer (Fischer 1991, 1996; Holm and Rieck 1992). Microlithization began in the second part of the late-glacial interstadial period (Rozoy 1989, 25). Cultural entities of this period in the North European Plain are variously termed Federmesser, Tjongerian, Arch Backed Piece, and so forth (Fischer 1991; Gob 1991; Schild 1976; Houtsma et al. 1996; Newell and Constandse-Westermann 1996). Large, tanged points continued in the northern edge of occupation, in the Brommian of Denmark (Fischer 1991), although some Federmesser elements are also known (Holm 1996). Ahrensburgian tanged points from the final cold spell in the Younger Dryas have been found across much of the North European Plain, again associated with reindeer hunting (Schild 1976; Fischer 1991). At the end of the Younger Dryas final Paleolithic industries continued until 9600 b.p. in poland, by which time the site of Friesack in Germany had already "gone Mesolithic," although this phenomenon cannot yet be linked to ecological factors because no faunal remains survive (Schild 1996). This pattern could be consistent with (1) specialized reindeer hunting using tanged points and (2) more generalized hunting using smaller armatures, moving north and south as climate and resources fluctuated. More work is, however, needed on late-glacial industries and resources before this supposition can be substantiated.

Final Remarks

This essay has tried to show why the Mesolithic period in Europe is no longer regarded as a cultural hiatus or a retrogressive backwater. Variability has been stressed; in some areas hunter-gatherer economies were apparently a viable alternative to farming for centuries or longer. Thus, when farming spread across Europe, groups of people who lived at the Portuguese shell middens and the Iron Gates hunter-fisher sites continued to occupy them for centuries although surrounded by farmers; by contrast, the boundary between hunter-gatherers and farmers in southern Scandinavia and northern Germany was more or less stable for over a millennium.

It is heartening that many of the changes in views discussed here have come about not as theoretical changes divorced from the archaeological material but as the direct consequence of methodological and interpretational advances on the part of Mesolithic scholars all across Europe. An optimistic view of the future of Mesolithic studies thus stresses the importance of continued work: excavation, interpretation, reinterpretation, synthesis. It is from this process that a greater understanding will come in the years ahead.

Peter Rowley-Conwy

See also

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Evans, Sir Arthur

(1851-1941)

Arthur Evans was the eldest son of the famous geologist and antiquary sir john evans. The father's friendship with many notable archaeologists such as Sir John Lubbock (lord avebury), hugh falconer, augustus pitt rivers, and gustaf montelius must have had an impact on his son Arthur, and the death of his mother when he was six resulted in a close relationship between father and son. Arthur Evans attended Harrow School and Oxford University and graduated in history in 1874. Independently wealthy, Evans traveled to Germany to study for a year, and he then went to Bosnia, Herzegovina, finland, and Lapland. He pursued independent research on the history and antiquities of the southern Slavic peoples and became an advocate of Illyrian independence from the Austro-Hungarian Empire. He returned to England in 1878 and married Margaret Freeman.

In 1883, Evans and his wife left for an extended tour of greece, meeting heinrich schliemann in Athens and visiting his sites. Seeing preclassical Mycenean civilization captured and kept Evans's interest for the rest of his life. He returned to England to become keeper of the ashmolean museum in Oxford, restoring its collections and rehousing them in a new building. In 1894, a year after the death of his wife, Evans traveled to Crete for the first time.

His subsequent passion for Cretan archaeology was the result of his interest in the nature and extent of oriental influences on the cultures of early Europe. He returned to Crete in 1895 and 1896 and successfully negotiated the purchase of one-quarter of Kephala Hill at Knossos from its Turkish owner. He was able to purchase the rest in 1899 after the Turks had been driven from Crete as a reward for his public support of Greek independence.

Evans and his colleage david hogarth established a Cretan Exploration Fund, with links to the British School in Athens, and with Evans's private resources began to excavate. In the first year, the general plan of the Bronze Age palace of knossos was uncovered, and the “throne room” and “magazines” were revealed. Other finds included the first of the marvelous frescoes, traded items from Egypt and babylon, and tablets covered with linear script. Intensive excavation of the site continued for the next eight years and was largely financed by Evans, whose success at Knossos encouraged more excavations on Crete and in Greece proper.

Of equal importance to his excavations were Evans's self-funded efforts to restore the palace of Minos. Although Evans's motivations were to make the site comprehensible to others and to stabilize it, he was greatly criticized for compromising conservation in favor of restoration and worked at the site to that end until 1931. Between 1921 and 1936, Evans's most enduring legacy, the book *The Palace of Minos at Knossos,* was published.

Evans resigned from the Ashmolean in 1908 and worked for the Hellenic Society and the British Schools in Athens and Rome. He transferred all of his property on Crete to the British School in Athens, and during the Versailles Peace Conference after World War I, he tirelessly lobbied the British government to support an independent Yugoslavia. He was an accomplished draftsman, numismatist, collector, and excavator, and his artistic tastes were matched by his deductive flair. His development of the chronology of Knossos was a tour de force.

Tim Murray

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Evans, Sir John

(1823-1908)

Born in Buckinghamshire, England, and educated at his headmaster father's school, John Evans intended to go to Oxford but instead traveled to Germany. On his return in 1840, he joined his uncle's paper-manufacturing business, John Dickinson and Company, of which he became a partner in 1850. Although he was an excellent businessman, and did not retire from the company until 1885, he also pursued many interests that lay outside the field of his employment. These included geology and palaeontology, which led him to accompany geologist sir joseph prestwich to France, as an assistant, to visit French palaeontogist jacques boucher de perthes and examine chipped flints from the Somme gravels.

Evans and Prestwich were convinced that the stone tools were indeed proof of human antiquity in western Europe, and Evans began to collect stone and bronze implements, to visit cave sites, and to publish his findings. Evans also collected and published on fossil remains of extinct animals and the provenance, typology, and distribution of medieval antiquities, Anglo-Saxon and Lombardic jewelry, posy-rings, bronze weapons, and ornaments. His real area of expertise was in numismatics, and his collections of ancient British money, Roman emperor gold coins, and Anglo-Saxon and English coins were unique. He also contributed more than a hundred items to the *Numismatic Chronicle* and the standard works on British coins.

Evans was elected a fellow of the Royal Society in 1864 and was the society's vice-president from 1876

to 1878 and then its treasurer from 1878 to 1898. He was president of the Geological Society from 1874 to 1876, and in 1880, he received the Lyell Medal for his services to geology, particularly post-tertiary geology, and for developing the relationship between archaeology and geology. At various times in his busy life, he was a member and president of the society of antiquaries of london, the Numismatic Society of London, the Anthropological Institute, the egypt exploration society, the Society of Arts, the Paper-makers Association, and the British Association. He was also a trustee of the british museum and was awarded many academic honors in England and abroad, as well as being on one occasion high sheriff of Hertfordshire. He left his collections to his son sir arthur evans, who in turn presented portions of them to the ashmolean museum in Oxford.

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F

Falconer, Hugh

(1808-1865)

Born in Scotland, Hugh Falconer graduated from Aberdeen University in 1826. Despite his interests in botany, geology, and paleontology, he went to Edinburgh University to study medicine. After graduating, and before taking up a position as surgeon with the East India Company, he spent a year in London working with the botanist Nathanial Wallich and with William Lonsdale, curator for the Geological Society of London. It was through these contacts that he finally traveled to India as a botanist rather than as a doctor.

Falconer eventually became superintendent of the East India Company's botanical gardens at Saharanpur in northern India, which allowed him to also pursue his interests in natural history in the nearby Siwalik Hills, which he dated to the Tertiary period. With the help of a military engineer, Falconer recovered a series of wonderful fossil mammals and reptiles from sites in the hills, for which he and the engineer were awarded the Geological Society of London's Wollaston Medal in 1837. Falconer's work in northern India stimulated his interest in the issue of human antiquity.

Because of illness, Falconer spent the years between 1838 and 1847 in London working on his collections at the British Museum. He returned to India and served as the superintendent of the Royal Botanic Gardens in Calcutta until 1855 when he retired from colonial service. Back in London, Falconer took up full-time paleontological research, examining fossil faunal assemblages from caves across Europe. In 1858 he met the Cornish archaeologist william pengelly, and together they excavated brixham cave in Devon.

The results of these excavations had consequences for the extension of human antiquity, as they provided evidence for the coexistence of human beings with extinct mammals. It was with Falconer's support that geologist sir joseph prestwich and the archaeologist sir john evans demonstrated the similarity of evidence from Brixham Cave with evidence from open sites in the Somme River valley found by the French paleontologist jacques boucher de perthes. In 1860, Falconer provided even more evidence for human antiquity through his discoveries of material at the Grotta di Maccagnone near Palermo, Sicily.

Falconer was also deeply involved in resolving the moulin quignon controversy concerning the authenticity of human remains found France in 1863 and with the first description of the Gibraltar skull and site in 1864. He received the Royal Society's Copley Medal in 1864, was elected to the Royal Society in 1845, and was its vice-president when he died in London.

Tim Murray

Finland

The historical roots of antiquarianism and archaeology in Finland date from the era of Swedish rule, most notably from the seventeenth century when sweden was a leading European power and the ideological potential of antiquities was recognized by the state. A royal decree of 1666 placed antiquities under the official protection of the state, listing ancient fortresses, earthworks, cairns, and rune stones to be protected *ad maiorem patriae gloriam,* and administration for this purpose was established. The clergy in both

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Fleure, Herbert J.

(1877-1969)

Born on the English Channel island of Guernsey, Herbert J. Fleure as a child was kept isolated and on the island by ill health until he was fourteen, and his interests in natural history and Darwinian theory were encouraged. In 1897, he won a scholarship to Aberystwyth University College in Wales where he read zoology, geology, and botany. In 1904, he took up a fellowship at the Zoological Institute in Zurich, switzerland, where he studied physical anthropology and marine biology. He returned to Aberystwyth to work as lecturer in geology, zoology, and geography, and in 1910, he became professor of zoology and a lecturer in geography.

In 1917, Fleure became professor of anthropology and geography at Aberystwyth, uniting these two disciplines to develop concepts of human physical and social evolution in diverse environments worldwide. At this time the study of geography was in its infancy, and Fleure realized and taught its full potential and popularized it in books such as *The Peoples of Europe* (1922).

Fleure was also influenced by physical anthropologist sir grafton elliot smith's ideas about the Neolithic period and the invention of agriculture and by raphael pumpelly's “oasis hypothesis,” which he wrote about with harold peake in *The Corridors of Time* (1927-1956), a widely read ten-volume series about prehistory.

In 1930, Fleure became professor of geography at Manchester University in England, between 1949 and 1950, he was professor at both Alexandria and Cairo Universities, and in 1946, he was made honorary lecturer at University College, London. He published his large *Natural History of Man in Britain* in 1951,a work that was to become a classic. He was the first professional geographer to be made a fellow of the Royal Society in 1936, and he was president of Royal Anthropological Institute and its Huxley Medallist and lecturer in 1937.

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Florida and the Caribbean Basin, Historical Archaeology in

The post-1492 history of the Caribbean Basin has been largely defined by colonialism. It has the longest colonial history in the Americas, with the first European colony in the region established in 1493 and the last European colonies and American commonwealths remaining there until 1995. This time depth is accompanied by a cultural diversity unparalleled elsewhere in the post-Columbian Americas. The Caribbean Basin is the only region in the hemisphere in which American Indian, Spanish, French,

English, Danish, Dutch, African, and Euro-American people established societies and claimed political dominion during the colonial era. At least partly because of this complexity, relatively few historians and even fewer archaeologists have treated the circum-Caribbean area as a coherent unit (for one of a number of exceptions see Williams 1970). Instead, its written history-to which historical archaeology is inextricably linked-has been largely defined and organized by discrete episodes of European and North American intervention and involvement in the region.

Historical archaeology as used here refers to the archaeological investigation of sites occupied after 1492 for which both written documents and European technology are pertinent to interpretation. This endeavor has been largely a twentieth-century phenomenon not only in the Caribbean region but throughout the Americas as well. Both avocational and professional historical archaeologists in the Caribbean Basin and Florida have addressed questions related to an exceptionally diverse array of cultural and ethnic groups, time periods, site types, historical

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Historical archaeology as used here refers to the archaeological investigation of sites occupied after 1492 for which both written documents and European technology are pertinent to interpretation. This endeavor has been largely a twentieth-century phenomenon not only in the Caribbean region but throughout the Americas as well. Both avocational and professional historical archaeologists in the Caribbean Basin and Florida have addressed questions related to an exceptionally diverse array of cultural and ethnic groups, time periods, site types, historical

questions, and anthropological problems over the past century, during which changing social philosophies, national interests, and technologies have additionally affected the orientations and outcomes of archaeology (*see* Patterson 1991; Sued Badillo 1996). Despite recent criticism that historical archaeology in the region has been unfruitful and dominated by concerns defined by European hegemony (Sued Badillo 1992), twentieth-century historical archaeological research in Florida and the Caribbean has, in fact, addressed questions of internal development, indigenous American identity and colonialism for several decades.

The following discussion of the history of that work in the Caribbean and Florida is ordered in a general way by the chronology of archaeological research in the region; however, it should be emphasized that equally important organizational distinctions for historical archaeology in the Caribbean are provided by the dominant postcontact cultural distinctions of the region-that is, American Indian, African, Spanish, French, English, and Dutch-as well as by the traditional geographic distinctions-that is, the Lesser Antilles, the Greater Antilles, the Bahamas, Florida, and the mainland Caribbean coasts. These will be incorporated as necessary.

The chronology of circum-Caribbean historical archaeology is organized here for convenience by four somewhat artificial and overlapping periods, which nevertheless correspond roughly to paradigmatic and political developments in the region. These include: (1) the period before 1935 and the formalization of professional archaeology, (2) the years of ca. 1935-1970, (3) the period between ca. 1970 and 1990, and (4) the Quincentennial-dominated post-1985 period.

Historical Archaeology before 1935

A few essentially archaeological studies of post-Columbian sites took place in Florida and the Caribbean before 1930; however these were generally undertaken by historians or other nonspecialists to commemorate the anniversary of a historic event or a famous European person. In 1767 for example, the French geographer Moreau de St. Mery attempted through survey and collection to locate and identify the site of La Navidad, the first fort that Columbus was forced to establish in Haiti after the wreck of the *Santa Maria* in 1492. In the process, he inadvertently identified the site of Puerto Real, a sixteenth-century Spanish town, as La Navidad (Moreau de St. Mery 1958; Hodges 1995). Another early archaeological effort to study Columbus was that commissioned by the North American Commission for the Observance of the Columbian Quadricentennial in 1891. The U.S. Navy vessel *Enterprise* was sent to the site of La Isabela in the Dominican Republic, which was the first settlement intentionally established by Christopher Columbus in the Americas. The site was surveyed, mapped, and described by Navy Lt. Colvocorresses (Thatcher 1903).

Little historical archaeology was attempted in Florida or the Caribbean Basin during the early twentieth century, and most information about postcontact archaeological sites was buried as footnotes or ancillary observation in studies of pre-Columbian sites (e.g., Hatt 1932). One notable exception to this was the work of William Goodwin in Jamaica. A businessman who went to the West Indies in 1915 to recover from nervous prostration, Goodwin began a long-term study of the early Spanish and English ruins of Jamaica, occasionally studying presumed Spanish ruins in Florida as a comparison (Goodwin 1946). Between 1911 and 1937 he mapped and excavated a series of colonial sites on the island, including what was probably the first underwater search for Columbus's caravel ships (Goodwin 1946, 46-55), and collaborated with local collectors and antiquarians to document many of Jamaica's historic colonial remains. It was not until after 1935, however, that the largely idiosyncratic interest in monumental sites and highly visible historical events manifested by nineteenth- and early-twentieth-century investigators coalesced into the discipline of archaeology in Florida and the Caribbean. From this time onward, historical archaeology was practiced consistently, if eclectically, in the region.

1935 to ca. 1970

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out in Florida and the Caribbean during the 1930s and 1940s, most of it devoted to the Spanish colonial presence in the region, and much of it dominated by North American concerns. These projects reflect the diffuse nature of American historical archaeology at that time, both in the reasons for doing archaeology and in the people who did it. Avocational archaeologists, for example, played a central role during this period in the development of historical archaeology in the region.

A major emphasis was the study of monumental sites for purposes of historical interpretation, not only by archaeologists but often by historians or architects. Other concerns of the period addressed primarily by archaeologists were questions of artifact classification and chronology and of Spanish influence on, and the acculturation of, the American Indians of the region. All of these themes have endured as important emphases in the historical archaeology of Florida and the Caribbean to the present day.

Three developments in the United States at this time shaped the direction of historical (and pre-Columbian) archaeology. The establishment of the society for american archaeology in 1935 marked the formalization of professional archaeology in the Americas. Although prehistory was the primary concern of the Society, its establishment focused professional consensus on appropriate archaeological questions and methodologies, which in 1935 were predominantly those of classification and chronology (*see* Dunnell 1986; Willey and Sabloff 1980, 73-74). This coincided with the establishment of the United States Works Progress Administration Program of the 1930s, which provided some of the first opportunities to develop and implement these archaeological methodologies on historic sites.

The end of this period was marked by the emergence of historical archaeology as a recognized discipline, signaled by the establishment of the Conference on Historic Sites Archaeology. This annual conference was first organized by Stanley South in 1960, and was held in conjunction with the Southeastern Archaeological Conference (*see* South 1994). Florida historical archaeologists John Goggin, John Griffin, Hale Smith and Charles Fairbanks were particularly active in the conference, and the first four conference proceedings were published in the *Florida Anthropologist.* During the 1960s the conference was largely devoted to what Goggin called the “brass tacks” of historical archaeology, “to the kind of details that archaeologists deal with. In other words my feeling is that as archaeologists we deal with artifacts, and with few exceptions colonial artifacts have not been analyzed or classified by a method suitable for the archaeologists to handle” (South 1964, 34). Resolving this problem was to be one of the enduring themes of historical archaeology after 1960.

The Development of Enduring Themes: Spanish Towns and Monuments

St. Augustine, Florida-the United States' oldest European settlement-was an early beneficiary of the U.S. Works Progress Administration program. A program of survey, excavation, and study of historical resources was undertaken jointly from 1935 to 1937 by the Federal Works Project Administration, the Carnegie Institution of Washington, D.C., and the St. Augustine Historical Society. The work was explicitly multidisciplinary, involving archaeologists, historians, and architects, and it emphasized monumental sites in its attempt to archaeologically study and partially reconstruct the Spanish defensive systems in the colony (Chatelaine 1941). The archaeological program initiated in St. Augustine during this period has continued to the present day, evolving to incorporate questions of Spanish acculturation and the development and recognition of colonial identity (see Cusick 1994; Deagan 1983; Deagan 1991).

Interest in monumental sites associated with early Spanish presence was sustained throughout the period, often in support of restoration and public interpretation of sites. The historical archaeology of the sites of forts and towns in Florida during this period was continued in St. Augustine at the Castillo de San

Marcos in 1947 and 1953 and at several domestic sites in the town by Smith and Griffin (*see* Deagan 1991, xvi-xvii; xxv-xxiv). Elsewhere in Florida, investigation was initiated at other seventeenth- and

began in Santo Domingo, in support of restoration and interpretation efforts of the sixteenth-century section of the city. Excavations during this time contributed primarily to the mitigation of threatened sites, the interpretation of Spanish colonial presence to the tourist public, and the beginnings of the systematization of Spanish colonial material culture. The results of much of this work are summarized in a large and varied literature (*see* Nieves Sicart 1980; Ortega 1982; Pérez Montás 1984). Archaeology in Santo Domingo continued into the 1990s with much the same objectives, and was greatly stimulated in the 1980s by the observation of the Columbian Quincentenary (Veloz Maggiolo and Ortega 1992).

Spanish-Indian Interaction and Transculturation

Not all of the historical archaeology in Florida and the Caribbean was oriented toward descriptive or restoration goals during this period. Several pioneers of American historical archaeology, including Griffin, Smith, Goggin, José Cruxent, Francisco Prat Puig and Fairbanks developed active programs in Florida and the Caribbean between 1940 and 1960. They were explicitly interested in the mechanisms and consequences of European-American Indian contact, primarily from the perspective of the American Indians (see Smith 1956).

Among the most important elements of these programs were the Florida missions, which provided the focus for some of the first anthropologically oriented historical archaeology in the United States. In 1934, a historic-period Indian burial ground was discovered on the grounds of the Fountain of Youth Park tourist attraction in St. Augustine by archaeologist J. Ray Dickson, and the site was identified by smithsonian institution archaeologist Matthew Stirling as a probable Spanish mission. Archaeological and physical anthropological research at the mission site and surrounding areas has been carried out at the site intermittently since then for more than sixty years, not only focusing on the Timucua village associated with the mission, but also locating the original site of St Augustine (Chaney and Deagan 1989).

The focus of mission archaeology was explicitly defined by Griffin and Smith during the 1940s when they undertook the study of several seventeenth-century Spanish missions in order to better understand the responses of the Florida Indians to Spanish colonization and evangelization (Boyd, Smith, and Griffin 1951; Smith 1956). Recent assessments of this work, as well as syntheses of mission archaeology into the 1990s can be found in Thomas 1990, among others.

Questions of interaction and transculturation between Spaniards and American Indians in settings other than missions were the focus of considerable archaeological attention during the 1930s and 1940s, and were centered on Cuba, due largely to the influence of anthropologist Fernando Ortíz. Not only were a number of contact period Indian sites located and recorded, but some of the first explicit theoretical attention was paid to the processes of transculturation in the contact period (Ortíz 1983). This was largely owing to the activities of the Grupo Guamá, an organization of archaeologists committed to the archaeological investigation of Caribbean history, prehistory, and art. Organized and based in Cuba, the group also included archaeologists from the Dominican Republic, Venezuela, and North America, and sponsored projects and expeditions throughout the Caribbean Basin. The Grupo Guamá was active during the 1940s and 1950s, and during that time laid the groundwork for much subsequent Spanish colonial and contact-period Taino archaeology in the West Indies. This emphasis, too, has continued in Cuba to the present time (*see* Dominguez and Pantoja 1992; Fariñas Gutierrez 1992).

Tools of Chronology and Classification

A significant amount of pre-1970 historical archaeology in Florida and the Caribbean was undertaken specifically to develop classificatory and chronological tools. The most notable and broadly based of these efforts were Goggin's comprehensive studies of Spanish majolica (a tin-enameled earthenware

pottery) and Spanish Olive Jars (storage containers) (Goggin 1960a, and 1958, respectively). Goggin not only drew from existing collections but also initiated surveys,

began in Santo Domingo, in support of restoration and interpretation efforts of the sixteenth-century section of the city. Excavations during this time contributed primarily to the mitigation of threatened sites, the interpretation of Spanish colonial presence to the tourist public, and the beginnings of the systematization of Spanish colonial material culture. The results of much of this work are summarized in a large and varied literature (*see* Nieves Sicart 1980; Ortega 1982; Pérez Montás 1984). Archaeology in Santo Domingo continued into the 1990s with much the same objectives, and was greatly stimulated in the 1980s by the observation of the Columbian Quincentenary (Veloz Maggiolo and Ortega 1992).

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surface collections, and excavations throughout Florida and the Caribbean between 1949 and 1957 in order to recover well-dated samples of majolica to use in a dated typological seriation (Goggin 1968). The result was a detailed classification of majolica using the then-standard North American Midwestern Taxonomic system. Despite criticism of his typological system, Goggin's majolica study has remained a reliable classificatory and dating system since its publication, with only minor revision (Deagan 1987).

Sunken Towns and Ships

Systematic underwater historical archaeology in Florida and the Caribbean began during the 1950s with a series of investigations loosely coordinated by Mendel Peterson of the Smithsonian Institution (see Peterson 1965, 5-17). Various shipwrecks, including those of the Spanish treasure fleets and British privateers sunk in Florida were studied; however the most important project of this period was at the sunken city of Port Royal, Jamaica. The British colonial city was plunged into the sea by an earthquake in 1692 and remained submerged as a seventeenth-century time capsule. Edwin and Marion Link, avocational archaeologists working with Peterson and a team of U.S. Navy divers, began investigation of the site in 1956 to identify sunken structures and recover evidence of life in seventeenth-century Port Royal (Link 1960).

Archaeological research at the site has continued to the present day under the auspices of the Jamaican government, carried out from 1965 to 1968 by Robert Marx (Marx 1973), and during the 1980s and 1990s by the Institute for Nautical Archaeology at Texas A&M University under the direction of Donald Hamilton (Hamilton 1992). Through Texas A&M's involvement, Port Royal became the site of one of the few academic field training programs in underwater archaeology in the Americas. Port Royal is also one of the few colonial sites in the hemisphere at which underwater and terrestrial excavations have been conducted simultaneously, in order to coordinate the study of submerged remains with those buried remains not drowned by the 1692 earthquake.

Meanwhile in Florida, developments in shipwreck excavation shaped a very different kind of trajectory for underwater archaeology in the state, which until recently was defined by the search for sunken treasure. The first organized treasure hunting consortium in Florida, Real Eight, was formed during 1959 and 1960 through the efforts of Kip Wagner and Mel Fischer. Real Eight received permits from the State of Florida to salvage several wrecks off the east coast, with 25 percent of the recovered value going back to the State of Florida. Archaeologists Goggin and William Sears provided oversight for both the projects and the division of remains, but by 1964 fiscal and contractual problems resulted in the appointment of Florida's first State Underwater Archaeologist, Carl Clausen (*see* Burgess and Clausen 1982; Wagner and Taylor 1972). The State Underwater Archaeologist was assigned to manage and oversee the study and salvage of Florida's marine resources, and the position as well as the permitting partnerships have been maintained since that time.

One consequence of these early developments in Florida's marine archaeology program was the sustained interest of Goggin in underwater archaeology. Goggin and Fairbanks encouraged the incorporation of submerged archaeological data with terrestrial research in a way that has rarely been seen since that time. Goggin's early interest in underwater historical archaeology was focused on a variety of sites and materials submerged in rivers and springs, including isolated finds, mission refuse, Seminole materials, and abandoned settlements (Goggin 1960b; Fairbanks 1964).

Despite the level of activity and the diversity of interests in the historical archaeology of Florida and the Caribbean during the period from 1935 to 1970, the field was not formally recognized as a coherent school, specialty, or subdiscipline within the wider archaeological community until the 1960s. The Conference on Historic Sites Archaeology was organized by Stanley South and many of the Florida

historical archaeologists (*see* South 1994), publishing its first several proceedings in the *Florida Anthropologist.* The primary professional organ for

Caribbean archaeology was not established until 1965 with the name "The International Congress for the Study of pre-Columbian Man in the Lesser Antilles," and the first congress paper with an explicitly historical-archaeological theme was not included in the Congress Proceedings until 1977 (Garcia Arévalo1978b). In 1979 the archaeologists in the region decided to change the name of the congress to "The International Congress for Caribbean Archaeology" to reflect the broader temporal and geographical interests of archaeology in the Caribbean that developed after 1970.

Historical Archaeology, 1970-1990

Historical archaeology in both Florida and the Caribbean region expanded considerably in scope and in intensity after 1970 as a consequence of political and professional developments at both the international and regional levels. The decade of the 1960s was one of widespread political change in the Caribbean, with seven British colonial nations gaining independence between 1962 and 1974 and the communist revolution in Cuba in 1959. These events ultimately directed historical archaeology toward questions of colonialism and American cultural identity near the end of the period.

One of the most influential professional developments was the gradual formalization through the 1960s of American historical archaeology as a distinct discipline, with the expansion of the Conference on Historic Sites Archaeology, and the formal establishment of the society for historical archaeology in 1967 (*see* South 1994). The latter event marked the advent of a conscious self-identification of historical archaeology as a social science distinct from both prehistoric archaeology and from history, with its own set of theoretical and methodological principles, and therefore a distinct set of guiding questions. One of the most important of these for historical archaeology in the circum-Caribbean was the explicit general recognition that the encounter between Europe and America-which first took place in this region-was one between literate and nonliterate people, and that systematic investigation of that world-changing process required both archaeological and documentary information. Historical archaeology was the only field that developed and articulated such an approach.

Archaeologists working in Cuba had been among the first to explicitly address these issues, as well as others that focussed on colonialism. The Cuban revolution of 1958 promoted active attention among Cuban historians and archaeologists toward questions of cultural origins and national identity. For much of the subsequent three decades, during which cold war politics dominated the globe, Cuban historical archaeology was relatively isolated from the rest of the Caribbean. Cuban archaeologists during this period continued to work on the questions of transculturation and social dynamics posed during the previous period by the Grupo Guamá, but their inquiries came to be informed by Marxist theory and a concern with the dialectics of property and class considerably before these paradigms emerged in mainstream American archaeology.

The formalization of historical archaeology coincided with the emergence and general acceptance of what came to be known as the new archaeology, which called for attention to dynamic cultural processes rather than to the structural culture histories that had dominated earlier periods (*see* Dunnell 1986). These concerns had a profound effect on the kinds of questions asked by historical as well as pre-Columbian archaeologists in Florida and in the Caribbean, and in the methods used to answer them. Subsistence strategies and environmental adaptations, for example, figured prominently in frameworks for investigation, and required the incorporation of multidisciplinary specialists in the natural sciences in addition to those in history and architecture. Although some interdisciplinary research, such as Elizabeth Wing's pioneering study of food remains from Nueva Cádiz (1961), had been carried out in the Caribbean and Florida before 1970 the involvement of multidisciplinary scholars did not become standard in the historical archaeology of the region until after about 1975.

A third important influence on historical archaeology throughout the Americas during this period was the increased consciousness of and

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legal attention to cultural resources management issues. This was particularly influential in those areas under formal U.S. government jurisdiction after the passage of the Moss-Bennett Bill in 1974, as well as in Cuba after the establishment of the Castro government. Although legislation mandating survey and mitigation of archaeological sites was not universal throughout the Caribbean, the management of cultural resources for the preservation of cultural patrimony and the potential for tourism was nearly so.

Serious attention was given to the definition of national identities and the management of historic sites, and this encouraged the development of programs throughout the region that were designed to recover information relevant to public interpretation.

Developments in marine archaeology during this period were closely tied to the management of historical archaeological resources on land. Research-oriented archaeology of shipwrecks evolved into an important, if controversial, emphasis in the historical archaeology of Florida and the Caribbean during the period from 1970 to 1990, paralleled by an even greater growth in treasure hunting and salvaging of shipwrecks for commercial reasons.

These developments directed the course of historical archaeology in Florida and the Caribbean after 1970 in several ways. One was by encouraging explicitly historical archaeological research unrelated to the specific concerns of prehistoric archaeology or of historic monument restoration, and by placing stronger emphasis on systemic questions of encounter and acculturation, colonialism, capitalism, and slavery, and less emphasis on chronology and classification. Archaeologists in general became more interested in cross-cultural studies as a way to address some of these questions, and increasingly turned archaeological attention to non-Spanish and postcolonial historic sites for the first time. This broadening of focus was also encouraged by the requirements of cultural resources management programs aimed at cultural patrimony in newly independent nations, which brought attention to bear on both non-Spanish and post colonial sites. This trend has been perhaps most notable in the initiation and rapid growth of effort devoted to African-American archaeology since 1970.

It should be noted that a number of programs continued research after 1970 to refine and enhance the understanding of historic material culture classification, chronology, and interpretation. Such efforts built upon and extended the work begun in the previous period (*see* Cruxent and Vaz 1975; Deagan 1987; Marken 1994).

The formalization of historical archaeology as an entity was reflected in both Florida and the Caribbean during this period in the training of archaeologists. Formal training in historical archaeology was provided at the state universities of Florida by Fairbanks, Smith, and Griffin and led to many of the historical archaeological programs ongoing in the Caribbean and Florida. Another training program with far-reaching influence on Caribbean historical archaeology was the *Curso de restauracion de bienes muebles especializado en ceramologia historica.* This program was established in Panamá in 1974 under the auspices of the Organization of American States and the Instituto de Cultura de Panamá, and continued for a decade under the direction of José M. Cruxent (Cruxent 1976, 1980).

Basic methods for excavation methodology and artifact classification-including those of historical archaeology-were taught in the program, which trained archaeological technicians from throughout Latin America and the Caribbean.

Cultural Resources Management

In some areas, such as San Juan, Santo Domingo, and St. Augustine, management programs built upon the studies of monumental sites that dominated the pre-1970 period, and were intensified by formal programs of cultural resources management. In other areas, programs of urban cultural resources

management archaeology began during this period, including in Havana (Cuba), Pensacola (Florida), and Spanish Town (Jamaica). In all of these areas historical archaeologists are still attempting to accompany the rapid growth and development in these cities, to salvage sites, and to trace the cities' architectural and economic evolution.

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The 1970s also marked the initiation of programs that concentrated on rural sites and regional landscapes in areas occupied by English, Dutch, African, and French colonists. The impetus for these efforts was often provided initially by historical architects in the region, working with international and national historic preservation organizations such as the International Council of Monuments and Sites (ICOMOS), the Organization of American States (OAS) and the United Nations Educational, Scientific and Cultural Organization (UNESCO). Between 1978 and 1982 historic preservation architects and archaeologists from throughout the Caribbean, coordinated by Eugenio Pérez Montás of the Dominican Republic, worked on the development of a region-wide plan for historic preservation. Plan CARIMOS (Plan for Monuments and Sites in the Wider Caribbean) was formalized at the University of Florida in 1982, with its seat established in Santo Domingo. Since that time, CARIMOS, working with the OAS, UNESCO,ICOMOS, and the University of Florida's Preservation Institute-Caribbean (PIC) has been an important force in the intensification and diversification of historical archaeology throughout the Caribbean. (For summaries of CARIMOS activities *see* Pérez Montás 1991.)

Underwater Archaeology

Much of the marine archaeology during the period from 1970 to 1990 also developed in the context of the management of resources for public interpretation and, with the exception of Port Royal, was dominated by shipwrecks of the Spanish treasure fleets and explorers (see Burgess and Clausen 1982; Borrell 1983; Marx and Marx 1993; Smith 1993). The necessity for protecting underwater resources and developing a broad base of public support for noncommercial marine archaeology led to programs of site protection and public interpretation throughout the region. In some areas, such as the Dominican Republic and Florida, a significant part of underwater archaeology was carried out through joint efforts between private salvers, recreational sport divers, and government archaeological agencies. The Comisión de Rescate Arqueólogico Submarino was established in the Dominican Republic in 1979 to oversee the management and study of the submerged historic resources of the Dominican Republic. The Comisión, coordinated by Pedro Borrell, worked closely with the Grupo de Investigaciones Submarinas, Inc., a group of professional and avocational divers and archaeologists, and the commercial firm of Caribe Salvage, Inc. to study and interpret many of the vast number of shipwrecks along the country's north coast (see Borrell 1983). This ongoing effort is still under way.

Florida during this period was the location of some of the earliest underwater historical archaeological parks in the region. The U.S. National Park Service established Fort Jefferson National Monument (today known as Dry Tortugas National Park) near Key West in 1935, and Biscayne National Park in southeast Florida in 1968. Underwater surveys were first undertaken at these sites in 1970 and 1975 by George Fischer of the National Park Service, and continue.

Shipwrecks in Florida were both studied and salvaged (often simultaneously) during this period. Although most of the shipwrecks were investigated by private salvage companies operating under permits issued by the state, academic and governmental research programs increased toward the end of the period. Unlike the initial days of public-private partnerships, the projects of the 1970s and 1980s, such as the excavation of the controversial *Atocha,* were often conducted by professional marine archaeologists working for private companies (Matthewson 1986). A heated debate over the conduct and ethics of underwater archaeology for commercial purposes was born during the 1970s, centering on the issues of professional methods and the ethics of selling artifacts. The debate remains vigorously unresolved.

The Institute of Nautical Archaeology (INA) at Texas A&M University, through the efforts of George Bass, Donald Keith, and Donny Hamilton, was also an important influence on the development marine archaeology in the Caribbean and in Florida during this period. Through the 1980s INA initiated a series

of academic marine survey and study projects in the Caribbean that were intended to illuminate the evolution of ship architecture and maritime economy in the region.

Late-fifteenth and early-sixteenth-century ships of discovery and exploration provided a primary focus for the INA efforts, at least partly in anticipation of the 1992 Quincentenary of Columbus's voyages of exploration. Survey and testing were carried out in the Dominican Republic, Jamaica, the Bahamas, and Panamá.

Crewmen on a commercial salvage expedition lift a bronze cannon, believed to be from the galleon Atocha. The Atocha, which sank in a hurricane in 1622, was believed to be carrying $100 million in gold and silver.

(© Bettmann/Corbis)

Programs of marine archaeology were begun in several non-Spanish areas of the Caribbean toward the end of the period between 1970 and 1990 (*see* Bequette 1991), offering a systematic basis for international comparisons of circum-Caribbean maritime technology and economy.

Transculturation, Adaptation, and the Euro-American Experience

The emphasis on culture contact and interaction exhibited by archaeologists during the period from 1970 to 1990 had strong roots in the previous period, particularly in the research of the Grupo Guamá and the work in the Florida missions. Unlike historical archaeology in the earlier period, however, research on European-American contact and interaction after 1970 was concerned with adaptations in Euro-American as well as in Native American society. This interest corresponded in the Caribbean to the increasing influence of nationalism that pervaded the Caribbean after World War II and particularly through the 1960s (see Sued Badillo 1996; Williams 1970, 463-478).

Long-term multidisciplinary programs of historical archaeology were undertaken in several Spanish-American town sites, building on work begun in the previous period. While the pre-1970 projects had been devoted primarily to the excavation and reconstruction of monumental remains, the later projects were intended to better understanding of the adaptive processes and resulting Creole cultural forms of post-Columbian America (*see* Deagan 1988), and were often carried out by interdisciplinary teams of researchers. These have included Santo Domingo (1502-present) and Concepción de la Vega (1498-1562) in the Dominican Republic, Puerto Real in Haiti (1503-1578), Havana, Cuba (1511-present), St. Augustine, Florida (1565-1763), and Sevilla Nueva, Jamaica (1510-1535).

Research in these towns has concentrated on cultural interaction among Spanish, American Indian, and African residents and the resulting syncretic and newly developed *criollo* forms. In all of the excavations that have been so far reported from these sites, a pattern of differential adoption and incorporation of Amerindian and/or African traits along gender lines has been documented in Spanish households. The archaeological record suggests that this admixture included the incorporation of Amerindian elements in non-socially visible, infrastructural areas, such as diet and food preparation, while visible symbols of social identification remained rigidly Spanish. Even after the extinction of the native Taino and related Amerindian people in the Caribbean, Spanish colonists continued to incorporate non-European traits into their households, replacing Indian contributions with African.

Subsistence studies have been central to these interpretations. Faunal analysis in historical archaeology was pioneered during the 1970s by Elizabeth Wing (1961, 1989) and her students working in Florida and the Caribbean, notably Elizabeth Reitz (1979, 1990). Zooarchaeological analysis is now a standard part of historical archaeology throughout the region. The use of floral remains has been an even more recent development.

The Non-Spanish Caribbean

The attention to multicultural transculturation and integration that has pervaded the post-1970 historical archaeology of Spanish-occupied areas has not been as pronounced in the English, French, or Dutch colonial sites of the region. This is at least partly owing to the developmental histories of both Euro-American societies in these areas and the historical archaeology that occurred there. By the time many of the seventeenth-century English, French, and Dutch colonies were established, the resident Amerindian populations had been severely decimated, thereby reducing the opportunities for cultural exchange. The populations of these areas came quickly to be dominated by people of African origin, brought for the most part unwillingly to the Caribbean and Florida as slaves (see Dunn 1972). The non-Spanish colonial occupations of the Caribbean and Florida Basin were furthermore dominated by dispersed plantation systems, in contrast to the more centralized towns that characterized the Spanish colonies, and this led to different approaches to the archaeological database.

Systematic historical archaeology first took place in these areas during the 1970s and 1980s and was informed by the methodological advances of cultural resources management that pervaded American archaeology in general. These advances emphasized regional settlement patterns and broad-scale surveys and were particularly appropriate for the problems related to plantation economies. Much of the initial work in these areas was thus devoted to survey and inventory, such as that done in Barbuda and Antigua (Clement 1995); St. Eustatius (Barka 1985); Montserrat (Goodwin 1982); Jamaica (Higman 1991); the Virgin Islands (Righter 1990) and Curacao (Haviser and Simmons-Brito 1991).

Although some archaeological attention has been devoted to European towns-most notably Spanish Towne and Port Royal, Jamaica, Oranjestad, St. Eustatius (Barka 1985), and more recently in the Guyanas to contact period Amerindian sites (Petitjean Roget 1991)-historical archaeology in the non-Spanish Caribbean has for the most part concentrated on plantations rather than on towns, with particular attention paid to slave settlements and to agricultural industrial systems.

Some of the earliest explicit archaeological attention to sugar production remains took place in Florida, with the study and excavation of the eighteenth-century Bulow sugar plantation. Intermittent projects in industrial archaeology took place at sugar installations in the Caribbean after that time; however, it was the advent of resource management surveys and historic preservation in the region after about 1980 that focused attention on industrial aspects of the Caribbean sugar plantations (*see* Eubanks 1993).

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towns in British-dominated areas to vacant lands in Florida (Fairbanks 1978, 171). The Seminoles furthermore formed close alliances and lived together with African runaways.

The archaeological study of Seminole sites was actually initiated before 1970 by Goggin, who incorporated Seminole archaeology into his overall schemes of cultural evolution and chronology in Florida and defined archaeological manifestations of Seminole culture for the eighteenth and nineteenth centuries (Goggin 1958). His colleagues and students subsequently became interested in aspects of Seminole-European interaction (Gluckman and Peebles 1974), and by the 1990s there was increased archaeological interest in Black Seminoles (Harron 1994). Archaeological work that took place between 1970 and 1990 to better understand Seminole cultural formation and development has been synthesized by Weisman (1989).

Much of the archaeological attention to African influence in the colonial Caribbean has focused on Afro-American ceramic traditions. One of the earliest inquiries into this question was that of Duncan Matthewson, who correlated locally made folk pottery in Jamaica with West African ceramic traditions. Since that time, African-Caribbean ceramic traditions have been studied in a number of areas, including Cuba (Dominguez 1980), Haiti (Smith 1986), Jamaica (Eubanks 1993), and the lesser Antilles (Heath 1988; Peterson and Watters 1988). Like those of Ferguson and others in the southeastern United States, these investigations concluded not only that African influence was considerably more pronounced in the material world of post-Columbian American society than has traditionally been acknowledged, but also that African contributions are most accurately understood through historical archaeology (rather than through history or archaeology alone). This has been especially relevant in the Caribbean region, where African influence in the Americas persists most visibly in the syncretic societies of the twentieth century.

Historical Archaeology in the 1990s

The 1990s in Florida and the Caribbean were marked by the convergence of nationalist ideology in the Caribbean and by postmodernist thought (“postprocessualism”) in historical archaeology. A focus for this convergence was provided by the 1992 Quincentenary of Columbus's first voyage, which marked the beginning of European colonialism in the Americas and provoked not only an enormous increase in attention to the Caribbean past but also a great deal of support for historical archaeology in the region.

Postprocessualism gained ascendancy as a major paradigmatic addition to historical archaeology in the 1980s, and in fact, much of the Quincentenary-related archaeological research informed by postprocessual thought was initiated and largely carried out in the 1980s. Postprocessualism of the 1980s objected to “reductionist” approaches designed to provide a generalized expression or description of cultural behavior (such as statistical correlations reflecting group characteristics), and especially to efforts to arrive at general statements or lawlike generalizations about past behavior. These activities were perceived essentially as masking the true internal diversity of a society as represented by the individuals who constituted it, and as inevitably communicating the prevailing dominant perspective while burying the roles of resistance and individual variation. Individual actions and decisions were seen as more important and influential than group norms or environmental variables in shaping societies and the archaeological records they leave. The postprocessualist approach is concerned with individual decisions and acts-rather than systemic processes or environmental factors-that reflect, mitigate, or enforce the unending cycle in societies of efforts by both individuals and groups to assert social dominance in some cases and to resist it in others (*see* Little 1994; Paynter and McGuire 1991; Schmidt and Patterson 1996).

Despite claims to the contrary by at least one Caribbean ethnohistorian (Sued Badillo 1992), the

coincidence of the Quincentenary with the entry into the mainstream of postprocessual thought provoked many historical archaeologists throughout the Caribbean to turn attention toward questions of modern Caribbean cultural identity, the historical roles of non-European

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Flowerdew Hundred Plantation, Virginia

Flowerdew Hundred Plantation is a working plantation and an archaeological park on the James River near Hopewell, Virginia. A 1,000-acre grant in 1617 to Governor George Yeardley was named for his wife, Lady Yeardley, née Temperance Flowerdew, and occupation has been continuous since 1619 despite numerous changes in ownership.

Excavations in the late 1960s by N.F. Barka of the College of William and Mary exposed a compound enclosing a large house of post construction, a stone foundation for a dwelling, its outbuildings, and other early- and later-seventeenth-century structures. William and Mary field schools in the 1970s explored both prehistoric and historical sites, and in the 1980s, j. f. deetz, with students from the University of California at Berkeley, initiated long-term research into the succession of plantation and settlement types from the early-seventeenth century through the mid-nineteenth century. Deetz synthesized the results in *Flowerdew Hundred* (1993).

Dates derived from measuring bore diameters of pipe stems recovered from eighteen sites indicated three groups: seven early-seventeenth-century sites, six late-seventeenth-century ones, and five mid- to late-eighteenth century sites. Deetz interpreted the evidence from each grouping in light of local, regional, and global factors influencing changes on the Chesapeake frontier of the British Empire, offering comparisons with British colonial sites in South Africa and elsewhere and assessing findings in light of contemporary debates in historical archaeology.

Evidence from Flowerdew indicates slave manufacture both of pottery and decorated clay pipes, products formerly assumed to be of Native American manufacture. Deetz saw Flowerdew as a microcosm for examining the emergence of a distinct American culture from a British colony.

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Primarily as a result of a graduate archaeology seminar, Fontana became interested in historic sites. In 1958, while still a student, he and others began excavations at the eighteenth-century mission of San Xavier de Bac, outside Tucson, Arizona. This work was followed in 1962 with the publication of a book on Papago Indian pottery, a study that has achieved status as a regional classic and remains the only reliable source on this historic pottery. Also published in 1962 was the johnny ward's ranch report on the 1960-1961 excavations at a nineteenth-century site in southern Arizona. The ranch was the first non-Spanish period historic site to be excavated in Arizona, and the pioneering report received national recognition because it was the first to treat late-nineteenth-century interchangeable parts type artifacts seriously. The report remains a widely used classic.

Additionally, Fontana taught the first-ever regular historic sites archaeology course in the American Southwest from 1966 to 1972. This stimulating and innovative course served to encourage many students to pursue a career in the field.

Fontana's professional career, which has spanned thirty-five years, has been punctuated by contributions to historic sites archaeology in addition to those in ethnography, history, and related subjects. Despite the fact that archaeology was not his major field, Fontana undoubtedly will be best remembered for his contributions to historic sites archaeology at a time when historic sites were neither popular nor valued.

James Ayres

Foote, Robert Bruce

(1834-1912)

Robert Bruce Foote was an officer of the Geological Survey of India employed mainly in the southern part of the country. He was deeply influenced by the Royal Society's acceptance of the geological antiquity of man in 1859. Both Neolithic stone tools and microlithic flakes and tools had been found in various parts of India, but it was Foote who discovered Paleolithic evidence in a gravel pit near Madras in 1863. He pursued his prehistoric interests for the rest of his working life, publishing a two-volume catalog of his collection in the Madras Museum (Foote 1914, 1916). He worked all over southern India and in Gujarat in western India. Many of the premises he developed, based on his study of the prehistory and protohistory of the areas where he worked, have been found to be substantially correct by modern researchers (see Chakrabarti 1979).

Foote's work symbolizes a vigorous phase of prehistoric discoveries in India during the second half of the nineteenth century. It was during this time that the basic significance and the general distribution and stratigraphy of prehistoric artifacts, and their association with extinct fauna in some cases, came to be well understood. Among his contemporary workers were Valentine Ball in east India, William King in south India, and A.C.L. Carlleyle and William Cockburn in central India. However, it must be emphasized that investigators during this period were concerned not only with stone tools but also with a wide ranges of “prehistoric” finds from southern Indian Iron Age megaliths to Neolithic sites. Rock paintings were discovered throughout central India.

Dilip Chakrabarti

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February 1911, and perhaps because of that birth date took on a Lincolnesque appearance with dark black hair and a lean six-foot, four-inch height. He excavated and reported his results on sites from Point Barrow, Alaska, to the viru valley in Peru, but he is best known for his work in the southeastern United States.

Ford received his B.A. degree from Louisiana State University in 1936, his M.A. degree in anthropology from the University of Michigan in 1938, and his doctoral degree from Columbia University in 1949. His passage through the formal requirements of academia was slowed by World War II and the pull of opportunities for fieldwork. His all-around skills in excavating and interpreting what he had found had created a market for his talents by the late 1930s. Later his position at the American Museum of Natural History enabled him to direct his own field program.

Ford and a high school associate, Moreau Chambers, worked for three summers, 1927-1929, doing survey work for the Mississippi Department of Archives and History, and they became closely associated with Henry B. Collins of the Smithsonian Institution at the excavation of sites in Yazoo County in 1929. Collins introduced them to northern Alaskan archaeology in 1930-1931, and he also sponsored Ford as assistant to Frank M. Setzler, also of the Smithsonian, who initiated the first labor relief program during the Great Depression at Marksville, Louisiana.

Ford is best known in the southeast United States for his excavations at Oculgee National Monument near Macon, Georgia; a group of Hopewellian mounds near Helena, Arkansas; and the Jaketown multicomponent site near Belzoni, Mississippi, in association with Philip Phillips and William G. Haag. He also coauthored reports on the early Marksville period Crooks site in LaSalle Parish, Louisiana, with gordon r. willey and on the Tchefuncte early Woodland period of southern Louisiana with George I. Quimby. A survey report in 1951 on the lower Mississippi Valley was coauthored with Phillips and james b. griffin.

The 1951 landmark survey report was a major presentation of Ford's seriation of the pottery collections with the percentage computation of individual types per site, or site unit arranged stylistic inception, popularity, decline, and extinction. This methodology confirmed his concept of a uniform gradualistic ceramic change, and he became a convert to cultural determinism. He wanted to introduce quantitative and empirical methods to make archaeology a science, and he also employed the direct historical approach, diffusion, migration, and interareal relationships.

Ford was president of the society for american archaeology in 1963-1964, received the Spinden Award in 1966 for outstanding accomplishments in theory, methodology, and chronology, and chaired a number of southeastern archaeological conferences. He did not like large gatherings or formal social events, and he was unhappy living in or large cities. He was very effective espousing his ideas to small groups of archaeologists, and he was a versatile and ingenious innovator and a probing theoretician. He was a living refutation of his belief that an individual does not make a difference in the pattern of cultural change, for he was a leader in changing the tenor of archaeological work in the southeastern part of the United States and in South America.

James B. Griffin

See also

United States of America, Prehistoric Archaeology

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France

The study of prehistory began in France. In the nineteenth century the worked stone tools that the customs officer jacques boucher de perthes collected in northern France were the oldest tools known anywhere in the world, even older than their discoverer had thought, since they dated back 700,000 years (Demoule 1990).

One hundred and fifty years later, in one of the two issues of *World Archaeology* devoted to "regional traditions of archaeological research,"

Françoise Audouze and andré leroi-gourhan (1981) called their contribution "France: A Continental Insularity," emphasizing how separate French research had been from that of other countries. Yet there was nothing original about the work done in France after the time of Boucher de Perthes. French archaeology has been unique only in that more than half of its professional archaeologists have excavated abroad. Most of the excavations within France were conducted by amateurs, and archaeology in France suffered as the result of a severe economic crisis (Chapelot et al. 1979; Querrien and Schnapp 1984). At the end of the 1970s French archaeology received only about one-tenth of the funding that its counterparts in equally affluent European countries did.

In fact, for a very long time in France, prehistoric and historic remains were given no protection whatsoever if they were not monumental (well known and associated with known historical events); the public authorities were not even interested in them. Archaeological research was entirely free from any government control or protection until 1941, when the Vichy government issued the first law relating to archaeology (endorsed in 1945), at a time when part of France was occupied by the Germans. Under the law, excavations required authorization, chance finds had to be declared to the authorities, and the land on which they were found was "frozen." This law was the first recognition of archaeology as a part of French heritage. However regional organizations, later established around a few "directors of antiquities," were given virtually no resources to protect or conserve archaeological sites. Nothing in dreams or reality gave any indication of the radical changes that were to occur in the last quarter of the twentieth century.

The Upheavals at the End of the Twentieth Century

The first signs of change in the French government's approach to archaeology came at the end of the 1960s, when two scandals, caused by clashes between archaeological authorities and powerful commercial interests, caused a considerable stir in Paris and Marseilles. These arguments reached the highest levels of government and the scandals had such an impact that a report was commissioned from Jacques Soustelle in 1974. On Soustelle's advice, the Fonds d'Intervention pour l'Archéologie de Sauvetage (Intervention Fund for Rescue Archaeology) was established. In 1977, an article was added to the urban planning regulations stipulating that a building permit could be refused or issued subject to restrictions if the project threatened the conservation or enhancement of archaeological remains. But nothing was stipulated about how and by whom the costs of excavation or conservation were to be met.

In 1981, a "Department of Archaeology" was finally created to study, protect, conserve, and promote archaeological sites. Then, in 1996, France ratified a European Union convention (the Malta Convention) intended to "protect the archaeological heritage as a source of the European collective memory and as an instrument of historical and scientific study." In ways that no one had foreseen, the number of excavations in France rose-from 720 in 1964 to 3,410 in 1995. France made up for lost time, and whole areas of national heritage were preserved.

The number of staff employed by the state to supervise excavations multiplied by 25 in 25 years (increasing from 10 in 1964 to 255 in 1988). Local authorities, who had not hired an archaeologist before 1971, employed 120 archaeologists in 1988. In 1989 there were 160 researchers working on French archaeological topics employed either by the national funding body for academic research, the Centre National de la Recherche Scientifique (CNRS), or by the universities. During the 1980s, significantly, major politicians began claiming a personal interest in archaeology. Heritage issues, often rather ambiguous ones-tied up with the effects of globalization on the national consciousness-came to play a key role in the budgets allocated by state and private enterprise to rescuing the archaeological remains that they were destroying. French president François Mitterrand, like the emperor Napoleon III and Marshal Pétain before him, started making references to the mythical ancestors of the French, the

Gauls. In September 1985, he made a speech

on this theme at the top of Mont Beuvray-where Vercingetorix had been proclaimed “leader” of the uprising against Julius Caesar. At the same time, he granted the site, which had been dug in the nineteenth century by joseph déchelette, more generous funds for excavation and improvement than ever before in French research. The complete refurbishment of the louvre Museum, including the building of a glass pyramid in the center of the main courtyard, was another of the principal cultural endeavors of the Mitterrand presidency.

However, public authorities had to operate in a total legal vacuum as they attempted to force developers to contribute to the costs of rescue archaeology, amounting to 400 million francs per year nationally. This contribution was exacted on each occasion in return for the release of the land in question, following bargaining (which might be described as racketeering) based on the extent of the threat that the plans posed to the national heritage, and the legal obligation of the developers to preserve it. The funds were collected from the developers, with the backing of the Ministry of Finance, by a voluntary organization: the Association pour les Fouilles Archéologiques Nationales (Association for National Archaeological Excavations), better known by its acronym, AFAN. Between 1985 and 1989, AFAN's budget increased from 30 million francs to 130 million. In 1990, it had more than 1,300 archaeologists working under contract, that is, many more than in all French research institutions put together.

Thus, in a country that had for so long refused to recognize that remains under the ground constituted part of its heritage, rescue archaeology made steady progress at the end of the twentieth century. It is estimated that, in the last twenty-five years of the century, it was the source of 90 percent of the data produced by French archaeology.

Archaeologists Resort to Public Demonstrations

By the end of the 1990s, in the absence of any law on funding rescue digs and of resources allocated by the state to its own services, developers were becoming less and less inclined to pay for excavations. Furthermore, since developers' contributions were limited to releasing the land, analysis studies and publications of the archaeological material could not keep up. It looked as if there would be an inevitable division into two opposing types of archaeology. On the one side, field archaeology (*de terrain*) with abundant material and means but with little time to think about their findings, and on the other side, laboratory archaeology with little material and few facilities but with plenty of research time. This split deeply affected a professional community with a short institutional past. The archaeologists working on French sites-who had acquired their status only twenty years earlier-were still full of the utopian dreams and dynamism that drives any first generation of conquerors. It was at this point, in 1998, that the Ministry of Finance recommended that rescue archaeology be privatized and subject to financial competition. Archaeologists went on strike, occupied government buildings, opened museums and invaded television studios. In the end, more than a thousand archaeologists (over two-thirds of the archaeological community) demonstrated noisily in the streets of Paris against the government's policy.

To deal with this crisis, an emergency committee with three members, including archaeologist Jean-Paul Demoule, was set up by the Ministry of Culture. A parliamentary bill on the funding of rescue archaeology and the creation of a new public agency were proposed, and the bill was passed into law and the agency created in 2001. At the start of the second millennium, French archaeology-both scheduled archaeology and rescue archaeology-is still united, employs 2,000 people, and at long last has the modern resources that it requires.

Nevertheless some questions remain: Why was there so little hurry to professionalize archaeology in France, and why has the country never felt a lasting need to investigate its origins? The answer lies in the vision that France has always had of its citizenship and culture, having for years looked for its past in the

Parthenon or the Capitol rather than in the huts

of “our ancestors the Gauls.” In any case, in a country with a large immigrant population, it was thought absurd to wish to show all the nation's children that their ancestors were Gauls.

Why Has France Never Felt a Lasting Need to Investigate Its Origins?

France is the source of the modern concept of the nation-state, based on the ideals of the French Revolution. It is also the most complete example of a nation-state in that, for longer and more strongly than elsewhere, the central government in France has asserted its supremacy over all other democratic institutions. The continuity of the structures of the state is indeed usually taken-now, as for several centuries past-to be identical with the unity of the country.

Nevertheless, the Revolution and the upheavals of the eighteenth century that affected Europe's sense of space, identity, time, and history led in France to the profound questioning of the concepts of society and nation. During that period the medieval myth of the Germanic and Trojan origins of the aristocracy was replaced by a different social and national model, in which the history of the nation was driven by historical, ethnic, and social forces that pitted the winners-the Franks-against the losers-the Gauls (Olivier 1999). Given the attitude toward social emancipation propounded by the Revolution and following in the philosophical tradition of the Enlightenment, the Frankish racial ancestry claimed by the aristocracy became socially indefensible. The nation henceforth was to be made up of the whole of society, meaning all those-whatever their origins-who had chosen to live together, and anyone who supported the values of the Republic was deemed to be a citizen.

However, conjuring away the racial ancestry allegedly bequeathed by the Franks to the minority of their noble descendants in favor of the cultural inheritance from the Gauls and Romans (supposedly the prerogative of the majority) gave rise to a pernicious notion of the French nation and its citizenship. As French archaeologist Laurent Olivier argues, these notions are both political (all those who support the values of the Republic are citizens) and ethnic (all those who live within the national frontiers are French). This ambiguity was to reemerge every time that the structural legitimacy of the state or the country's frontiers were challenged: in the reign of Napoleon III, after the defeat of 1870, and during the Second World War under the Vichy régime. Appeals were made to archaeology on each occasion because, on each occasion, the myth of “our ancestors the Gauls” was revived. This myth, by supporting the idea of the continuous existence of the nation ever since the very beginning (and France or the Republic being taken as its expression), made it possible-very briefly-to give legitimacy to the coincidence of the state, the frontiers, and the nation.

It is therefore logical that in 1996, at a time of increasing Americanization and when socially productive relationships were being affected by globalization, France did not hesitate to sign the Malta Convention, which advocated the protection of archaeological heritage as a source of European collective consciousness. It is also easy to understand why the French archaeological community shifted in a couple of decades from “universal” interests to curiosity about questions of identity, unconsciously based on a return to the values of a “national” past.

Low Priorities: Theoretical Models and Epistemological Curiosity

For many years the second feature peculiar to French archaeology was its rejection of theoretical models and its lack of epistemological curiosity. During the 1970s and 1980s, this trend was contradictory to those in the rest of society because French philosophy was emerging from one of its most productive periods, with figures like Sartre, Merleau-Ponty, Lévi-Strauss, Ricœur, Lacan, Goldmann, Lefèvre, Braudel, Althusser, Foucault, Barthes, Piaget, and later Vernant, Godelier, Bourdieu, Baudrillard, Derrida, and others making contributions. The paradox was even odder in that

Anglo-American postmodern (or “postprocessual”) archaeology borrowed most of the terms for its concepts from French.

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Anglo-American postmodern (or “postprocessual”) archaeology borrowed most of the terms for its concepts from French.

It must be borne in mind, however, that French archaeologists were still few in number,

and their institutions lacked, to put it mildly, coherence and policies. They had ludicrously tiny resources, and as a result theoretical models were not among their top priorities. Furthermore, at the time when French metropolitan archaeology was at last becoming established, modernity and grand explanatory paradigms were no longer in fashion. Besides, the individuality and proliferation of "post-modernist" ideas, which have continued to spring up ever since, were unable to gain widespread acceptance. French intellectuals grow up in a Cartesian deductive tradition, captured in the famous phrase *cogito, ergo sum.* In other words, their ability to think is their prime certainty. Their "reason" is not a faculty for epistemological questioning but a means of acquiring a direct grasp of the way things are. By following the logic of *cogito, ergo sum,* the intellectual can come to know and understand this reality purely through deduction.

Consequently, unlike their British or North American counterparts (who grow up in a system of empiricism), French researchers are not tempted to throw out the old paradigms and replace them with new ones that appear better suited to the problems of the moment. Instead, old and new concepts are combined as necessary into a general intellectual approach that cannot easily be labeled. This is why, for instance, structuralism in France has never been considered to be a theory or a school of thought, but simply a working method. Moreover, although nowadays young French archaeologists are familiar with epistemological concepts and ideas, they have difficulty in believing that there could be archaeological theories. The French indeed observe that archaeological data have never been used directly as the basis of a theory, when theory is defined as an explanatory system that works for data *other than* those used originally to generate the theory.

Archaeology, French Style

We have seen that, despite several crises of national legitimacy, French archaeology developed without the impetus of necessity. Local archaeology from the northern shores of the Mediterranean was never very interesting or contentious in France because of its inability to ever match up with the vision of excellence of Greco-Roman "civilization." This notion of archaeology as distinct from any idea of civilization is extremely important for an understanding of the situation of archaeological research in a country where the intelligentsia has always held a dominant position.

Yet everything began well. The fifteen volumes of *L'Antiquité expliquée en figures* by the Benedictine scholar bernard de montfaucon (published 1719-1724), which brought to public notice the antiquities attributed to the Gauls, and the *Recueil d'antiquités égyptiennes, étrusques, grecques, romaines et gauloises* by the comte de caylus (1752-1757), which emphasized the new notion of a typology, are evidence of the birth and growth of archaeological knowledge well able to take its place among the other humanities (Schnapp 1993). Admittedly, Montfaucon and Caylus were antiquaries, representatives of a style of archaeology that was mainly object-based and concerned only with monuments. But Caylus was not content merely with using antiquities for "illustrative" purposes. He wanted the study of antiquities to be one particular means of learning about the past, to interpret them using ethnographic comparisons, and to establish stylistic rules that would make it possible to assign a date and a place of origin to every object. Hence the care taken to collect the objects, describe them, and publish them formed the basis of a technical knowledge that, in the hands of men like Auguste Millin (1826) and later Solomon Reinach, was extremely important for French classical archaeology.

However, this prestigious tradition was eclipsed in the first half of the nineteenth century by the rise of German archaeology. In Germany, the *Altertumswissenschaft* revolution was under way, in which philology was given pride of place. It carried along with it German classical archaeology, which acquired a position in academe well before archaeology elsewhere in Europe was accorded similar status. Admittedly, the discoveries in France and the immense prestige of j.-f. champollion and, later, p. e. botta

contributed to the creation of outstanding schools of Egyptology and Assyriology. But Orientalism

developed in Europe more as a cultural phenomenon than as a branch of archaeology. The philological research of scholars like Champollion or sir henry rawlinson mattered more at that time than did the work of explorers like Botta or austen layard. But the years 1830 to 1850 were decisive for the French study of prehistory quite independently of these other developments (Laming-Emperaire 1964). Prehistory in France grew out of anthropology, which had utterly different philosophical roots.

Despite his literary interests and his general culture, which were influenced by the Enlightenment, Boucher de Perthes helped create a type of prehistoric archaeology that owed little to the antiquaries of the eighteenth century. The natural history of mankind-as it developed in the second half of the nineteenth century, and to which the anthropological school of physical anthropologist Paul Broca made a substantial contribution-was very much a branch of natural science that devised its methods by analyzing remains directly in the field. It turned to experimentation and ethnological comparison for the same assistance that classical archaeology derived from aesthetics. This major difference still divides the field of archaeology and explains why prehistory and classical archaeology have had such dissimilar fates in France. Men like Jacques Boucher De Perthes, édouard lartet, and gabriel de mortillet never had positions in the French academic system. And although Lartet was appointed late in life to the Museum of Natural History (where he did not have time to take up his chair) and de Mortillet was given a curatorship at the Museum of National Antiquities, French prehistorians were doubly excluded from academe until the 1950s, barred from both arts and science faculties. At the very time that French prehistory was making an impact on the study of archaeology worldwide, thanks to the wealth of finds in France and to de Mortillet's abilities as an organizer and theoretician, it was completely lacking in resources for action. Within France, nevertheless, de Mortillet's nomenclature and his typological definition of lithic industries were adopted as the frame of reference for the study of prehistory. But although the discipline was magnificently equipped to investigate Paleolithic periods, it had to look elsewhere-to Scandinavia, Britain, Germany, and Central Europe-for the elements it needed in order for the study of French protohistory to develop beyond its earliest stages. Despite the work of Déchelette, prematurely ended by his death in the First World War, French protohistorical archaeology never raised itself to the same standard as archaeology in Scandinavia or Central Europe. Excavations were few in number and depended entirely on private funding, and although oscar montelius's methods were acknowledged and adopted, they never generated original extensions.

A Long Period in the Wilderness

After the First World War, the Durkheim “school” of sociology, under its director, anthropologist Marcel Mauss, resumed its work. Faithful to the universalist traditions of the Enlightenment, it broadened its approach to include linguistics, comparative studies (*comparatisme*), and Orientalism. However, the archaeology of France itself did not seem able to develop, or to raise much interest. The state continued to exist, in conjunction with national unity, and in contrast to what happened in Germany nationalist claims were still not sufficiently intense to generate the idea of a foundation myth and a national archaeology. There had never needed to be any appeals to the origins, prehistory, and protohistory of France in order to legitimize anything. Consequently, while the human and social sciences started to grow around the journal *Année sociologique* and as Lucien Febvre and Marc Bloch launched *Les Annales,* the most influential French historical journal, French prehistorians and archaeologists were nowhere in sight.

Henri Hubert, curator at the Museum of National Antiquities, and Marcel Mauss worked together to initiate some fascinating studies of the expansion of Celtic culture. Classical archaeology, based on the French Schools in Athens and Rome, continued to develop slowly, and the abbé henri breuil offered a first synthesis of the cultural prehistory of Europe. But the only courses of study available to anyone

interested in prehistory were those of the Institute of Human

Paleontology, where men like Raymond Vaufrey and Henri Vallois maintained the tradition, rather than helping to train the key professionals in an expanding discipline. From that time onward the choice was straightforward: between orthodoxy (superbly represented by the abbé breuil and françois bordes) or heterodoxy, inevitably shaped by the ideas of people who were self-taught. The institutional marginality and creativity of someone like André Leroi-Gourhan reaped their own reward in this setting.

Standing stones in Carnac, France

(Corel)

André Leroi-Gourhan and Prehistoric Ethnology

After Gabriel de Mortillet, André Leroi-Gourhan was undoubtedly the person who made the greatest contribution to shaping French prehistory. Like de Mortillet, he was self-taught and he brought the same passionate interest to understanding technical systems as the former did to defining the laws of evolution (Leroi-Gourhan 1943, 1945). By laying the foundations of comparative ethnography and drawing on anthropology and Orientalism, he established prehistory as a field in its own right. His approach to prehistory was completely different from the typologies of Breuil, which François Bordes later brilliantly developed and transformed (Bordes 1973). Whether with regard to the techniques of human labor, hominization, the interpretation of wall paintings, or excavation finds, the work of Leroi-Gourhan provided a frame of reference, an area of debate as vital for prehistoric archaeology as the work of Gordon Childe for protohistory. Against the disciplinary approach of traditional archaeology, which was primarily concerned with culture and classification, Leroi-Gourhan argued in favor of synthesis, combining anthropology and semiology in “prehistoric ethnology.”

Leroi-Gourhan's approach-which had similarities with oriental archaeology-seemed well placed to win the day. But because it stayed deliberately marginal to both traditional prehistory and established ethnology, the work of Leroi-Gourhan was for a long time a matter of disappointment rather than development. It is important to realize that the questions raised by Leroi-Gourhan were discussed, then accepted or rejected. But the repercussions for archaeology

were patchy rather than fully assimilated, and details, rather than the whole approach, were adopted. Excavation techniques were used when necessary, as was the criticism of ethnographic analogy when trying to establish a different analogy (Leroi-Gourhan 1985). Nevertheless by the end of the 1990s and at the beginning of the third millennium, his overall view of the process of hominid development-which raises the question of what it is to be human-was at last put into perspective, and his analysis of post-Neanderthal epiphylogenesis became part of the cognitive sciences. The visionary postulate of his book *Le Geste et la parole* (1964, 1965) and the logic underlying *Mécanique vivante* (1983), written in 1954, appear now to be remarkably relevant and epistemologically inspiring, compared with the debates on the origins of modern humans that stir up and cause futile clashes between researchers from all parts of the world.

Stumbling Blocks on the Way Out of the Wilderness

Etudes archéologiques, the wide-ranging volume by several authors edited by Paul Courbin in 1963, was uninspiring and made no impact outside professional circles. But some of the papers (such as the one by Courbin himself on stratigraphy) were critical of French archaeology abroad, which had long been accustomed to clearing the most renowned sites around the Mediterranean in a somewhat cavalier fashion. Other papers, such as those of André Leroi-Gourhan and Jean-Claude Gardin, set out the program of work for the future. For this reason, these two authors were to be among the few French role models for a whole generation.

Almost all archaeological attention in the 1960s and 1970s concentrated on the technical aspects of observation and recording. As prehistoric archaeology emerged from the wilderness of a lack of public and government support, essential improvements in excavation methods quickly became an ideological stumbling block: for classical archaeologists, stratigraphic excavation was an end in itself, whereas prehistoric archaeologists always and everywhere excavated using the delicate tools of dentist's spatula and fine brush. Consequently, when in 1971 Bohumil Soudsky started excavating at Cuiry-les-Chaudardes and other sites in the Aisne valley by machine-stripping, which he had perfected twenty years earlier in Bohemia, this use of this innovation-which was generally accepted everywhere else in Europe-caused outrage. And when, also in the Aisne valley, the first report appeared in 1973 listing all the sites threatened with destruction and suggested the idea of "selecting" which should be given priority on the basis of urgency, available funding, and scientific interest, the same violent reaction was unleashed. At that time in France there was no middle way between excavating inch by inch and total destruction. Methods based on physics and chemistry ("archaeometry") that had begun to be used by archaeologists were another stumbling block. The ability to obtain data and generate results using scientific apparatus and statistical techniques opened up the possibility of dispensing with philosophy, or the under-picture, which gave physicists-themselves just as much novices in this new collaboration-an unwarranted feeling of absolute power. Disillusionment was, however, painful when the first assessments were made in the early 1980s and these substitutes for clear thinking were found lacking. Documentation, data-processing, and interpretation encountered the same problems. Leroi-Gourhan's seminar at the Collège de France was devoted to developing a "temporary terminology" that was not just descriptive but also provisional. The creation of archaeological databases and expert systems as proposed by Gardin (1970) suffered from the same generalizing and self-defeating tendencies. In fact, the difficulty of creating a list of standardized generally applicable terms, required in order to computerize data, was an obstacle to creating a completely formal scientific discipline in the manner prophesied by Gardin (1979). Instead, two disparate kinds of study developed: nonspecialist documentary studies using a highly simplified descriptive vocabulary and individual, narrowly specialized research projects using incompatible complex descriptive terms. In studies of prehistory, the "analytical typology" of Laplace was unlikely to be adopted because its

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formal approach was much more difficult to put into practice than François Bordes's synthetic lists, and its criteria were not relevant to the questions that could now be addressed by analyzing the technologies of prehistoric tools.

For most people, the problems were intellectual, institutional, and financial; for others, the stumbling block was conceptual. Those who tried to echo the discussions about the "new archaeology" (Cleuziou et al. 1980; Schnapp 1980) were obliged to begin with the fundamentals, which meant becoming directly involved in the reform of institutions. This commitment was all the more necessary because archaeology was disastrously lacking in resources. The journal *Nouvelles de l'Archéologie,* launched in 1979, was a particularly effective weapon in this regard. A similar strategy, though less political, if not actually apolitical, was adopted by Gardin, who was the main architect of what he saw as a general reorganization of archaeology in France with the creation of a national archaeological institute, the Centre de Recherches Archéologiques. Thus it was that some members of the younger generation of the time, imbued with the utopian visions of 1968 and exceptionally united, tried-first via a systematic survey of the resources of French archaeology-to make the decision-makers fully aware of the discipline's chronic lack of funding (Normand and Richard 1974; Chapelot et al. 1979). This group worked tirelessly for more than twenty years to reshape university teaching, to create a unified discipline, to define policies for research, and to get funds earmarked, but also to adapt the techniques and strategies of excavation to the realities on the ground and the academic issues involved.

Consequently contacts with the inspiring new ideas of the "new archaeology" were real but anecdotal and personal. A notable exception was the debate between François Bordes and lewis binford on the meaning of the different Mousterian *faciès,* which the former interpreted in terms of different cultures whereas the latter saw them as reflecting different functions. Ironically, the more "conservative" position (that of Bordes) was probably the more relevant. Thanks to the interest of American scholars in the Perigord, Bordes's work was soon translated and became popular in the United States, as he did himself. By contrast, the studies of Leroi-Gourhan (which should have generated even more interest) remained unknown to the English-speaking public until the1990s.

The Special Characteristics of French Archaeology in Its Early Phases

It is noteworthy that archaeology played only a tiny role in the *Annales* school of history, in spite of the efforts of Lucien Febvre and Marc Bloch and Fernand Braudel's interest in "material civilization." Prehistory and "new history" came into contact only rarely (Brun 1987), and then with regard to material culture (Coudart and Pion 1986). It is true that *Annales* was the victim of its own success. Swept along by the growth of publishing and the media and affected by the European disenchantment with the models of economism and Marxism, the journal ultimately switched its focus to the history of *mentalités,* of cultural areas and "micro-history" rather than history over long periods (*de la longue durée*). Nevertheless, the studies undertaken by the Center for Historical Research at the École des Hautes Études en Sciences Sociales (EHESS) helped to develop the history of deserted villages and the social investigation of the rural world in the Middle Ages. It was a medieval historian and an archaeologist, then teaching at the EHESS, who produced the fullest survey of the medieval village (Chapelot and Fossier 1980). Today, other fields are proving equally fruitful. Excavations and work on the Bronze and Iron Ages are shedding new light on the role and situation of the Bronze Age and Celtic inhabitants of the temperate regions of Europe. The archaeology of Western Europe now faces vast ethnic and historical questions that so far have barely been addressed.

As for the school of Jean-Pierre Vernant and Pierre Vidal-Naquet, which brings together history, the history of religions, and anthropology, the focus there has been on framing questions of social and economic history and examining the role of images in ancient Greece (Vernant and Bérard 1984; Durand

1986; Schnapp 1993). This approach-the result of combining a

structuralist analysis of the Greek tradition with an analysis of iconography-has been highly revealing and has helped to demonstrate the need for an hermeneutics of archaeology. This kind of history should now be deriving new material from the excavations in urban areas that have been under way in France since the 1980s. These major sites (the most famous is at the Louvre) are totally transforming the knowledge of daily life in medieval and postmedieval cities.

The French have also developed particular expertise in the specialized field of technological culture. This tradition arose from the conjunction of three things. The first is ethnology proper, starting with the work of pioneers such as André-Georges Haudricourt and André Leroi-Gourhan, who were followed by Charles Parain, Bertrand Gille, Robert Cresswell, François Sigaut, and most recently Pierre Lemonnier. Second is Leroi-Gourhan's ethnological approach to the study of prehistory. Last are the experiments in the technology of stone tools conducted by Jacques Tixier and the team he established. The anthropological study of technologies and technical systems, which has been particularly strong and is well illustrated by the group producing the journal *Techniques et culture,* is at present of greater interest to archaeologists than to ethnologists. The former are hoping that it will yield theories about the relationship between artifact and cognition, between material culture and society. But it is above all in the field of stone tools that archaeological experimentation in France has developed a wide range of resources-instruments for observing and monitoring movements of lithic raw materials (Tixier et al. 1980, 1984), "*chaînes opératoires*" (operating sequences) for producing tools, theories on the technical and cognitive capacities of *Homo erectus,* etc. Technology was therefore the direction taken by what may be called the "ethno-archaeological strategy" in the 1980s (Pétrequin 1984; Pétrequin and Pétrequin 1984). But the use made of ethnology has been both prudent and highly empirical, whether with regard to vernacular architecture in the Middle East, pottery-making in India, the dynamics of lake-settlements in Bénin, processing skins in western North America, the lifestyles of Arctic peoples, or tool-making in New Guinea. This research taken as a whole has, however, yielded a substantial quantity of data and fresh ideas.

At the Beginning of the Twenty-first Century: Every Reason for Optimism

Only with the creation in 1979 by Fernand Braudel's Maison des Sciences de l'Homme of the journal *Les Nouvelles de l'Archéologie,* an academic journal also concerned with policies and information, did conceptual thinking about archaeology acquire coherence in France. At the same time, as we saw earlier, rescue archaeology was radically overhauled-a development that the editors of the journal were to follow and sustain with interest. The idea of an excavation plan became indispensable in the context of the large-scale rescue operations, and at the same time it led to the development of practical thinking about prospecting, sampling, and quantitative methods. Salvage excavations and regional programs to support them and bring together all available methods were put into place, and proved effective in the Aisne valley in Picardy and on Lakes Clairvaux and Chalain in the Jura. Nevertheless it took the revolt of the archaeologists in 1998 (the third of its kind since 1989) and the appointment of Catherine Trautmann as minister of culture for this growth at last to be restructured through reform, law, and the creation of a public body responsible for excavation and research that would look after rescue archaeology, and indeed archaeology in general (*Les Nouvelles de l'Archéologie* 1999-2000, 73-79).

As is clear from the catalogue for the 1989 Paris exhibition (Mohen 1989), and in spite of the work of people like Jacques Cauvin (1994) or the 30- and 40-year-olds who received less media coverage, French archaeology in the 1990s was still committing the same sins as before. Thus most archaeologists continued to be skeptical about building social and cultural models, following in the tradition of people like Bordes, Leroi-Gourhan (his position in the 1970s and 1980s, at least), Courbin, Gardin, and some others. This skepticism led them to deal in notions that are all the more dangerous because they are not

stated explicitly. For instance, the arsenal of techniques drawn from the natural sciences has often given rise to oversimplified determinist environmental models. At the same time, the appearance from time to time of British or North American scholars in France has encouraged the development of antidiffusionist approaches-frequently based on an excessive use of radiocarbon dating, with its imprecise measurements that can give a false impression that objects are contemporary-that do not always appear to fit the facts. Similarly, certain postprocessual works have been read by people without enough background and this has led to ahistorical interpretations at variance with the facts or lacking in any determinism. By contrast, in a completely different field, diffusionism has been much used in France by a group of extreme right-wing intellectuals, "the New Right," in order to account for the Indo-Europeans and to demonstrate the superiority of European civilization. In passing, it should be pointed out that archaeology alone certainly would not provide a simple answer to this intriguing question; rather, the solution would require the close collaboration of archaeologists, linguists, and experts on ethnology and myth to produce new theoretical models (Demoule 1980, 1999).

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Frankfort, Henri

(1897-1954)

Born in Amsterdam, Henri Frankfort served in the army of the netherlands during World War I and later studied history at the University of Amsterdam before transferring to University College, London, to

work on his M.A. with sir william matthew flinders petrie. From 1925 until 1929, Frankfort directed excavations for the egypt exploration society at Tell el amarna, abydos, and Armant. He received a Ph.D. from the University of Leiden in 1927.

In 1929, Frankfort was invited by the great American ancient historian Henry Breasted to be field director of the University of Chicago's oriental institute's Iraq Expedition at Diyala, a position he held until 1937. In 1932, he was appointed Research Professor of Oriental Archaeology at the Oriental Institute of the University of Chicago and concurrently held the position of extraordinary professor in the history and archaeology of the ancient Near East at the University of Amsterdam. During World War II, Frankfort lived in Chicago and concentrated on research, publications, and teaching, and during the war and afterward he influenced a generation of U.S. student archaeologists and anthropologists.

Frankfort published fifteen books, among which are the seminal *Studies in Early Pottery of the Near East* (1924-1927), *Cylinder Seals* (1939), *Ancient Egyptian Religion: An Interpretation* (1948), *Kingship and the Gods* (1948), and *The Art and Architecture of the Ancient Orient* (1954). He also wrote over seventy-three journal articles and as many book reviews.

In 1949, he accepted the directorship of the Warburg Institute in London and a professorship in the history of preclassical antiquity at the University of London. He last visited the Near East in 1952 as a Guggenheim fellow to research and write *The Art and Architecture of the Ancient Orient.*

Tim Murray

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French Archaeology in the Americas

As might be expected, French archaeological research in the New World began only at the start of the nineteenth century, when the independence of the United States put an end to Spanish colonial rule. The same is, of course, mostly true for other European countries, if one does not take into account the early years of archaeological investigation in the United States and the Moundbuilders controversy. In their *History of American Archaeology* (1974), gordon willey and Jeremy Sabloff called the period from discovery until 1840 the time of witnesses and armchair historians. ignacio bernal garcia, in his *History of Mexican Archaeology* (1980) differed somewhat, considering the discovery of the Calendar Stone in mexico in 1792 and its study by Alzate and Leon y Gama as the starting point for the next period of early study. In fact, the first four decades of the nineteenth century were a period of intense activity-but mainly due to local, French, or English investigators. The publication of john stephens and frederick catherwood's *Incidents of Travel in Central America, Chiapas and Yucatán* in 1840 was the culmination of this early interest.

From 1840 to 1914 the explorations and descriptions of archaeological sites in the Americas were intensive, but by the end of the nineteenth century there was more of a tendency toward institutional and scientific research. During this period French explorers were quite active, but 1914 marked the end of an era, and this date has a deep significance for the whole of Americanist research. Specific events, such as the Mexican Revolution and its consequences and World War I in Europe, generated a rare strain of European field research that was to last for several decades and, therefore, an Americanization of archaeological investigation that would continue until the end of World War II. The year 1914 also brought strong changes in archaeological theories and methods. The development of new techniques, such as the stratigraphic revolution, and the establishment of new institutions in Mexico and the United States, such as the Carnegie Institution, accompanied a complete transformation in the ideological background of archaeology, under American anthropologist Franz Boas's influence.

The aftermath of World War I resulted in a nearly total absence of French investigators the Americas for many years. French anthropological research fared slightly better in the 1930s, but the political situation prevented the acceleration of this trend, and it is not possible to discern French involvement in the Americanization process until the 1950s. By the time French investigators and archaeologists once again became active in this field, American archaeology had undergone a complete and autonomous growth, to which the Europeans had to adapt themselves. In the 1950s those working in the field of archaeology experienced turmoil and dissatisfaction, partly because of their own results but also because of the introduction of new techniques (aerial photography, radiocarbon dating). This occasioned a change in theoretical approaches toward functional and contextual preoccupations, which in turn paved the way for the “New Archaeology.” Many Latin American countries began to organize archaeological research on an institutional basis and to promote the legal protection of sites and their national patrimony. Renewed French archaeological research had to adapt to these many changes: ultimately, it took several years to put together the scientific and institutional basis that gave birth to the new French Americanism, which is still very active today.

Thus, the history of French Americanism does not fit within either Willey and Sabloff's or Bernal's proposed chronological frameworks, as exemplified in the accompanying table (see page 536). If 1492 is taken as a starting point, the first period-the period of discovery and history-would last until 1824-1834, ending

with the publication of *Antiquités Mexicaines.* The next decades, up to 1860, continued this early start, and from 1860 until 1914 France took an active role in the exploration and registration of archaeological sites in the Americas. The first half of the twentieth century saw a collapse of French archaeological research in the Americas, and it is only after 1960 that this complex history resulted in actual scientific and systematic studies of the American past.

	Willey-Sabloff American research	**Bernal Mexican research**	**French archaeology Proposed chronology**
1492	Discovery Witnesses and historians	Discovery Armchair studies	Discovery Historians and collectors
1792	First archaeological discoveries in Mexico		
1834			Publication of *Antiquités Mexicaines*
1840	Publication of Stephens and Catherwood's book		
1860	Explorers	Explorers	French Scientific Commission in Mexico Explorers
1914	Start of the stratigraphic revolution The classificatory period	Mexican Revolution and Archaeological School of Mexico	World War I: the end of the explorers
1940-1950		The institutionalization of archaeological research	The collapse of French Americanism
1960	The first dissatisfactions The beginning of New Archaeology		Starting anew: a rebirth of French archaeology in America

From Discovery to Antiquités Mexicaines

It took France some time to become interested in the discovery of the Americas. Like Great Britain, France was deeply entangled in its struggle against the Spanish king Charles V in Europe, and the existence of a new continent aroused only slight interest in intellectual circles, mostly among writers and artists. Writers such as Michel Eyquem de Montaigne or François Rabelais sometimes referred to the inhabitants of the New World; this interest did not amount to more than a mere curiosity for exotics and new artifacts.

As its political situation improved, France slowly paid more attention to the American continent. While corsairs plundered colonies and attacked Spanish fleets in the south, the arrival of Jacques Cartier in canada in 1534 marked the beginning of French colonial enterprises in that part of the world. Canada quickly became a French stronghold and would remain so for several centuries, but French settlements in Florida and Brazil did not succeed, and only a few scattered settlements in the West Indies were permanently occupied. These territories proved themselves, in many respects, much less attractive than Mesoamerica or Peru, and France quite naturally turned its attention toward the exploitation of economic resources, rather than Indian civilizations. Very few artifacts were taken away to be featured in the Wunderkammer, or Cabinets de Curiosités (collections of strange objects and precursors of museum collections), in France. Those that were featured there, as Pascal Riviale (1993) demonstrated, were usually classified as “naturalia” or “artificialia,” rather than works of art. From the very beginning

American artifacts in France were assigned to the realm of natural history.

This does not mean that French Cabinets de Curiosités were entirely devoid of American objects. Their presence was acknowledged, the most important instance being the *Codex Telleriano-Remensis,* the collection of artifacts given to the Royal Library by Archbishop Le Tellier at the beginning of the eighteenth century. A few Peruvian ceramics were also taken back to France by smugglers from Saint Malo, with the help of French residents in Lima, such as Dr. Leblond. In addition, there was a great desire to acquire larger collections, as was made obvious in documents such as the instructions issued to the Jussieu-La Condamine and Dombey expeditions to peru, which directed the teams to try to collect artifacts from Chancay and Pachacamac. But the whole collection amounted to little more than a few items, and the American past was more likely to be the subject of speculative or literary activity.

As Keen amply demonstrated (1971), from the end of the sixteenth century until 1820, the Americas and the Amerindian civilizations became the focus of a growing interest. The pioneering books of De Belleforest in 1572 and Thevet, a geographer in the court of King Henri II, were quickly translated into many languages. Discussions of the Americas became contentious as time went by, and most well-known eighteenth-century philosophers, such as Buffon, Voltaire, and Prevost, took sides in these controversies. The Americas even provided a source of inspiration for poetry, theater, and opera. This general interest for American civilizations was part of an increasing tendency to dwell on humankind's past. As Schnapp recently demonstrated, archaeology-or at least scholarly activity in archaeology-was establishing itself as a scientific discipline, and discoveries in southern Italy quickly led to the systematic study of ruins. The kings of spain promoted this research and sent explorers to the Mayan ruins of palenque (Baudez 1987). In Mexico the chance discovery of aztec sculptures in 1792 prompted national investigations by scholars such as Alzate and Leon y Gama. The Bonaparte expedition to Egypt stands out as the most famous example of early French studies in archaeology. The American continent was not entirely neglected, as evidenced by the travels of Humboldt and Bonpland in South and Central America in 1810. The French concept of the American past was anthropological in nature, expressing a natural historical approach rather than an interest in American art, and French research focused mainly on human diversity, not just upon archaeological remains. The end of Spanish rule in Latin America provided opportunities that France and other countries seized immediately.

The breakthrough for French Americanism came in 1834, six years before Stephens and Catherwood's book, with the appearance of *Antiquités Mexicaines.* This book included the manuscripts of Galindom Del Rio and Juarros, as well as articles by Humboldt, Warden, Jomard Baraère, and even Chateaubriand, but it failed to attract much attention. The French public had to wait 150 years to be able to read Stephens and Catherwood's book in translation. This situation symbolizes perfectly the original inadequacy of French Americanism in the nineteenth century-too little and too late.

A Century of Exploration

For the whole of the nineteenth century (or, more precisely, from 1824 to 1914), American archaeology in France remained restricted to a small circle of explorers and scholars, who succeeded in obtaining the backing of official institutions but failed to raise public interest. French explorers and adventurers, though few in number, *were* able to organize associations and committees to raise funds for their travels. The French Ministry for Public Instruction was the most prominent sponsor, especially after the creation of the Mission Service, but the Natural History Museum and the Navy also played useful roles. For example, in 1836, the ship *La Venus,* commanded by Dupetit-Thouars, was instructed by Brongniart to collect Peruvian ceramics for the Musée de Sèvres. Societies such as the Geographical Society in Paris created prizes and medals, published reports, and organized conferences, and they succeeded in attracting investigators from other countries, such as the American antiquarian Ephraim Squier and naturalist Alexander von Humboldt, as corresponding members.

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In North America explorers were less numerous, but some of them made important contributions to archaeology. In the Mississippi Valley Lesueur excavated some mounds, and Pinart's research on the northwest Pacific Coast is still significant. The most important contribution was made by Cessac, whose lithic collections in the Chumash area still form the basis of the history of California.

mesoamerica attracted most investigators. There, Charnay used photographs for the first time to register monuments. He also identified the mythical Tollan as Tula, and he conducted the first excavations of that site. Diguet's contribution to the archaeology of northwestern Mexico still awaits proper evaluation, and in the Mayan areas, Périgny discovered the Rio Bec site and style. The Swiss investigator De Saussure published a unique article on the site of Cantona, now for the first time the subject of a vast archaeological project. But his main contribution lay in the study of glyphs, with his publication of *Codex Becker*.

The study of Mesoamerican writing systems constituted a special branch of archaeology in which French scholars participated during the nineteenth century. Brasseur's discovery of Landa's Relacion de las Cosas de Yucatan and of the Popol Vuh and then the Codex Tro-Cortesianus were essential landmarks in the field of epigraphy. Despite the intervention of scholars such as Charencey and Rosny later on, epigraphical studies were quickly left to German or American specialists (Seler, Förstemann, Scwellhas, Maler, Maudslay, and Goodman).

South American civilizations were somewhat neglected but not ignored by French archaeologists: Wiener is known for having brought back 2,500 artifacts from his two-year stay in Peru, many of them characteristic of previously unknown styles such as Recuay. The Créqui-Montfort expedition to the South Andes benefited from the help of specialists such as gabriel de mortillet and Boman, and it brought into focus little-known aspects of South American civilizations, including the Diaguites. A special mention must be made of Ber, who, though still neglected, insisted for the first time upon the need for a contextual approach to collecting Peruvian remains. This list of researchers is far from exhaustive: one could add many other names, among them Nadiallac, Crevaux, and Colpaert in Peru and Pector in Central America.

This intense activity rested, as already mentioned, on a fragile theoretical basis, but it led to some outstanding results, including the organization of the first International Congress of Americanists in Nancy, France, in 1875. This meeting proved to be such a success that three more congresses were held in Paris before 1900. The Société des Américanistes recruited old hands such as Rosny, Hamy, Lejéal, and Nadaillac, as well as newcomers such as Cordier, Capitan, Rivet, and even Maspéro, and the duke of Loubat. The duke sponsored field research, either by French or foreign scholars (Seler, Holmes, and Saville), and he created the first academic position, at the Collège de France, where Lejéal and Beuchat had a chance to teach. Unfortunately, these changes came too late, and in the field, French explorers were confronted with trained archaeologists from other countries such as max uhle, Alfred Tozzer, and manuel gamio. Exploration gave way to scientific research, and at the creation of the first school of archaeology in Mexico in 1910, only one Frenchman was involved-Enguerrand, who stands as the perfect symbol of this new situation. French explorers lost touch with current trends and the study of the Americas was no longer deemed fashionable. When World War I exploded in 1914, most French scholars in archaeology were either dead or retired, and the Americanization of American studies was on its way.

1914-1960: A Collapse?

If we follow Willey and Sabloff's chronological scheme, the period between 1914 and 1960 was characterized by the stratigraphic revolution. Everywhere in America, chronologies were sought after,

excavations were conducted by huge teams, and at the end of the period, the use of new techniques such as aerial photography and radiocarbon dating allowed for the elaboration of secure aereal chronological charts. Although similar progress occurred in France itself, with some influence on this evolution,

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French archaeologists were not in the field in the Americas. French research was limited to a short-lived grant allowance that enabled young students in anthropology to spend some time in the field (such as Soustelle Ricard, Gessain, Stresser-Péan), and to the field intervention of a few trained investigators such as d'Harcourt, Beuchat, and Rivet. Their most important achievement lay in the creation of the Musée de l'Homme, in Paris, the third stronghold of French American studies.

The public perception of American Indian art, at the same time, went through a significant change under the influence of both artists (e.g., the surrealists) and antiquarians. Along with African and Far Eastern civilizations, the peoples of Mesoamerica and the Andes were at last recognized as art producers. Several exhibitions and numerous articles and catalogs were devoted to the popularization of native art from the Americas, which had finally found a place in French art history.

World War II suppressed this renewed interest. The turmoil of war and political instability caused many European anthropologists, among them Armillas Palerm and Wittfogel, to emigrate to the American continent. But only Rivet in colombia contributed to the establishment of scientific research. French-trained archaeologist Reichel-Dolmatoff migrated as well, and his synthesis of Colombian archaeology stands out among the few general publications of the 1950s. In chile Emperaire conducted field research on the Alakaluf, a neglected area, and some other archaeologists kept working, including Flornoy in Peru and Lehmann in guatemala. But ethnology and general anthropology were the dominant interests, and the French contribution to the archaeology of the Americas remained small. One must nonetheless mention Soustelle's books on the Aztecs, which, though closer to ethnohistory, showed that French American studies were not to be underestimated.

By the end of the 1950s the economic situation in France had improved, and French research, which was supported by the firmly established structures of the Société des Américanistes, the Musée de l'Homme, and the International Congresses, could begin again.

Institutional Research: The Flowering of French Activity

French Americanists sought official backing from the French government's secretary for foreign affairs, who was called on to create the equivalent of the Athens or Rome schools of archaeology in the Americas. This caused the birth of the Institut Français d'Etudes Andines (IFEA) in Lima and the Mission Archéologique et Ethnologique Française (MAEFM, now known as CEMCA) in Mexico, both of which were devoted to anthropological investigation in the Andes and Mesoamerica. The MAEFM was established in 1961, and the IFEA in Peru was part of a general cooperational governmental agreement in 1970 between Mexico and France, on a permanent basis. There is some justification for the existence of such centers, despite their being characteristic of a French state-oriented mentality. They provide stability and financial or technical help to French investigators, and they encourage an interdisciplinary approach that suits the present needs of scientific research.

It is too early to judge recent research in the Americas, but this history of French Americanist archaeology would be incomplete if it did not include the results of the IFEA and MAEFM. French archaeology in the Americas has grown steadily. In 1971 these institutions directed three archaeological projects; by 1990 fifteen projects were under way in nine different countries.

Thanks to the help and efficiency of P. Guillemin, director of the department who manages IFEA and MAEFM at the secretary for foreign affairs,the IFEA and the MAEFM consolidated their local position, and simultaneously in France, specialized sections at the Centre National de la Recherche Scientifique (CNRS) and at various universities were organized. Archaeological research also started up in French territories-that is, in Guyana and some islands in the West Indies, an area that had previously been

neglected.

These institutional and governmental structures were also strengthened by French investigators living in the Americas, and French-trained archaeologists and French Canadians began to get involved: Paul Tolstoy and Louise Paradis in Canada, A. Nelken Terner, C. Niedergerger, and P. Gendrop in Mexico, and A. Ruz Lhuillier, who helped create a teaching department for archaeology in Paris, are only a few examples. Meanwhile, the European Community has generated cooperative archaeological projects in Spain, Germany, England, belgium, and Holland (with whom France shares some interest in the West Indies) and in northwestern Mexico (research by Hers and Daneels, for instance).

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French Archaeology in the Classical World

France was not in the forefront as a founder of archaeological science. In the fifteenth and sixteenth centuries, it was the Italians, such as cyriac of ancona and Pirro Ligorio, who were the pioneers in the field, which was only to be expected given the abundance of antiquities on Italian soil. Meanwhile in France, as elsewhere in the western world, the climate of the Renaissance and the spread of humanism sparked an interest in antiquity. The humanists were concerned primarily with the writings of earlier authors and the discovery of new manuscripts; archaeology took second place to philology. Mention should be made of the collections of King Francis I (1494-1547) of France and the casts he commissioned of Roman remains.

In the seventeenth century, however, the presence of the French was very significant in the field of classical archaeology. Nicolas-Claude de Fabri, seigneur of Peiresc, was typical of the new breed of French antiquarian. He was a councilor at the parliament of Aix-en-Provence and was interested in law and sciences as well as archaeology. His cabinet of curios, one of the most famous in Europe, testified to his eclectic tastes: antiques were displayed alongside works of art and natural curiosities. For him, an artifact was not merely a sign of prestige but also an object of study that led to knowledge of antiquity. Although he never published any of his research, he had a considerable influence on scholars through the network of connections he established in Europe. Yet his influence had its limitations; even though he had done the grand tour of Italy, he remained more interested in collectable objects than in historical

monuments, more interested in written works than in sites to be explored.

In the second half of the seventeenth century, a new spirit of inquiry appeared as the result of voyages by both scholars and ambassadors accompanied by artists and men of letters. In 1674, the marquis of Nointel, the French ambassador at the Turkish court, visited Athens and had drawings made of the sculpted marble of the Parthenon-pediments, frieze, and metopes-thus preserving a record of the state of the temple before it was badly damaged by the Venetians in 1687. One sign of the new way of thinking was that antiquarians began to concede a greater importance to material sources, which they saw as being more reliable records than the printed word. They were particularly interested in inscriptions and coins found at the sites where they had been made.

Jacques Spon may be seen as the best example of this new type of antiquarian. He was a doctor

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French Archaeology in Egypt and the Middle East

By the end of the eighteenth century, France began a political extension toward the Oriental world. Simultaneously, far from its national borders, it entered into archaeological research, first in Egypt, then in the Near East (i.e., the Asiatic possessions of the Ottoman Empire that came into existence as nations after World War I), and lastly in Persia (modern iran). Considering the importance of the archaeology undertaken by France in those countries, it is not feasible to catalogue or sum up nearly two hundred years of its archaeological work in this article. However it should be understood that the prestige of French archaeology lies less in the great width of its activities than in the simple fact that, more than once, these stand as landmarks in the history of the archaeological studies of the Ancient Near East.

The first contact between France and Eastern civilization happened in a rather striking way. In 1798, for intricate political, scientific, and ideological reasons, Napoleon Bonaparte decided to have scholars and engineers join his army in a military expedition to Egypt. His science crew's mission was to obtain and collect all the information they could about Egypt, both ancient and modern.

Although the works and facts recorded about Coptic and Islamic monuments proved to be the most remarkable achievements of this expedition, the greatest immediate influence was the investigation of Pharaonic relics from antiquity. For instance, the knowledge of Upper Egyptian sites, so far virtually unknown, increased considerably. Vivant Denon was the first author to publish accounts of the expedition, in his *Voyage dans la Basse et la Haute-Egypte, Pendant les Campagnes du Géneral Bonaparte en Egypte.* This very successful work was the result of the first investigations of Upper Egypt in 1798, when Denon followed General Desaix, who was pursuing Mourad-Bey and his followers on their retreat south.

Edouard de Villiers and Prosper Jollois, two young engineers, made important additions to Denon's accounts. Both men were members of a commission departing for Upper Egypt in early 1799 with numerous tasks, one of which was to draw the outlines of the Nile Valley. Fascinated by the monuments they encountered, of their own accord they made thousands of drawings and notes of them. With the full cooperation of the other members of the expedition, who had concentrated on the monuments of Lower Egypt, this vast collection of data was published in the monumental multivolume work *Description de l'Égypte* in late 1799. This exceptional work not only comprises the largest and most comprehensive collection of documents ever to have been published on Egypt in those days, but it is still referred to, and is seen as all the more precious as many of the sites it recorded no longer exist. The scientific achievements of the different expeditions constitute the most lasting and least questionable gain of Napoleon Bonaparte's adventures in Egypt.

During a military expedition, on the eve of the land battle of Aboukir (1799), Captain Bouchard, as a consequence of prebattle trenching at Rosette, came across the famous “Rosetta” stone bearing inscriptions in two languages and three kinds of writing: hieroglyphic, demotic, and Greek. The importance of this find was immediately understood by scholars. England confiscated the stone after the Eastern Army surrendered to them, and however unfortunate this loss was for French scholars, it was no hindrance to jean-francois champollion. Working from a copy of the stone, in 1822 he established the foundations for deciphering hieroglyphic writing.

The exciting years at the close of the Age of Enlightenment at the end of the eighteenth century and those at the beginning of the nineteenth century mark the beginning of scientific Egyptology. France became involved in the protection of monuments and laid the foundations for its future research at these sites.

auguste mariette, the excavator of Memphis Serapeum, was prominent in the creation of the “Service des Antiquités,” an organization that policed and protected archaeological sites, and the first museum in Egypt. A few years prior to this, between

and results of excavations undertaken in Susiana, as well as control over the whole archaeology of Persia. The Délégation lasted fifteen years, from 1897 to 1912, and its prestige was due to the character of Jacques De Morgan. A prehistorian by training, De Morgan's great knowledge of Iran was the result of extensive travel between 1889 and 1891, from the Caucasus into and around Northern Persia, then over the whole country, and finally to Susa. When the French government appointed him to a position in Persia, he had already successfully managed the Service des Antiquités in Egypt.

De Morgan's plans were initially very ambitious, with the whole of the archaeological wealth of Persia under his control. But De Morgan believed that the urgent work at Susa had to come first before all other projects and should never be sacrificed for the sake of hazardous ventures. So, facing a financial situation that did not allow him to diversify his research unless he jeopardized the studies at Susa, his efforts and those of the Délégation were essentially devoted to the Susa site. His important work at Susa greatly benefited both the louvre Museum and other scholars, and in the long term it seems that Jacques De Morgan was right about his priorities. However, he was criticized about his research choice and attacked by fellow workers, and by then his long, hard-working years in the Middle East had exhausted him. In 1912, De Morgan resigned, and with this the Délégation Scientifique Française en Perse came to an end.

The agreement that founded the Délégation was not repealed until 1927, and France's archaeological interests were maintained by the Direction des Antiquités under command of André Godard until 1960 and the Institut Français de Recherche en Iran (IFRI). But while the Délégation ceased to exist after De Morgan's departure, the excavations at Susa continued. After World War I, when France diversified its archaeological research into the Iranian plateau and along its borders, Susa and Susania remained the center of its activity. Roland de Mecquenem until 1946, then Roman Ghirshman, and finally Jean Perrot from 1968 have been successively responsible for the work in this area. Nothing less than two world wars and, in 1979, the Islamic Revolution in Iran, could interrupt nearly a century of French research in Susania.

The archaeological activity of France in most of the Near East goes back to the nineteenth century. Due to scientific concerns, politics, and economics other areas have been opened to research more recently. In Arabia France is presently engaged in numerous archaeological projects. Twice interrupted by world wars, and then, occasionally, by the repercussions of political events, the archaeological activity of France in the Near East and Egypt has carried on for two centuries and, as much as circumstances will allow it, it continues.

Nicole Chevalier

See also

Egypt: Dynastic; Egypt: Predynastic; Israel; Syro-Palestinian and Biblical Archaeology

Frere, John

(1740-1807)

John Frere was born in Norfolk, England, and graduated from Caius College, Cambridge. An antiquary and a member of the local upper-middle class, Frere was also high sheriff of Suffolk in 1766, was elected to Parliament for Norwich in 1799, and became a fellow of the Royal Society in 1771.

In 1797, Frere reported to the society of antiquaries of london that he had found stone tools (what are now described as Acheulean hand axes) in the same levels as the bones of long-extinct animals-four

meters down-in undisturbed Pleistocene deposits in a brickpit at Hoxne, Suffolk. He argued that the overlying strata, which included evidence of a rise in sea level and half a meter of deposit, could only have been laid down over a very long period and that the stone tools and animal deposits had to be over 6,000 years old. *Archaeologia* in 1800 included a description of the find, a stratigraphic description, and a section of the deposit. Frere and his publication were politely ignored by the scientific establishment mainly because the conclusions seriously challenged the accepted date for the creation of human beings, which had been established in 1650 by Bishop james ussher, based on biblical calculations, as occurring on the evening of 22 October 4004 b.c. At

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Gabrovec, Stane (1920-)

Stane Gabrovec is a Slovenian archaeologist and a specialist in the Bronze and Iron Ages of central and southwestern Europe. He graduated in archaeology and classical philology from Ljubljana University in 1948, specialized in prehistoric archaeology at the University of Tübingen in Germany, and received his Ph.D. from the University of Zadar in Croatia. He was curator of prehistory at the National Museum in Ljubljana after World War II (1948) and after 1956, head of the Prehistory Department at the same institution. From 1969 to 1989, he taught prehistory at the University of Ljubljana. Gabrovec became a member of the Slovenian Academy of Arts and Sciences and a correspondent member of the Bavarian Academy of Sciences in Munich.

Gabrovec has dedicated most of his scientific work to solving problems of chronology and cultural definition in the Bronze and Iron Age cultures of the southeastern Alps and Caput Adriae, the area comprising slovenia, austria, northeastern italy, western Hungary, and northern Croatia. His most important and highly influential work on Slovenian prehistoric archaeology and beyond, i.e., on the establishment of the chronology for the late-Bronze and early-Iron Ages in Slovenia, was published in *Halstatska kultura v Sloveniji* [Hallstatt Culture in Slovenia], *Arheoloski vestnik* (Ljubljana) 15-16 [1964- 1965]: 21-63. In those studies, he defined five regional groups within the Slovenian Hallstatt culture: the Dolenjska (lower Carniola) group in central Slovenia, the Sveta Lucija (St. Lucia) group in western Slovenia, the Notranjska (inner Carniola) group in southwestern Slovenia, the Gorenjska (upper Carniola) group in northwestern Slovenia, and the Stajerska (Styria) group in northeastem Slovenia and southeastem Austria. Gabrovec incorporated these groups into the cultural and chronological schemes of southeastern and central Europe, and he also demonstrated that the process of transition from the late Bronze Age to the early Iron Age is characterized to a great extent by cultural and ethnic continuity from the "Urnfield culture" and by the presence of the early Iron Age elements originating from the Balkans. He demonstrated a similar phenomena of ethnic and cultural continuity in the la tène period in Slovenia, when several cultural groups continued their development from the early Iron Age while celts populated only parts of central and eastern Slovenia in the middle La Tène period.

Gabrovec also published an extensive and updated synthesis of the late Bronze Age and early Iron Age in Slovenia. Among the numerous sites excavated by Gabrovec, the most important is the famous princely hill fort at stična. This large barrow was excavated between 1960 and 1964, and part of the settlement was excavated between 1967 and 1974. Besides studies of the Bronze and Iron Ages, his work includes the history of Slovenian archaeology, prehistoric topography, and prehistoric art.

Methodologically, Gabrovec's approach can be described as part of the so-called Gero von Merhart historical school, developed in the 1940s and 1950s at the University of Marburg in Germany. This approach is based on a detailed analysis of material culture, its chronological sequence and development, and its geographical distribution, and such analysis is applied to the definition of the different cultural regions, the

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identification of cultural groups, and their social structure, historical, and ethnic adherence.

Predrag Novakovic

See also

Kastelic, Jožef

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Gallatin, Albert

(1761-1849)

Albert Gallatin was born in Geneva, switzerland, into an aristocratic family. He studied classical and modern languages, geography, and mathematics and became a follower of the French philosopher Jean-Jacques Rousseau and European Romanticism. He left Geneva for the United States in 1789, where he briefly taught French at Harvard College before purchasing land on the then-frontier in western Pennsylvania. He was not a successful farmer or frontiersman and soon became involved in politics. He was elected to the state legislature between 1790 and 1791 and then served as a senator in the federal government, becoming a friend of thomas jefferson, Henry Adams, James Madison, and Alexander Hamilton. He married into New York society, served in Congress, and was secretary of the Treasury from 1801 to 1814. He then served as a diplomat, traveling to Russia and Belgium, and was a representative for the government of the United States in Paris from 1816 to 1823 and in London from 1826 to 1827.

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Tim Murray

Gamio, Manuel

(1883-1960)

Manuel Gamio was born in Mexico City and studied mining until 1903, when his father sent him to administer a family plantation. While engaged in that work, he had contact with the indigenous Nahua people, learned their language, and was appalled by their poverty. Returning to Mexico City in 1906, Gamio studied anthropology and archaeology at the National Museum for two years. His first archaeological excavations were of the site of Chalchihuites, Zacatecas,

identification of cultural groups, and their social structure, historical, and ethnic adherence.

Predrag Novakovic

See also

Kastelic, Jožef

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In 1917, Gamio founded and was the first director of a federal department of anthropology and, despite political upheavals, received sufficient resources to set up several research programs. One of these was the first multidisciplinary anthropological program in the Americas- work on the population of the Teotihuacán Valley. This program lasted five years (1917-1922), involved investigations by over twenty scholars, and combined ethnographic and archaeological studies. The five-volume report that resulted is still an indispensable reference source for central Mexican anthropology and history. Gamio also wrote a doctoral dissertation for Colombia University based on this research.

Other projects initiated by Gamio during the 1920s included investigations into the early sedentary archaic (formative) cultures in the basin of Mexico, the excavation of Copilco and other sites, and supporting a project by Byron Cummings at an early urban center of Cuicuilco. Gamio also founded and edited the journal *Ethnos* (1920-1925), which published influential reports and essays by Gamio and others concerning the archaeology, ethnology, and contemporary problems of the indigenous peoples of Mexico.

Between 1924 and 1925 Gamio had a brief political career as undersecretary of public education, but after denouncing government corruption in Mexico City newspapers, he had to flee the country. He spent over two years in exile in the United States and guatemala, during which time he began his famous studies of Mexican immigrant laborers in the United States, which became classic in sociology and applied anthropology. After his return to Mexico and for the rest of his life, Gamio was primarily concerned with the direction of several key government and international institutes devoted to improving the living conditions of indigenous groups. He founded and then directed (1942- 1960) the Inter-American Indian Institute, and his work still exercises a profound influence on contemporary Mexican anthropology.

Roberto Cobean and Alba Guadalupe Mastache Flores

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Garbology: The Archaeology of Fresh Garbage

Gold cups, jade beads, mummies, temples lost in rainforests-to me, these were the essence of archaeology. Oh, how I longed to become an archaeologist and journey back to the days of our ancient ancestors by following the breadcrumb trails of the artifacts they left behind. In 1954, when I was nine, that was the archaeology I dreamed about as I drifted to sleep beside my dog-eared copy of *The Wonderful World of Archaeology* (Jessup 1956).

Fourteen years later I found myself in graduate school immersed in the stifling smell of dusky potsherds punctuated every so often by the thunderous explosions of 200-300 broken pieces of pottery being poured out of linen bags onto masonite laboratory tables. These potsherds had become my path to ancient lives. By this time, I had learned enough of archaeology's arcane secrets that I fully appreciated the stories that could be told by potsherds and other commonplace discards about a society's rise and fall and its day-to-day existence. I was, in fact, literally excited to be systematically and scientifically analyzing the vast expanse of discards to discover replicated patterns of human behavior that we can still recognize today. At the time, I believed I was about to add my own small piece to understanding the puzzle of the classic Maya collapse (Rathje 1971, 1973). In 1968, that was the archaeology I dreamed about when I dozed off late at night on top of my well-worn copy of *Uaxactun, Guatemala:*

Excavations of 1931-1937 (Smith 1950).

Today, more than three decades years later, I look back on my past dreams of archaeology with a bemused smile on my face, my hands full of fresh garbage, and my mind dancing with thoughts of the calories from fat in our diet or of the recyclables mixed into garbage instead of separated for curbside collection. And instead of

estimates of the refuse that goes to MSW (municipal solid waste, or standard community refuse) landfills. Nevertheless, C/D accounted for 20 percent or more of excavated refuse by volume and was the second-largest category of discarded materials recovered by the Garbage Project from MSW landfills.

The largest category occupying MSW landfill space was paper. This was true for refuse buried in the 1980s as well as for refuse dating as far back as the 1950s, because in most landfills, paper seemed to biodegrade very slowly. As a result, by volume, nearly half of all of the refuse excavated by the Garbage Project consisted of newspapers, magazines, packaging paper, and nonpackaging paper such as computer printouts and phonebooks.

Not long after the Garbage Project's first reports following its landfill digs, the energy directed at passing bans was largely redirected toward curbside recycling. A number of communities began placing emphasis on reuse and recycling programs for C/D, and paper recycling promotions started stressing the need to keep paper out of landfills because it did not biodegrade as quickly as most people had once hoped. An association of state attorneys general determined from dig data that several products that claimed to be “biodegradable,” including some brands of disposable diapers and plastic garbage bags, did not biodegrade in landfills, and the false advertising of these products was eradicated. All of this was evidence that some crucial views of garbage held by policy planners, the media, and the public had changed-and that garbology had been validated as a new kind of archaeology, one that could make an immediate public contribution.

The Rationale for Garbage Archaeology

For as long as there have been archaeologists there have been jokes, cartoons, and stories that guess what it would be like for an archaeologist to dig through our own refuse (Macaulay 1979). Although often humorous, such speculations are, in fact, based on a serious rationale: if archaeologists can learn important information about *extinct* societies from patterns in ancient garbage, then archaeologists should be able to learn important information about *contemporary* societies from patterns in fresh garbage. The pieces of pottery, broken stone tools, and cut animal bones that traditional archaeologists dig out of old refuse middens provide a surprisingly detailed view of past ways of life, just as all the precisely labeled packages, food debris, and discarded clothing and batteries in modern middens reveal the intimate details of our lives today.

During the summer of 1921, the great American archaeologist alfred v. kidder seemed to understand this fact when he took the trouble to observe the artifacts that were coming out of a trench being cut for a sewer line through a “fresh” garbage dump in Andover, Massachusetts. From at least this point on, archaeologists have studied contemporary urban refuse informally and sporadically as class exercises and methodological experiments. A variety of subspecialties-ethnoarchaeology, historic sites archaeology, industrial archaeology, and experimental archaeology-have been edging ever closer to analyzing what citizens of the industrialized world discarded last year, last month, and even yesterday. In fact, all archaeologists are aware that it is inevitable that contemporary rubbish will be studied by traditional archaeologists in the same manner they now study the middens of ancient Troy and Tikal-that is, in a hundred or so years from now.

If there are useful things to learn from an archaeological study of our garbage-things that can enrich human lives and minimize the undesirable environmental consequences of the industrialized world-why wait until we (and I literally mean you and I)are all dead and buried to find them out? At least, that is what a group of students and I thought when we founded the Garbage Project at the University of Arizona in the spring of 1973. Today, all of us who are a part of the project, including codirector Wilson

Hughes who was one of the founding students, are still thinking along these same lines (Rathje 1996).

After nearly two and a half decades of sorting, recording, and interpreting MSW, garbology, or the archaeological study of contemporary urban refuse, has become a recognizable subspecialty within archaeology and other behavioral

(such as three or four half-full cans of paint or several full containers of pesticide in just one pickup). The Garbage Project's interpretation was that the media surrounding the collection day made people aware of the potentially hazardous commodities in their homes, but for those who missed the collection day, no other appropriate avenue of discard had been identified. As a result, some residents disposed of their hazardous wastes in the only avenue available to them-their normal refuse pickup. The same pattern was verified in subsequent studies in Phoenix and Tucson (Rathje and Wilson 1987). The lesson learned: communities that initiate hazardous waste collection days should inform residents of future collection times or of other avenues for appropriate discard.

Such counterintuitive interview/refuse patterns indicate that consumers may not be aware of how much their reported behaviors differ from their actual behaviors and that the Garbage Project is beginning to document a previously unmeasurable phenomenon between what people think is happening and what is really going on. Such studies have already led to some general principles of the differences between people's awareness of their behavior and their actual behavior (Rathje 1996).

The Garbage Project's contribution to a better understanding of the relationship between what people report they do and what they actually do (Rathje 1996; Rathje and Murphy 1992a) relies heavily on the use of archaeological methods and theory to quantitatively document actual behaviors from refuse. This is the grist of any archaeologist's mill, and the validity of the Garbage Project's data records and interpretations is based upon 100 years of previous archaeological studies that have analyzed refuse to reconstruct behavior.

For the same period of time, archaeologists have also been studying refuse in an attempt to count the number of people who lived within particular sites or regions at particular times. The Garbage Project has now done the same thing at the request of the U.S. federal government. The U.S. Census Bureau has long been aware of the criticism that its interview-survey methods lead to a significant undercounting of ethnic minorities, especially young adult males who may be undercounted by 40 percent. In 1986, the Quality Assurance Branch of the Census Bureau funded a study to answer the question, Could the Garbage Project count people based on the types and quantities of residential refuse they generate? The answer was yes (Rathje and Tani 1987). For any unit of time in any given neighborhood, the overall weight of total refuse discarded (minus yard wastes, which vary markedly between suburbs and inner cities) varies directly according to the number of resident discarders. The Garbage Project converted quantities of refuse thrown out per week to numbers of people by using “per person” generation rates documented in test areas. Overall, a series of garbage-based estimates of population were within 5 percent of the actual number of residents. The Garbage Project now stands ready to cross-verify census counts with a method that does not violate the subjects' anonymity.

Ongoing Research

Since 1980, the Garbage Project has worked on a large number of specialized topics similar to the census study, and all of them are the focus of continuing inquiry. Landfill excavations, for example, are gauging the impact of recycling programs on the volume of wastes that reach landfills. The first reported results estimated that metropolitan Toronto's “blue box” curbside recycling program has conserved some 20 percent of landfill space in the metropolitan area since 1982 (Tani, Rathje, Hughes, Wilson, and Coupland 1992).

The recovery of 2,425 datable, readable newspapers from the project's excavations dramatically changed the view that biodegradation is commonplace in landfills. To better understand why biodegradation does and does not occur in landfill environments, the Garbage Project has so far conducted four cooperative digs that have involved microbiologists and environmental engineers from the

University of Arizona, University of Oklahoma, University of Wisconsin-Madison, Argonne National Laboratories, and Proctor and Gamble's Environmental Laboratory (Suflita et al. 1993). In this same

mode, the Garbage Project excavated and examined samples of refuse from a ten-year-old “bioreactor” landfill in Sandtown, Delaware, one designed to enhance biodegradation. According to the project's evaluation, after ten years of burial, the Sandtown refuse exhibits some indications of increased biodegradation but nothing conclusive (Rathje 1999). The next Sandtown dig is scheduled for 2008.

The Garbage Project has also initiated several studies that integrate its fresh and landfill data on hazardous wastes in MSW. The heavy-metal assays of finds are being compared with detailed item-by-item lists (such as two lightbulbs, one drain opener can, two newspapers, etc.) of the refuse identified within each 150 pounds of landfill sampled. The goal is to determine the rate of movement of heavy metals in commodities and inks and other hazardous wastes from refuse into the landfill matrix (Rathje, Hughes, et al. 1992).

Garbage Project Students and Staff

The Garbage Project does not consist of only systematic records compiled by a hands-on sorting of household garbage; it also consists of the sorters and project staff attached to the hands. Although many people find the results of project data studies interesting, most of them also find the sorting process itself revolting. In fact, a few market researchers realized in the 1950s that household refuse contained useful information but after repeated experiments they found they could not pay people to sort refuse. Those hired either quit quickly or kept sloppy records. Who would possibly be willing to rummage through someone else's smelly trash and keep accurate records of its contents?

The answer is a matter of public record. *Rubbish!* (Rathje and Murphy 1992b, paperback 1993) contains a list of more than 900 university students and others who sorted refuse for the Garbage Project between 1973 and 1991. The intimate archaeological view these and subsequent sorters have had of the materials that are discarded from households much like their own has provided them with a unique perspective, and while they do not preach to others, they are enthusiastically dedicated to providing everyone possible with the same insights they have drawn from their own hands-on sorting of residential refuse.

In attempting to share results, the Garbage Project has focused most directly on schools, museums, and other avenues of access to students. The rationale is that the archaeology of our own society will mean the most to the young people who can do the most with archaeological insights. Currently, the project is especially proud of two endeavors. The first is the compilation of *WRAP (Waste Reduction Alternatives Program) Resource Manual* (Dobyns and Hughes 1994), which has been distributed to schools throughout Arizona and the United States. The manual is designed to help both students and teachers learn how their individual behavior can produce significant quantities of garbage and how they can each make changes that will greatly decrease that amount of garbage. The second endeavor resulted in “The Garbage Dilemma,” an interactive video on permanent display in the Hall of Science in American Life at the Smithsonian's National Museum of American History. The video was the product of cooperation among the Garbage Project staff, the Smithsonian's design staff, and the Chedd-Angier Production Company. Schools and museums-not landfills-provide the kinds of environments where the Garbage Project hopes all of its results will eventually come to reside.

Garbology in the Twenty-first Century

What has set the archaeologists of the Garbage Project apart from other behavioral science researchers is that all of their studies have been grounded in the hands-on sorting of quantifiable bits and pieces of garbage instead of collecting data through interview surveys, government documents, or industry records. In other words, the Garbage Project is studying consumer behavior directly from the material

realities that are left behind rather than from self-conscious self-reporting.

The exhaustive level of detail Garbage Project student sorters use to record data has also set the project's studies apart from other data sources. Many local plans by engineering consultant firms and even by solid waste managers

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Garrod, Dorothy

(1892-1968)

Born in London the daughter of Sir Archibald Garrod (who became Regius Professor of Medicine at Oxford University), Dorothy Garrod studied history at Newnham College, Cambridge. During World War I, in which all three of her brothers were killed, she worked for the Ministry of Munitions and then for the Catholic Women's League in france. Convalescing in Malta toward the end of the war, where her father was director of war hospitals, she first became interested in archaeology.

After the war, Dorothy Garrod began to study anthropology at Oxford under R. R. Marret, one of the excavators of the Paleolithic site of La Cotte de St. Brelade on the Channel island of Jersey. By the time she graduated, Garrod had become fascinated by Paleolithic archaeology, and Marret sent her to study in Paris under the great French paleontologist henri breuil. There she gained valuable practical experience, excavating Upper Paleolithic cave sites at La

Garstang, John

(1876-1956)

Born in England, John Garstang was educated at Blackburn Grammar School and owing to his excellence in mathematics, won a scholarship to Jesus College, Oxford, in 1895. He became interested in archaeology while he was still at school and after excavating the Roman camp of Bremetennacum at Ribchester, he published his findings in 1898. Garstang spent his undergraduate vacations excavating, and after he graduating with third-class honors in mathematics, he took up archaeology full time, joining sir william matthew flinders petrie at abydos in Egypt and discovering and excavating the tomb of Beyt Khallaf.

Garstang was appointed reader in Egyptian archaeology at Liverpool University in 1902 and led expeditions to Negadah, Hierakonpolis, Esneh, and Beni Hassan in Egypt over the next two years. By then his interests in the Hittites had been aroused, and in 1904, he traveled to Asia Minor and received permission to excavate the Hittite capital of bogazköy, turkey. In 1907, at the personal request of the Kaiser of Germany, this site was instead given to German archaeologists to excavate.

From 1907 until 1941, Garstang was professor of the methods and practice of archaeology at Liverpool University where he contributed to the establishment of the Institute of Archaeology and the journal *Annals of Archaeology and Anthropology*. In 1908, he returned to Asia Minor, excavating the late Hittite site of Sakje-Geuzi in Turkey; in the winter, he returned to Abydos in Egypt to continue excavating there. His topographic study of Hittite monuments, *The Land of the Hittites*, was published in 1910.

From 1909 to 1914, Garstang excavated at Meroe in the Sudan, the site of the capital of Meriotic civilization from early third century b.c. to the early fourth century a.d. He served with the Red Cross in France during World War I, and in 1919, he became head of the newly created School of Archaeology in Jerusalem (serving in that post until 1926) and working as director of the Department of Antiquities in Palestine (1920-1926). Among his many achievements during this time was the discovery of the site of Hazor in israel, an important Canaanite town. He published *Joshua Judges* in 1931 and *The Heritage of Solomon* in 1934, and from 1930 until 1936, he excavated Jericho until the political situation made it impossible to continue.

In 1936, Garstang returned to Turkey to survey the Cilician plain, and he excavated the site of Yumuk Tepe near Mersin until the outbreak of World War II. He returned to complete this work in 1946, published in *Prehistoric Mersin* (1953), and to help establish the British Institute of Archaeology at Ankara in 1948, becoming its first director. He received honorary degrees from Aberdeen University, received the Legion of Honour in 1920, and became a Commander of the British Empire in 1949.

Tim Murray

Geoffrey of Monmouth

(ca. 1100-1154)

It is thought that Geoffrey of Monmouth was born in Monmouth, Wales, at the beginning of the twelfth century. The son of the family priest of William, earl of Gloucester, an influential aristocrat of the time, Geoffrey was brought up by his paternal uncle Uchtryd, archdeacon and later archbishop of Llandaff, Wales. Geoffrey attended Oxford University where he met another archdeacon, Walter Calenius, from whom he was supposed to have obtained the material for his monumental book *Historia Regum*

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Garstang, John

(1876-1956)

Born in England, John Garstang was educated at Blackburn Grammar School and owing to his excellence in mathematics, won a scholarship to Jesus College, Oxford, in 1895. He became interested in archaeology while he was still at school and after excavating the Roman camp of Bremetennacum at Ribchester, he published his findings in 1898. Garstang spent his undergraduate vacations excavating, and after he graduating with third-class honors in mathematics, he took up archaeology full time, joining sir william matthew flinders petrie at abydos in Egypt and discovering and excavating the tomb of Beyt Khallaf.

Garstang was appointed reader in Egyptian archaeology at Liverpool University in 1902 and led expeditions to Negadah, Hierakonpolis, Esneh, and Beni Hassan in Egypt over the next two years. By then his interests in the Hittites had been aroused, and in 1904, he traveled to Asia Minor and received permission to excavate the Hittite capital of bogazköy, turkey. In 1907, at the personal request of the Kaiser of Germany, this site was instead given to German archaeologists to excavate.

From 1907 until 1941, Garstang was professor of the methods and practice of archaeology at Liverpool University where he contributed to the establishment of the Institute of Archaeology and the journal *Annals of Archaeology and Anthropology*. In 1908, he returned to Asia Minor, excavating the late Hittite site of Sakje-Geuzi in Turkey; in the winter, he returned to Abydos in Egypt to continue excavating there. His topographic study of Hittite monuments, *The Land of the Hittites*, was published in 1910.

From 1909 to 1914, Garstang excavated at Meroe in the Sudan, the site of the capital of Meriotic civilization from early third century b.c. to the early fourth century a.d. He served with the Red Cross in France during World War I, and in 1919, he became head of the newly created School of Archaeology in Jerusalem (serving in that post until 1926) and working as director of the Department of Antiquities in Palestine (1920-1926). Among his many achievements during this time was the discovery of the site of Hazor in israel, an important Canaanite town. He published *Joshua Judges* in 1931 and *The Heritage of Solomon* in 1934, and from 1930 until 1936, he excavated Jericho until the political situation made it impossible to continue.

In 1936, Garstang returned to Turkey to survey the Cilician plain, and he excavated the site of Yumuk Tepe near Mersin until the outbreak of World War II. He returned to complete this work in 1946, published in *Prehistoric Mersin* (1953), and to help establish the British Institute of Archaeology at Ankara in 1948, becoming its first director. He received honorary degrees from Aberdeen University, received the Legion of Honour in 1920, and became a Commander of the British Empire in 1949.

Tim Murray

Geoffrey of Monmouth

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Geoffrey's sources for his work included manuscripts from the tenth century, such as the Latin "Nennius," which is extant, and a book of Breton legends, which has since vanished. The latter was the source of the story of the descent of British princes from the fugitives of Troy, a legend that is also common in stories about the origins of the Franks in Gaul; the story seems to have become popular in both countries after the invasion of the Teutonic tribes in the sixth century. Although the legends were not recorded by the historian Bede in his eighth-century chronicle, they were part of written history by the ninth century.

The publication of *Historia Regum Britanniae* marks a milestone in the literary history of Europe. Within fifty years of its completion, stories about the Holy Grail, Lancelot, Tristan, Perceval, and the Round Table had appeared, and Merlin and Arthur had become as popular in Germany and Italy as they were in England and France. The book was later translated into Anglo-Norman, and 100 years later into English. The material was then used by a long line of famous British storytellers and historians such as Robert of Gloucester, Roger of Wendover, Holinshed, Shakespeare, Milton, Dryden, Pope, Sir Thomas Malory, Wordsworth, and Tennyson.

As important as its long-term impact on European civilization was the book's short-term influence on the people of England, which included a large part of France at the time. The popularity of the work's legends and stories helped to defuse racial animosities among Welsh, Breton, British, French, and Teuton, and the various groups became more politically unified through their mutual belief in a shared origin.

Tim Murray

Geographic Information Systems

Historical Background

Archaeologists, like geographers, think spatially, and both make sense of their data by referring to its spatial dimension. Archaeology-particularly European archaeology-has been closely linked to geography and has borrowed from it methodological principles to develop its own theoretical tenets. This close association with geography dates from the formal mapping methods of attributes and artifacts developed by the Austro-German school of "anthropogeographers" of the 1880s and 1890s. However it is with the Cambridge School of New Geography, and in particular with Peter Haggett's *Locational Analysis in Human Geography* (1965), Richard Chorley and Peter Haggett's *Models in Geography* (1967), and Michael Chisholm's *Rural Settlement and Land Use* (1968) that the otherwise implied sway of geography toward archaeology was formalized. This influence is best reflected in the archaeologists Claudio Vita-Finzi's and eric higgs's 1970 site catchment analysis of Mount Carmel, Ian Hodder and Clive Orton's *Spatial Models in Archaeology (*1976), and david clarke's *Spatial Archaeology* (1977).

More recently, geography is once more leaving its mark on the theoretical development of archaeology. The emergence of landscape archaeology, a derivation of geography's landscape theory, has re-ignited interest in the spatial associations between archaeological sites and their physical environment on both sides of the Atlantic. Within this context, the application of geographic information systems (GIS) has been hailed as the new paradigm. But just how much can the application of GIS assist in the

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Development of GIS

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make the analysis of enormous amounts of data feasible. With the advent of the personal computer as an affordable, fast, and user-friendly analytical tool, it is now possible to process in a very short period of time amounts of data that otherwise would have taken days or even weeks to process.

The sheer size of the databases that archaeologists have to work with, which include archaeological and environmental data, made it extremely difficult, if not virtually impossible, to integrate all the material into a spatial-temporal framework. The best archaeologists could hope for was that through the production of accurate maps of site or artifact distribution, a meticulous visual inspection would reveal any spatial pattern.

Traditionally, maps have been an indispensable tool for archaeology and related disciplines. The basic geographic features are displayed using various visual artifices, such as diverse symbols or colors or text codes, which are explained in the legends. Naturally, the most important limitation these maps have is the amount of information they can effectively communicate, if more information is needed, it would have to be included in another form.

Map production, however, is a very expensive and time-consuming activity. As our scientific knowledge of the earth advances, new information needs to be charted almost immediately, but the effective and prompt assessment of natural resources, meteorological phenomena, and urban growth requires that maps be produced expediently and at low cost.

The demand for detailed map information has put pressure on for the development of better mapping techniques, and naturally, computer applications such as computer assisted design (CAD) and computer assisted mapping (CAM) have been instrumental in meeting this demand. Still, these advantages in map production and the ability of computer applications like CAM or CAD to identify spatial patterns between the mapped features-points, lines, and polygons-are very limited, because they are not linked to a relational database. It is only with the advent of GIS that we are able, for the first time, to link the geographic position of the mapped features with the qualitative and quantitative information that describes them and make queries about them.

In essence, GIS is a spatially referenced database that allow us to store great amounts of data, retrieve it with ease, manipulate it mathematically, and visualize the results within its spatial context. Hence, the core of the analytic power of GIS lies in its ability to handle digital maps to create new information from the preexisting data.

To fully understand this advantage we need to take a closer look at the conceptual changes in maps as a result of the insertion of GIS. Prior to this insertion, the study of the spatial distribution of natural resources and human and plant populations was approached in a qualitative way. The principal aim was to produce inventories of these data, and the enormous amount of information produced forced the cartographer to rely on qualitative methods of classification and mapping.

Consequently, quantitative descriptions were hindered mainly because of a lack of the appropriate mathematical tools needed to describe the spatial variations. With GIS, however, maps underwent a critical transformation because spatial variations could now be rendered as digits. Therefore, maps are no longer conceived as simplified pictorial depictions of the real world but as numbers. This is a major conceptual leap since throughout the approximately 8,000 years of mapmaking, maps have been primarily *descriptive,* which has limited their application to showing the exact location of things. Increasingly, however, maps are becoming *prescriptive,* containing the data necessary to assist us in making decisions.

Applications of GIS in Archaeology

GIS technology is relatively recent as the first operational GIS was developed in Canada in 1972, around the same time that the first text on GIS was published. It was not until the 1980s, however, that archaeologists begin applying GIS to their field of study. In 1982, the study of the settlement patterns in relation to the seasonal availability of natural resources in western Arizona was approached using GIS.

Database management and cultural resource management (CRM) applications began in the mid-1980s, and toward the latter part of the decade, GIS was being used in site prediction models.

By enabling the management of extensive spatially related databases, GIS has provided archaeologists with a powerful analytical tool, one that can lead to the discovery of the various levels of spatial patterns in the archaeological record. This in turn can lead to a more in-depth analysis of the underlying principles of those spatial patterns. There are three broad categories into which all spatial modeling done using GIS fall: data mining, predictive modeling, and dynamic simulation. The first two are perhaps the more common forms applied in archaeology.

Data mining consists of the retrieval of specific data items or a combination of items in relation to their spatial/temporal location. The settlement pattern studies in western Arizona mentioned above, and the study of the potential impact on known archaeological sites owing to works of infrastructure, e.g., the construction of a dam or a road, constitute good examples of this type of model.

Predictive modeling in GIS differs from simple mathematical models in the sense that it interpolates the field data into mapped variables, thus providing us, in addition to a hard figure, with the spatial location of the relevant variables. Predictive modeling is frequently used in CRM when dealing with the potential effects to unknown archaeological sites from the aforementioned infrastructure works. There are also various examples in the American Southwest where site prediction has been used in the study of settlement patterns, and its potential in assisting in the design of the archaeological survey strategies has just been tapped.

Only recently has the third category begun to be explored in connection with archaeological problems. Its most promising feature is that it enables the user to interact with the spatial model by allowing for change in the variables in order to track alternative behavioral patterns. A fine example of this type of modeling is Kohler and Carr's swarm-based modeling of prehistoric settlement systems in the American Southwest. Swarm is an object-oriented model designed to ease the process of simulating large numbers of interacting agents, and traditional GIS modeling was combined with this object-oriented model to explore and refine models of settlement behavior in the Mesa Verde region of Colorado. The initial GIS approach was limited to the data mining and prediction models mentioned above, which resulted in statistical measures of strength and significance of association of sites with the relevant environmental variables. In the case of Mesa Verde, the agents were represented by the prehistoric households, which were “released” onto the paleoproductivity landscapes generated with the GIS, and the Swarm model was run to observe their locational solutions to making a living on those landscapes.

It has become apparent that the application of GIS to archaeological issues has assisted archaeologists in addressing more complicated questions on the nature of the interaction between human societies and their landscapes and that it can ultimately help in obtaining a better understanding as to how the factors involved in the formation of the archaeological record interact. More and more, through the application of GIS, archaeologists are enable to address not only questions such as, Where is? or How many? but also questions such as, What if?

Armando Anaya Hernández

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German Archaeological Institute

See deutsches archäologisches institut

German Classical Archaeology

The first scientific approaches to classical archaeology in Germany date back to the so-called antiquaries, who were active from the sixteenth century on and who-due to their systematic classification of the material estate of Antiquity-were often and rather unjustly called ignorant. The *Thesaurus Brandenburgicus selectus,* written by Lorenz Beger (1653-1705) and published in three volumes between 1696 and 1701, may be regarded as the most significant opus of an antiquary in Germany. The intensity of the antiquaries' influence, especially that which they exerted on following generations of classical scholars, characterized particularly in Germany by the factual and substantial organization of manuals and, above all, of corpora.

Even johann joachim winckelmann (1717- 1768), who vehemently opposed the antiquaries, followed an antiquarian pattern in the draft of his *Monumenti antichi inediti,* published in 1772. Winckelmann's hermeneutic method (i.e., his explanation of antique monuments mainly by means of Greek mythology) and his aesthetic approach built on the achievements of the antiquaries. A significant difference, however, can be noted in his observation that the art of antiquity, until that time regarded as an absolute entity, could be given a chronology. In this observation he was partially influenced by concepts taken from the late-Hellenistic period, although Winckelmann's judgment was predominantly influenced by the aesthetic criteria of his time. His discovery of the possibility of differentiating the various stages of the development of antique art by means of stylistic analyses enabled him to subdivide that art into several periods, a classification that is more or less still valid today. In his *Geschichte der Kunst des Altertums* (1764) he distinguished between the *Alterer Stil* (Older Style) of the first half of the fifth century b.c., the *Hoher Stil* (Grand Style) of the period of Phidias, the *Schoner Stil* (Beautiful Style) of Praxiteles, Lysipp, and Hellenistic works of art, and the *Stil der Nachahmer* (Style of the Imitators) of the classicist period. The time of the Roman Empire was defined as an era of decay and the complete decline of art.

Winckelmann's aim was to discover the Wesen der Kunst (nature of art) and define the use of beauty and verity, distinctive to a particular work of art. Both of these values he regarded as fulfilled in the Hoher Stil and the Schoner Stil. He also wanted to develop a model of general (as in a universal) validity: “The history of art should teach the origin, the growth, the change, and the decline of art, as well as the different styles of peoples, periods, and artists and to prove this to the greatest possible extent by means of those works of Antiquity left over” (Winckelmann 1764).

In this way Winckelmann prepared the basis for a developmental approach to art, which is still influential today. This model of development of a comparative art history almost necessarily implied a concentration on each and every work of art, as well as an understanding of its contents and its value (despite this being often determined subjectively). Winckelmann's influence on successive generations of scholars was considerable and his passionate and refined language, used to describe such monuments as the outstanding statutes Laocoon and the Apollo of Belvedere, was also influential. Both the study of art, according to his model, and his literary attainments can be regarded as strange contrasts to the intended delineation of art-historical contexts. Winckelmann's subjective idealization and, above all, mystification of Greek art and his intention to deduce aesthetic rules and standards from it was inherently contradictory to an interpretation striving for historical facts.

Christian Gottlob Heyne (1729-1812), the realistic, dispassionate archaeologist who was also enthusiastic about Greek beauty, was Winckelmann's counterpart. Heyne was greatly important to the development of archaeology as an academic discipline, primarily because of his “Academic Lectures on the Archaeology of the Art of Antiquity,” which he had given since 1767 at the University of Gottingen. His work “Introduction into the Study of Antiquity, or Draft of a Guide to the Knowledge of Ancient Works of Art,” published in 1772, was also very significant and pioneering because he was a

philologically determined classical scholar. On the one hand he proceeded methodically according to

perspective, that is, when different approaches are used for a reciprocal control.

This limitation on the role of monuments is echoed in Adolf Heinrich Borbein's recent request for a model of interpretation that comprises the artistic form as an upholder of significance, those external circumstances by which the latter is influenced, different kinds of contemporary artistic expressions, political, social, and cultural phenomena, and the question of the relation of each of these factors to the other and for their mutuality in substance. In this view, visual art provides the concrete idea of the "spirit of time" or of its contemporary and intellectual tendencies, even more so than historical facts. By extension, artistic farsightedness may influence or anticipate future developments in other social fields.

This concept, which integrates historical context and aims to describe the historical position of monuments, allows new access to the comprehension of Roman art, an area to which German archaeology has recently been devoted. Tonio Holscher's 1960 treatise *Roman Picture Language as a Semantic System* must be understood in this way. Proceeding on the assumption of a pluralism of styles in Roman art, formulated earlier, Holscher demanded that monuments must begin to be observed within an overall cultural-historical context, before a single aspect of Roman visual art and its significance can be commented on. Furthermore, he propounded the substantial thesis that in Roman art for different allied subjects and different patterns from different epochs of Greek art were selected. These established patterns were reused throughout Roman art, unaffected by contemporary stylistic tendencies. On the basis of examples he succeeded in demonstrating that the choice of Greek stylistic forms followed a system, or semanticization of styles. Holscher argued that by Augustan times there was an established canon of representational modes and picture types, that is, a more or less constant picture language, and this semantic system did not undergo serious changes during the first and second centuries a.d. With regard to the relation of picture language and style, he made clear that style "as an expression of general taste and habit" represents a variable factor, in contrast to the more likely static character of the picture language. This picture language submitted to the semantic system does not exclude stylistic changes, that is, different modes and types of representation. In the historical dimension of his examinations Holscher showed that a systematic, static picture language was advantageous for the conveyance of messages and general communication in the Roman Empire. He also pointed out that the tendency to set up norms, observed in a section of art, was generally characteristic of Roman imperial culture. Holscher's theoretical analyses of Roman art characterized the position of German classical archaeology today: to practice archaeology as both a science of art and a historical discipline.

E. Thomas

See also

German Prehistoric Archaeology

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German Prehistoric Archaeology

Germany, like other European nation states, has a long tradition of prehistoric research, but prehistoric archaeology was first taught in the universities

is further complicated by significant differences within the archaeological record itself. Roman and Celtic antiquities are concentrated in the south and west of Germany and in Switzerland and Austria, but in the eastern and northern parts of Germany, Germanic (and partly Slavic) antiquities dominate. In the past this was a permanent source of conflict for the discipline. Nevertheless, it is possible to uncover some common themes in its development.

The name traditionally used by institutions that deal with research on human prehistory in Germany, Austria, and Switzerland is *Vor- und Frühgeschichte* (or *Ur- und Frühgeschichte*). This is most aptly translated as "pre- and proto-history" and refers to those periods from which written sources are unknown or, at best, rare. The German term *Archäologie* (archaeology) has long been virtually reserved for the archaeology of classical antiquity (*Klassische* archaeology). Only in the last few years has it become customary among prehistorians to use the term *Archäologie* or, more accurately, *Ur- und Frühgeschichtliche Archäologie* (pre- and proto-historic archaeology).

Toward a History of Prehistoric Archaeology in Germany

The history of prehistoric archaeology has been a topic of interest within the discipline of archaeology in Germany for a long time. In 1938 Hans Gummel published a thick volume on the history of German prehistoric archaeology from the seventeenth century until the 1930s. In retrospect the early date chosen for the beginning of this synthesis seems somewhat surprising. The first ordinary chair for prehistoric archaeology at a German university was established only in 1927, at the University of Marburg. Before that time prehistory at German universities was taught by extraordinary professors or by lecturers and scholars from other disciplines. The first extraordinary chairs were established at the turn of the twentieth century at the Universities of Vienna (assumed by Moritz Hoernes in 1900) and Berlin (occupied by gustaf kossinna in 1902), and as early as 1874 rudolf virchow had expressed doubts as to whether prehistory would ever become an independent discipline. Under these circumstances, why was such an early date given for the history of archaeology in Gummel's work? From the historical context it is clear that Gummel's synthesis must be seen in relation to contemporary attempts to transform prehistoric archaeology into what could be regarded as a mature discipline. Due to political circumstances the success of this initiative remained limited.

Gummel's efforts to promote the necessity of a continued reflection on the history of prehistory were not very successful. Despite his own early monograph and other early contributions to this topic, especially by Ernst Wahle (1951), research on the history of prehistoric archaeology even today remains underdeveloped in central Europe, and critical assessments of the history of prehistoric archaeology have only become available since the mid-1990s (Härke 2000). Many of the more recent attempts focus on the role of prehistoric archaeology during the Third Reich (Leube 2000), a topic that was dealt with earlier by historians (Bollmus 1970; Kater 1974). Older periods of the history of prehistoric archaeology are still only seldom written about, and apart from publications that deal with single aspects of the subject in Germany, only one recent overview is available today (Kossack 1999; also see Kossack 1992 and Kühn 1976). In that overview author Georg Kossack drew on his own long experience within German prehistoric archaeology and not only gave valuable information on important scholars, excavations, methods, and ideas but also described the political background of twentieth-century prehistoric archaeology.

A Short Outline of the Development of Prehistoric Archaeology in Germany

The history of prehistoric archaeology in central Europe is closely linked with the political history of the relevant countries. This is especially true in Germany. The main crises and resolutions in German history during the nineteenth

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is further complicated by significant differences within the archaeological record itself. Roman and Celtic antiquities are concentrated in the south and west of Germany and in Switzerland and Austria, but in the eastern and northern parts of Germany, Germanic (and partly Slavic) antiquities dominate. In the past this was a permanent source of conflict for the discipline. Nevertheless, it is possible to uncover some common themes in its development.

The name traditionally used by institutions that deal with research on human prehistory in Germany, Austria, and Switzerland is *Vor- und Frühgeschichte* (or *Ur- und Frühgeschichte*). This is most aptly translated as "pre- and proto-history" and refers to those periods from which written sources are unknown or, at best, rare. The German term *Archäologie* (archaeology) has long been virtually reserved for the archaeology of classical antiquity (*Klassische* archaeology). Only in the last few years has it become customary among prehistorians to use the term *Archäologie* or, more accurately, *Ur- und Frühgeschichtliche Archäologie* (pre- and proto-historic archaeology).

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the Viking age settlement of Haithabu, also joined the party and shared the new ideology; he became head of the prehistory section of the SS-Ahnenerbe, an association founded in 1935 by members of the Nazi secret police (Schutzstaffel, or SS) with the aim of studying the German past.

The situation for Gerhard Bersu (1899- 1964) and Gero von Merhart (1886-1959) was very different. In 1935 Bersu was removed from his post as first director of the RGK because of his Jewish background. He left Germany in 1937 and spent the war years in England, where his excavations at Little Woodbury contributed to the development of British field archaeology. Gero von Merhart, a professor at Marburg University, was accused of not complying with the demands of the new regime by party members (including Reinerth) and was forced to retire.

Despite such cases of open discrimination, however, the Nazi influence on prehistoric archaeology was probably not as effective as it could have been. From the beginning there were conflicts between leading opponents of the new ideology, especially between scholars working in the Rosenberg office and those in the SS-Ahnenerbe. Both sections struggled for influence within Germany and, after the beginning of the war, within the countries that Germany occupied, where they confiscated whole museum collections and transported them back to their homeland. In the end Jankuhn's SS-Ahnenerbe proved to be more successful, and Reinerth and his adherents came under pressure during the war.

Looking at these developments, it comes as no surprise that after Germany lost the war in 1945, the reputation of its prehistoric archaeology was diminished. As a consequence of the misuse of archaeological knowledge for political reasons, the discipline's central paradigm was suspect, and the prospect of Germans writing a prehistory of European peoples seemed illusory. No alternative paradigms had been developed over the Nazi period. From an organizational point of view, however, the structure of the discipline was kept intact despite changes in personnel.

When Bersu returned to office and reorganized the work of the RGK in Frankfurt, Reinerth was banned from holding a publicly funded post in West Germany. He became director of the Lake Village Museum (Pfahlbaumuseum) at Unteruhldingen on Lake Constance, a private institution. But Reinerth was the only person eliminated from public service. Despite their membership in the SS many other prehistorians eventually held high positions within the discipline. Jankuhn, for example, ultimately became the director of the University Institute at Göttingen, continuing his research on the social and economic problems of pre- and proto-historic communities of northern Germany and directing large archaeological projects on the coastal region of northwest Germany.

With the partition of Germany into two opposing political systems-the capitalist Federal Republic of Germany (FRG) and the socialist German Democratic Republic (GDR)-cold war prehistoric archaeology also became paradigmatically divided into two camps. In West Germany a traditional culture-historical approach still dominated, but in East Germany a small group of archaeologists lead by Karl-Heinz Otto (and later Joachim Herrmann) tried to develop a specific Marxist approach to prehistory. Although a large number of publications were produced, this project ultimately proved unsuccessful. In practice most East German archaeologists continued to adhere to the traditionalist, culture-historical outlook.

Apart from these ideological battles, the post-World War II period, especially the decades between 1960 and 1990, was characterized by the major development of state archaeological services, in both the FRG and the GDR. In the short time since German reunification in 1990, there has been a reorganization of institutions, and some attempts have been made to achieve a paradigmatic renewal of German archaeology. Because it is too early to speculate about the outcome of these efforts, the main contributions of the German tradition to the development of prehistoric archaeology will be summarized

in the following section.

Main Contributions of the German Tradition of Prehistoric Research

From a long-term perspective at least four central aspects characterize the archaeology of German-speaking

Today German prehistoric archaeology is appreciated worldwide for its solid and meticulous work on primary evidence, for its careful source criticism, and for its prolific publications. It would be unfair, however, to limit the acknowledgment of German scholarship to these points alone. In the past more abstract ideas played an important role, especially with regard to the concept of writing history by archaeological means and, even more concretely, writing the history of prehistoric peoples.

Ulrich Veit

See also

German Classical Archaeology; Lindenschmidt, Ludwig

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College.

Getty Museum

The J. Paul Getty Museum was established in 1953 to make Getty's personal collections of Greek and Roman antiquities, French decorative arts, and European paintings available to the public. Located first in one wing of a ranch house in a Malibu Canyon in California, the museum moved in 1974 into a Roman-style villa built on the same site. Designed with the assistance of Norman Neuerburg, the plans for the building were adapted from the ground plans of the original Villa dei Papirii in herculaneum in italy, which has not yet been fully excavated; various other Roman villas in pompeii and Herculaneum provided the inspiration for the building's elevations and interior and exterior architectural details and wall paintings.

Although the museum as an institution has never participated in archaeological excavations, it has served as a resource and sponsor for archaeological and archaeometric research. Its collections now include over 25,000 ancient objects in various media; most represent the cultures of greece and Rome, though some examples of the arts of cyprus, Persia, and Egypt are also included. The primary collections include Cycladic sculpture and terracottas, Greek and Roman sculptures in stone and bronze, Greek and southern Italian vases, Greek and

Ghosh, Amalananda

(1910-)

Along with Indian archaeologist hasmukh d. sankalia, Amalananda Ghosh was the most important archaeologist of postindependence India. From 1953 to 1965 he was the director general of the Archaeological Survey of India, which he had joined in the 1930s, and a tremendous surge of work that was initiated all over the country, covering virtually all phases of cultural development, occurred as a result of his leadership and guidance.

Ghosh's early work was in Bihar in eastern India, where he surveyed early historic Asur sites on the Ranchi plateau and the Buddhist city site of Rajgir. English archaeologist mortimer wheeler supervised Ghosh's fieldwork at Taxila, India, and earlier Ghosh had been involved in the Archaeological Survey of India's excavations at Ahichchhatra in India. Soon after independence in 1948, Ghosh surveyed the Ghaggar Valley in the former Bikaner state of Rajasthan, which resulted in the discovery of a large number of Indus sites in that part of India. On the assumption of the office of the director-general of the survey, which greatly expanded in size under him, Ghosh had little time to be in the field for prolonged periods, but it was he who finally recommended sites for excavation and edited the reports of the survey's officers.

After retirement in 1965, Ghosh worked briefly in Indonesia and elsewhere and wrote a thoughtful volume, *The City in Early Historical India* (1973). The two volumes of the *Encyclopaedia of Indian Archaeology* (Ghosh 1989), which he painstakingly edited, carry, for those who knew him, the unmistakable stamp of his intimate familiarity with all the ways and byways of ancient Indian historical and archaeological scholarship. These include entries on Sanskrit and epigraphy, which were the foundations of his academic career. He established a school of archaeology in the survey to train staff, and it has served its purpose well.

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Gjerstad, Einar and the Swedish Cyprus Expedition

(1897-1979)

Einar Gjerstad first traveled to cyprus in 1924 to undertake postgraduate research. His *Studies on Prehistoric Cyprus* (1926) presented a summary of all known Bronze Age sites, and a critical evaluation of past research was presented alongside the results of his pioneering excavations of settlement sites. The typological and chronological systems he developed at this time and later remain fundamental to Cypriot research. After completing his doctoral work, Gjerstad conceived and organized the Swedish Cyprus Expedition.

There are few projects in the history of archaeology that match the scale and professionalism of the Swedish Cyprus Expedition. Together with the other three members of the expedition (Alfred Westholm, John Lindros, and Erik Sjoqvist-and their families), Gjerstad spent the years 1927-1931 surveying and excavating a series of twenty-five sites of all periods across the island. The expedition's

professional approach to excavation, recording, analysis, and publication resulted in the efficient production of the first three volumes of very substantial detailed site reports in 1934, 1935, and 1937 (*The Swedish Cyprus Expedition*). Six further volumes, containing syntheses and overviews, were published over the next thirty-five years. One of these, volume four, published in 1948, was Gjerstad's own study of the Cypro-geometric and Cypro-archaic periods. The Swedes set new, and very high, standards of efficiency, quality, and thoroughness for Cypriot archaeology, and the data they collected and the frameworks they developed continue to structure approaches to research on the island.

In 1935, Gjerstad turned his attention to the archaeology of early Rome following his appointment as director of the Swedish Institute there, but he maintained a continuing involvement in Cypriot archaeology.

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Gladwin, Harold Sterling

(1883-1983)

Harold Sterling Gladwin was born in New York City and educated in England. After returning to the United States in 1901, he became a stockbroker until 1922 when he moved to California and became associated with the Santa Barbara Museum of Natural History. Although his first scientific interest was with butterfly mutations, Gladwin also developed an interest in the prehistory of California, and that interest soon excluded any other and expanded to include the archaeology of the Americas with a particular interest in theories of migrations from Asia.

By 1924, Gladwin had become a friend of the great American archaeologist alfred v. kidder and a research fellow in archaeology of the Southwest Museum in Los Angeles. Gladwin began to excavate the ruins of the casa grande in Arizona, where he used occupation refuse to develop a chronology and identify the prehistoric Hohokam culture. His work revived archaeological interest in southern Arizona, which had been neglected since Frank Cushing's work twenty years earlier. In 1928, Gladwin and his wife-to-be, Winifred MacCurdy, established the Gila Pueblo Archaeological Foundation outside Globe, Arizona, and that foundation became the research center for Southwestern prehistory for the next thirty years. In 1951, Gila Pueblo was given to the University of Arizona, and its collections were transferred to the Arizona State Museum.

Gladwin created a number of new field methods, such as a method of archaeological surveying that allowed for extensive but economic data collection. The result was the establishment of records of 10,000 ruins and habitation sites across a huge area of the United States-from Montana to mexico and from California to the Mississippi River-and these records were the basis for ongoing research. His greatest contribution was in the area of cultural reconstruction, mapping large data sets over long time periods, and he was an early convert to the use of dendrochronology in archaeology. Gladwin's best known publications were *Men out of Asia* (1947) and his popular synthesis, *A History of the Ancient Southwest* (1957).

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Godwin, Sir Harry (A. J. H.)

(1901-1985)

A. J. H. (Harry) Godwin was born the son of a grocer, attended a local grammar school, and won a scholarship to Clare College, Cambridge, in 1918. Godwin studied both botany and geology, and he was influenced by the ecological work of the botanist Sir A. G. Tansley. Godwin obtained first-class honors at Cambridge and went on to study for a Ph.D. in plant physiology. He began teaching at Cambridge in 1923, moving from junior university demonstrator in botany to research fellow at Clare College in 1925, college fellow from 1934 to 1968, and professor of botany from 1960 to 1968, when he retired.

In 1923, Godwin began the systematic study of Wicken Fen, in Cambridgeshire, applying methods of pollen analysis to the deep deposits of peat in this fen (or swampland) to establish a long history of changes in its vegetation. Godwin proved the relationship between pollen zones and peat stratigraphy based on the identification and relative abundance of pollen grains of different trees in different strata-which helped define the ecology of the area during prehistoric times, i.e., its climate, forest composition, and agricultural practices. These data and their interpretation were published in *The History of British Flora* (Godwin 1950).

Godwin became a global leader in ecological thought and practice. He was president of the British Ecological Society in 1942-1943 and joint editor of the *New Phytologist* from 1931 to 1961. In 1948, he was founding director of the subdepartment of quaternary research within the School of Botany at Cambridge University.

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Holding this position until 1966, he contributed to the uses of radiocarbon dating, to the geological history of changes in land and sea levels, and to the archaeological implications of this work. He was elected fellow of the Royal Society in 1945, received the Prestwich Medal from the Geological Society of London in 1951, the gold medal of the Linnean Society in 1966, and was knighted in 1970.

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Golson, Jack

(1926-)

A native of Yorkshire, England, famed as a cricketer as well as an archaeologist of great skill and wisdom, Jack Golson studied archaeology at the University of Cambridge in the late 1940s and early 1950s. Originally intending to pursue research in medieval archaeology (he had embarked on graduate fieldwork at the abandoned English village of Wharram Percy in 1953), Golson soon emigrated to New Zealand to take up a position as the first prehistoric archaeologist appointed to the University of Auckland. His relocation to New Zealand lent great impetus to the development of prehistoric archaeology in that country and in the developing field of Pacific archaeology. Moving to the Australian National University (ANU) in 1961 to assume a founding position in prehistory, Golson set about conducting fieldwork in tropical northern Australia and encouraging the earliest of the thirty-nine graduate students who would earn Ph.D. degrees under his supervision.

Golson's role at the ANU (which concluded with his retirement in 1991) has marked him as one of the most significant archaeologists in Australia. However, it was his excavations in the western highlands of Papua New Guinea, particularly at the site of Kuk, that brought him considerable international fame due to the site's association with evidence of early agriculture in the region. A past president of the world archaeological congress, Golson is an inspiring educator and scientist whose strong political and ethical principles have done much to establish the special character of Australian and Oceanic archaeology.

Tim Murray

See also

Mulvaney, John; New Zealand: Prehistoric Archaeology; Papua New Guinea and Melanesia

Gorodcov, Vasiliy Alekeyevich

(1860-1945)

Vasiliy Alekeyevich Gorodcov was born in the Russian province of Riazan. The son of a village sexton, he initially studied to become an Orthodox priest but instead joined the army, serving as an officer from 1880 until 1906. Gorodcov's interest in archaeology was inspired by his reading of Anuchin's Russian translation of John Lubbock's (lord avebury's) *Prehistoric Times,* and he began to undertake field surveys in the areas where his military unit was stationed.

In 1887, Gorodcov attended the Seventh Archaeological Congress and reported on some Neolithic sites he had found, but it was not until the following congress in Moscow that prehistoric archaeology, with the support of the geographer and anthropologist Anuchin and the geologist Inostrantsev, became part of the congress agenda. In response to the interest in prehistoric sites and the need for archaeological mapping, Gorodcov mapped the Neolithic settlements of the Oka River and began to excavate the dunes. In 1901, when he was transferred to the southern part of the Russian Empire, he

excavated burial mounds in the Donets River basin and organized excavations in the Izium district of Kharkov; in 1903, there were more excavations in the Bakhmut district of Yekaterinoslav Province. In 1905 and 1907, in the monumental transactions of the Twelfth and Thirteenth Archaeological Congresses, Gorodcov published the full reports of all of these excavations, including summary tables for the distribution of grave materials and photographs that were a model of archaeological reporting for their time.

The scope of Gorodcov's fieldwork was extraordinarily wide, but he also became interested in the theoretical and methodological analysis of archaeological material. In a paper of 1902 entitled “Russian Prehistoric Ceramics,” he attempted to create a universal classification system for pottery that was even more rigorous

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Golson, Jack

(1926-)

A native of Yorkshire, England, famed as a cricketer as well as an archaeologist of great skill and wisdom, Jack Golson studied archaeology at the University of Cambridge in the late 1940s and early 1950s. Originally intending to pursue research in medieval archaeology (he had embarked on graduate fieldwork at the abandoned English village of Wharram Percy in 1953), Golson soon emigrated to New Zealand to take up a position as the first prehistoric archaeologist appointed to the University of Auckland. His relocation to New Zealand lent great impetus to the development of prehistoric archaeology in that country and in the developing field of Pacific archaeology. Moving to the Australian National University (ANU) in 1961 to assume a founding position in prehistory, Golson set about conducting fieldwork in tropical northern Australia and encouraging the earliest of the thirty-nine graduate students who would earn Ph.D. degrees under his supervision.

Golson's role at the ANU (which concluded with his retirement in 1991) has marked him as one of the most significant archaeologists in Australia. However, it was his excavations in the western highlands of Papua New Guinea, particularly at the site of Kuk, that brought him considerable international fame due to the site's association with evidence of early agriculture in the region. A past president of the world archaeological congress, Golson is an inspiring educator and scientist whose strong political and ethical principles have done much to establish the special character of Australian and Oceanic archaeology.

Tim Murray

See also

Mulvaney, John; New Zealand: Prehistoric Archaeology; Papua New Guinea and Melanesia

Gorodcov, Vasiliy Alekeyevich

(1860-1945)

Vasiliy Alekeyevich Gorodcov was born in the Russian province of Riazan. The son of a village sexton, he initially studied to become an Orthodox priest but instead joined the army, serving as an officer from 1880 until 1906. Gorodcov's interest in archaeology was inspired by his reading of Anuchin's Russian translation of John Lubbock's (lord avebury's) *Prehistoric Times,* and he began to undertake field surveys in the areas where his military unit was stationed.

In 1887, Gorodcov attended the Seventh Archaeological Congress and reported on some Neolithic sites he had found, but it was not until the following congress in Moscow that prehistoric archaeology, with the support of the geographer and anthropologist Anuchin and the geologist Inostrantsev, became part of the congress agenda. In response to the interest in prehistoric sites and the need for archaeological mapping, Gorodcov mapped the Neolithic settlements of the Oka River and began to excavate the dunes. In 1901, when he was transferred to the southern part of the Russian Empire, he

excavated burial mounds in the Donets River basin and organized excavations in the Izium district of Kharkov; in 1903, there were more excavations in the Bakhmut district of Yekaterinoslav Province. In 1905 and 1907, in the monumental transactions of the Twelfth and Thirteenth Archaeological Congresses, Gorodcov published the full reports of all of these excavations, including summary tables for the distribution of grave materials and photographs that were a model of archaeological reporting for their time.

The scope of Gorodcov's fieldwork was extraordinarily wide, but he also became interested in the theoretical and methodological analysis of archaeological material. In a paper of 1902 entitled “Russian Prehistoric Ceramics,” he attempted to create a universal classification system for pottery that was even more rigorous

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than the Linnaean system for biology. He based it on his classification for fragmentary Neolithic ceramics, from which he could define territorial and chronological boundaries of groups as well as contacts and influences, a system more useful for diffusionists than for evolutionists. Between 1908 and 1916, Gorodcov published his analyses of pre-Scythian burial mounds-a quantum leap for prehistoric archaeology in russia, taking it from antiquarianism to twentieth-century science through his delineation of pit, catacomb, and timber graves and the Indo-European origins of their occupants.

In 1907, after his retirement from the army, Gorodcov began to teach archaeology at the Moscow Archaeological Institute. In 1908 he published the first part of his lectures as *Prehistoric Archaeology,* and in 1910 the second part, *Everyday Archaeology,* appeared. Both served as basic manuals and reference books for decades in russia. In 1919, Gorodcov became professor at Moscow University and in 1923 head of the Archaeological Department of the Russian Association of Scientific Research Institute of Social Sciences (RANIION).

An active school of archaeology formed around Gorodcov, and many Russian archaeologists of the second half of the twentieth century were taught and influenced by him. In 1933, some of his work on classification was translated into English and influenced the North American archaeologists Clyde Kluckhohn and irving rouse. He survived the Stalinist political upheavals of the early 1930s, and the radicalism of Marxist archaeology, and received an honorary doctoral degree in 1934.

Leo Klejn

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For references, see *Encyclopedia of Archaeology: The Great Archaeologists, Vol. 1,* ed. Tim Murray (Santa Barbara, CA: ABC-CLIO, 1999), pp. 261-262.

Graebner, Fritz

(1877-1934)

Fritz Graebner was born and studied history in Berlin, where by chance he became a research assistant in the Royal Museum of Ethnography in 1899. By the time he graduated from Berlin University a year later, Graebner had become fascinated by ethnographic problems and had begun working with the museum ethnographer Bernard Ankermann. In 1904, Graebner and Ankermann founded *Kulturkreislehre* ("study of culture circles," or "cultural-historical ethnology") within the Berlin Society for Anthropology, Ethnology, and Prehistory. Stimulated by the work of anthropologist Leo Frobenius and the geographer friedrich ratzel, Graebner and Ankermann lectured on *Kulturkreise* ("culture circles") and *Kulturschichten* ("culture strata") in Oceania and Africa, rejecting the then-dominant biological-evolutionary concepts of ethnography.

In 1907, Graebner moved to Cologne to work at the new Rautenstrauch-Joest-Museum where he was able to research the museum's collections and continue his work on theoretical issues. The result of was his book *Die Methode de Ethnologie* [The Method of Ethnology] in which he argued for an epistemology of "culture-historical" research, emphasizing the importance of culture-historic connections for the interpretation of data and the understanding of development sequences. With the museum's director, Willy Foy, Graebner founded the museum's publication *Ethnologica*.

Graebner's area of fieldwork was the South Pacific, and he published wide culture-historical-based work concerning that area. In 1914, while trying to leave Australia after a conference, he was arrested and interned for the duration of World War I.

After his return to Germany, he studied for his Ph.D. at the University of Bonn and became a professor there in 1921. He succeeded Foy at the museum in Cologne in 1925 and became a professor at the University of Cologne in 1926. Ill health caused his early retirement in 1928, and he moved back to Berlin. Graebner's studies of Oceania are still relevant today, but his culture-historical theories, which greatly influenced researchers in Vienna, central Europe, and Scandinavia until the middle of the twentieth century, are today regarded as crudely reducing cultural variation to a few key geographic influences.

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Great Zimbabwe

Great Zimbabwe stands at the top of a granite hill in the modern nation of Zimbabwe, in the center of the Victoria District. The site consists of a stone-walled settlement composed of enclosures, towers, portals, and staircases, occupying both the hilltop and the valley below. Great Zimbabwe existed for over 500 years as a bustling center of trade and commerce, and it politically dominated the surrounding valley and plateaus. At its peak, around a.d. 1200, it was probably the largest settlement in sub-Saharan Africa (Ndoro 1994). Built by ancestors of the present Shona people, Zimbabwe derived its name from the Shona word for "houses of stone." In 1980 Rhodesia was renamed Zimbabwe in recognition of the country's cultural heritage.

First documented by Portuguese explorers in the sixteenth century, the site was noted for its carvings and sophisticated architecture. From the beginning of colonial contact in the nineteenth century, the city's origins were a focus of controversy. Europeans were unwilling to recognize a connection between the impressive ruins and the indigenous Shona people of the area. Instead, explorers and excavators proposed a range of sources for Great Zimbabwe, suggesting, for example, that it was a palace of the Queen of Sheba or King Solomon or a monument built by the Phoenicians, south Indians, or Arabs. These attempts to strip the local African people of their archaeological past persisted well into the twentieth century and served as a tool in the recession efforts of the white Rhodesia Front government in the 1960s (Mahachi and Ndoro 1997).

The ruins were looted repeatedly beginning in the late 1800s in an effort to find the legendary gold of King Solomon and to carry away ornamental stonework and artifacts. Richard Hall was appointed curator of the site in 1902 and conducted large-scale, unscientific excavations that resulted in the destruction of almost all culture-bearing deposits in the stone enclosures. Later archaeologists, such as gertrude caton-thompson who excavated in the 1930s, argued that the site showed evidence of local African development and had clearly been built by indigenous inhabitants. Such views were largely ignored, however, in favor of sensationalist foreign-origin theories. Recent research supports the African Iron Age provenance of the site, and current investigations are being conducted by Zimbabwean archaeologists such as Kundishora Tungamirai Chipunza and students eager to reclaim their history.

Inhabited from a.d. 900 to 1450, Great Zimbabwe occupied an important trade position between the Zimbabwean plateau and the Indian Ocean coastline. Its wealth was derived from control of local gold and ivory production and trade of the resulting goods with Arab and Swahili merchants. The city functioned as a marketplace and trade emporium, importing such exotic items as cotton cloth, Persian glass beads, and Chinese porcelain. The political influence of the Great Zimbabwe complex extended as far as Mozambique, Botswana, and South Africa; other important contemporary sites of this Zimbabwe Tradition include Khami, Nalatale, Danamombe, and Tsindi (Chipunza 1997).

Inhabitants raised cattle, cultivated sorghum and millet (Callahan 1998), and depended on food tribute from surrounding farming communities. The center declined with the degradation of the local environment (including depletion of the soil and exhaustion of firewood sources), due to the demands of a dense urban population. The Shona inhabitants had largely abandoned the area by 1500, only to be forced back by European settlement of the more fertile and productive high plains areas during the colonial period. The widespread distribution of the Shona language over this area today gives support to the idea that a powerful trading empire was based at Great Zimbabwe in the past (Callahan 1998).

The stone walls of the hilltop complex delineate a classic African village design, containing groups of wattle-and-daub huts within each stone-walled enclosure. These would have been occupied by elite family groups associated with the settlement's leader (Callahan 1998). The ruler lived in the uppermost

enclosure, removed from the common people and proclaiming his or her power through the visible manifestation of stone walls and towers (Pwiti 1996). Architectural similarities found in other ruins on the Zimbabwe plateau indicate that Great Zimbabwe had established hegemony over a network of trading centers and gold and ivory production sources. This dominance may have been achieved by installing members of the royal family as local leaders in the outlying sites.

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The permanent population in the surrounding valley numbered between 3,000 and 6,000 people; at its height, Great Zimbabwe itself may have had a population between 12,000 and 15,000 people (Ndoro 1997). The site occupies about 1,800 acres and consists of three main parts-the Hill Complex, the Great Enclosure, and the Valley Ruins (Ndoro 1997). The stone walls, rising up to 11 meters, were not constructed according to a preconceived plan. Instead, workers built and expanded walls as the need arose, creating an organic settlement plan.

The Hill Complex occupies the top of the granite hill that dominates the site. This area was inhabited dating to the early Iron Age, before the use of dry stone walling. Sophisticated engineering techniques were employed to stabilize the walls in the complex on the uneven granite boulders that were incorporated into the architecture. The Great Enclosure is located in the valley and includes a 178-meter-long outer wall and an interior conical tower, decorated with stones in a chevron-and-checker pattern. The Valley Ruins are located between the Hill Complex and Great Enclosure and consist of several individual enclosures with parallel passages connecting them (Ndoro 1997).

Erosion has been a problem at the site since Hall's excavations in 1902, when large soil deposits were removed without backfilling, and it has been made worse by reconstruction efforts that entailed the removal of earthen structures and archaeological deposits surrounding the stone walls. In the 1950s all wooden structural elements were removed for carbon dating, resulting in further damage. Future efforts at the site include the preservation of fragile stone architecture, a more accurate restoration of material remains, and the integration of the Shona's historical beliefs into the official literature interpreting the site for visitors (Ndoro 1994).

Thalia Gray

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Greece

The astonishing wealth of archaeological material found in Greece over the last 300 years has provided something of interest to virtually everyone that has seen it, and the precise nature of that interest has varied greatly according to the culture and personality of the viewer. Art historians from Enlightenment Europe, intellectuals from a newly independent Greece, U.S. university professors between the two world wars, and the local schoolchildren and foreign tourists of today have all looked for different archaeologies of Greece, and so far, Greece has always been able to provide them.

The history of archaeology in Greece has often been told from the point of view of the

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perfection to revive western European art, and a convenient location to house a military garrison. To understand the history of archaeology in Greece, we need to investigate a wide range of participants and place them within their social and political contexts.

Art, Enlightenment, and Statue Smuggling

During the eighteenth century, the aristocrats of western Europe were educated in the classics, and part of a young man's education was to go on “the grand tour” of classical sites. They first went mainly to Italy, the home of western Christianity and the Renaissance and thus more relevant to European culture. Gradually their destination changed, as the Enlightenment encouraged reason, logic, and a belief in human progress as opposed to an unquestioning acceptance of a universal order imposed by God. The relics of Christianity became irrelevant, and the search for the origins of Europe led to the art and architecture of ancient Greece.

As the new values became prevalent, painters and architects were dispatched to Greece to record this first flowering of European civilization and thereby rejuvenate the art of their own more decadent times. In 1751, for example, a prestigious London dining club called the society of dilettanti sent the painter James Stuart and the architect Nicholas Revett to Athens to paint and record the ruins there. Their meticulous work was marred only by minor inaccuracies in recording the higher parts of the temples, owing mainly to a chronic shortage of ladders. The four volumes of *The Antiquities of Athens* published between 1762 and 1816 were intended entirely for a British audience and provided models for the then-current craze for Greek architecture and ornament. The Ottoman governors of Greece, when it suited them, were happy to gain credibility with the European powers by allowing their painters and architects to record apparently valueless ruins. As for the local inhabitants, they only appeared as small and stereotypical figures in the paintings to provide local color and a scale for the architecture of their ancestors.

By 1800 the shift in European intellectual fashion from Italy and Christian origins to Greece and European origins was complete and was further heightened by the Napoleonic Wars, which prevented easy travel to Italy. There was yet another intellectual change. Eighteenth-century art historians, particularly the Prussian johann joachim winckelmann, had used ancient texts to elucidate the Greek spirit that lay at the origins of European civilization. Thanks partly to the efforts of Stuart and Revett and their successors, there was, by the early nineteenth century, a firm interest in the monuments and masterpieces themselves.

When lord elgin was appointed British ambassador to Constantinople in 1799, he originally intended only to make casts of the Parthenon sculptures for the inspiration of British artists. Ottoman gratitude for British help in removing the French from their province of Egypt gave him the opportunity to go further, however, and between 1801 and 1804 he was able to remove and export the actual pieces. The removal was not without criticism. The British architect Robert Smirke, watching Elgin's men extracting the sculptures, commented on his feelings: “a strong regret” as they were being taken “as a sort of signal of the annihilation of such interesting monuments.”

Smirke's reservations were amply confirmed by the activities of European architects and agents in Greece during the first two decades of the nineteenth century. Not content with painting and measuring, they competed with each other in finding and removing statuary and even whole buildings for their various collections and national museums. If they could not gain permission, then perhaps the local governor could be bribed; if not, they could smuggle the statues out of the country by night. In 1811, for example, the English architect Charles Cockerell managed to send his newly discovered statues from the Temple of Aphaea on the island of Aegina to Athens with the help of a bribe to the pasha of the islands.

From there they were smuggled out from a small fishing village to the island of Zante (now Zákinthos or Zacynthos), which was then under British occupation. At an international auction for the pieces the next year, the british museum representative was misdirected to Malta, and the statues were snapped up by the

agent of Prince Ludwig of Bavaria for £6,000. Like the scramble for colonies in the later part of the century, western powers scrambled for Greek statuary to inspire their artists and bring prestige to their museums and their countries.

Archaeology and Hellenism in Independent Greece

Five years before the auction of the Aegina Marbles, the leading intellectual of the Enlightenment in Greece, Adamantios Koraïs, had called for the protection and preservation of Greek antiquities. The year after the auction, in 1813, a group of Greek intellectuals formed the Philomousos Eteria, or Society of Lovers of the Arts. Their aim was to discover antiquities and display them in a museum, originally intended to be the Erechtheum in Athens, for the benefit of the people of Greece in general and the country's youth in particular. Under Ottoman rule little progress could be made, but a revolution in 1821 and the eventual independence of the southern part of Greece under a Bavarian monarch in 1832 changed the situation. Even in 1825 the temporary government had protested the looting of antiquities and proposed setting up a museum in every school to teach future generations the importance of their ancestors.

One of the earliest laws that the new government passed concerned the archaeological heritage of the Greek nation. This law, passed in May 1834, declared that all antiquities were “national heritage” and “state property” and could not therefore be exported. Excavations could be carried out only with a permit. The foundation of the Greek Archaeological Service the next year provided the personnel and infrastructure to carry out excavations in the new state and marked a major shift toward Greek-run projects.

The reason for the major emphasis on archaeology lay in the ideology of the new kingdom and its need to create a new and widely accepted identity. Previously the inhabitants of this relatively unimportant Ottoman province had called themselves *Romei* (“Romans”) and Orthodox Christians; they were ruled by Ottoman governors and by local chiefs and aristocrats who had attained some measure of autonomy-all of which hardly made them members of a modern European nation. Thanks to the European Enlightenment, however, they could appropriate their own classical past and identify themselves with “the Hellenes,” the originators of European civilization. To do so required knowledge and control of the classical past, discovery of the tangible monuments of that past, and appropriate education of the people now to be called Hellenes.

The most famous symbol of the Hellenic past was the Acropolis, but the four classical structures that can be seen there today-the Parthenon, the Erechtheum, the Propylaea, and the Temple of Athena Nike-had been converted, respectively, into a mosque, an armory, a fortress, and a bastion. Visually, they were dominated by a tall Frankish defensive tower beside what had been the Propylaea and were surrounded by a warren of small houses and alleys. The task of the new Archaeological Service was to purify this morass of different periods and peoples. Under the directorship of Kyriakos Pittakis, conservator of antiquities from 1836, the mosque and minaret within the Parthenon were demolished, the Venetian and Turkish defenses were removed, the various houses and streets were destroyed, the blocks of the Temple of Athena Nike were discovered and reconstructed, and the Erechtheum porches were restored. This work of cleaning and restoring continued into the 1860s when the Acropolis Museum was built, and finally, in 1874, the Archaeological Society of Athens, with financial help from the archaeologist Heinrich Schliemann, demolished the Frankish tower. The Acropolis was thus returned to its original “pure” classical form with all its barbarian accretions removed.

There were dissenting voices. Not everyone, including some Greek intellectuals, agreed with the removal of all traces of later periods. King Otto, the son of the same Ludwig of Bavaria who had so eagerly

acquired the Aegina Marbles, was wholeheartedly in favor of Greek classicism, but he and his advisers also favored the Byzantine period, which was a better symbol of stable autocracy than the warring democracies and oligarchies of the classical city-states. In

1837, Otto passed a royal decree protecting Byzantine monuments as Greek archaeologists were happily destroying them in their enthusiasm for the classical antiquities that lay beneath. Greek archaeology, however, was firmly launched on a classicist agenda, and that agenda culminated in 1889 with the completion of the National Museum, an imposing Greek Revival structure designed to display the national heritage in suitable classical grandeur.

The western end of the Acropolis in Athens as seen from the pediment of the Parthenon ca. 1801. The Frankish tower stands in the center. Drawing by Sir William Gell.

(British Museum)

The Foreign Missions

The Greek state and the growth of the Greek Archaeological Service did not, of course, mean an end to foreign participation in archaeology in Greece. As archaeological methods improved during the nineteenth century, teams from Germany, Great Britain, the United States, France, and elsewhere were keen to excavate major classical and prehistoric sites. The difference was that foreign projects were now carefully controlled and they were entirely at the mercy of the Greek government, which often gained considerable prestige and power from the situation.

A good example of the need for control was Heinrich Schliemann's work at Mycenae in 1874. He brought with him from his excavations at Troy in northwestern Anatolia a reputation for smuggling gold artifacts out of the country without the knowledge of the Ottoman authorities and generally for trying to get round his permit in any way possible. The Greek government had actually given the permit to excavate at Mycenae to the Greek Archaeological Society, but as often happened, it was short of funds and asked Schliemann to excavate on its behalf and at his expense.

The government was decidedly wary of Schliemann but finally agreed to his excavation on condition that he was supervised by Panayiotis Stamatakis, on behalf of both the society and the government, and that all the finds would belong to Greece. The gold masks and jewelry that Schliemann's excavations uncovered in the sixteenth-century b.c. shaft graves are well known. Less well known are the briefness of Schliemann's visits to the site, his impatience with the classical and Roman material that interfered with his search for Agamemnon, and the constant difficulties of Stamatakis, who was actually running the excavation but with every obstruction put in his way by Schliemann and his Greek wife, Sophia.

It was clearly easier for the Greek government to deal with respected foreign institutions such as universities and museums. It was also easier for the foreigners to have representatives of their countries permanently in Athens to carry on the often complex negotiations with the government. The first foreign school of

new law in 1928 limited the foreign schools to three excavation permits each. But with the economic problems of the late 1920s and early 1930s, the Greek Archaeological Service was almost bankrupt. For this reason, one of the potentially most exciting sites in Athens, the Athenian Agora, had to be given to the Americans. Between 1927 and 1940, they lavished on the site $1 million donated by John D. Rockefeller alone, quite apart from other sources. Much of the money went for expropriating the land from the several thousand refugees from Asia Minor who had inhabited it since 1922. In spite of gaining independence and control over its own archaeology, Greece could not quite escape the influence of the western archaeological powers.

Part of Arthur Evans's workforce in the Hall of the Double Axes at the Palace of Knossos in 1901

(Ashmolean Museum)

The Advance of Method and Chronology

As early as 1852 the German archaeologist ernst curtius began raising money for a new type of excavation at Olympia, one that would not remove archaeological material to other countries but one that would systematically record and analyze this important site. It was only after Schliemann's more dramatic, if less systematic, work at Mycenae and elsewhere that the Germans (and others) began to appreciate the need for large-scale, well-funded projects. Curtius finally won his funding in 1875, and a treaty was signed between Germany and Greece allowing the German Archaeological Institute (deutsches archäologisches institut--dai) to undertake systematic exploration at Olympia, on condition, of course, that all finds remained in Greece. Stratigraphy and particular find spots were carefully recorded, structures underwent architectural analysis, and the Olympia excavations became a model of the new systematic, scientific excavation methods.

Another result of Schliemann's massive self-publicity was a sudden interest in the prehistoric period. The key figure here is Christos Tsountas, who followed Schliemann at Mycenae and worked there over a period of more than two decades as well as at numerous other Bronze Age and earlier sites all over the mainland and islands of Greece. Unlike his predecessor, Tsountas set out, not to prove a myth, but to investigate material culture and the development of human society. He achieved his aims partly by remarkable finds, such as an undisturbed fifteenth-century b.c. princely tomb at Vapheio in Laconia, which he excavated in 1889, complete with weapons, jewelry, and gold cups. More pertinently, through the meticulous excavation of a broad range of sites, particularly cemeteries, and the careful comparison of their materials, he was able to put together a broad picture of the development

of prehistoric Greece. *The Mycenaean Age*, written by Tsountas and J. Irving Manatt and published in 1897, was the first great synthetic work of Aegean prehistory, and the book made the subject the major branch of Mediterranean archaeology that it has been ever since.

Improvements in excavation techniques were accompanied by a general systematizing of the analysis of artifacts, particularly pottery, the basis of most archaeological dating. Before and after World War I, the Englishman Alan Wace and the American Carl Blegen complemented Tsountas's work by producing a coherent and precise chronology of pre-Mycenaean pottery. In the field of classical archaeology, the first half of the twentieth century was characterized by connoisseurship. Archaeological knowledge was ordered and classified, with artifacts being sorted and pigeonholed into vast corpora of inscriptions, coins, potsherds, figurines, lamps, and so on. The ultimate analysis was that of Greek vases by the Oxford art historian john beazley. By identifying characteristic stylistic traits and mannerisms, as well as using the occasional signatures, he managed to detect the “hands” and “workshops” of individual ancient painters. Classical archaeology remained subservient either to art history, with statues, vases, and buildings being taken out of context as works of art, or to textual history, where the objects merely illustrated the accounts of Thucydides, Euripides, and the other classical writers.

Further changes came to archaeological methods and interpretations in the 1960s with the advent of scientific techniques and processual archaeology. Prehistorians such as Colin Renfrew led the way in modeling the influences and processes that had caused social change in the past. Most classical archaeologists remained firmly entrenched within their empiricist and descriptive traditions until the 1970s and 1980s when scholars such as Anthony Snodgrass began using the contextual analysis and theories of social change that are more normally associated with prehistory to question the rich range of data from the Iron Age and classical period.

Another striking change in archaeological methodology in Greece during the last two decades of the twentieth century was a rapid growth in the popularity of archaeological survey and landscape archaeology. These involved the use of a very different technique than that used in the exploration and site-hunting by earlier archaeologists. Teams of field-walkers covered large areas of landscape systematically and intensively, recording and sampling the surface material they found. This allowed an examination of small rural sites such as farmsteads and hamlets and when combined with geomorphological mapping and other disciplinary studies, enabled investigators to study the development of agriculture, ancient soil management, and a host of other off-site activities.

Because such survey projects found material of all periods, especially the late post-Roman period, they sparked an important interest in the archaeology of medieval and Ottoman Greece, in striking contrast to the classical purists of the nineteenth century. In 1988, the Greek government amended the antiquities law to allow each school to run three surveys and three excavations each year, and Greece now leads the eastern half of the Mediterranean in the field of archaeological survey.

The Archaeology of the Greek Nation

“Hellenic archaeology, gentlemen, is not a profession but a sacred mission.” So spoke Georgios Oikonomos, secretary of the Archaeological Society of Athens, during preparations for the society's centenary in 1937. Ever since the War of Independence, in the first third of the nineteenth century, archaeology had been something greater than a job or an interest. Classical antiquities were considered to be almost sacred relics that expressed the innermost spirit of the Hellenic nation, which, above all, was the reason why the Greek state was determined to keep control over all artifacts and excavations and why it worked so hard from as early as the 1820s to educate future generations about the importance of the classical past.

The precise nature of this belief, of course, varied according to occasion and individual and developed in accordance with changing ideological and political conditions. Christos Tsountas, for example, was interested in the Mycenaeans for their own sake as they had an important and

fascinating culture. But he also felt it was important to refute the views of his foreign colleagues who declared that the Mycenaean civilization was non-European and certainly non-Greek. To Tsountas, the Hellenic spirit could appear at different times in different forms, and the rich culture of late Bronze Age Mycenae was one of those manifestations. He was proved right in a very literal sense in 1952 when the British architect Michael Ventris deciphered the Linear B tablets from the palace archives of the late Bronze Age and discovered that they were written in an early form of Greek.

In 1833, newly independent Greece encompassed only a fraction of its current area, and as new areas were gradually acquired, they had to be incorporated into the state. Archaeology played a vital role in this process of nation building. When Macedonia (that is, the current Greek province of Macedonia) became part of Greece after the Balkan wars of 1912-1913, a Greek Archaeological Service of Macedonia was immediately set up, and numerous excavation projects were organized. It was initially rather awkward that the area lacked much of the classical architecture and artwork of southern Greece, and as a result, there was a strong focus on the much richer Byzantine culture of the region. In the mid-nineteenth century, the Byzantine period had been considered unimportant or even shameful, a time when Greece was ruled by an outside empire. Now it was incorporated into the Hellenic heritage, and the Byzantine churches of Thessaloníki that had been converted into mosques were restored to their original “pure” form.

Archaeology in Macedonia, and its role within the Hellenic nation, received a major boost in 1977 when Manolis Andronikos discovered a rich fourth-century-b.c. tomb at Vergina in Macedonia. Quite apart from the elaborate wall paintings, armor, and silver vessels, a gold ossuary within a marble sarcophagus contained bones wrapped in gold and purple cloth that were identified as those of Philip of Macedon, father of Alexander the Great. The outer chamber of the tomb also contained a gold box holding cremated ashes and was embossed with a star burst, or “star of Vergina,” a symbol of the Macedonian kings. This archaeological discovery was widely believed to be a direct link with the Hellenic past. Macedonia was suddenly flooded with up to forty archaeological projects a year, and a wealth of publications appeared, both academic and popular. The star of Vergina became the national symbol of Greece in 1993, and when Andronikos died in 1992, he was given a state funeral and the honor of being the first Greek archaeologist to be depicted on a postage stamp.

The importance of archaeology to Greek national identity has, of course, led to disputes with other groups making rival claims to the past. One was with the former Yugoslav Republic of Macedonia, which also claimed the star of Vergina as a state symbol. Most well known is the dispute over the Parthenon (or Elgin) Marbles, which became a major national issue in the 1980s owing to the hugely popular ex-actress and minister of culture, Melina Mercouri. The campaign for the restitution of the sculptures by the British Museum is inspired above all by an almost religious belief in their centrality to Hellenic culture and identity. Manolis Andronikos, in a 1983 newspaper article, declared that “these sculptures belong to the most sacred monument of this country, the temple of Athena, which expresses the essence of the Greek spirit and incorporates the deepest nature of the Athenian democracy.”

Conclusions

Greek archaeology has never been static or monolithic. Nor is its history a mere list of discoveries and acquired facts. The antiquities of Greece and the societies that produced them were major players in the European Enlightenment, the development of western art, the new academic discipline of archaeology, and above all in the formation of the identity and character of an independent Greek nation. Such is Greece's archaeological wealth and variety that there is still material to satisfy all new trends in archaeology, from scientific techniques of dating and analysis to an interest in the entire landscape of a region to the recent growth in underwater archaeology. New trends will arise, but Greece will always

have the material to satisfy their pursuits.

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Although there has been great variety in the last 300 years of archaeology in Greece, some general themes are common to much of the period. The wealth of material has not always been beneficial, attracting treasure hunters and allowing academics to slide into mere description rather than the questioning and analysis of material. The balance between local and foreign participation has swung to and fro depending on the international relations of the time, but cooperation has always been to the benefit of all parties. Even the Cockerells and Schliemanns inspired important developments in the history of archaeology in Greece.

The most striking aspect of Greek archaeology is its unique double association with a national identity and an international culture. The antiquities of Greece do indeed lie at the heart of western culture, through the artistic and intellectual revolutions of classical Athens, their rebirth in the Renaissance, and the craze for neoclassicism in the eighteenth and nineteenth centuries, but they are also the inspiration and symbol of one of the proudest national identities in Europe. The history of archaeology in Greece reflects the tension between the two sides of this paradox, as locals and foreigners alike focus on a heritage that is both universal and uniquely Greek.

Michael Given

See also

Linear A/Linear B

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Green, Roger Curtis

(1932-)

Born in New Jersey, from an early age Green was interested in archaeology, and first studied anthropology at the University of New Mexico. He moved to Harvard to study for his doctorate in 1955, and was deeply influenced by Professor gordon willey's settlement pattern approach to archaeology. Green was also influenced by julian steward and Clyde Kluckhohn, but it was Douglas Oliver who steered him firmly away from the archaeology of the Southwest and Central America and toward the archaeology of the Pacific.

In 1958 Green took up a Fulbright Fellowship in New Zealand, based in the anthropology department at the University of Auckland. Here he worked with social anthropologist Ralph Piddington and British archaeologist jack golson. Green excavated a coastal midden at Tairua on the Coromandel Peninsula that was a landmark for its careful interpretation of all the material recovered, and for Green's use of what Golson has characterized as the “ecological approach.”

Green then undertook major fieldwork projects in French Polynesia, Samoa, and the Solomon Islands based on settlement pattern study and ethno-historic approaches, which established him as a major figure in the relatively new field of Polynesian archaeology. From 1961 to 1967 Green taught at the University of Auckland and carried out a number of small excavations and surveys to provide training and opportunities for students. He served a term as president of the New Zealand Archaeological

Association and played an important role in the early effort to establish protection for archaeological sites. He produced a major synthesis of the prehistory of the Auckland province and a revision of the Fijian sequence. Green also taught at the University of Hawaii.

Despite his activity in New Zealand, Green's major interest lay in tropical polynesia, and with support of the Bishop Museum in Honolulu, the U.S. National Science Foundation, and other institutions in New Zealand and Fiji, he returned to Western Samoa between 1963 and 1967 as part of the Polynesian Prehistory Program. From 1968 until 1970 Green undertook the Makaha Valley Historical Project in Hawaii, a major contract investigation funded entirely by private sources, which also made major contributions to the professional literature. Green also began his long collaboration with New Zealand ethnobotanist Douglas Yen at this time.

Green returned to New Zealand as the first Captain James Cook Fellow at the Auckland Institute and Museum and began a major fieldwork project in the southeast Solomons, co-directed by Yen and involving participants from New Zealand, Hawaii, and Australia. The major outcome of the project was the discovery of a number of sites containing Lapita pottery on the Santa Cruz and Reef Islands. This became the focus of his subsequent work. Green had been an important contributor to the definition of Lapita and other pottery in the central Pacific; now he was to become influential in defining the Lapita cultural complex in the western Pacific as well. The second phase of the southeast Solomons project during the late 1970s, again directed by Green and Yen, was concerned with Lapita sites on the Santa Cruz group.

During the 1970s Green wrote influential papers on the chronology of Oceanic languages, reviewed what was known about the Lapita cultural complex, and developed his ideas about Near and Remote Oceania. In the 1980s Green, along with archaeologist Dimitry Anson, undertook the reinvestigation of Lapita sites on Watom Island as part of the multi-institutional Lapita Homeland Project organized by Jim Allen, then of the Australian National University. The ongoing analysis of Lapita material from this project and from the Santa Cruz and Reef Islands absorbed Green over more than a decade.

In 1973 Green was appointed to a personal chair in the anthropology department at Auckland University, which he held until his retirement in 1992, and he then became professor emeritus. He has continued to exert an influence through his teaching and the supervision of numerous theses. He has played a major role in the growth of Pacific archaeology, and his culture historical approach has been influential. He has served on the council of the Royal Society of New Zealand and he was elected a Fellow of the Royal Society of New Zealand in 1975 and a member of the American Academy of Sciences in 1984.

Janet Davidson

See also

New Zealand: Historical Archaeology; New Zealand: Prehistoric Archaeology; Papua New Guinea and Melanesia

References

For references, see *Encyclopedia of Archaeology: The Great Archaeologists,* Vol. 1, ed. Tim Murray (Santa Barbara, CA: ABC-CLIO 1999), pp. 835-849.

Griffin, James Bennett

(1905-1997)

Griffin was born in Kansas, the son of a railway worker who eventually settled his family in Illinois. Griffin originally studied law and business at the University of Chicago but changed to anthropology. In 1930 he received his M.A. and began his long-term association with the Hopewell culture, digging the Morton site near Lewiston, Illinois. In 1931 he excavated late Algonkian and historic Delaware sites in Pennsylvania. In 1932 Griffin began a doctorate in American archaeology at the University of Michigan and became one of the founding members of the National Society for American Archaeology. In 1936 he received his doctorate for his dissertation that focused on the ceramics from the Norris basin in Tennessee.

From 1936 to 1941 Griffin was a research associate and associate curator in charge of the Ceramic Repository in the Museum of Anthropology at the University of Michigan. With this responsibility he began his lifelong investigation of eastern archaeology, characterized by specimen study and frequent travels to conferences

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and museums. In 1937 he helped to found the Southeastern Archaeological Conference in conjunction with James A. Ford, then a graduate student at Michigan. He also formulated the preliminary synthesis that became the intellectual background for his seminal paper on “Cultural Continuity and Change,” delivered at the American Anthropological Association meeting in 1941. Griffin's goals were always larger than mere cultural-historical integrations, although his forays into that realm were very influential. He was interested in cultural process. From early on he also repeatedly examined the connection of prehistoric remains to the historically recorded tribal units-*ethno-historic* concerns, as they are now termed. The cardinal rule of his investigations was to obtain as much firsthand knowledge of the sites and artifacts as he could, and in his search for broad expertise he traveled extensively. He was also open-minded about new methods of analysis. He helped to pioneer the use of Carbon 14 dating in North America and to establish the radiocarbon-dating laboratory in Ann Arbor, which would serve as a major source of New World dates for nearly twenty years.

During the war he taught economic and political geography to soldiers. In 1945 he was finally made an associate professor of anthropology with regular teaching responsibilities, and his title at the museum was upgraded to director in 1946. In 1941 Griffin had teamed up with James Ford at Louisiana State University and Philip Phillips of Harvard's peabody museum to undertake extensive field survey and archaeological testing in the Lower Mississippi Valley that continued during the war, resulted in a major and influential monograph, and was representative of his interest in spatial expanses and interareal interactions.

Over the next twenty-five years, until he retired in 1975, Griffin continued to build his record of accomplishments from his base in Ann Arbor. He became a full professor in 1949, and his teaching and extensive involvement with graduate students increased as the Museum of Anthropology and the department became one of the principal training grounds for North American archaeologists in the country. Griffin was president of the society for american archaeology from 1951 to 1952, and in 1957 the society awarded him the Viking Fund Medal for Archaeology for his achievements. He was made a member of the National Academy of Science in 1968.

Griffin's legacy to American archaeology was significant. His strong published record of basic research totaled more than 260 items. He affected the personal and intellectual lives of scores of students and scholars-by 1975 he had guided more Ph.D. candidates through their degrees than anyone else in the department. He had a fine-tuned ability to evaluate new data and new ideas critically. All serious students of the archaeology of eastern North America must acknowledge Griffin's contribution, whether their area is woodland influences on the western plains or on the mid-Atlantic coast or the question of Iroquoian origins in the Great Lakes region. Griffin covered an unequaled range of subjects in space and time.

Stephen Williams

See also

United States of America, Prehistoric Archaeology

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Guatemala

Guatemala is one of the five independent republics of Central America and comprises a major part of what is defined in archaeology as the Mesoamerican region. The population today is approximately 12 million, over half of whom are Indians of Maya ancestry. Some twenty-two Maya dialects have been identified since the Spanish conquest, as well as Pipil (Nahuat) and Xinca, which are currently nearing extinction. Today the predominant Maya language groups in Guatemala are the Quiche, Cakchiquel, Tzutujil, Kekchi, Pokomam, and Mam.

Two major geographic-ecological regions have affected cultural evolution through time: the tropical lowlands and the temperate highlands. The lowlands area includes the Pacific coast and piedmont zone and the entire northern

part of the country known as Petén. The highlands area is the mountainous and volcanic region that lies between the Pacific piedmont and Petén.

The history of Guatemala begins with its conquest in 1524 by Pedro de Alvarado, a trusted captain under Hernán Cortés in the conquest of Mexico. However, the area of Peten, occupied by groups such as the Maya Itzá, was not subdued until 1697. The country remained a Spanish colony until it gained independence, along with the rest of Central America, in 1821.

Precursors to Archaeological Exploration

Various letters and reports of the Spanish conquerors (e.g., Pedro de Alvarado and Bernal Diaz del Castillo) and early chroniclers described the Cakchiquel capital of Iximche and the Quiche capital of Utatlan in the highlands. Cortés wrote of various villages, such as Tayasal in Petén and Nito around Lake Izabal, on his march through the lowlands en route to Honduras in 1524 and 1525. All of these centers were abandoned by the inhabitants shortly thereafter. A few documents written by the Quiches and Cakchiquels in the early colonial period survive, including the *Popol Vuh* and the *Memorial de Tecpan Atitlan,* and these provide important information regarding these peoples' pre-Columbian history, their early migrations to Guatemala, and their worldview in general. Early land titles also contained references to events prior to the conquest. Reports by the clergy often provided valuable descriptions of native life, among them those by Bartolome de Las Casas in the 1550s, Bartolome de Fuensalida, and Juan de Orbita (1618-1619), and Andres de Avendaño y Loyola (1695-1696), as well as reports by the clergy to the various religious orders, such as those by Francisco Ximenez at the end of the seventeenth century.

The native population declined rapidly after the Spanish conquest, largely due to exposure to European diseases and the harsh conditions imposed by heavy labor in construction and agriculture. Christianization was achieved rapidly, and the influence of Christianity was seen in the native writings. These often reflected the biblical notions of the Spanish regarding the origins of the Americans, including the idea that they were descendants of one of the Lost Tribes of Israel. One exception was the work of Francisco Antonio Fuentes y Guzman who, writing in the 1700s, used the native documents and maps of the ancient centers to highlight the achievements and illustrious past of the former inhabitants and to show that the Guatemalan Indians of his day were descendants of those people (Fuentes y Guzman 1933, 2: 211, 3: 199).

The Enlightenment of the eighteenth century was reflected in Guatemala by a new interest in archaeological remains. The inclusion of Naples, Italy, in the Spanish domain during the reign of Carlos III awakened this interest and inspired the colonial authorities in Guatemala to carry out the first archaeological explorations on record. Between 1784 and 1789 three investigations were carried out in palenque and Chiapas, which today are part of mexico but at that time were still part of Guatemala. The reports, maps, and drawings from the third expedition were published in London in 1822 and circulated among the intellectuals of the era. The first museum in Guatemala, exhibiting both natural and archaeological specimens, was established by the Sociedad Economica in 1797. It functioned until 1801, when it was closed by the Spanish government on the pretext that it was involved in political movements toward independence from Spain (Lujan 1972, 354, 360).

Guatemala succeeded in obtaining its independence in 1821, along with the rest of Central America. In 1832, after a period of turbulence and civil wars, the government of Guatemala under Mariano Galvez organized an investigation of the archaeological sites of Utatlan and Iximche in order to put together an atlas and recapitulation of the history of the country. Galvez also reinstalled the Sociedad Economica and ordered that a new archaeological museum be established under its aegis (Lujan 1972, 364).

With independence from Spain, Guatemala experienced heightened interaction with the outside world, including the United States, England, France, and other European countries. During the time of the Federal Republic of Central

America, organized in 1823 and lasting until 1839, numerous archaeological explorations were carried out by Europeans and others. In 1839 and again in 1841 john l. stephens, a New Yorker, and the Englishman frederick catherwood traveled to Mexico and Central America and visited Maya sites such as Tonina, Palenque, and Uxmal in Mexico, Quirigua, Utatlan, and Iximche in Guatemala, and Copan in Honduras. Subsequently Stephens published his account of the trips, along with drawings by Catherwood, and this helped to call the attention of the world to the subject of Maya archaeology.

The Beginnings of Archaeological Investigation in the Nineteenth Century

The second half of the nineteenth century witnessed increasing archaeological explorations in the Peten both by Guatemalans and by foreigners. In 1848 Ambrosio Tut, a Guatemalan, discovered the ruins of tikal. He reported these to the governor of Petén, Modesto Mendez, who published information on the find in the local newspapers and in the journal of the Academia de Geografía e Historia de Guatemala. In the next few years he found more sites in the general area of Petén (Lujan 1972, 364). Toward the end of the century further exploration was encouraged by the interest of U.S. companies in obtaining chicle from the forest for the manufacture of chewing gum.

Carved monolithic head from Monte Alto

(Image Select)

Between 1881 and 1894 the Englishman Alfred P. Maudslay discovered and systematically issued reports on archaeological sites and monuments, all accompanied by excellent photographs and maps, which stimulated the first studies of Maya hieroglyphs. Slightly later the Austrian Tobert Maler discovered and photographed a number of sites along the Usumacinta River, and the results of his work were published by the peabody museum of Archaeology and Ethnology of Harvard University. The inception of coffee cultivation in Guatemala brought a number of Germans and other Europeans to the country to establish plantations, especially in the highlands. Karl Sapper, Otto Stoll, and Erwin Dieseldorff made important studies on the local ethnography and archaeology, especially in the region of Alta Verapaz.

The organization of liberal governments at the end of the nineteenth century promoted interest in pre-Columbian archaeology as a way of reconstructing national history. For this purpose Manuel García Elgueta, considered by some to have been the first Guatemalan archaeologist, carried out excavations in the highland sites of Xolchun and Chalchitan (Lujan 1972, 368). In celebration of the fourth centennial of the discovery of America in 1892, President José Maria Reyna Barrios ordered molds of monuments to be made and presented, along with archaeological objects, at the Columbian Exposition in Chicago and at another exhibition in Seville, Spain. During this endeavor the site of Ceibal in Peten was discovered by Federico Artes (Morley 1937-1938, 80). President Reina Barrios was the first government official to design laws to protect archaeological goods in the country, prohibiting the illegal excavation and exportation of these materials to other countries. The laws, however, were ignored during the following decades (Rubin de la Borbolla and Cerezo 1953, 13).

Professionalizaion of Archaeological Investigation in the First Half of the Twentieth Century

With the twentieth century came a new era in archaeological investigation in Guatemala, carried out by professional, trained archaeologists

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New Trends in Archaeological Investigations

Beginning in the late 1940s and continuing into the present, the Guatemalan government has focused on using archaeological sites to attract tourists. The first of such project was the restoration of the site of Zaculeu, the ancient Mam capital in the northwest highlands, financed from 1946 to 1949 by the United Fruit Company. The French Archaeological Mission carried out a similar project (1959-1974) at Iximche, the Cakchiquel capital in the central highlands at the time of the Spanish conquest, and another at Jilotepeque Viejo (formerly known as Mixco Viejo). The Tikal Project (1956-1969) was undertaken with the idea of developing it as a national park in the Peten, sponsored by the Museum of the University of Pennsylvania; with the cooperation of the Guatemalan government, almost $1 million was obtained for this project from various foundations in the United States (Rainey 1970, 3). In 1970 the project was taken over by the Instituto de Antropologia e Historia, and the investigations continue under Guatemalan direction at the present time, more recently with cooperation from Spain.

In the 1950s the Rockefeller Foundation funded an educational program in archaeology at the Universidad de San Carlos, the national university in Guatemala City, to train professionals in the field. The program was short-lived, but some of the students were able to continue their field training by participating in the Tikal Project. By 1967 the university established a formal program in archaeology in the form of a regular curriculum to obtain a professional degree. From this time forward archaeological field projects increased significantly in all regions in Guatemala. In 1981 the Universidad del Valle initiated its Department of Archaeology, where the Madeleine and Alfred V. Kidder Chair was inaugurated in 1986, providing the funds for student training.

The guerrilla warfare that disrupted Guatemala beginning in the 1960s and continued for the next thirty years seriously interfered with archaeological investigation. The conflicts causing this unrest were settled by the Peace Accords of 1998, which included new regulations concerning rights and public access to "sacred places," often synonymous with pre-Columbian sites. Another public concern in Guatemala is the issue of national identity, and for this theme archaeological, historical, and ethnohistorical information is essential and is receiving more attention. The ethnohistorical studies of the Quiche by Robert Carmack in the 1970s are a good example of the type of work being done in this area. The recently published *Historia General de Guatemala* is helping to incorporate the archaeological, historical, and ethnohistorical information into the educational system at all levels.

A law issued in Guatemala in the early 1980s requires construction companies to finance at least a year of excavation on the land on which they wish to build, especially if it is suspected that archaeological remains are present. The law has facilitated archaeological research in many areas, especially on the south coast and at Kaminaljuyu, located on the southwestern fringe of the modern capital of Guatemala City. Nevertheless, although more public attention is being drawn to archaeological information through education and the media, investigation is being seriously hampered by urban expansion and rampant looting.

The accompanying table presents a summary of some of the archaeological projects carried out in Guatemala since the 1970s.

Matilde Ivic de Monterroso and Marion Popenoe de Hatch

See also

French Archaeology in the Americas

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Guo Moruo

(1892-1978)

President of the Chinese Academy of Sciences from 1950 until his death in 1978 and Chinese Minister for Culture, Guo Moruo (or Kuo Mo-jo) was a famous writer, a poet, a cofounder of the literary Creation Society, and a radical who had communist leanings. In 1927 he escaped from china and Chiang Kai-shek's anticommunism to Japan, where he lived in exile for ten years. During his exile he wrote several influential books, *A Study of Ancient Chinese Society* (1930), *A General Outline of Bronze Inscriptions of the Western and Eastern Chou Dynasties* (1932), *A General Study of Oracle Inscriptions* (1933), and *An Illustrated Catalogue of Bronze Inscriptions of the Western and Eastern Chou Dynasties* (1934), which established him as an important scholar of ancient China and some of which remain indispensable reading. Guo was not a field archaeologist, but his first book *A Study of Ancient Chinese Society* (1930) was the first attempt to write a Marxist history of China and was influential in archaeological circles. Both Guo's periodization of ancient Chinese history and production as the basis of society became fundamental to the writing of history and archaeology after 1949, when Marxism became the national and party doctrine.

Tim Murray

See also

China

H

Halaf

See Mesopotamia

Hallstatt

See Austria; Switzerland

Hamilton, Sir William

(1730-1803)

Hamilton was born into the British aristocracy, becoming an equerry to his foster-brother, the Prince of Wales, later King George III. After serving in the army in Holland, he married a wealthy wife and was briefly a member of Parliament until 1764. At that time he was appointed the British envoy extraordinary and plenipotentiary at the court of Naples in southern italy. He was popular at the court, and with little diplomatic work spent most of his time pursuing his interests in volcanoes and antiquities.

Hamilton was elected a fellow of the Royal Society in 1766. He published his observations on volcanoes and presented a collection of volcanic earths and minerals to the british museum. Nonetheless, his interest in geology gradually gave way to his passion for the Greek and Roman antiquities of southern Italy. He purchased the outstanding Porchinari family collection in Naples, which he sold to the British Museum in 1772, founding the museum's department of Greek and Roman antiquities. Hamilton also published inventories and pictures of other collections of artifacts, helping to create the fashion for collecting the antiquities of greece and Rome among the English and European aristocracy and wealthy middle classes during the late eighteenth and early nineteenth centuries.

Hamilton spent almost forty years in Naples assembling collections and then selling them. He never saw himself as an antiquarian or an archaeologist. Instead, he valued antiquities as models for modern artists, which also justified his funding of the excavation and plunder of cemeteries, and of Roman sites such as pompeii and herculaneum. His second collection was sent to England in 1798, and a third was partially lost when the ship carrying it went down. These collections greatly influenced the styles and fashions of the day-from architecture and furniture to fashion and fine arts, with Josiah Wedgwood reproducing elements from them

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Hamilton, Sir William

(1730-1803)

Hamilton was born into the British aristocracy, becoming an equerry to his foster-brother, the Prince of Wales, later King George III. After serving in the army in Holland, he married a wealthy wife and was briefly a member of Parliament until 1764. At that time he was appointed the British envoy extraordinary and plenipotentiary at the court of Naples in southern italy. He was popular at the court, and with little diplomatic work spent most of his time pursuing his interests in volcanoes and antiquities.

Hamilton was elected a fellow of the Royal Society in 1766. He published his observations on volcanoes and presented a collection of volcanic earths and minerals to the british museum. Nonetheless, his interest in geology gradually gave way to his passion for the Greek and Roman antiquities of southern Italy. He purchased the outstanding Porchinari family collection in Naples, which he sold to the British Museum in 1772, founding the museum's department of Greek and Roman antiquities. Hamilton also published inventories and pictures of other collections of artifacts, helping to create the fashion for collecting the antiquities of greece and Rome among the English and European aristocracy and wealthy middle classes during the late eighteenth and early nineteenth centuries.

Hamilton spent almost forty years in Naples assembling collections and then selling them. He never saw himself as an antiquarian or an archaeologist. Instead, he valued antiquities as models for modern artists, which also justified his funding of the excavation and plunder of cemeteries, and of Roman sites such as pompeii and herculaneum. His second collection was sent to England in 1798, and a third was partially lost when the ship carrying it went down. These collections greatly influenced the styles and fashions of the day-from architecture and furniture to fashion and fine arts, with Josiah Wedgwood reproducing elements from them

on his “Etruscan” ware in Staffordshire. Hamilton survived the French invasion of Italy and retired to England in 1800, spending his last years living with his second wife, Emma, and her lover, Lord Horatio Nelson.

Sir William Hamilton

(Image Select)

Tim Murray

See also

Britain, Classical Archaeology

Harappa

The type site of the Harappan (indus) civilization, Harappa is a major city located in the Punjab, south asia, and is thought to have been at its height between 2500 and 2000 b.c. Harappa was recognized as an archaeological site in 1826, but research had to wait for nearly a century when, between 1920 and 1921, Rai Bahadur Daya Ram Sahni of the Archaeological Survey of India began to explore the site. M.S. Vats continued the work during the time before the beginning of World War II, and after the war, sir mortimer wheeler, during his time at the Archaeological Survey of India, dug for a season in 1946. Another long hiatus in activity was broken in 1986 when George Dales began excavations here.

Ancient ruins of Harappa in Pakistan

(Corel)

Tim Murray

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Outside the laboratory and away from the field Harrington was equally a pioneer. He wrote the first survey of North American historical archaeology in 1952, and the article "Archaeology as an Auxiliary Science to American History" (Harrington 1955) initially defined the field and its relationship to history and the social sciences. He also carried the message of this new area of scholarship to the public in a number of popular articles. He was the first historical archaeologist named in the *National Geographic Magazine* (1942), and his well-written booklet *Archaeology and the Historical Society* (Harrington 1965) was widely distributed.

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Robert L. Schuyler

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Hassuna

Tell Hassuna is a prehistoric site found on the Tigris River in northern Iraq. It was first excavated by Seton Lloyd and Fuad Safar during World War II, when Lloyd was an adviser to the Iraq Department of Antiquities. The site is late Neolithic in age (about the sixth millennium b.c.) and is the type site of the Hassuna cultural complex, which features Hassuna, Samarran, and Halaf styles.

Tim Murray

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Mesopotamia

Haua Fteah

A large cave in Cyrenaica (Libya) excavated by charles mcburney during the 1950s and subsequently extensively published by him. Rich deposits span the Upper Paleolithic (earliest dates on this site from around 47,000 b.c.) to the Holocene. The lowest levels of the site have not been excavated but the complex sequence of stone tool industries defined by McBurney from this site mark it as the most

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Tim Murray

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Maghreb

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(1871-1945)

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The results of her excavations were published in 1897 in the *american journal of archaeology* and were the basis of her master's thesis, which she completed at Smith College in 1901. That same year Hawes began to excavate Gournia, a Bronze-Age town that is still the only well-preserved urban Minoan site on Crete. This time, however, she

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was sponsored by the American Exploration Society of Philadelphia for a number of seasons-1901, 1903, 1904-and the results of her work were published in 1908. Harriet Hawes was not only the first woman to direct an excavation, she was also the first woman to publish her results.

Between 1900 and 1906 Hawes taught archaeology, epigraphy, and modern Greek at Smith College. She married and had two children and continued to publish and teach, first at the University of Wisconsin and then at Dartmouth College (1910-1917). After World War I she became assistant director (from 1919 to 1924) and then associate director (from 1924 to 1934) of the Museum of Fine Arts in Boston. She taught at Wellesley College until 1936. In her later years she was more involved with international and U.S. politics than with archaeology, becoming an active New Dealer in Boston in the 1930s.

Tim Murray

Hawkes, Christopher

(1905-1992)

Hawkes was educated at Winchester and New College, Oxford. In 1928 he began working with the Department of British and Medieval Antiquities at the british museum as an assistant keeper. This position allowed him to develop an extensive overview of, and familiarity with, a wide range of material and artifacts. Hawkes was one of the national secretaries for the first International Congress for Pre- and Protohistoric Sciences (a forerunner of the International Union of Prehistoric and Protohistoric Sciences) held in London in 1932, publishing, with archaeologist thomas d. kendrick, *Archaeology in England and Wales 1914-31* and annual summaries of prehistoric research in Britain for the *Archaeological Journal.*

Hawkes came to archaeology through fieldwork, starting with sir mortimer wheeler in Wales, and then from 1924 to 1928 at St. Catherine's Hill, Winchester, both excavating the chapel and establishing the Iron-Age date of the fortifications. He also worked at Wroxeter, and directed the excavations at Alchester, a small Roman town north of Oxford. From 1930 to 1931 he participated in the excavation of the Iron Age *oppidia* (or fortified town) of Camulodunum at Sheepen Hill, Colchester. Hawkes's publication of this work firmly established his expertise in late Iron Age studies. In 1932 Hawkes joined the Fenland Research Committee, the first truly modern prehistoric project in terms of its interdisciplinary scope. He later endorsed gerhard bersu's principles of excavation as practiced at Little Woodbury, and rejected Wheeler's overreliance on section/sequence evidence, allying himself with the sociological school of open-area plan-recovery excavations.

Primarily concerned with the problems of protohistoric Europe, Hawkes's archaeology was removed from the pure prehistory practiced by contemporaries grahame clark, stuart piggott, vere gordon childe, and glyn daniel. Situated at the cusp of history/prehistory, it was formulated with an awareness of the impact of past migrations, ethnic pluralities, comparative philology, and social stratification. For many, it was the weight given to the historic that ultimately limited Hawkes's prehistory. His book *The Prehistoric Foundations of Europe, to the Mycenean Age* (1940) was both influential on, and comparable to, Childe's *Dawn of European Civilization,* but he was entirely overshadowed by Childe. By the 1960s his advocacy of invasion theory and diffusionism was considered dated.

During World War II Hawkes worked in the Ministry of Aircraft Production. In 1946 he was appointed Oxford University's first professor of European Prehistory. He was elected to the British Academy of Science in 1948. Hawkes established the Oxford Department of Archaeology and, in 1955, its

Research Laboratory for Archaeology and the History of Art. Fluent in both French and German, along with Childe, Hawkes was one of the most "continentally" influential British prehistorians and was responsible for the integration of much British material with core European sequences. He retired in 1972.

Christopher Evans

See also

Britain, Roman

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Hensel, Witold

(1917-)

One of the most eminent Polish archaeologists after World War II, Hensel studied prehistory at the University of Poznan under archaeologist józef kostrzewski, historian Kazimierz Tymieniecki, and ethnographer Eugeniusz Frankowski. While still a student, Hensel took part in excavations conducted by Kóstrzewski at biskupin, and he also participated in research on early Polish medieval sites in Gniezno, Klecko, and Poznan.

Hensel was one of the most important initiators of a huge archaeological and historical research project realized in connection with the commemoration of the anniversary of the millennium of the Polish state and the baptism of Prince Mesco I in a.d. 966. In a 1946 article entitled *Potrzeba przygotowania wielkiej rocznicy* (Need for Preparation of a Great Anniversary), Hensel outlined the main objectives of this research project. He actively participated in the activities of the Management of Studies of the Beginnings of the Polish State, which was changed in 1949 into the Institute of the History of Material Culture, Polish Academy of Sciences. His main scientific interests were focused on the problems of early medieval period, especially issues related to settlement studies, technology, contact, trade and exchange, and the process of creating the proto-classic societies and their transformation into the classic societies of early Piasts. These were western Slavic tribes who united to form small states between a.d. 800 and 960, and came to be ruled by the Piast dynasty, whose descendents ruled greater poland from a.d. 1047 until 1386.

Hensel was one of the founders of Slavonic archaeology, as he created the background that was fundamental for the development of the modern discipline in relation to the previous traditions of Polish archaeology. Additionally, that field of interest was one of the most important areas of contact between archaeologists from the former Soviet Union and the Slavonic former socialist countries. He contributed to the origin of a new journal, *Slavia Antiqua,* founded chiefly for the sake of these problems, and became its first and longstanding editor. Hensel also was the first director of the Department of Slavonic Archaeology at the University of Warsaw, and he contributed very effectively to the dynamic development of Slavonic archaeology in other Slavonic countries. He was one of the main initiators and organizers of the International Congress of Slavic Archaeology, held in 1965 in Warsaw, and he was elected the first president of an International Union of Slavic Archaeology.

After World War II, Hensel advocated the introduction of Marxist methodology into Polish archaeology. This methodology was to serve as a platform for an integrated archaeology of Poland, including classical archaeology and ethnography within the history of material culture. Hensel was also interested in the periodization of Polish prehistory as he wished to reconcile traditional archaeological chronological divisions with the general divisions of history originated by Friedrich Engels and lewis henry morgan. He devoted a great deal of time to the history of archaeology, and to the methodology of archaeological enquiry, and in the latter area he was to initiate microregional analysis.

Hensel was an active supporter of international cooperation in historical archaeology, and he was an active organizer. In 1953, he became a member of as organizational committee to establish the Institute of the History of Material Culture at the Polish Academy of Sciences. From 1954 to 1989 he was director of the institute, which was the central, largest, and the most important archaeological institution in poland, and under his supervision, the institute became the center for Polish archaeology. His other duties included working at and then becoming director of the Department of Archaeology at the University of Poznan (1945-1954). He was director of the Department of Slavonic Archaeology from 1956 to 1965 and director of the Department of Prehistoric and Early Mediaeval Archaeology at the

University of Warsaw from 1965 to 1970.

He is a full member of the Polish Academy of Sciences; editor of the archaeological journals *Slavia Antiaqua, Archaeologia Polona, Polskie Badania Archeologiczne* (Polish Archaeological Research), and *Swiatowit;* and a member of editorial committees for other Polish and foreign journals. Hensel remains an active member of

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many societies and institutions both scientific and social, for example, the International Union of Pre- and Protohistorical Sciences and the International Committee of Slavists, and he was a president of Archeologia Urbium.

Hensel has been one of the most productive Polish archaeologists of the postwar period, and has excavated in Poland (e.g., Czersk, Kruszwica, Poznan) and abroad (e.g., Algiers, Algeria; Styrmen, bulgaria; St. Jean-le-Froid, france; Cappacio Vecchia, and italy).

Arkadiusz Marciniak

Herculaneum

Herculaneum, like pompeii, was a Roman town in the Bay of Naples, destroyed by the eruption of Vesuvius in a.d. 79. The eruption followed a slightly different course at Herculaneum, where a final flow of volcanic mud buried the site much more deeply than Pompeii (over 20 meters deep in places). This has made excavation much more difficult but often more rewarding, since carbonized perishable material is much better preserved at Herculaneum.

Excavation leading to the remains of Herculaneum

(Ann Ronan Picture Library)

The site was discovered during the digging of a well in 1709. But lime burners seeking marble for their kilns displayed more interest in the find than did archaeologists, and systematic excavations only began in 1738, at the command of the Bourbon king Charles III. The theater and basilica were discovered in these early excavations, which were made by tunneling. The most sensational find came in 1750 in the form of the Villa of the Papyri (upon whose design the j. paul getty museum in Malibu, California, is based). The villa was packed with bronze sculptures, including a number of portraits of philosophers. Even more remarkable were the hundreds of papyrus scrolls, found carbonized but largely legible. They are mainly works by the Epicurean philosopher Philodemos. The villa may originally have been owned by the father-in-law of Julius Caesar, L. Calpurnius Piso, a patron of Philodemos.

Karl Weber might be considered the first semiprofessional archaeologist to work on the buried Roman cities around Vesuvius. A Swiss military engineer who had enlisted as a mercenary in Naples in 1743, he was in charge of the excavations at Herculaneum (as well as Pompeii and Stabiae) between 1750 and 1764. He oversaw the excavation of the Villa of the Papyri and produced detailed and accurate plans and other documentation. In this period of treasure hunting

for the royal collections, Weber was unusual for his interest in the archaeological context of his discoveries. The Academia Herculanensis was founded in 1755 for the discussion and publication of the finds. The eight volumes of *Le antichità di Ercolano esposte,* published between 1757 and 1792, had a dramatic effect on contemporary taste in Europe and the United States.

The foul air in the tunnels may have hastened Weber's death, and work was halted on the Villa of the Papyri in 1764 because of the fumes. Herculaneum was at that time beginning to be overshadowed by the finds at Pompeii and other sites buried by Vesuvius. Excavation has been rather fitful since that time, characterized by long breaks-for example, between 1780 and 1828 and 1876 and 1927.

Excavation in open trenches began in 1828 and was carried out on a large scale by Amadeo Maiuri between 1927 and 1958. The picture of Herculaneum that emerged was not of a prosperous commercial and industrial town like Pompeii but rather of a seaside resort. Public buildings were few and large, luxurious houses were restricted to the seafront. Dozens of skeletons (otherwise rare in Herculaneum) have recently been discovered on the ancient shoreline in front of the town, but generally excavation since the 1960s has been conducted on a modest scale. There is enthusiasm in some quarters for continuing the excavation of the Villa of the Papyri after a break of almost 250 years. The recovery of further papyri bearing ancient literature that otherwise has been completely lost is a very strong lure. The cost, however, would be enormous, and the project has been opposed by many who believe that state funds would be better spent on restoration and conservation. The excavation may proceed with private funding from the United States.

Ted Robinson

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Hewett, Edgar Lee

(1865-1946)

A pivotal figure in U.S. archaeology in the early part of the twentieth century, Edgar Lee Hewett is best known for his political influence and dominating personality. Although largely ignored by recent historical syntheses, his influence on the character of archaeology in the American Southwest was far reaching.

Hewett was born in 1865 in Warren County, Illinois, and received a bachelor's degree from Tarkio College in Missouri and a master's degree in pedagogy from the Colorado State Normal School in 1898. His initial experience in archaeology was avocational, acquired while traveling by wagon through the Southwest on summer holidays in the 1890s. His appointment as first president of the New Mexico State Normal School in Las Vegas in 1898 provided an institutional base for fieldwork as well as for the establishment of relationships with a number of prominent important political figures in New Mexico Territory.

While serving in that position, Hewett established a reputation as an advocate for archaeological work, which until that time had largely been conducted by expeditions from eastern universities and museums. His attempts to establish local control over excavations in the region, such as those at chaco canyon, brought him into conflict with those institutions. On a national level, Hewett became allied with cultural

nationalists and nontraditional scholars such as Charles Lummis and Alice Fletcher, heralding splits within the archaeological community along regional and class lines that became more evident following 1900.

Hewett's early field research concentrated on the Pajarito Plateau of northern New Mexico, an area that had been explored earlier by Adolph Bandelier, and some of the important sites in the region were subsequently preserved by the creation of Bandelier National Monument in 1916. Small-scale soundings may have been conducted in the region as early as 1895, and in the subsequent twenty years, excavations were conducted at the major prehistoric pueblos of Puye, Tyounyi, Yapashi, Long House, Tsankawi, and several smaller sites.

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Resentment over this appointment affected Hewett's relationship with his peers for decades. The school was installed in the Palace of the Governors in Santa Fe, New Mexico, where Hewett maintained a base for the rest of his life. The school's essential function was the training of students in archaeological field methods. The related Frijoles Canyon field school, which functioned between 1908 and 1913, was one of the first of its kind in the United States, and it served as an educational and intellectual center for archaeology in the region. Several future leaders of the discipline, such as alfred vincent kidder, sylvanus morley, Neil Judd, and Jesse Nusbaum, participated in its activities. Hewett subsequently conducted field schools through the University of New Mexico in the Jemez region and in Chaco Canyon in the 1920s and early 1930s.

Throughout his career, Hewett demonstrated a talent for amassing institutional appointments. These included the directorship of the Museum of New Mexico from 1909 until his death; director of exhibits for the Pan-American Exhibition in San Diego, California (1911); and faculty positions at the State Teacher's College in San Diego, California (1922), University of New Mexico (1927), and the University of Southern California (1932). He was also closely involved with popular archaeological journals of the day, such as *Art and Archaeology,* and traveled a strenuous lecture circuit.

With its emphasis on regional, rather than national, institutions and on the importance of building a popular constituency for the conduct of archaeology, Hewett's philosophy ran counter to broader trends within the discipline, which was evolving from a broadly defined community with avocational roots into a smaller, professional cadre based in major universities and museums. Ultimately, Hewett's establishment of the School of American Research, the Museum of New Mexico, and several departments of anthropology created the institutions from which much of the archaeology in the Southwest has subsequently been conducted. It is this work that is his principal legacy.

James Snead

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Hieroglyphics

See Champollion, Jean-François; Maya Epigraphy

Higgs, Eric

(1908-1976)

Eric Higgs did not take up archaeology as a full-time career until the age of 47. He had a degree in agricultural economics from London University and had worked as a professional card player, builder, and farmer. In 1954 Higgs began a two-year postgraduate program in prehistory at Cambridge University, studying with grahame clark and charles mcburney, who fostered his interests in the Paleolithic and the economic approach to prehistory.

Higgs participated in the final season of excavations at the cave of haua fteah in Libya with McBurney in 1955, becoming a research assistant in the Department of Archaeology and Anthropology, senior assistant in 1963, and assistant director of research from 1968 until 1972, when he retired. Higgs founded the Cambridge "Bone Room," which was the nearest that the university came to having archaeological laboratory facilities in the 1960s and 1970s. This provided the main focus for undergraduate teaching in practical work for many generations of students.

Between 1962 and 1967 Higgs carried out major fieldwork in the Epirus region of northwest greece that encouraged the development of paleo-geographic and paleo-economic approaches to the archaeological record. From 1967 to 1976 Higgs was director of the "Early History of Agriculture Project," housed in the Department of Archaeology, which consumed most of the funds then available for what was later to become known in Britain as "science-based archaeology." In his role as advocate of a more science-based methodology, he also edited jointly with Don Brothwell *Science in Archaeology,* one of the earliest comprehensive texts on the use of scientific methods in archaeology. Eric Higgs was a provocative and influential colleague and teacher, whose impact, despite only twenty years in archaeology, is still evident.

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Hildebrand, Bror Emil

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Swedish numismatist Bror Emil Hildebrand was a graduate of Lund University, the center for scientific archaeology in sweden during the first half and middle of the nineteenth century. Hildebrand first worked on the collections in the museum at Lund, and then was appointed chief custodian of National Antiquities in Stockholm in 1837. His expansion of the national collection during the 1840s and 1850s was the result not only of both agricultural land reclamations and methodical excavations, but also of his intention to create a national and scientific archaeological collection. As early as 1850 Hildebrand consulted Danish archaeologist christian jürgensen thomsen and reorganized the archaeological collections at Lund and Stockholm based on Thomsen's three-age system.

By the 1860s the Stockholm archaeological collection was remarkable for its quality and breadth-both of which were to influence the research of the next generation of Swedish archaeologists such as oscar montelius and B.E. Hildebrand's son, hans hildebrand. Because Sweden did not have the Roman monuments that absorbed the archaeological interest of much of the rest of Europe, its attitude to, and

care of, prehistoric material were exemplary. The homogeneity of prehistoric cultures in Sweden also meant that its collections provided an overall picture of source material and evidence of local variations. So both general and typical artifact features were easily traced, and were in fact were more accessible than ever before-as greater proportions of collections of artifacts were on exhibition during the nineteenth century than they ever have been since then.

Hildebrand's achievements in museology were more than well matched by his abilities as an outstanding numismatist. In fact he may not have been as effective in his museum role had he not had a numismatic background. In this area, once again Hildebrand was influenced by Thomsen, classifying coins in Copenhagen under Thomsen's personal supervision in 1830 and completing his doctoral thesis *Numismata Anglo-Saxonica* (Anglo Saxon Coins) based on work by one of Thomsen's students. Hildebrand also realized the value of coins for dating native artifacts and ancient remains

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from the Iron Age that were found with them. In his early numismatic works on Roman coins found in Scandinavia, Hildebrand argued that the silver denarii must have been deposited before the third century a.d., and that the coins, like other Roman products, must have reached the north via direct or indirect trade with Roman territories and not by any other means. The grouping of the different flows of imported coins during the Iron Age became an important starting point for determining Iron Age chronology. Hildebrand completed a preliminary classification of the more important groups of coins, and went on to classify Scandinavian coin finds into four main detailed classes-the basis for later Swedish archaeologists' development of a chronology for the Iron Age.

Tim Murray

See also

Evans, Sir John

Hildebrand, Hans

(1842-1913)

Archaeologist, numismatist, historian, museum curator, and director, and very much like his father, bror emil hildebrand, Hans Hildebrand graduated from the University of Uppsala in 1865 and received his doctorate in 1866. Hildebrand studied botany, geology, mineralogy, mathematics, and astronomy as well as the humanities at university, and was an early member of the Natural Science Society. He was also interested in geology and paleontology-contentious subjects in Europe at the time of his graduation. In 1862 he accompanied his father and the anthropologist Gustaf Retzius to London and visited henry christy, English banker and partner of the French archaeologist édouard lartet. The three Swedes examined the newest Paleolithic finds of Britain and france and borrowed literature on the subject from Christy. With his father Hans had visited Paris the year before, where they had no doubt heard the debates about jacques boucher de perthes's stone tool finds at Abbeville. He returned to sweden with a strong interest in the earliest history of humanity.

Hans Hildebrand was introduced to numismatics at an early age by his father, and his doctoral thesis *The Swedish People in Heathen Times* (1866) was on Iron Age coins. He was unique in his knowledge of both numismatics and archaeological data from the field and in the museum context. Between 1865 and 1866 Hans and oscar montelius helped B. E. Hildebrand reorganize the Iron Age exhibition in the National Antiquities Museum in Stockholm.

Hans Hildebrand is known as the originator of archaeological “typology.” Unlike his colleague, the great Swedish typologist Oscar Montelius, Hildebrand was not interested in using typology to further chronological research and methodology. He was interested in the methodology of classifying prehistoric material culture. In his essay *The Early Iron Age in Norrland* (1869), Hildebrand used numerous typological descriptions of artifacts and proposed their dating via their find contexts. He also used analogies with other artifacts from coin and bog sites from other parts of Scandinavia to create a descriptive typology. In *Towards a History of the Fibula* (1871) Hans Hildebrand argued, on the basis of descriptive typology, that the Hallstatt and la tène complexes were two successive horizons at the end of the Bronze Age and the beginning of the Iron Age in central and northern Europe. In 1874, as General Secretary of the International Archaeological Congress in Stockholm, he went on to suggest that both the Hallstatt and La Tène complexes were chronological and cultural concepts.

Like his father, Hildebrand was an advocate for the central and national collection of archaeological material in sweden, the subject of *Scientific Archaeology, Its Task, Requirement and Rights* (1873),

written on his return from his second Grand European Tour. In this pamphlet Hildebrand introduced the term *typology* into archaeology and stressed the importance of central museums for the development of scientific archaeology and the typological method. Other European countries such as England, France, and, later, Germany did not have national collections, and Hildebrand understood that they were one of the main reasons that Sweden dominated and led the development of prehistoric archaeology during the nineteenth century.

Hans Hildebrand used the term and concept of archaeological typology in the first section of his great book *The Prehistoric Peoples of Europe* (1873-1880). But it was his great knowledge and synthesis of anthropology, paleontology, geology, and Paleolithic prehistory in this book that was probably more remarkable-it was one of the first examples of a modern European prehistory.

In 1879 Hildebrand succeeded his father as the King's Custodian of Antiquities and director of the National Museum, a position he held until 1906. His book *Medieval Sweden* (1879-1903) remains essential reading today.

Tim Murray

Hissarlik

See Blegen, Carl William; Dorpfeld, Wilhelm; Schliemann, Heinrich; Turkey

Historical Archaeology

Historical archaeology as the archaeology of the modern world involves the excavation of sites and analysis of assemblages dating from approximately the last half millennium of human cultural history. Ironically, two of its distinctive hallmarks, its worldwide scope and the interconnected nature of its subject matter, are shared only with Paleolithic archaeology. This topical unity derives from three overlapping phases of modern world history: the early emergence and spread of major cultural innovations across Europe, Asia, and North Africa between a.d. 1400 and 1600; the subsequent creation of the first truly global world system, primarily a product of European expansion between a.d. 1500 and 1800; and the transformation of this planetary cultural system as a result of the Industrial Revolution (a.d. 1800 to the present).

Because the formation of the modern world spans six centuries and occurred at different times in different places, historical archaeology currently has a number of distinct subfields: postmedieval archaeology in Europe, archaeology of the colonial period in the New World (and by extension elsewhere), industrial archaeology in Europe and North America, and the exploration of post-1400 shipwrecks and submerged sites by underwater archaeologists around the world. Potential new subfields, such as Ottoman archaeology and archaeology of the twentieth century, are on the horizon.

Like its subject matter, historical archaeology arrived late in the sequence, and thus its professional history is limited to the twentieth century. Geographically, it is most developed in North America, with a continuous history extending back to the Great Depression of the 1930s; in western Europe and Oceania (Australia), it appeared only in the 1960s. Outside of Europe, in other regions of ancient Old World civilizations, it is almost nonexistent. With the exception of early work in the West Indies, the field is visible but only now developing in Latin America and parts of sub-Saharan Africa. A discussion of this discipline must therefore concentrate on North America.

Disciplinary Roots

In North America, historical archaeology has two separate but interrelated origins: the excavation of historic contact-Indian sites and the study of the archaeological record left by Europeans and other Old World peoples in the New World. Numerous encounters with both types of sites, and in a few instances excavation of historic sites, occurred in North America during the seventeenth, eighteenth, and nineteenth centuries. After the Pilgrims arrived in 1620, they dug into local burial mounds and found combinations of aboriginal artifacts and European trade goods. After the American Revolution and the closing of the colonial period, a British boundary commission in 1796 excavated the 1604 site of the du-Monts and

Champlain colony in canada on the St. Croix River in an attempt to set the border between the new United States and British Canada. Examples of such work on historic sites increased in the nineteenth century, and in 1856, John Hall, a civil engineer, scientifically excavated the foundation of Myles Standish's house in Duxbury, Massachusetts. Hall not only made a site plan and noted stratigraphy but also plotted the location of individual artifacts.

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Such incidents, although numerous and as yet poorly researched, were still isolated and disconnected. One of the two traditions behind the rise of historical archaeology, the excavation of contact sites, began to be carried out continuously in regions like the Southwest in the later nineteenth century, but it was not until the first half of the twentieth century that researchers influenced by the direct historical approach and the rise of ethnohistory were significantly drawn to historic Native American sites and the study of European trade goods. william duncan strong and his colleagues on the Great Plains, James A. Ford in the Southeast and, slightly earlier, alfred v. kidder in New Mexico began to examine historic contact sites in an attempt to link known ethnographic groups with prehistoric sequences. Nevertheless, although there were rare exceptions-like Arthur Woodward, who in 1927 started a lifelong study of historic trade goods and industries-few of these excavators gave primary attention to the historic period. Investigation of contact situations would have likely remained a footnote appended to North American prehistoric studies except that in 1930 a major crisis in world society transformed American archaeology.

The Great Depression of 1930 through 1941 and the following post-World War II years massively expanded the number and, more important, the variety of historic sites being excavated by professional archaeologists in North America, and for the first time, the second origin of the field, work on famous European and Euro-American historic sites, rapidly assumed centrality in the creation of an autonomous discipline. Earlier events helped to set the stage. Passage of the 1906 Antiquities Act, which protected historic as well as prehistoric sites, and the 1916 establishment of the National Park Service (NPS) put key elements in place. A few locally or privately organized projects that included archaeology were already under way, such as John D. Rockefeller's 1927 funding of the restoration of colonial Williamsburg, but it was the 1932 election of the Franklin D. Roosevelt administration, its numerous programs to combat the Great Depression, and the related 1935 Historic Sites Act that opened the door to historical archaeology.

Significant federal funding of some government programs, including the Civilian Conservation Corps, Works Progress Administration, and the Tennessee Valley Authority, and a desire to reemphasize national heritage in the development of national (and some state) parks and monuments meant that a growing number of archaeologists began to work on historic sites across the United States. These researchers shared a set of common traits: they were professionally trained archaeologists, they were specialists in North American prehistory, they had been educated within an anthropological tradition, and they lacked prior knowledge of historic artifacts and architecture. Because of this common background and new institutional sponsorship supplied by the NPS, which was assigned a central role in organizing projects, these archaeologists formed a small but integrated community of professionals.

As prehistorians they spent the two decades before and after World War II inventing American historical archaeology from whole cloth. The excavation of famous and nationally significant Euro-American sites began, such as G. Hubert Smith's 1936 work at Fort Ridgely in the Midwest, A.R. Kelly's 1933 excavation of the Macon Trading Post in the Southeast, Harvey R. Harwood's 1934 exploration of La Purisima Mission on the West Coast, and Preston Holder's 1941 testing at Appomattox Courthouse in Virginia. Some of the archaeologists did one or two projects and then returned to prehistoric research, but a small number made an exclusive commitment to the historic period.

Harrington at Jamestown

One of the converts, jean carl harrington (1911-1998), can be considered the founder of historical archaeology in the United States. He was similar to his colleagues in that he had trained in prehistoric archaeology and anthropology under Fay Cooper Cole at the University of Chicago but dissimilar in that he had a prior background in architectural engineering and one season of undergraduate experience in the restoration and recording of historic missions in the Southwest. When offered an NPS position at

jamestown, where a project started in 1934

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his fieldwork and material culture studies, for he defined and synthesized historical archaeology as a recognized intellectual endeavor. His article “Archaeology as an Auxiliary Science to American History” (Harrington 1955) established the importance of such research as a contribution to both history and science. Harrington viewed the field as properly centered on Euro-American, not contact-Indian, sites and most naturally tied into the specificity of history although he did recognize its anthropological potential. His suggested name for this new specialization, “historic site archaeology,” highlights his theoretical position.

By the early 1950s, Harrington and his colleagues, including among others Louis Caywood in the Northwest, Arthur Woodward in the Southwest, John W. Griffin and Hale G. Smith working for the Florida Park Service in the Southeast, and Carlyle Smith on the Great Plains, had created historical archaeology as an established area of research. Work on historic Indian sites continued as an important theme, for example, George I. Quimby's study of trade goods in the Great Lakes region and the excavation of sites like the Hopi historic pueblo and mission of Awatovi between 1935 and 1939. kenneth e. kidd's 1941 excavations on a famous Jesuit mission site (1639-1649) in Ontario and his subsequent 1949 publication of *The Excavation of Ste Marie I,* probably the first site report in the field issued in book form, launched historical archaeology in Canada.

1960-1970: A Decade of Transition

By 1960 historical archaeology had been established as a research topic, but it was not yet professionally set off as a specialty. Ten years later it was a successfully organized, separate, publicly visible, and rapidly expanding, if small, discipline within anthropology. Four developments during the 1960s brought about this transformation: new institutional housing for the field, expansion of its subject matter, entrance into the academic world (which allowed formal training and education in the field), and professional autonomy with the founding of several scholarly associations.

After 1960, historical archaeologists found new positions in federal agencies outside the NPS in the United States and the newly active National Historic Sites Service in Canada, and individual states, such as Florida, California, and Texas, entered the field. In Texas, for example, the Office of State Archaeologist was established in 1965, and the Texas Historical Survey (after 1972 the Texas Historical Commission) had started exploring land and underwater sites by the end of the decade. Perhaps more significant, the field was brought into the academic world, as is exemplified by the career of john l. cotter (1911-1999). Like his predecessors, Cotter had a long worked on prehistoric, including Paleo-Indian, sites before he was assigned by the NPS to direct the second major project at Jamestown (1954-1956). By 1960, he was at the NPS office in Philadelphia, and that year, at the request of the Department of American Civilization at the University of Pennsylvania, he taught the first class in the United States to carry the title “Historical Archaeology.” Within the next few years, other courses were introduced at Arizona by Arthur Woodward, Harvard by Stephen Williams, University of Florida by Charles Fairbanks, Illinois State University by Edward B. Jelks, University of California-Santa Barbara by james deetz, and University of Idaho by Roderick Sprague.

The subject matter of historical archaeology began to expand in the same decade. Excavators began to move beyond famous national heritage sites and limiting archaeology to restoration functions at such prominent locations. A telling example of this enlargement is the work of bernard l. fontana and his colleagues at johnny ward's ranch in Arizona. These adobe ruins were originally selected as possibly being one of the oldest Jesuit sites in the area, but when the structure turned out to be a late American ranch house (1858-1903), the project was not abandoned but its purpose and goals were changed. Publication of “Johnny Ward's Ranch: A Study in Historic Archaeology” (1962) marked one of the first reports on a common type of Anglo-American site in the West, and the detailed analysis of the

recovered assemblage became a classic guide for later-nineteenth-century artifacts.

and its domination by prehistorians, served as the crucial organization in nurturing and building the discipline. The SHA was soon joined by the smaller Society for Post-Medieval Archaeology (1966-1967) in Europe, the Society for Australian Historical Archaeology (1970) in Oceania, and more-specialized associations such as the Society for Industrial Archaeology (1972) in America.

1970-2000

American historical archaeology entered the 1970s as an organized and expanding discipline but still clearly secondary to prehistoric studies. The influence of anthropology and various cultural themes initiated in the previous decade now greatly enriched the field and its public appeal, and entirely new topics were added to its subject matter. The study of ethnicity and "peoples without history" began with the work of Charles Fairbanks and his graduate students on mestizo sections of St. Augustine, Florida, and slave plantations of the Old South, and their excavations created a distinct topical specialization on the archaeology of African Americans. Roberta Greenwood and her colleagues started to explore overseas Chinese sites, and urban archaeology, traceable to the early work of Arnold Pilling in Detroit and John Cotter in Philadelphia, now spread to other cities on the East Coast (New York City; Alexandria, Virginia; Paterson, New Jersey; and Lowell, Massachusetts) and in the West (Tucson, Arizona; Ventura and Sacramento, California).

Topical additions to subject matter occurred as the result of a general debate, begun in the late 1960s, concerning the merits of a "historicalist" versus an anthropological framework for the growing discipline; by the end of the 1970s, the debate was clearly decided in favor of anthropology. In 1977, Deetz published *In Small Things Forgotten: The Archaeology of Early American Life,* the first book on the subject to achieve substantial public sales, and in 1978, the first source book for the field, *Historical Archaeology: A Guide to Theoretical and Substantive Contributions,* reprinted thirty-five classic papers and served as a text or supplementary text throughout the 1980s.

During the 1980s and 1990s, new topics-the archaeology of gender, class, race, and labor-were added to continuing work on sites ranging from the contact period to the industrial age. Historical archaeology played a secondary but again quite visible role in the rise of postprocessual archaeology, and many overly speculative interpretations of this countermovement to processual archaeology were at least understandable and sometimes testable in a documented context.

Yet it was not the new research topics, or even the general theoretical debates, that most fundamentally altered historical archaeology after 1970 but the hard realities of politics and economics. In 1966 Congress passed the National Historic Preservation Act, and it was followed by Executive Order 11593 in 1971 and the Archaeological and Historic Conservation Act in 1977. These and related bills created the National Register of Historic Places and State Historic Prevention Office (SHPO) offices on the state level, and soon most large-scale building projects in the United States were required to carry out exploratory archaeology and, if required, mitigation(completely digging the site). Massive public and private funding soon moved both prehistoric and historical archaeology into the maelstrom of the general marketplace, and although universities tried to incorporate these new funding opportunities, they were mostly replaced by private companies practicing cultural resource management (CRM).

On 26 April 1976, the Society of Professional Archaeologists (SOPA) was incorporated to meet the changing environment for archaeology in the United States. Interestingly its first president, Edward B. Jelks, was a leading historical archaeologist, and both anthropologists Charles Cleland and Bert Salwen served on its board. SOPA was only partially successful, drawing just over 700 practicing archaeologists into its membership during its short existence, and in 1998 it was restructured as the larger and growing Registry of Professional Archaeologists (RPA). Again, historical archaeologists took

a leading SOPA-RPA) and Donald L. Hardesty as the first elected RPA president.

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subject, but her thesis has to date only been published in French (Penna 1999).

Robert L. Schuyler

See also

Individual countries

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Historiography

Historical works dealing with archaeology have been written to entertain the public, commemorate important archaeologists and research projects, instruct students in the basic concepts of the discipline, justify particular programs or ideas, disparage the work of rivals, and, most recently, try to resolve theoretical problems. These studies have taken the form of autobiographies, biographies, accounts of the development of the discipline as a whole, investigations of specific institutions or projects, and examinations of particular theories and approaches. They have used the analytical techniques of intellectual and social history and sought to treat their subject objectively, critically, hermeneutically, and polemically. Over time, historical studies have become more numerous, diversified, and sophisticated. Histories of archaeology are being written for all parts of the world, and in a growing number of countries, a large amount of material is being produced at local as well as national levels. There is no end in sight to the growing interest in this form of research.

The history of archaeology has been written mainly by professional archaeologists, who have no training in history or the history of science, and by popularizers. Only a small number of works have been produced by professional historians. Archaeology has attracted little attention from historians of science, despite its considerable interest to philosophers of science. This lack of interest is hard to understand since the difficulties inherent in inferring human behavior from archaeological evidence make archaeology an ideal discipline for addressing many of the issues of objectivity that are currently of interest to historians of science.

Early Histories of Archaeology

The earliest use of the history of archaeology appears to have been for didactic purposes. In the mid-nineteenth century, the physicist Joseph Henry, the first secretary of the smithsonian institution, sought to purge American archaeology of useless speculation and to encourage an interest in factual research. To do this, he commissioned Samuel F. Haven, the librarian of the American Antiquarian Society, to write a critical historical review of studies of American prehistory titled *Archaeology of the United States* (1856). To improve the quality of American archaeology, Henry also published reports on developments in the discipline in the *Annual Report of the Smithsonian Institution,* which was widely distributed in North America. The most successful of these was "General Views on Archaeology" (1861), the translation of a paper by the Swiss geologist and amateur archaeologist Adolf Morlot, which summarized major developments over the previous fifty years in European prehistoric archaeology, especially in Scandinavia and switzerland. This article did much to encourage the adoption of a

subject, but her thesis has to date only been published in French (Penna 1999).

Robert L. Schuyler

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scientific approach to archaeology in eastern North America.

Popular Histories

For the next century, most histories of archaeology were popular accounts of archaeological discoveries, and they emphasized the romance of exploration and the most spectacular discoveries. As a result, they generally concentrated on the archaeology of ancient civilizations and important Paleolithic finds. One of the most widely read works dealing with the history of archaeology was the rather superficial *Gods, Graves, and Scholars* (1951), written by the Czech journalist C.W. Ceram (pseudonym for Kurt Marek). The continuing demand for works of this type is demonstrated by the success of Brian Fagan's *The Rape of the Nile* (1975).

Some popular histories of archaeology have sought to do more than entertain. Stanley Casson's *Progress of Archaeology* (1934) attempted to provide a balanced survey of the development of archaeology while the Assyriologist Seton Lloyd's *Foundations in the Dust* (1947; 2d ed., 1981) recounted the history of Mesopotamian archaeology in a manner that was of interest to professional archaeologists as well as to the general reader. Both Geoffrey Bibby's *The Testimony of the Spade* (1956), which dealt with European archaeology, and Michael Hoffman's *Egypt before the Pharaohs* (1979) sought not only to provide regional histories of archaeological research but also to explain to readers how archaeology was carried out. The Egyptologist John Wilson's *Signs and Wonders upon Pharaoh* (1964) was a celebration of American contributions to Egyptian archaeology and Egyptology, while Jeremy Sabloff's *The New Archaeology and the Ancient Maya* (1990) sought to explain to nonarchaeologists how processual archaeology has provided more superior insights into the ancient maya civilization than did culture-historical archaeology.

In England, there has long been a receptive audience for popular biographies of archaeologists. These stress personal life and social contacts more than the intellectual context and scholarly contributions of their subjects. One of the earliest and best of these was Joan Evans's *Time and Chance* (1943), which recounted the lives of her father, john evans, and her brother arthur evans. More recent examples include Jacquetta Hawkes's *Mortimer Wheeler, Adventurer in Archaeology* (1982), H.V.F. Winstone's *Woolley of Ur* (1990), and, from the United States, J.J. Thompson's *Sir Gardner Wilkinson and his Circle* (1992). Personal and professional disputes are aired in autobiographies such as w. m. f. petrie's *Seventy Years in Archaeology* (1931) and mary leakey's *Disclosing the Past* (1984). Popular anthologies of archaeological literature include Edward Bacon's *The Great Archaeologists* (1976), a collection of articles from the *Illustrated London News* describing major finds between 1842 and 1970, and Jacquetta Hawkes's two-volume *The World of the Past* (1963), which contains excerpts from the publications of archaeologists who had worked around the world arranged geographically.

A final genre is the history of archaeological institutions pioneered by Joan Evans's *A History of the Society of Antiquaries* (1956) and exemplified more recently at its best by *The Scottish Antiquarian Tradition* (1981), a history of the society of antiquaries of scotland edited by A.S. Bell.

The principal characteristic of popular histories of archaeology is their emphasis on spectacular discoveries. The archaeologists who feature prominently in them include many individuals, such as howard carter, who made celebrated discoveries but contributed little to the intellectual development of archaeology. On the other hand, archaeologists whose ideas played a major role in shaping the discipline, such as oscar montelius, vere gordon childe, and grahame clark, are rarely mentioned in such works. To take account of the contributions of such individuals required the development of a more strictly professional history of archaeology.

Intellectual Histories

The modern scholarly history of archaeology began in England in the late 1930s, as a growing awareness of generational differences among professional archaeologists and the accumulation of a corpus of essential literature revealed changes in the conceptual basis of prehistory. A few far-sighted prehistoric archaeologists became convinced that knowing the reasons for the decline of evolutionary explanations of the

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of inferences based on only a narrow range of excavated material. On the other hand, the historian Gerald Killan's *David Boyle: From Artisan to Archaeologist* (1983) paid considerable attention to the social as well as the intellectual milieu that shaped the career of that nineteenth-century Ontario archaeologist. One encounters in archaeological biographies a similar range of approaches to that found in other studies relating to the history of the discipline.

Despite the influence of relativists such as Collingwood, Australian archaeologistTim Murray has rightly suggested that "much of the history of archaeology reads as an account of the slow journey out of the darkness of subjectivity and speculation towards objectivity, rationality, and science" (1989, 56). One might have expected that such an approach would have appealed to processual archaeologists, yet, in general, processual archaeologists rejected and trivialized the history of archaeology, even though they welcomed Willey and Sabloff's historical charter. In his *Behavioral Archeology* (1976), Michael Schiffer pronounced that "graduate courses should cease being histories of thought" and concentrate instead on communicating the established principles of the discipline and indicating future lines of inquiry (p. 193). If carefully formulated techniques of analysis and an expanding corpus of data can produce increasingly accurate approximations of the past and more accurate theories, the history of archaeology is irrelevant to its past or future practice. If, on the other hand, the relativists are correct, facts constitute the core of archaeology while interpretations amount to little more than a history of personal opinions.

Social Histories

In Britain, the 1970s witnessed the development of the history of archaeology in the direction of social history. Both social and intellectual history share a relativist view of knowledge, but social history is concerned with how economic, political, and social conditions influence the interpretation of archaeological data. Because of this focus on the relationship between archaeological understanding and the sociocultural context in which archaeology is practiced, social history is more broadly externalist than intellectual history, which at most seeks to understand how archaeological interpretations relate to the contemporary intellectual milieu. Thus, social history stands at the opposite extreme from an internalist approach, which aims to delineate only the changing understanding of a problem by archaeologists. The distinction between externalist and internalist approaches is the same one that an older generation of historians drew between intellectual history and the history of ideas.

The social history of archaeology developed as an unforeseen consequence of Daniel's efforts to promote the study of the history of archaeology around the world, for such studies drew archaeologists' attention to the very different conditions under which archaeology was practiced. Ole Klindt-Jensen's *A History of Scandinavian Archaeology* (1975) and ignacio bernal garcia's *A History of Mexican Archaeology* (1980) were both commissioned for Daniel's World of Archaeology series. Each author traced the successive impacts of renaissance, rationalist, romantic, and positivist thought on the development of archaeology in a different part of the world. Klindt-Jensen went further, however, and delineated the political conditions that he believed had promoted the development of antiquarianism and the beginnings of scientific archaeology in Scandinavia. In tracing subsequent developments, he stressed the impact that changing political and economic circumstances had on archaeology in each Scandinavian country.

Partly inspired, although he only grudgingly admitted it, by Benjamin Keen's superb history of *The Aztec Image in Western Thought* (1971), Ignacio Bernal examined in detail the differing attitudes toward the study of pre-Columbian mexico adopted by Spanish officials and Creoles prior to Mexico's independence, liberals, and conservatives during the nineteenth century, and the Mexican government between 1920 and 1950. He also demonstrated how the institutional setting of Mexican archaeology was molded by political events and how it, in turn, influenced the character of Mexican archaeology.

Bernal has perhaps gone further than any other historian of archaeology in delineating the

were responsible for the economic decline of Cyprus and Palestine in recent centuries. In the historical sections of *Black Athena* (1987), Martin Bernal has argued that since the Napoleonic period, as a result of racism and ethnocentrism, European archaeologists have systematically ignored evidence of historical ties between ancient Greece and Egypt.

The Impact of Postmodernism

In the 1980s, externalism was fueled by a growing postmodernist emphasis on subjectivity and relativism, an emphasis that has influenced archaeology no less than it has the other social sciences. Central to this approach is a radical idealism that views understanding as being determined by individual presuppositions rather than by evidence and therefore minimizes the possibility of objective knowledge. This approach has been embraced by many archaeologists who wish to eliminate colonial, gender, and class biases from archaeology or to disempower the discipline as an elite discourse. Basic to this approach is the radical relativist claim that it is impossible to judge any one version of the past as being more right or wrong than any other. Inherent in this nihilistic approach to archaeology is the belief that its main, and perhaps only, legitimate role is to become a vehicle for encouraging political action by calling accepted beliefs into question.

The principal influence of postmodernism on the history of archaeology has been to encourage more radical externalism that seeks to correlate specific changes in archaeological interpretation with particular social movements of varying durations and degrees of specificity. This approach is reflected in stimulating, but highly controversial, papers such as R.R. Wilk's “The Ancient Maya and the Political Present” (Wilk 1985) and Thomas C. Patterson's “The Last Sixty Years: Toward a Social History of Americanist Archeology in the United States” (Patterson 1986).

Although virtually all histories of archaeology agree that every interpretation of archaeological evidence is influenced to some degree by personal or social biases, there is little agreement concerning the distortions produced by bias. The more positivistic see these biases overcome, in either the short or the middle term, by archaeological evidence. At the other extreme are those who are inclined to accept Michael Shank's and Christopher Tilley's denials that it is possible for evidence to contradict presuppositions. Positivists such as Colin Renfrew have countered such claims by demanding to know on what basis any externalists claim to link archaeological interpretations to the social milieu.

Other historians of archaeology have attempted to determine empirically to what extent and under what circumstances archaeologists have been able to achieve insights that are objective in the sense that they have been able to withstand the double test of new evidence and changing social circumstances. This was the main objective of Bruce Trigger's *A History of Archaeological Thought* (1989). Trigger documented the wide range of subjective factors that have influenced the interpretation of archaeological data but at the same time offered evidence that the “resistance” of archaeological evidence had produced certain irreversible changes in the understanding of human history and human nature. Moreover, it appears that in general, as the archaeological increases, the ability of subjective factors to distort the interpretation of archaeological evidence is curtailed. Using the history of archaeology to address such theoretical issues and to understand archaeological practice makes the history of archaeology more of an essential part of the theoretical core of the discipline.

Methodological Developments

Over the years there have been marked improvement in the technical quality of scholarly studies of the history of archaeology. Early histories were based largely on scanning published works and sometimes on secondary sources. This practice continues, especially in large-scale syntheses, but is gradually being

replaced by more varied and sophisticated methods.

The American archaeologist Robert Heizer encouraged the critical reading of archaeological publications by publishing two volumes of original papers that he judged had been crucial for the development of archaeological method and theory: *The Archaeologist at Work* (1959) and

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Conclusions

With a declining adherence to positivism and a lessening belief in a culture-free methodology for explaining human behavior, the history of archaeology has ceased to be regarded as marginal to archaeology and is assuming a more central position in the discipline. Its study provides a matrix for evaluating established theories and is calling current dogmas into question. The field also provides a basis for discussing epistemological questions in terms that are familiar to archaeologists. The history of archaeology is therefore coming to play a major role in both the understanding and the application of archaeological knowledge.

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Hogarth, David George

(1862-1927)

Hogarth was born in Lincolnshire and educated at Winchester School and Magdalen College Oxford. He studied classics and won a Craven traveling fellowship to pursue his interests in archaeology. In 1887 and 1890 he traveled with the epigraphist Sir William Mitchell Ramsay in Asia Minor. In 1888 he excavated at the site of paphos on cyprus. Hogarth spent three seasons in Egypt in the early 1890s working for the egypt exploration society at Deir-el-bahri, Alexandria, and the Fayum, where he perfected his excavation techniques, but he preferred classical to Egyptian archaeology. He was as excellent a writer as he was an archaeologist, publishing a number of popular travel books.

In 1897 Hogarth became a correspondent on Crete for *The Times* newspaper to cover its fight for independence from turkey, and later in Thessaly (northern greece) to report on the Greco-Turkish war. At the end of this year he became director of the British School of Archaeology in Athens. During his three years as

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(1862-1927)

Hogarth was born in Lincolnshire and educated at Winchester School and Magdalen College Oxford. He studied classics and won a Craven traveling fellowship to pursue his interests in archaeology. In 1887 and 1890 he traveled with the epigraphist Sir William Mitchell Ramsay in Asia Minor. In 1888 he excavated at the site of paphos on cyprus. Hogarth spent three seasons in Egypt in the early 1890s working for the egypt exploration society at Deir-el-bahri, Alexandria, and the Fayum, where he perfected his excavation techniques, but he preferred classical to Egyptian archaeology. He was as excellent a writer as he was an archaeologist, publishing a number of popular travel books.

In 1897 Hogarth became a correspondent on Crete for *The Times* newspaper to cover its fight for independence from turkey, and later in Thessaly (northern greece) to report on the Greco-Turkish war. At the end of this year he became director of the British School of Archaeology in Athens. During his three years as

director he excavated at the site of Phylakopi on Melos, and at Naucratis. In 1900 Hogarth left the British School and joined sir arthur evans in his first season on Crete, which saw the beginning of the excavation of knossos.

David George Hogarth

(Image Select)

In 1903 Hogarth spent another season excavating at Naucratis, and in 1904 and 1905 he excavated the temple of Artemis at ephesus on behalf of the british museum. In 1908 he visited the upper Euphrates River surveying the sites of Carchemish and Tell Bashar. In 1908 he became Keeper of the ashmolean museum in Oxford, and to began to excavate Carchemish with the young archaeologists leonard woolley and T.E. Lawrence, both of whom would later become more famous than their mentor.

The Ashmolean Museum prospered under Hogarth-becoming especially important for its Cretan and Hittite archaeological collections, the later of which was Hogarth's primary interest. In 1915 he offered his linguistic, geographic, and historic expertise on Asia Minor and the Eastern Mediterranean to the War Office and was sent first to Athens and then to Cairo where he became director of the Arab Bureau. In this position and with the help of T.E. Lawrence and gertrude bell, Hogarth was able to encourage and support the Arab rebellion against Turkey, which was to be decisive in the war in the Middle East.

In 1917 Hogarth received the gold medal from the Royal Geographic Society and in 1925 he became its president. After the war he was a member of the British delegation at the Peace Conference at Versailles and he returned to the Ashmolean Museum and Oxford. He was awarded a D.Litt. from Oxford in 1918 and a Litt.D. from Cambridge in 1924.

Tim Murray

See also

Britain, Classical Archaeology; Mesopotamia

Holmes, William Henry

(1846-1933)

William Henry Holmes was the preeminent figure in American archaeology around the turn of the last century. With the careful eye of an artist, he pioneered material culture studies, particularly the understanding of ceramic form, function, and design, and lithic technology. His analysis of collections at the smithsonian institution (where Holmes was affiliated for nearly sixty years), replicative experiments, and excavations at prehistoric quarries enabled him to reconstruct in unprecedented detail the process and products of ceramic and stone tool manufacturing.

Studying stone tools revealed that what many people thought were primitive, ancient artifacts-indicators of an American Paleolithic period comparable in age to the Paleolithic of Europe-were merely rejects of the manufacturing process. Armed with that realization and the expertise developed in years of geological fieldwork in the western part of the United States, Holmes spearheaded the highly successful rout of the American Paleolithic. For several decades, Holmes, his geologist colleagues, and a protégé, the physical anthropologist ales hrdlicka, critically evaluated all purported claims of Pleistocene humans

in North America. Although they

correctly rejected those claims, the Folsom discovery in 1927 ultimately showed that human antiquity on the North American continent reached back to the late Pleistocene period.

Holmes's work was particularly valued by his peers because of his scientific approach, which entailed the considerable rhetoric on the proper conduct of science that was symptomatic of the growing professionalism of late-nineteenth-century archaeology, and Holmes's own explicit efforts to highlight the stark contrasts he saw between his efforts and the "old archaeology." Science to Holmes meant a commitment to empirical observation and measurement and a strong sense of order and method.

The method of choice, reflecting his geological background, was an archaeological uniformitarianism in which the past was understood in terms of the ethnographic present. Holmes was well aware, in principle, that traces of specific ethnographic groups could only be followed a short distance into the past, but, in practice, he often slighted that principle, attaching ethnographic labels to archaeological phenomena. He did so in the belief-partly rooted in his rejection of the American Paleolithic-that American prehistory was shallow. As a result, when he organized the archaeological record, it was along geographical lines and into cultural areas; temporal units were largely absent.

At the same time, however, Holmes was a confirmed evolutionist who followed anthropologist lewis henry morgan's general cultural evolutionary scheme and envisioned "the pathways of progress" from savagery to barbarism to civilization as being driven by human volition. Progress for Holmes was the axis and measure of evolutionary change, and he embarked on his ambitious effort to show through different classes of material culture "human progress from the point of view of material culture." But he ultimately came to realize that progress was not always evident in the small details, however clear on the larger scale.

Holmes was a key figure in Washington, D.C., museums and research bureaus when those were at the center of science in the United States. But in the twentieth century, that center shifted into the university system, and that caused a change in the theoretical compass of American archaeology. Holmes's brand of evolutionary theory was no longer fashionable, and the next generation of archaeologists-armed with stratigraphy and seriation and needing to fill the chronological gap created by Folsom-moved beyond his geographical archaeology into culture history.

David J. Meltzer

See also

United States of America, Prehistoric Archaeology

References

For references, see *Encyclopedia of Archaeology: The Great Archaeologists, Vol. 1*, ed. Tim Murray (Santa Barbara, CA: ABC-CLIO, 1999), pp. 188-191.

Honduras; Honduran Institute of Anthropology and History

See Instituto Hondureño de Antropología e Historia

Hrdlicka, Ales

(1869-1943)

Hrdlicka was born in Bohemia, in what is now the czech republic, and immigrated with his family to the

United States in 1881. He studied medicine at the New York Eclectic Medical College, and practiced in New York City while continuing to study at the New York Homeopathic College. In 1894 he became a junior physician at a homeopathic hospital for the insane and consequently became interested in anthropometry. In 1896 he was invited to join a multidisciplinary research team at the newly founded Pathological Institute in New York City. Prior to taking up this appointment Hrdlicka attended classes in Paris at the Ecole d'Anthropologie, and studied anthropometric techniques in the Laboratoire d'Anthropologie at the Ecole Practique des Hautes Etudes.

In 1899 he resigned from the institute and became an unsalaried field anthropologist for the American Museum of Natural History in New York City, where he worked under anthropologist frederic ward putnam from Harvard University. From 1899 until 1902 Hrdlicka undertook anthropometric surveys of the Indians of the American Southwest and northern mexico.

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In recognition of this field experience and the publication of his results he was appointed head of the new Division of Physical Anthropology at the National Museum of Natural History, smithsonian institution, Washington, D.C., in 1903.

During the next forty years in this position Hrdlicka built his department into a major research center, based on one of the best human osteological collections in the world. He founded the *American Journal of Physical Anthropology* in 1918 and the American Association of Physical Anthropologists in 1930. Hrdlicka's primary research interest focused on the origins and antiquity of Native American Indians. He studied all of the skeletal material claimed to be evidence of early human beings in America, and argued that it did not predate the postglacial period. He also undertook fieldwork in the Kodiak and Aleutian Islands off Alaska in the 1930s as part of a project to test the thesis that indigenous Americans had originally come from Asia. Hrdlicka was also interested in the origin of modern humans and argued that Neanderthals were the direct ancestors of modern humans, presenting the Huxley Memorial Lecture in 1927 on “The Neanderthal Phase of Man.”

Tim Murray

Huaca del Sol

A large platform mound in the Moche Valley of peru, Huaca del Sol (Shrine of the Sun), along with its companion mound Huaca del Luna (Shrine of the Moon), forms the heart of the Moche kingdom. Construction began around the time of Christ, and the site was intensively occupied for a period of 600 years prior to being devastated by floods around a.d. 560. Although the site was rebuilt, it was eventually abandoned owing to the encroachment of sand dunes, which had previously destroyed arable land in the vicinity. Huaca del Sol and its companion pyramid were two of the largest adobe edifices ever constructed in South America. It has been estimated that 143 million bricks were required to construct the stepped pyramid of massive dimensions (2,175,120 cubic meters) and that the rulers of the city employed a system of corvée labor to complete the task.

The Moche Pyramid at Huaca del Sol

(AAA)

Tim Murray

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Hume, Ivor Noël

(1927-)

Ivor Noël Hume was born in 1927 in London, educated in England, and initially entered the profession as the Guildhall Museum archaeologist (1949-1957) exploring the exposed remains, including postmedieval deposits, of postwar London. However, it was not until he crossed the Atlantic in 1957 to assume command of archaeology at another capital, colonial Williamsburg in Virginia, that he embarked on a career of over forty years that helped to transform historical archaeology.

With the support of his wife and professional colleague, Audrey Noël Hume (1927-1993), he continuously built the field within three spheres: fieldwork, public education, and scholarly publication. As a result of his English archaeological training, he introduced the tradition of tightly controlled stratigraphic excavations to colonial sites within and around Williamsburg. Site reports soon followed, but of equal importance were the articles and monographs reflecting the accumulating knowledge of both of the Humes on recovered archaeological assemblages. In 1970, Noël Hume published *A Guide to Artifacts of Colonial America,* a work that revolutionized understanding of seventeenth- and eighteenth-century archaeology in English North America and, by extension, the world. It stands to this day as the only general source for the field.

Noël Hume was set off from his American colleagues not only because he was not an anthropologist but also because of his ability to handle and appreciate primary archival sources-he produced a fully *historical* archaeology. As early as 1966 he authored *1775: Another Part of the Field,* which made him one of the few archaeologists in the United States to publish straightforward history. His archaeological publications have been equally grounded on documentary as well as belowground data. In 1977, the spectacular discovery and areal excavation of the early-seventeenth-century site at Wolstenholme Town in Martin's Hundred on the James River in Virginia made him equally an expert on the seventeenth as well as the eighteenth century. His 1982 popular *Martin's Hundred* and the full site report have given scholarship one of the best-excavated and most fully explored early-seventeenth-century sites (1620-1622) in the world.

Accomplished as a researcher and scholar, Hume has been an equally important advocate for public education. Numerous lectures, articles (see Hume 1979), and well-received books such as *Here Lies Virginia* (1963) and *Historical Archaeology* (1969) have vividly and invitingly brought the romance of historical archaeology to the general public. Unlike many of his colleagues, Noël Hume can write clear and readable English. Perhaps no single contribution better combines his efforts in field archival research, careful scholarship, and public presentation than *The Virginia Adventure: Roanoke to Jamestown, an Archaeological and Historical Odyssey* (1994), one of the most widely read books in the field. He used a combined archaeological-archival approach in this volume to correctly predict the survival and the location of the original jamestown Fort (1607-1620s), which has since been discovered and is being excavated by William Kelso.

Hume's English training and perspective initially separated him from his U.S. anthropological colleagues, but his productive and insightful scholarship has helped to bridge the Atlantic divide. In January 1967, he was an important participant in the organizational meeting in Dallas, Texas, that created the society for historical archaeology (SHA) and at which he urged an internationalist-global perspective for the new discipline. His membership on the SHA board of directors and vice-presidency of the parallel Society for Post-Medieval Archaeology in Europe helped to link these two organizations in their founding years. Ivor Noël Hume has received many awards, including being made an Officer of the British Empire (1991) for his work in Virginia, and in 1991, the SHA presented him with the highest honor achievable

in historical archaeology, the j. c. harrington medal.

Robert L. Schuyler

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I

Inca

The Inca empire, which controlled much of the Andes of South America, was overthrown as a result of the Spanish conquest in 1532. As they did to the aztec civilization in mesoamerica, the Spanish exploited local political divisions to bring about a swift collapse of imperial authority. The Inca had, themselves, only recently achieved such political and military dominance, with their expansion out of the region of Cuzco beginning only about a century earlier.

In one sense, the Inca were the clear successors of earlier cultures, such as the moche and the chavín, but in terms of political organization, the Inca system of imperial control, which (where possible) allowed for the retention of local religions and power structures, was a unique development. Major sites such as Machu Picchu and Cuzco and their extensive network of roads and bridges, irrigation systems, and terracing demonstrate the Inca's abilities as engineers and builders, but their material culture (particularly in textiles) was also of the finest order.

An example of gold jewelry from the Chimu Culture

(Gamma)

Tim Murray

See also

Ecuador; Peru

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India

See Indus Civilization; South Asia

Indo-Pacific Prehistory Association

The Indo-Pacific Prehistory Association (IPPA) has had several names since its inception in Batavia (at that time the capital of the netherlands Indies) in 1929 and its first congress in Hanoi in 1932. At first it was known only through the names of its congresses. The Hanoi congress was known as the First Congress of Far-Eastern Prehistorians; the second, held in 1935, was titled the Second Congress of Far-Eastern Prehistorians; and the third, held in 1938, was called the Third Congress of Prehistorians of the Far East. At the fourth congress, held after World War II, the name came to be the Far-Eastern Prehistory Association (FEPA). That name continued until 1975 when the organization adopted its final and present name, the Indo-Pacific Prehistory Association.

The beginning came about as a result of the Fourth Pacific Science Congress and the interest of Herbert E. Gregory, founder of the Pacific Science Association. In the preliminary organization of the Batavia Pacific Science Congress (1929), Gregory included a prehistory section and asked P.V. van Stein Callenfels to organize it. Among those taking part in this section, besides van Stein Callenfels, were Davidson Black, sir grafton elliot smith, Sir Richard Winstedt, Victor Goloubew, and henry otley beyer. This group agreed to start an organization to promote research in prehistory in the Far East and settled on Hanoi for its first congress, to be hosted by the government of French Indo-China.

George Coedes was the organizing chairman of the congress, Paul Rivet was president, and Paul Mus acted as secretary. Other local organizers were Victor Goloubew and Madeleine Colani; other members were van Stein Callenfels from Java, Beyer from the philippines, Richard Winstedt of Singapore, Ivor H.N. Evans of Taiping in what was then the Federated Malay States, Prince Rajadabhisek and Luang Boribal Buribhand of Thailand, Joseph Shellshear of Hong Kong, C. Haguenauer from japan, and Henri Parmentier of cambodia. The proceedings of the congress were published as *Praehistorica Asiae Orientalis* in Hanoi in 1932. The second congress was to have been in Bangkok in early 1935, but because of troubled conditions there in 1934, the congress was shifted to Manila. At that congress, there were sixteen delegates and nine associates representing eight different countries. Proceedings of this congress were never published, although a few of the papers presented were published later (Solheim 1957, 8).

The president of the third congress, held in Singapore in 1938, was W. Linehan, and he was assisted by F.N. Chasen and M.W.F. Tweedie. There were twenty-seven delegates and six associates, and in addition to the countries represented before, institutional delegates and associate members came from Australia, New Zealand, and china-from Australia, D.A. Casey and fred d. mccarthy and from China, Lin Huisiang (the founder of the first Anthropology Department in China and a former student of Beyer). Chasen and Tweedie (1940) edited the proceedings.

The fourth congress was to be held in Hong Kong in 1941, but the threatening international situation caused its postponement. It was finally held, jointly with the Eighth Pacific Science Congress, in Manila in 1953, organized by Beyer, in Batavia, with the prompting of H.E. Gregory. This was much larger than the previous congresses and included representatives from many Pacific islands as well as those from countries that had attended previously. Eighteen countries were represented with official delegates, and there were sixty-three members and delegates as well as seventeen associates and observers, with many more Asian participants.

The Far-Eastern Prehistory Association was organized at the final business meeting of the fourth congress. Eleven council members were elected to carry on FEPA business between congresses, and Beyer was elected as honorary chairman. Council members were McCarthy (Australia), li chi (China), Alexander Spoehr (Hawaii and the United States), F.S. Drake (Hong Kong), Bernard P. Groslier (Indochina), H.R. van Heekeren (indonesia), Ichiro Yawata (Japan), C.A. Gibson-Hill (Malaya), roger duff

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PREV NEXT

(New Zealand), E. Arseno Manuel (Philippines), and Prince Dhani Nivat (Thailand). From these members, an executive committee of five was selected: Groslier as permanent president, Duff as permanent secretary, Li, Drake, and van Heekeren. Among other instructions, the executive committee was to sponsor future congresses, encourage the formation of branches in member countries or areas, prepare for member institutions and countries a semiannual report on prehistoric and other anthropological activities, and receive and administer funds.

Solheim was elected president of FEPA and was asked to write a constitution-up to this time, the organization had been without a constitution or bylaws. At each meeting, Solheim would propose incorporation, and Duff would counterpropose a vote of confidence in Solheim and that the organization should continue informally with Solheim doing all of the work. Duff always won. In 1972, Solheim started editing *The Far-Eastern Prehistory Association Newsletter* and continued to do so until 1975 when R.J. Lampert of Australia took over. The newsletter was replaced by the *Bulletin of the Indo-Pacific Prehistory Association* in 1980, edited by Peter Bellwood, who continues as editor.

A major congress was held in Nice, france, in 1975 in conjunction with the Eleventh Congress of the International Union of Prehistoric and Protohistoric Sciences. At this congress, a constitution was accepted, and it resulted in a reorganization and the change of the name to the Indo-Pacific Prehistory Association (Solheim 1977, 172-175). Solheim was elected president, and jack golson became vice-president, to assume the office of president in 1980. Rajendra Misra took over as president of IPPA in 1985 at the group's first independent congress, the twelfth, held at Penablanca, Cagayan Province, Philippines. Proceedings of a portion of this congress appeared in *Asian Perspectives* (Bellwood and Solheim 1984-1985). The second independent congress, the thirteenth, was held in Osaka and Tokyo in 1987, and the fourteenth congress took place in Yokyakarta, Indonesia, in 1990, with roger green assuming the office of president. The fifteenth congress was held in Chiang Mai, Thailand, in January 1994 where R.P. Soejono took over as president and the sixteenth conference was held in Malacca, Malaysia, in 1999.

Wilhelm G. Solheim II

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Indonesia

The growth of archaeology in Indonesia from an amateur activity to a science can be divided into five phases of development. The first phase comprises the intensive registration of ancient remains without the coordination and supervision of any authorized archaeological organization and occurred during the eighteenth and nineteenth centuries. The second phase, from 1900 to 1950, saw the institutionalization of archaeological activities, the consolidation of archaeological work, the emergence of new data, and the

formulation of hypotheses across many different fields of archaeology. During the third phase, from 1950 to 1956, little archaeology was undertaken due to disruption by the struggle for political independence from Holland. Between 1956 and 1975 the study of archaeology of Indonesia by Indonesians was consolidated. From 1975 until the present archaeology in Indonesia has come of age.

Prior to the eighteenth century, knowledge of ancient objects and monuments was acquired through local and descriptive exploration, sometimes accompanied by classification based on their historical background but more often partly mythological and based on the beliefs of the local people. This kind of descriptive activity

was carried out during the peak of the Majapahit kingdom in the middle of the fourteenth century by Npu Prapanca, as affirmed by several cantos of the Nagara Krtagama [Book of Royal Ode/Hymn] (Krom 1920, 1926, 1, 2, 47; Pigeaud 1960-1963, vol. 3).

The Eighteenth and Nineteenth Centuries

Descriptions of ancient objects and remains increased with the arrival of European powers in Indonesia. Many merchants, scholars, soldiers, civil servants, naturalists, travelers, priests, etc. (Koentjaraningrat 1958, 15-48) wrote about their experiences and Indonesia's curiosities as they explored the Indonesian archipelago (Rumphius 1705). Their descriptions included not only local traditions, history, and the economic situation but also prehistoric remains. Some descriptions, particularly during the eighteenth century, were in the form of reports and were later supplemented with more accurate observations of archaeological objects, such as the measurement of the Prambanan Temple by F. van Boeckholtz in 1790. The foundation of the Bataviaasch Genootschap van Kunsten en Wetenschappen (Batavian Society of Arts and Sciences) in 1778 had a great impact on research into the history, traditions, and archaeological remains of Indonesia.

During the nineteenth century, there was an increase in activity in several archaeological domains. Apart from more extensive observations, particularly of Hindu Buddhist temples (or *candis*), methods of dealing with the problems posed by ancient remains became more advanced. Archaeological activities were primarily of a documentary nature, with particular emphasis on *candis,* and they took the form of drawings (by H. Cornelius, H.N. Sieburgh, C.J. van der Vlis, F.C. Wilsen), photographs (by J. van Kinsbergen), inventories (by F. Junghuhn), restorations (e.g., of Mendut), and excavations (such as the temples on the Dieng Plateau). Systematic surveys and documentation (by J.F.G. Bramund, C. Leemans, W.P. Groeneveldt, R.D.M. Verbeek, J. Crawfurd, T.S. Raffles, etc.) are still important sources of information about Indonesia's past. Other European methods of site recording, such as the making of glass negatives of the Borobudur monument by A. Shaefer in 1845, were used with little success in Indonesia.

Other activities in prehistory undertaken during this century (Soejono 1969) included the grouping or classification of rectangular axes (C. N. Pleyte and others), a great interest in megalithic remains (H. E. Steinmetz and others), and the provenance of bronze kettledrums (jens jacob worsaae, A.B. Meyer, and others). By far the most significant achievement in prehistory during the nineteenth century was the discovery of *Pithecanthropus erectus* (Java Man) by eugene dubois at Trinil, on the island of Java, in 1891.

Interest in Indonesia's Islamic past and observations and recordings of Islamic remains were minimal during this period. However, some fieldwork in this area included reports on the discovery of ancient gravestones in Aceh (1884) and a plan for the documentation (drawings, photographs, rubbings) and restoration of Islamic remains (Tjandrasasmita 1977). Many observers of ancient remains such as *candis,* megaliths, and bronze artifacts concluded that they were Hindu in origin. This observation was often the consequence of British archaeological activity in India and the structural resemblance between temple complexes and statues of deities or gods in Indonesia and those in India.

The increase of interest in ancient relics led to some attempts to establish a specific organization concerned with field archaeology, such as the Commissie tot het Opsporen, Verzamelen, en Bewaren van Oudheidkundige Voorwerpen (Commission for the Discovery, Collection, and Conservation of Ancient Objects) in 1822, but such attempts were unsuccessful. The private sector attempted to assist in archaeological research by founding the Archaeologische Vereeniging (Archaeological Society) in 1885, chaired by the engineer J.W. Ijzerman. He succeeded in exposing the basement of the Borobudur

Temple decorated with Karmawibangga reliefs, which is, at present, covered by the lower terrace.

The foundations for the development of archaeology as a discipline in Indonesia were created by the Dutch in the fields of documentation, restoration, excavation, and interpretation.

These activities paralleled similar developments in Europe (Daniel 1950), as did all advances in archaeology in Indonesia during this period. By the middle of the nineteenth century, European principles of archaeology, such as the application of the three-age system to ancient objects, diffusion, homotaxis, typology, the comparative method, synchronization techniques, and stratigraphic excavation, were being applied to sites and data in Indonesia. However, only a few of these, such as diffusion, typology, and homotaxis, were successfully applied. The reason may be that the archaeological practitioners in Indonesia were primarily amateurs and unable to fully grasp the development of the European methods of research, which had turned archaeologists there into professionals (such as christian j. thomsen, austen h. layard, heinrich schliemann, and others).

1900-1950

The focus on Hindu-Buddhist monuments continued into the twentieth century, indeed, until World War II. The Commissie in Nederlandsch Indie voor Oudheidkundig Onderzoek op Java en Madura (Commission in the Dutch East Indies for Archaeological Research in Java and Madura) was established in 1901, and its name reveals its limited powers and limited research scope. Behind its establishment was concern for the neglected state of Javanese antiquities, which had received little careful, detailed, or systematic examination, and the political necessity of creating a specialist archaeological organization similar to such organizations already in existence in Indochina and India. The commission survived until 1913 when the chairman of its board, J.L.A. Brandes, died. Then the Oudheidkundige Dienst (or OD, Archaeological Service) was created by the government of the Dutch East Indies, and N.J. Krom was appointed as its director. The OD's tasks, authority, and staff were extended in order to ensure better results.

The establishment of those two organizations was an important step in the development of archaeology in Indonesia. For the first time, a variety of archaeological activities was undertaken, and there was a center for the planning and direction of archaeology, which led to many improvements in archaeological practice in Indonesia (Soekmono et al. 1977). For the first time the results of archaeological research were published in the *Rapporten van de Oudheidkundige Commissie* (or *ROC* [Report of the Archaeological Commission]), which later continued as *Oudheidkundig Verslag van de Oudheidkundige Dienst in Nederlandsch Indie* (*OV;* Archaeological Report of the Dutch East Indies Archaeological Service). Archaeological schedules were proposed for every part of Indonesia, not just Java and Madura, and the technical support for the implementation of these plans was increased. H.L. Leydie Melville, P.J. Perquin, and J.J. de Vink were employed in the areas of inventory and documentation.

The restoration of Javanese temples received special attention, but it was not without controversy. There were arguments for a limited restoration of the remains of extant monuments, arguments for reconstructions of them on paper only (Krom), and arguments for the restoration of monuments, as far and as much as possible, by reconstruction. While F.D.R. Bosch was in charge of the OD, in 1916, there was conspicuous progress in temple restoration in Java. These restoration activities resulted in the formation of a permanent technical staff for this specialist restoration work located at Prambanan.

As the OD matured, there was more interest in other fields of archaeology such as Islamic remains (P. J. Moquette), prehistoric remains (P. V. van Stein Callenfels), and the more recent historic remains of the Portuguese and the Dutch East India Company (V. I. van de Wall). The investigation of inscriptions, pioneered in the previous century by R.M. Th. Friederich, Cohen Stuart, H. Kern, and others, increased, and archaeological investigations took place in Sumatra, Kalimantan, Sulawesi, Bali, the Lesser Sunda Islands, and the Moluccas.

Archaeological activities were also supported financially by prominent people outside the OD, such as civil servants, experts from other government institutions, and private individuals. The position of archaeology in Indonesia became even more stable after the Dutch East Indies government promulgated the Monumenten Ordonnantie (Ancient Monuments

Conservation Act) in 1931, which protected ancient remains and sites against damage, removal, and destruction.

The improvement in research, restoration, and recording led to the development of theories and hypotheses regarding the creation; distribution; styles; cultural, social, and religious significance; and history of Indonesia's antiquities. Bosch argued for the Indonesian people's greater involvement in the construction of their temples (Bosch 1919), counter to some opinions that Indians were the architects of these buildings and Indonesians only the laborers. These Indonesia-centric theories were supplemented more and more by the views of other scholars (Krom, W.F. Stutterheim, etc.). Other archaeological landmarks of this period include the publication of basic books on the Jago, Singasari, and Penataran monuments by Brandes (1904, 1909); Borobudur by Krom (1920) and Krom and van Erp (1920-1931); and Krom's work on Hindu-Javanese history (1926; Krom and van Erp 1920-1931) and Hindu-Javanese architecture. There was also growth in scientific archaeological activities when the OD was led by W.F. Stutterheim in 1936, but fieldwork declined owing to a shortage of staff and the economic crisis of the 1930s.

Although institutional and scientific archaeology was productive in Indonesia until the outbreak of World War II in East Asia, only a cadre of Dutch professionals were active in it. The OD was not large, and it was staffed by a core of Dutch archaeologists who worked across extensive regions. Archaeology stagnated in Indonesia during the Japanese occupation and the fight for independence from the netherlands after 1945. Only the technical staff at Prambanan was able to keep on with restoration and excavation during the Japanese occupation.

In 1945, during civil dissidence against the Dutch army, many documents that had been collected in Jakarta since the beginning of archaeological activities in Indonesia (such as archives of photographs, drawings, and books and a collection of research objects) were destroyed or disappeared. In 1947, the Dutch army, which had reoccupied Jakarta, set up and reorganized the OD.

This time the organization had technical branches in Ujung Pandang (South Sulawesi) and Gianyar (Bali). During the period of the struggle for independence, between 1947 and 1949, the prehistorian H.R. van Heekeren excavated in South Sulawesi, particularly at Maros, the cave-painting area, and at Kalumpang, a Neolithic settlement site. During this same period, J.C. Krijgsman was actively involved in the restoration of the ancient Hindu-Buddhist monuments of Bali.

1950-1956

In 1950, the Dinas Purbakala R.I. (Archaeological Service of the Republic of Indonesia) was established, with headquarters in Jakarta and A.J. Bernet Kempers as its head. Technical staff from Ujung Pandang were recalled to reinforce the staff at headquarters, and district offices called Seksi Bangunan Dinas Purbakala R.I. (Building Section of the Archaeological Service of the R.I.) were established. It was clear that the Republic of Indonesia urgently needed more support to become effective archaeologically as its scientific and technical staffs were inadequate.

In 1953, the Dinas Purbakala R.I. was placed under the charge of R. Soekmono, which meant that for the first time in the history of archaeology in Indonesia, the responsibility for Indonesia-wide archaeological work was under the supervision of an Indonesian archaeologist. Dutch archaeologists such as V.R. van Romondt, H.R. van Heekeren, J.G. de Casparis, M.J. van den End-Blom, and J.C. Krijgsman continued to work in Indonesia until 1960. Important work was accomplished in prehistory (Heekeren 1957), the Hindu-Buddhist or classical period (Bernet Kempers 1959), the Islamic period, and epigraphy (Casparis, 1950; Goris,1954).

The last issues of *OV* (1941-1947, 1948, 1949) were published, and the journal was replaced by *Laporan Tahunan Dinas Purbakala* [Annual Reports of the Archaeological Service], which was published from 1950 to 1955. These publications contained general descriptions of the activities of the various branches of archaeology. The archaeological journal *Amerta,* a popular analysis of archaeological research in Indonesia, was also published at this time, and a more scientific

PREV NEXT

analysis of data could be found in the series *Berita Dinas Purbakala* [Newsletter of the Archaeological Service]. More Indonesian scholars became involved in prehistoric, classical, and Islamic archaeology, and staff in the building sections were supplemented with Indonesian personnel and placed under Indonesian management. Professional courses for Indonesian archaeologists began at the Universities of Jakarta, Yogyakarta, and Denpasar, ensuring an ongoing Indonesian participation in the discipline.

When Dutch archaeologists returned to Holland after Indonesia's political independence, archaeological activities slowed down because of a shortage of appropriate Indonesian personnel. Although the operating budget for archaeology was minimal, Indonesian archaeologists, charged with the task of continuing the work of the OD, remained committed to the importance of Indonesian archaeology. Ironically, just at the time when more Indonesian archaeologists were beginning fieldwork and the science of archaeology was advancing rapidly, political circumstances in Indonesia made their lives and work difficult. Much effort was expended to fill gaps in the archaeological record and, with limited resources, to try to keep up with the many changes in archaeology and within the archaeological profession at an international level. Contact with international circles was maintained by means of regional and international conferences, publications in international media, and participation in joint archaeological programs with foreign teams.

Dutch archaeologists made significant contributions to the archaeology of Indonesia, and they were responsible for the establishment of Indonesia as an important area of archaeological research in Southeast Asia. In spite of many shortcomings, Dutch archaeologists laid the foundations for the further development of archaeology in Indonesia. Their most significant oversight was their failure to educate a cadre of Indonesian archaeologists to succeed them. (This was the case in many other ex-colonies in Southeast and south asia as well.) At independence, there was no leadership and little expertise in archaeology among the Indonesian people. Dutch archaeologists had concentrated on developing technical staff to support their interests and fieldwork, and it was only these staff members who had received any education or training. Consequently, the archaeological infrastructure and focus bequeathed by the Dutch to Indonesia was outside the capabilities and interests of the Indonesian people.

It is important to note that prior to World War II, the Dutch discovery of Indonesian archaeological evidence contributed to the development of an Indonesian identity and to Indonesian nationalism, and Dutch archaeological literature and research remain important parts of Indonesia's archaeology. In 1956, the small number of Indonesian archaeologists left to shoulder the archaeological burden of the country found it almost impossible to carry out administrative and organizational tasks and also to conduct field and scientific research. Funding, facilities, and resources for archaeology declined to levels below those provided for it before World War II.

1956-1975

During this period, although archaeology in Indonesia remained complex and vast, and despite a lack of resources, the discipline matured and produced professional and high quality results. The Lembaga Purbakala dan Peninggalan Nasional (National Institutes of Archaeology and Antiquities, the former Archaeological Service) was set up with four field or branch offices. The provision of minimal facilities and funding, for both the central and the branch offices, meant that planned archaeological fieldwork, such as surveys, excavations, and restorations, was difficult to accomplish. Between 1956 and 1975, little fieldwork took place, and documentation, registration, reports, and scientific article writing all stagnated. Factors such as the system of government, politics, and socioeconomics, and the small higher-education system, meant that archaeology in Indonesia continued to develop slowly.

But there were some achievements, including the designation and restoration of the Borobudur Temple

as a national project supported with special funds, the implementation

of joint programs with teams of foreign archaeologists, and the sending of Indonesian archaeologists abroad to further their education in both the technical and the theoretical fields. The last two achievements have increased Indonesia's ability to carry out restorations with the support of laboratories, technology, and the appropriate surveys and excavations.

One of the ornate temples at Borobudur, Indonesia

(Corel)

1975-

A military coup of 1975 and the rule of the Suharto regime until 1999 drastically affected the organization of archaeology in Indonesia. The state organization for archaeology was divided into two special units, each with its own function and tasks (Soejono 1987). Archaeological activities were divided into two categories, administrative and scientific. The organization in charge of the administrative functions became the Direktorat Sejarah dan Purbakala (Directorate of Archaeology and History), and the organization in charge of the scientific activities was the Pusat Penelitian Purbakala dan Peninggalan Nasional (Center of Archaeological Research and National Monuments). These names have been changed and are now the Direktorat Perlindungan dan Pembinaan Peninggalan Sejarah dan Purbakala (Directorate for Protection and Development of Historical and Archaeological Remains) and the Pusat Penelitian Arkeologi Nasional (National Research Center of Archaeology).

This division is significant for two reasons. First, each division concentrates on its respective area and tackles problems separately. There had been too many and complex administrative and organizational problems for a joint organization to resolve. Second, the division has created more opportunities for scientific work. The division of archaeology has been unified and coordinated with a large and qualified staff, a broad organizational structure, and a sufficiently large infrastructure. It is possible to avoid overlapping activities, and the two official divisions work to develop a national plan of priorities for monuments and archaeology.

National short- and long-term development programs now support a wide range of archaeological projects. These programs have improved conditions for archaeology, and their

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Indus Civilization

First Phase (1924-1946)

On the basis of excavations in what is now Pakistan by D.R. Sahni at harappa in 1920-1921 and by rakal das banerji at Mohenjo Daro in 1921-1922, john marshall, the then-director general of the Archaeological Survey of India, made the first formal announcement of the discovery of this civilization in 1924 (Marshall 1924). Both of these sites were known earlier, however. In 1911-1912, D.R. Bhandarkar had visited Mohenjo Daro to report on a Buddhist stupa there; in 1876, alexander cunningham had published some seals and antiquities from Harappa; and "Indus" material from the site of Sutkagendor along the western part of the Makran coast in Baluchistan, much to the west of the Indus Valley, had been illustrated by W.T. Blandford in 1877. However, the Bronze Age character of these sites was not understood earlier (Chakrabarti 1988, 156-164; Deva 1982; Pande 1982; Possehl 1982).

Before mortimer wheeler (1947), a successor of John Marshall, reexcavated the citadel mound at Harappa in 1946 and began a new phase of Indus studies, the work on that civilization had proceeded in the following directions. Mohenjo Daro in the lower Indus Valley, or the province of Sind, was excavated until 1927 under Marshall's supervision. It was further excavated in 1927-1931 by E. Mackay who, although an outsider to the survey, was engaged for the purpose because of his experience at the large and more or less contemporary Mesopotamian site of Kish. In 1935, Mackay excavated Chanhudaro, another Indus site in Sind. In both north and south Baluchistan, some Indus sites were reported by aurel stein (1929, 1931) after exploring the region in 1927. Information about more of the sites in Sind were published by N.G. Majumdar (1934) and M.S. Vats (1938). In Gujarat in western India, an Indus site was identified by Vats (1937) at Rangpur. Sahni excavated Harappa in the upper Indus Valley, or Punjab, in 1920-1921 and 1923-1925, but between 1926 and 1934, the site

was excavated by Vats (1940) who reported another site near Harappa in addition to pointing out the Indus character of Kotla Nihang Khan in the Simla foothills of northern India. In 1942, Stein (1942) reported Indus sites in Bahawalpur in what is now Pakistan.

Thus, in the first phase of its study, the distribution of the Indus civilization was known to have extended from the Makran coast to the Simla foothills and from northern Baluchistan to Gujarat. Its extensive distribution in Sind and in the dried-up Ghaggar-Hakra drainage system of Bahawalpur was also understood during this period. More significantly, the classical excavation reports on Mohenjo Daro (Mackay 1938; Marshall, ed. 1931), Harappa (Vats 1940), and Chanhudaro (Mackay 1943) were published.

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Second Phase (1947-1963)

The second phase of Indus studies began in 1947 when Wheeler published the results of his excavations at the western mound of Harappa in 1946. The main achievement of this work was that a major Indus civilization site came to be bracketed between earlier and later occupations. Wheeler also argued that the Indus civilization was ruled by “priest-kings,” had a military character in the form of defense walls, and eventually fell to the Aryan invaders whose archaeological evidence he claimed to have found in Cemetery H ware at the site. In 1950, in his new capacity as the archaeological adviser to the government of Pakistan, Wheeler outlined the fortification wall of the western mound of the site and argued for the presence of a granary among its building complexes.

Seals of the Indus Valley culture

(Image Select)

In 1953, Wheeler published the first edition of *The Indus Civilization,* a work that in two major ways marked a significant departure from the earlier analysis of the civilization by Marshall. First, its chronology was brought down to 2500-1500 b.c. Assuming that evidence of its contact with Mesopotamia went back only to the Sargonic period (c. 2300 b.c.) and that its end coincided with the assumed date of Aryan invasions to India around 1500 b.c., the Indus civilization, instead of being roughly a contemporary of the Sumerian antiquities of Mesopotamia, as in Marshall's analysis, became one of its late contemporaries. Second, Wheeler argued that the idea of civilization in the Indus Valley was derived from Mesopotamia. This idea was a complete turnaround from those of Marshall's days and marked the beginning of a trend that has only been reinforced by the writings of a large number of Western scholars who have recently worked between iran, the Gulf, and the Indus.

In India, this phase was marked by a great number of discoveries in the Ghaggar-Drishadvati system in Rajasthan-Haryana and Gujarat. This was also the time when the easternmost point in the distribution of Indus sites was traced at Alamgirpur in Uttar Pradesh near

Delhi. Among the excavations in India undertaken or begun during this period were those at Rupar in Punjab, Alamgirpur in the Doab, Rangpur and Lothal in Gujarat, and Kalibangan in the dried-up Ghaggar Valley in Rajasthan (Pande 1982, 397-398). In Pakistan, the major breakthrough at Kot Diji led to the premise of a continuity between the earlier Kot Diji culture and the later Indus civilization level at the site, and at Amri, there were further elaborations of Majumdar's work during the preceding phase. Some miscellaneous work in Baluchistan highlighted the early character of village farming communities in the region. Along the Makran coast, the "port" character of the Indus site of Sutkagendor was highlighted, especially in the context of new discoveries in the Gulf area throwing light on its contact with the Indus civilization (annual volumes of *Pakistan Archaeology,* a government publication from 1964 onward).

Third Phase (1964-1984)

Beginning in about 1964, the third phase lasted up to the mid-1980s. This phase perhaps began with G.F. Dales's publication on the mythical massacre at Mohenjo Daro (Dales 1964), in which the improbability that the city fell to Aryan invaders was argued graphically. The excavations at Kalibangan in Rajasthan (Lal 1979) continued through the 1960s, and excavations began during this period at Surkotada in Kutch in northwestern India (Joshi 1990) and at Banawali (Bisht 1982, 1987) in Haryana. In Pakistan, this phase witnessed the beginning of a massive structural and other documentation project at Mohenjo Daro, including an intensive surface survey to locate craft-activity areas (Jansen and Urban 1984, 1987). A late level of the civilization was identified at Daimabad (Sali 1986) in the Godavari Valley of Maharashtra, and a mature form of the civilization was located at Shortughai, around the Indus River in India (Francfort 1989).

In Pakistan, the discovery of a large number of sites from the presumably fifth millennium b.c. Hakra ware phase to the late "Harappan/Indus" horizon of the second millennium b.c. in the dried-up Hakra drainage system in Bahawalpur (Mughal 1982) was a major event. In India, it was found that the entire area between the Ghaggar course in Rajasthan (known as the Hakra in Pakistan) and Saharanpur in the Doab was dotted with early, mature, and late sites. Another major discovery was that of the Ganeshwar-Jodhpura culture in the Sikar district of Rajasthan, a culture contemporary with the early phase of the civilization. The northernmost extension of the Indus sites in India was found at Manda in Jammu, and in Gujarat, too, there were major discoveries during this phase, notably in Kutch (Joshi, Bala, and Ram 1984).

Ideas regarding the origin and decline of the civilization took some specific forms during this period. On the basis of earlier work at Amri and Kot Diji and the ongoing work at Kalibangan, a. ghosh (1965) argued in favor of a homogeneous pre-Harappan substratum in the entire Harappan distribution area. Other scholars also favored such a hypothesis, which was put on a more solidly documented basis by R. Mughal (1971). However, the reason for the transformation from the early to the mature Harappan was not explained, which left scope for factors such as long-distance trade and proto-Elamite influence to be invoked as catalytic factors in the genesis of the Indus civilization. Radiocarbon chronology was applied to this civilization in the early 1960s (Agrawal 1964), but so far it has not been able to dislodge the Wheeler bracket of 2500-1500 b.c., an attempt at calibration (Brunswig 1975) and evidence of pre-Sargonic contact with Mesopotamia (Chakrabarti 1982) notwithstanding. The quest for Aryans is not yet over (cf. Hiebert and Lamberg-Karlovsky 1992).

On the whole, however, there was no difficulty at all in visualizing the late phase of the Indus civilization as transformation into an essentially nonurban form that developed regional characters in all the relevant areas. Subsistence (Vishnu-Mittre and Savithri 1982; Weber 1991), trade (Chakrabarti 1990; Lahiri 1992, 67-144; Ratnagar 1981; Shaffer 1982), metallurgy (Agrawal 1971), script (Mahadevan 1977),

miscellaneous craft behavior such as the manufacturing of shell bangles and beads (Hegde, Karanth, and Sychanthavong 1982; Kenoyer 1984), etc., began to be subjected to detailed study. In the early 1980s, the “Neolithic” discovery at Mehrgarh in the Bolan Valley

alluvium of Baluchistan provided a very long rural antecedent to the development of civilization in the Indus region.

Lower city with well shaft at Mohenjo Daro, Pakistan

(AAA)

Current Phase (1985-)

Since the mid-1980s, the study of the Indus civilization has been in its fourth and current phase. In India, this phase is likely to be dominated by the ongoing excavations at Dholavira in Kutch (Bisht 1991), which have already added new features to Harappan planning, water management, stonemason's work, etc. The discovery of a few large script signs, made of carefully cut crystalline material and presumably set on a wooden board, has also led to a fresh appreciation of the extent of Harappan literacy. This site has also shown the entire archaeological sequence of this civilization in Kutch, including its early and later phases. In Pakistan, this is the phase of prolonged excavations at Harappa, especially in its eastern sector, and the stratigraphic and cultural details that have already emerged (Dales 1992) help us to understand this civilization, as at Dholavira, as an integral part of a deep-rooted cultural development and its subsequent transformation.

On the theoretical side there is now a marked contrast between an approach centered on western Asia and an approach that favors an indigenous framework of development and transformation. The first approach favors a short chronology for the civilization and restricts it, by implication, to the status of being a mere episode in the history of south asia. Second, this approach puts an inordinate amount of emphasis on external trade with various areas in western and central Asia. For instance, western archaeologists who work in Oman argue that Oman was the main supplier of copper to the Indus civilization, despite the very large presence of copper on the subcontinent. In contrast, the indigenous approach argues for a long chronology, cites ethnographic data to argue that the civilization's external trade was not characteristically different from the trade that continued well into the twentieth century in this region overall, and provides a scheme that helps to understand the civilization as an integral part of the total process of Indian history and culture.

Basically, there were apparently two major variables in the emergence of the Indus civilization. First, the sites in the Indus Valley shift to

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Industrial Archaeology

A systematized means of utilizing artifacts, images, structures, sites, and landscapes in the investigation of the industrial past, industrial archaeological studies are making significant contributions to historical understanding. There are learned societies, journals, and publications on the subject in most western European countries, in North America, in japan, and in Australia. Industrial heritage is receiving increasing attention in russia and in Latin America and is beginning to be recognized in most other countries.

An international organization, the International Committee for the Conservation of the Industrial Heritage (TICCIH), was formally constituted at a conference at Grangärde, Sweden, in 1977 after preliminary meetings at Ironbridge, England, in 1973 and Bochum, Germany, in 1975. TICCIH holds conferences, usually at three-year intervals, and each result in a volume of reports on developments in the industrial heritage of particular countries in addition to the conference proceedings (CEHOPU 1992; CILAC 1981, 1985; Cossons 1975; Georgeacopol-Winischhofer, Swittalek, and Wehdorm 1987, 1990; Kroker 1978; Nisser 1978, 1981; Nisser and Bedoire 1978; Vanderhulst 1992; Victor and Wright 1984; Wright and Vogel 1986). TICCIH also encourages the establishment of national organizations for promoting the study of the industrial heritage, and its council and officers are elected by the accredited representatives of such bodies.

In England, the expression *industrial archaeology* is sometimes used to imply that it is a social activity, and, in other European countries, terms meaning industrial heritage-*patrimoine industriel* or *industrieel erfgoed,* for example-are similarly comprehensive, encompassing such activities as the conservation and operation of railways and canals, the collection of steam road vehicles, and the adaptive reuse of industrial buildings. The term *industrial archaeology* is best used in a more narrow academic sense to describe research into past industrial societies based on the scientific analysis of physical remains, whether these are artifacts, images, structures, sites, or landscapes, and industrial archaeology is a subsector of the broader field of investigation defined as archaeology.

The Portuguese polymath Francisco de Sousa Viterbo (1845-1910) first used the term *arqueologia industrial* in 1896 in a study in which he argued that much could be learned from study of the physical remains of past manufacturing activities and from the memories of people who had been involved in the production process (Sousa Viterbo 1896/1986). The value of artifacts in the study of industrial history was acknowledged by the founders of the great national museums of technology like the Musée National des Techniques, Paris; the Science Museum, London; and the Technisches Museum für Industrie und Gewerbe, Vienna. Historians of industry in the first half of the twentieth century nevertheless made sparse use of archaeological evidence, and some standard works on the British Industrial Revolution show a remarkable ignorance of the most basic technological processes and scarcely any awareness of the most important manufacturing complexes. The only outstanding archaeological study of industry in England in this period was by an amateur scholar (Straker 1931).

Industrial archaeology was reborn in the 1950s. The Belgian scholar René Evrard (1907- 1963), founder of the Museum of Iron and Coal in Liège, was using the term *archéologie industrielle* by 1950. The first recorded use of the English term in print was by Michael Rix (1913-1981) of the University of Birmingham in an article published in 1955 (Rix 1955), although supposedly it was used by scholars in the Department of Economic History at the University of Manchester before that date. Kenneth Hudson (1916-), journalist, broadcaster, and subsequently museum critic, was the author of

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Instituto Hondureño de Antropología e Historia

Founded in 1952, the Instituto Hondureño de Antropología e Historia (IHAH, Honduran Institute of Anthropology and History) is the legal guardian of the archaeological patrimony of Honduras and publishes the journal of Honduran anthropology and history entitled *Yaxkin*. Through its function in approving research proposals, it shapes the course of Honduran archaeology. The institute has sponsored significant programs of research, trained Hondurans in archaeological methods, and fostered the development of archaeology as a career in the country.

According to Honduran archaeologist Ricardo Agurcia, the earliest Honduran government action directed toward preservation of the archaeological record was legislation passed in 1845 to control exploration of the ruins of classic Mayan Copán and place the responsibility for their protection in the hands of local authorities. Nonetheless, Agurcia notes that in the 1890s, legally approved expeditions from Harvard University's peabody museum and the british museum removed large quantities of archaeological remains from the site. These actions led to new legislation in 1900 prohibiting the exportation of material from Copán and also from other ruins in the country. The legislation explicitly allowed exploration, including excavation, with prior permission by the executive branch of the government. In 1946, the first legislation authorizing a governmental body charged with exploration and protection of the archaeology, ethnography, and history of the country was produced, laying the groundwork for IHAH.

The founding of IHAH in 1952, according to Honduran archaeologist Vito Veliz, owed much of its

impetus to Jesus Nuñez Chinchilla, an archaeologist trained in mexico in the 1940s. Nuñez Chinchilla conducted excavations at Copán, and during its early years, IHAH emphasized this site. New legislation in 1968 legally established IHAH as an autonomous institution, and this legal status gave IHAH control over its personnel and facilities and effectively allowed it to function as an investigative unit. According to Agurcia, this new status reached fruition in 1975 when IHAH began its modern history of aggressively fostering archaeological research.

All archaeology conducted in Honduras since the last date has taken place under permits issued by IHAH. Even in the 1960s and 1970s, the scope of projects proposed by outside researchers extended far beyond Copán to encompass a broad corridor extending south from the Ulua Valley through Lake Yojoa, Comayagua, and the Gulf of Fonseca and extending east along the north coast. In addition to reopening research in these areas by its approval of outside projects, beginning in the 1970s IHAH initiated its own programs of archaeological inventory

and periodic conferences, IHAH has begun the development of standards crucial to coordinating research, which in recent decades has involved archaeologists from france, Germany, Great Britain, japan, Australia, canada, the United States, and Mexico and Hondurans trained in European, North American, and Latin American traditions.

Stele B from Copán

(Image Select)

Rosemary A. Joyce

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International Union of Prehistoric and Protohistoric Sciences

The creation in La Spezia, Italy, in September 1864 of the Congres Paleoethnologique International (CPI) during a meeting of the Societa Italiana di Scienze Naturali marks the de facto beginnings of the International Union of Prehistoric and Protohistoric Sciences. In 1867, the CPI changed its name to Congres International d'Anthropologie et d'Archéologie Prehistoriques (CIAAP), and that organization can be described as the direct ancestor of the contemporary union. The origins of the present organization therefore go back some 130 years. The prime movers in this international initiative were Giovanni Capellini (president of Societa Italiana di Scienze Naturali) and the French archaeologist gabriel de mortillet.

Between 1866 and 1912, fourteen international congresses were organized (a Permanent Council was created during the Lisbon session of the CIAAP in 1880), but World War I put a stop to these fruitful and constructive meetings. The Institut International d'Anthropologie (IIA), founded in 1921 after the war, tried to bring archaeologists and anthropologists together again, but this group was almost totally French inspired and dominated (all five members of the executive committee were French). It was also totally different from the CIAAP in two essential ways: its main emphasis was on “anthropology” in its widest sense (as the study of living human communities, comparative religion, folklore, etc.), with prehistoric archaeology forming a smaller section than had previously been the case; and scholars belonging to the “vanquished nations” were excluded from the activities of the IIA. For both of these reasons, numerous prehistorians and anthropologists did not choose to join or belong to the IIA, and several (such as marcellin boule, R. Verneau, hugo obermaier, and P. Bosch-Gimpera) tried to continue the real international tradition of the prewar CIAAP.

After several efforts at collaboration between members of the Permanent Council of the CIAAP and the Executive Committee of the IIA, it was finally decided that the fifteenth session of the CIAAP and the fourth session of the

Seventh, members of the National Organizing Committee serve for five years and are responsible for organizing the next international congress. The Permanent Council elects the secretary of the National Organizing Committee, and its members are the Permanent Council members of the country hosting the next congress.

Over the years, a number of special committees have been created to organize projects of international importance, and many of them still continue. Several of these special committees have built up an imposing group of specialists and are responsible for a long list of publications. In addition, some twenty scientific commissions have been incorporated into the organization of the U.I.S.P.P. to coordinate research in specific areas of pre- and proto-history, which can be thematic, regional or interregional, chronological, interdisciplinary, etc. Finally, several international associations have become affiliated with the UISPP, through which they have access to the CIPSH. All of the special committees, scientific commissions, and other organizations meet regularly during congresses and in symposia, colloquiums, and conferences, and the results of their work are generally published, sometimes in multivolume proceedings, sometimes in less ambitious collections of papers.

To conclude, I quote part of the Preamble to statutes of the UISPP, in which the international union clearly proclaims its scientific aims and philosophical convictions:

The U.I.S.P.P. is an international association of scholars; the universality of Science is the philosophical basis of its activities. Its aim being the collaboration of the scholars from all countries to help advance prehistoric and protohistoric studies, it proclaims its total attachment to academic freedom.

Knowledge of Humanity concerns all present-day societies. For this reason, the U.I.S.P.P. is in total opposition to any form of discrimination based upon the concepts of race, ethnic group, geographical unit, philosophical conviction, nationality, sex, language or any other; such discrimination being, by its intolerance and its very definition, the negation itself of any form of co-operation. The U.I.S.P.P. excludes no bona fide scholar from its scientific activities.

(Bulletin of the XIII Congress of the International Union of the Prehistoric and Protohistoric Sciences, Forli, Italy, 1996, 34-38).

Jacques Nenquin

Iran

No comprehensive history of archaeology in Iran exists though there are a few summaries about specific aspects (e.g., Amiet, Chevalier, and Carter 1992; Dyson 1968; Moorey 1972; Young 1986) and a few autobiographies (Dieulafoy 1888, 1890; Ghirshman 1970; Goff 1980). There are also important recent syntheses and collections of articles (Hole 1987; Olszewski and Dibble 1993; Smith 1986; Voigt and Dyson 1992), a basic bibliography for the prehistoric periods (Voigt and Dyson 1992), virtually exhaustive bibliographies for all periods (Van den Berghe 1966, 1979; Van den Berghe and Haerinck 1981), and an archaeological tour of Iran (Matheson 1972).

Historical Overview

Archaeology in Iran has developed unevenly in terms of periods and regions studied. The earliest archaeological investigations, from the late nineteenth century onward, concentrated on western and southwestern Iran, and this pattern has largely persisted. This emphasis is primarily owing to the facts that these areas had the strongest interaction with mesopotamia; they were the homeland of historically important civilizations such as Elam and Achaemenid Persia, which were of greatest interest to western

scholars; and access to them was relatively easier. In addition, the discipline has been compartmentalized chronologically, and with some exceptions, researchers fall into one of three groups: those few who have studied the relatively neglected Paleolithic period, the majority who have focused on the Neolithic to the Achaemenid periods, and another smaller group of people who have concerned themselves with the post-Achaemenid and Islamic periods.

Late-nineteenth- and early-twentieth-century archaeology in Iran can be reasonably characterized

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Late-nineteenth- and early-twentieth-century archaeology in Iran can be reasonably characterized

as museum-driven, object-oriented research. Throughout this period, france had a monopoly on archaeological research in the country, and they concentrated almost entirely on the great Elamite and Achaemenid site of Susa in Khuzistan. There was no expansion of archaeological research in Iran immediately after the hiatus caused by World War I because the French retained their monopoly for several more years and western archaeologists had much easier access to Iraq, Syria, Lebanon, and Palestine, which had all become foreign mandates. In 1927, Reza Shah's government radically revised the antiquities regulations, and the French monopoly was finally broken. The scope of archaeological research widened greatly thereafter as other international expeditions finally gained access, and there was also some general improvement in field methods, which, hitherto, had been primitive. Because of the pronounced geographical and environmental regionalization of the country, the main thrust of Iranian archaeology from then on has been the establishment of regional sequences.

World War II brought another hiatus in fieldwork, but after it, the discipline continued to improve, especially from the late 1950s onward with the launching of many major new projects and the first impact of "the new archaeology." In addition to elaborating regional sequences, there was a strong focus on sophisticated regional surveys and on achieving a more comprehensive investigation of the entire country. All work came to an abrupt halt as a result of the 1979 revolution, and it is only recently that fieldwork, conducted by the Iranians themselves, has resumed in a very limited manner.

Knowledge of Iran's Past Prior to the Late Nineteenth Century

By the end of the Sassanian period (a.d. 651), knowledge of the preceding Achaemenid (550-331 b.c.), Hellenistic/Seleucid (331-175 b.c.), Parthian (175 b.c.-a.d. 224), and Sassanian (a.d. 224-651) periods was virtually lost within Iran itself. Alexander the Great was (and still is) remembered in oral tradition and the Iranian national epic, the *Shahnameh* [Book of Kings]-but as the half-brother of Darius III. The advent of Islam in the mid-seventh century a.d. effectively discouraged any scholarly or popular interest in a pagan past. Only under the Qajar shahs in the nineteenth century did Iran experience a revival of concern with the Achaemenids and their successors. Although there was no systematic research, it became fashionable to copy Achaemenid reliefs for architectural decoration and to carve new reliefs in an archaic style. Indirect knowledge of Achaemenid Iran was preserved in Europe through the Old Testament and classical Greek sources, especially Herodotus (though he never visited the country) and Xenophon. Reports from other ancient Greek travelers and mercenaries and the testimony of expatriate Persian refugees in greece provided additional detail.

From the fourteenth century onward, European travelers brought back descriptions of the great ruined cities of persepolis and Pasargadae, though their true identity remained unknown until the beginning of the seventeenth century. From the seventeenth to the nineteenth centuries, an increasing number of European travelers, diplomats, and scholars-mostly French, British, and Dutch-reported in greater and greater detail about the standing monuments of Iran (Sancisi-Weerdenburg and Drijvers 1991; Wright 1977).

The first excavations occurred in 1825 when Colonel Stannus, the East India Company resident at Bushire, dug at Persepolis and made the first set of molds of sculptures along the north facade of the Apadana. Colonel Macdonald, head of a mission to Iran, also excavated at the site shortly afterward. In 1835, henry creswicke rawlinson, a former officer in the Indian army who had studied Persian, Arabic, and Hindustani, was posted to Kermanshah as a military adviser, and by 1837, he had produced fairly accurate copies of the trilingual (Old Persian, Akkadian, and Elamite) cuneiform relief carved by Darius I in about 520 b.c. on a rock face at Bisitun (Behistun). In the subsequent decade, Rawlinson unraveled the Old Persian and Akkadian texts. In 1840-1841, austen henry layard, later distinguished by his work at the great Neo-Assyrian capitals of nineveh and nimrud, traveled throughout western Iran and visited

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Susa. In a report to the Royal Asiatic Society in 1850, he suggested that excavations be conducted at the great mound of Susa for the express purpose of discovering more bilingual inscriptions, and he persuaded the British prime minister, Lord Palmerston, to provide a parliamentary grant of 500 pounds for further explorations of the site.

Royal bodyguard, relief from the palace of Darius I in Susa, ca. 500 B.C. of the Persian Kings

(Image Select)

Beginnings of Sustained Archaeological Research in Iran

The first scholarly excavations in Iran were those of the British geologist, William Kennett Loftus, a member of a commission formed by the British and Russian governments to arbitrate the delineation of the frontier between Persia and Turkey. In 1850, Loftus and another member of the commission, Henry A. Churchill, visited Susa intending to excavate. Because of local resentment, the visit was brief. The two returned in 1851 along with Colonel W.F. Williams, the commandant of the frontier commission, and they planned the site, identified it through inscriptions as the Susa of the Old Testament, and established the presence of Sassanian, Achaemenid, and earlier (Elamite) levels.

The French at Susa

During a trip across Persia in 1881-1882, Marcel-Auguste Dieulafoy, a French engineer, soldier, and architectural historian, visited Susa with his wife, Jane, and upon their return to France, Dieulafoy persuaded the national museums to provide modest financing for excavations. Unlike most of his contemporaries, Dieulafoy was more interested in architecture than museum-quality objects. Thus, from 1884 to 1886, the Dieulafoys worked exclusively on the columned Apadana (Audience Hall), previously identified by Loftus, from which they retrieved spectacular Achaemenid remains. These antiquities became the core of the louvre's extensive Susa collection.

In 1886, Nasir el-Din Shah (1848-1896), who was aware that the local population was still discontented with the excavations, shut them down, and almost a decade passed before the French legation in Tehran felt it could reopen the matter. In 1895, the French ambassador, Rene de Balloy, finally persuaded the shah to sign a treaty that granted the French an exclusive concession for archaeological research throughout Persia. In Mesopotamia, then under Ottoman control, considerable rivalry between

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Hamadan (the ancient Median capital, Ecbatana) in the late nineteenth century reported that excavation for antiquities in large areas in and around the city was a systematic industry farmed out by the government for revenue. There was also a thriving production of fake antiquities, mostly coins, for the European market.

Griffin-lion shown in tiled relief, from a royal site (probably Persepolis or Susa), fourth century B.C.

(Image Select)

The modernizing reforms of Nasir al-Din, the most able of the Qajar shahs, brought about his assassination in 1896. His successors were either ineffectual or despotic, and the period leading up to World War I was one of great internal turmoil that culminated in the invasion of northern and southern Iran by Russia and Britain, respectively. In 1911, members of the first Majlis (National Assembly) introduced a bill designed to cancel the French archaeological monopoly, but by 1913, the French ambassador had successfully arranged for the bill to be shelved. The war brought excavations to an end though sir aurel stein conducted a survey in Seistan in 1915-1916. De Mecquenem remained in Iran until the end of the war to protect French archaeological interests.

The Interwar Period

French control of archaeology continued until 1927 when it was finally abolished by Reza Shah Pahlavi (1925-1941). As a concession, the shah established an archaeological museum and library in Tehran and appointed a French director-general of antiquities responsible for establishing an archaeological service, making an inventory of historic monuments, and carrying out necessary restorations. The position was taken in September 1927 by a French architect, Andre Godard, who held it until 1960. Godard's achievements were considerable: he created the necessary administration, the Iranian Archaeological Service (IAS), and established the Muze Iran Bostan (now the National Museum of Iran) and oversaw its construction in Tehran between 1935 and 1937. He also conducted important work on Islamic architecture and supervised the restoration of historic buildings, especially in Isfahan. In 1931, when the antiquities market was being flooded by Luristan bronzes from illegal excavations in central-west Iran, Godard wrote what became the standard text on the bronzes. He was also vigorous in the

popularization of Iranian art and archaeology on an international level. Laudable as these achievements were, they were largely self-serving, and there was virtually no provision for the training of Iranians who could conduct independent archaeological research, staff museums, or educate the next generation.

Throughout most of Godard's tenure, the only Iranians involved in excavations were those working for antiquities dealers and, up until the 1950s, only three Iranians (Mahdi Bahrami, Issa Behnami, and Mohsen Moqaddam) managed to obtain doctorates in Iranian art and archaeology from French universities. Some excavations initiated by the IAS (e.g., Hasanlu and Khurvin) were, from an Iranian point of view, arbitrarily transferred to foreign projects. There was also a vigorous illegal trade in antiquities, and much material ended up in the british museum, the Louvre, and numerous other museums and private collections. In 1959 alone, the Louvre bought 500 Luristan bronzes from Jacques Coiffard, the French ambassador in Tehran-the question of provenance was never raised.

Other Foreign Projects

In 1931, the oriental institute of the University of Chicago (OIC) began a major archaeological project in Fars with the Achaemenid capital of Persepolis as the main focus and headquarters. Excavations at Persepolis and neighboring sites were directed by Ernst Herzfeld (1931-1934) and Erich Schmidt (1934-1939). The OIC subsequently undertook other projects, including aerial and ground surveys, in the mountains of Luristan and elsewhere in Iran between 1935 and 1937. Brief excavations were made at over a dozen sites. Also in 1931, the university of pennsylvania museum (UM) began two important projects in the little-explored northeastern part of Iran.

During the 1930s, there were few foreign expeditions apart from those of the major players, the French and the Americans. Aurel Stein (Harvard University and the British Museum) made four trips between 1932 and 1936 visiting and testing numerous sites in southeastern (Kerman, Baluchistan, and Fars) and western Iran, and he identified numerous ancient sites, such as Hasanlu, that subsequently became archaeologically famous. A Swedish expedition led by T.J. Arne investigated Shah Tepe in the Gurgan Plain in 1933. Although the situation in the 1930s can be described as considerably improved, there was no coordination of international efforts, excavation methods remained fairly crude, and programs of excavation, while sometimes sustained, were not at all systematic. The decade of research prior to World War II threw isolated and random shafts of light on the development of Iran from the Neolithic to the Achaemenid period, and in no region was there anything approaching a complete sequence.

However, great strides had been made. For example, Herzfeld's 1934 Schweich Lectures on the archaeological history of Iran, over 100 pages in length, devoted only 8 pages to the pre-Median and pre-Achaemenid eras (Herzfeld 1935). Seven years later, D.C. McCown (1942) needed over 60 pages to synthesize the comparative stratigraphy of the prehistoric periods of north-central, western, and southwestern Iran even though some areas were still relatively unexplored. The prehistory of northwestern Iran was disposed of in a single page, and southeastern Iran was not mentioned. World War II and internal conditions in Iran brought a second hiatus in foreign fieldwork.

The Post-World War II Period: 1945-1979

The accidental discovery of the fabulous early-first-millennium-b.c. golden hoard at Ziwiyeh in northern Kurdistan in 1947 gained widespread international interest, but foreign fieldwork still recommenced rather slowly after World War II. The French returned to Susa promptly enough in 1946 under a new director, Roman Ghirshman, who held the post until 1967 when he was succeeded by Jean Perrot (1967-1990), who introduced modern stratigraphic methods there. The British returned to the field in 1948, and the IAS was increasingly active following the completion of work at Persepolis. The IAS

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In the two decades between 1959 and 1979, archaeology flourished in Iran perhaps more

popularization of Iranian art and archaeology on an international level. Laudable as these achievements were, they were largely self-serving, and there was virtually no provision for the training of Iranians who could conduct independent archaeological research, staff museums, or educate the next generation.

Throughout most of Godard's tenure, the only Iranians involved in excavations were those working for antiquities dealers and, up until the 1950s, only three Iranians (Mahdi Bahrami, Issa Behnami, and Mohsen Moqaddam) managed to obtain doctorates in Iranian art and archaeology from French universities. Some excavations initiated by the IAS (e.g., Hasanlu and Khurvin) were, from an Iranian point of view, arbitrarily transferred to foreign projects. There was also a vigorous illegal trade in antiquities, and much material ended up in the british museum, the Louvre, and numerous other museums and private collections. In 1959 alone, the Louvre bought 500 Luristan bronzes from Jacques Coiffard, the French ambassador in Tehran-the question of provenance was never raised.

Other Foreign Projects

In 1931, the oriental institute of the University of Chicago (OIC) began a major archaeological project in Fars with the Achaemenid capital of Persepolis as the main focus and headquarters. Excavations at Persepolis and neighboring sites were directed by Ernst Herzfeld (1931-1934) and Erich Schmidt (1934-1939). The OIC subsequently undertook other projects, including aerial and ground surveys, in the mountains of Luristan and elsewhere in Iran between 1935 and 1937. Brief excavations were made at over a dozen sites. Also in 1931, the university of pennsylvania museum (UM) began two important projects in the little-explored northeastern part of Iran.

During the 1930s, there were few foreign expeditions apart from those of the major players, the French and the Americans. Aurel Stein (Harvard University and the British Museum) made four trips between 1932 and 1936 visiting and testing numerous sites in southeastern (Kerman, Baluchistan, and Fars) and western Iran, and he identified numerous ancient sites, such as Hasanlu, that subsequently became archaeologically famous. A Swedish expedition led by T.J. Arne investigated Shah Tepe in the Gurgan Plain in 1933. Although the situation in the 1930s can be described as considerably improved, there was no coordination of international efforts, excavation methods remained fairly crude, and programs of excavation, while sometimes sustained, were not at all systematic. The decade of research prior to World War II threw isolated and random shafts of light on the development of Iran from the Neolithic to the Achaemenid period, and in no region was there anything approaching a complete sequence.

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vigorously than anywhere else in western Asia. There was a virtual explosion of international activity with expeditions from Britain, the United States, canada, West Germany, France, sweden, italy, japan, belgium, and denmark. In 1976, for example, there were seventeen archaeological surveys and thirty excavation projects. By 1978, the number of foreign expeditions in Iran had risen to over fifty, the majority of them being major projects. For the first time, some balance was achieved in chronological coverage, at least in western Iran, and other previously neglected areas began to be explored.

Though some important achievements occurred in Paleolithic studies, this subfield continued to lag. Iran's great environmental diversity and complex geography of deserts, mountain valleys, and coastal plains are reflected in the numerous cultural adaptations in prehistory. For this reason, archaeologists have eschewed syntheses of larger areas and time periods in favor of constructing prehistoric regional sequences (see Voigt and Dyson 1992). This period also saw the introduction of modern excavation standards and close attention to stratigraphy, so necessary when dissecting complex mound settlements, and, by the mid-1960s, the impact of the theoretical and methodological innovations of "the new archaeology." In addition, there was a rapid and intense development of surface survey strategies, perhaps more so than anywhere else in western Asia. This was inspired by gordon willey's virú valley project in peru in 1953 and the extensive surveys conducted in both Iraq and Khuzistan by robert mccormick adams.

Survey data were used to identify administrative hierarchies; stylistic, functional, and chronological variability; trading networks; population dynamics; and so forth through the employment of such methods as gravity modeling, rank size indexing, cluster analysis, multidimensional scaling, and statistical analysis. A number of important ethno-archaeological projects were also conducted, especially Patty Jo Watson's and Carol Kramer's separate studies of two villages in central-west Iran. There was a notable increase of fieldwork done by the IAS as well as an increase in the number of Iranians being trained not only in Iran but also in Europe and North America. In 1958, Ezatollah Negahban, himself a graduate of the OIC, created the Institute of Archaeology at the University of Tehran. The institutional framework was further strengthened with the appearance of the Iranian Centre for Archaeological Research (ICAR), directed by Firouz Bagherzadeh, and also the National Organization for Restoration of Historical Monuments. By 1961, both the British Institute of Persian Studies and a German institute had been opened in Tehran, and the American Institute of Iranian Studies was opened soon afterward. Specialized journals appeared, especially *Iran* (1962), *Iranica Antiqua* (1965), *Archaologische Mitteillungen aus Iran,* new series (1967), and *Cahiers de la Délégation Archéologique Française en Iran* (1971), and in addition, numerous international colloquia, symposia, conferences, and exhibitions were organized.

History of Paleolithic Research in Iran

Because of the relative lack of overlap between Paleolithic research and that of later periods, the history of Paleolithic archaeology in Iran is most effectively dealt with separately. Compared to other areas of western Asia, Paleolithic research in Iran was very late to develop. Stone tools were recovered from a Pleistocene context near the Caspian Sea in the late nineteenth century by de Morgan, and further discoveries were reported from river terraces in Seistan. De Morgan's belief that, during the Pleistocene, the mountains and plateaus of Iran would have been uninhabitable possibly dissuaded further interest. Indeed, much of the country is at such a high altitude that it is likely that the entire Paleolithic sequence of Iran will be consistently marked by hiatuses around glacial maxima.

dorothy garrod's pioneering research in southern Iraqi Kurdistan in 1928 documented Lower, Middle, and Upper Paleolithic occupations at the surface site of Chemchemal and in the caves of Zarzi and Hazar Merd near Sulaimaniya, and it was expected that similar evidence would be discovered in Iran. In

1934, Middle Paleolithic flints were recovered near Shiraz in Fars Province, and Herzfeld, in the first published synthesis of Iranian archaeology,

emphatically endorsed a Paleolithic occupation of the entire country, though he could say nothing beyond that (Herzfeld 1935, 1). It was not until 1949 that the U.S. physical anthropologist Carleton S. Coon (UM) conducted the first excavations with the objective of discovering the western Asian antecedents to the European Upper Paleolithic. Coon excavated in Hunter's Cave at Bisitun (Kurdistan), Tamtama Cave near Rezaiyeh (Azerbaijan), and the Khunik rock shelter (southern Khorasan near the Afghan border), all of which contained only Middle Paleolithic deposits. In Belt Cave (Ghar-I Kamarband) on the Caspian foreshore and in nearby Hotu Cave, Coon found evidence of Mesolithic, Neolithic, and later occupations.

In the 1960s and 1970s, there was a brief flurry of activity in Paleolithic research with projects emanating from Britain, Canada, Denmark, France, Italy, and the United States. For example, in 1959 and 1960, robert braidwood (OIC) conducted a survey and excavated several Middle and Upper Paleolithic sites in the region of Kermanshah. Between 1962 and 1964, charles mcburney (University of Cambridge) investigated Mesolithic levels in the cave of Ali Tappeh near Beshshahr (1964) and Middle Paleolithic deposits in Mazandaran (1963). In 1969, McBurney also surveyed a number of rock shelters in the Zagros and a Middle Paleolithic rock shelter (Houmian) in Luristan and as well as several caves in the mountains around Mashad, including a very large one at Moghan. Frank Hole (Rice University) and Kent Flannery (University of Michigan) identified a Middle Paleolithic “main component” at Kunji Cave in the Khorramabad Valley, central-west Iran, in 1963. In the 1960s and 1970s, Paleolithic research concentrated in the Zagros region, but shanidar cave (Iraqi Kurdistan), with its rich Mousterian sequence, is still the preeminent site for the general area. Notwithstanding considerable foreign activity, interest in the Paleolithic among Iranian archaeologists has been virtually nonexistent.

Achievements to 1979

One person's periphery is another person's center. By the end of the period from 1959 to 1979 it had become apparent that, far from being peripheral to the development of civilization in western Asia, Iran had played an important part in the Neolithic transition, the development of agriculture and pastoralism, and the development of urbanism. Western and southern Iran had generated polities that had brought about the collapse of the once-mighty Assyrian empire and had gone on to conquer much of western Asia under the Achaemenids, the Parthians, and the Sassanians. In addition, it was now possible to construct a prehistoric chronology for Iran based primarily on internal evidence rather than on parallels to Mesopotamia and other adjacent areas.

Post-Achaemenid Archaeology in Iran

Limited references thus far to the work of Iranian archaeologists belies their overall contribution since much of their work has focused on the post-Achaemenid period. For the Parthian period alone, major excavations have been conducted in the Parthian cemetery at Hamadan (M. Azarnoush, ICAR), in the Anahita temple complex at Kangavar (Sayfollah Khambakhsh-Fard, ICAR), and in the city of Bishapur (Ali Akbar Sarfaraz, IAS). Also worthy of note is the extensive survey of Mazanderan and associated excavations at Qal'eh-i Kharab Shar in the late 1970s by M.Y. Kiani (ICAR).

There have also been several major foreign projects that have focused on the post-Achaemenid period. These include excavation of Shahr-i Qumis (ancient Hecatompylos), occupied in the Parthian, Sassanian, and Islamic periods; a Sassanian fire temple at Takht-i Sulaiman; the sprawling elite Sassanian complex at Qal'eh-i Yazdegird; Sirjan, the late Sassanian and early Islamic capital of Kirman Province and largest city in southern Iran by the tenth century a.d.; Islamic Ghubayra; Siraf, the famous medieval seaport on the Gulf, south of Bushire, with trade connections to India, china, and the eastern Mediterranean; and the rich Islamic site of Tepe Dasht-i- Deh.

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Important projects have been conducted on the citadel mound of the ancient Median capital of Ecbatana at Hamadan (Muhammad Sarraf); at Ziwiyeh (Nosratollah Motamedi); on the Apadana mound at Susa (Mir-Abedin Kabuli); at Shahdad (Kabuli); at the Sassanian site of Borazjan on the Persian Gulf (Ehsan Yaghmaei); in prehistoric mass graves in Luristan (Alireza Farzin); at Tepe Mil, a prehistoric, Sassanian, Seljuk, and Islamic site near Rayy (Zarintaj Sheibani); and in the important Sassanian complex at Kuh-i Khwaja in eastern Seistan. In 1995, the governments of Iran and Germany signed an accord on scientific and cultural cooperation, but assistance on the archaeological front was limited to educational exchanges. Although foreign scholars may visit and study in Iran, foreign archaeological projects remain prohibited.

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See also

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a protégé of louis leakey. During the 1970s Isaac helped desmond clark establish the University of California, Berkeley, as a center for the study of African archaeology. In 1983 he transferred to Harvard University.

Isaac became one of the most significant prehistoric archaeologists of his generation as a result of his brilliant excavation of major sites in East Africa such as olorgesailie, Naivasha, and Peninj and his novel and challenging interpretations of hominid behavior occurring millions of years ago. From 1970 until his early death he was codirector with Richard Leakey of the East Turkana Research Project, which contributed a great deal of new information about fossil hominids and the environments in which they lived. He was also responsible for educating, encouraging, and working with a new generation of African archaeologists from African nations. Isaac died at a tragically young age, very much at the height of his powers.

Tim Murray

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Island Southeast Asia

This essay includes both prehistoric and historical archaeology. The definition of Island Southeast Asia depends on the distinction between Island Southeast Asia and Mainland Southeast Asia. This definition was made at the Eleventh Pacific Science Congress, held in Tokyo in 1966, and was approved as Resolution 2.2 of the Congress (Solheim 1967a, 2). This resolution presented, for the first time, the terms *Mainland Southeast Asia* and *Island Southeast Asia.* The ad hoc committee of the Anthropology Division of the Congress that submitted this resolution, first to the Anthropology Division and then to the Council of the Pacific Science Association, further presented tentative boundaries as follows: “Mainland Southeast Asia would extend from the thirtieth parallel of latitude (approximately the Yangzi River) to the south as far as Singapore, and from the Irrawaddy River to the South China Sea; Island Southeast would include all the islands off the coast of Mainland Southeast Asia, from Formosa around to the Andaman Islands” (Solheim 1967a, 3; 1967b, 896). As presented and as used here, both terms are capitalized. For the record, the ad hoc committee that developed these terms was made up of Tom Harrisson, R.P. Soejono, and the author.

There was little communication between historical and prehistoric archaeologists working in Southeast Asia until recently. Historical archaeologists have been interested primarily in monumental architecture and art (stone and bronze sculpture in particular) and have done very little excavation. An attempt to bring historians, historical archaeologists, and prehistoric archaeologists together on the transition from prehistoric to historic times in Southeast Asia was the “London Colloquy on Early South East Asia” held in 1973 (Smith and Watson 1979). Until recently, historical archaeologists depended primarily on ancient Chinese records for the interpretation of their finds previous to European contact in the area.

Art history has been an important approach to historical archaeology but, unfortunately, there has also been little communication between archaeologists involved in prehistoric archaeology and art historians. In an attempt to bring art historians and archaeologists together, a symposium on “Early Chinese Art and its Possible Influence in the Pacific Basin” was organized by the Department of Art History and

Archaeology of Columbia University (Barnard 1972). While art historians were saying that Chinese art styles, primarily of late Chou times, were an important influence on Pacific Basin art, in part by way of the spread of Dongson art through Indonesia into the Pacific, archaeologists were pointing out that virtually all of the specific examples presented were earlier in Southeast Asia than in china and that the influence was Southeast Asian rather than Chinese. There was little communication between the two different approaches.

It is not possible to establish a universal periodization for this history as to some extent each country (and even each portion of a country as

large as indonesia) has a different history. The one thing that all these countries share is that the first stage of archaeological study for each was initiated and carried out by foreigners. Only gradually did the original inhabitants of the countries become involved and finally take over, through archaeology, the study of their own past. There is one other element of this history that is shared by all the countries of Island Southeast Asia, and that is that World War II marked the end of the total domination of archaeological research by foreigners. Following the war there was a short period of adjustment when a few new foreigners entered the field and quickly started training local archaeologists. As these countries, except for Brunei and, to a lesser degree, Taiwan, are developing countries, they do not have big budgets for archaeological research. While they are able to locally train archaeologists needed for the jobs available, they need an increase in trained archaeologists to keep up with development and to start covering the whole area of their countries.

Island Southeast Asia is treated here country by country, within three very generalized time periods: pre-World War II, the short adjustment period following the war, and the last thirty-five years of the twentieth century, when local archaeologists became the primary research force.

Colonial Archaeology, 1700-1942

Indonesia

The first archaeological research in Island Southeast Asia, as elsewhere, was the making and recording of surface collections. For Southeast Asia, this continued to be the major source of archaeological data until after World War II. In Island Southeast Asia, as in much of the rest of the world, it was, and still is, widely believed that polished stone artifacts are supernatural objects of extraterrestrial origin, brought to earth through thunder and/or lightening. As a result these ancient stone tools, when discovered, were kept by the finders as amulets for protection against fire started by lightening, for protection of crops in the fields, and for personal protection. Much of the early collections was created by purchasing these artifacts from local farmers and villagers. The earliest-known such collector in Indonesia, who published data on his collections, was G.E. Rumphius (1705; Soejono 1969, 68-69; Solheim 1969a, 31-32).

Soejono (1969, 70-73) lists a number of collectors who published on polished adzes, bronze drums and weapons, megalithic and cave sites, human skeletal remains, and ancient beads during the nineteenth and early twentieth centuries. (*See* Soejono 1969, 70-73 for details on this work.) Heine-Geldern (1945, 129) states that "the first systematic excavation of a prehistoric site ever to be undertaken in the Archipelago…. was that of the Toala Caves in Southwest Celebes by Paul and Fritz Sarasin in 1902." A major event was the discovery of the *Pithecanthropus* skull cap in Trinel, Java, by eugene dubois in 1891. Between 1907 and 1908 a follow-up German expedition, led by Frau L. Selenka, searched in Trinel but found nothing else. Soejono also said:

During the first quarter of the twentieth century, intensive studies were done in cave cultures, kettledrums, and the Megalithic culture.... It was suggested that the megalithic tradition was introduced by peoples of the Mediterranean; differing racial groups were assumed to be the producers of the different cave cultures; and ancient beads were thought to have an interconnection with regions in Asia and the Mediterranean. The Archaeological Service,…. however, did not pay much attention to drums, caves, megaliths, or beads, as its greatest concern was the survey and preservation of "Hindu-Javanese" movements. The existence of a prehistoric stage preceding the Hinduized cultural level was still a matter of obscurity.

(1970, 12-13)

Historical archaeology had its beginnings almost as early as prehistoric archaeology, but in the form of

written references to historic sites rather than collections of artifacts. In 1733 a Dutch official mentioned the Prambanan temples, which he had visited, in his diary, and toward the end of the eighteenth century F. von Boekholz described them in detail. In 1805 J.H. Cornelious was ordered by the Dutch administrator to explore them (Soekmono 1969, 93).

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East Malaysia and Brunei

The early period of random finds in Sarawak, Brunei, and Sabah produced very little. “It did include, however, a time of world attention on Sarawak in the late 1870s when exploration of Sarawak caves and the Great Cave at Niah, in particular, was sponsored by Darwin, Huxley, and Wallace (Harrisson 1958, 550-560; 1970, 19) in an attempt to find the so-called 'missing link' in the evolution of man” (Solheim, et al. 1985, 12). “The reported results were that 'cave deposits of this part of Borneo are wholly without interest except to local naturalists'” (Solheim 1983, 35). This survey did, however, establish that there were cave and open sites with prehistoric and early historic remains, not only at Niah but also at the Bau Caves in southwestern Sarawak and at Santubong, at the mouth of the Kuching River (Harrisson 1954, 1958; Harrisson and O'Connor 1969, 3-6; Solheim 1961). No reports on these findings were published.

Banks, as an early curator of the Sarawak Museum, published a few descriptions of prehistoric artifacts he came across in Sarawak, and Ivor Evans, in what was then British North Borneo, did the same for North Borneo (1913, 154-158; 1922).

Philippines

There are several publications on the history of Philippine archaeology (Beyer 1947; Evangelista 1969; Solheim 1952a, 1953, 1968). This history refers primarily to the articles by Evangelista and Solheim (1968).

The one true archaeological survey during the nineteenth century was done by Frenchman Alfred Marche. In 1881 he made a systematic survey, primarily of cave sites, on two of the central Visayan Islands, the more important being of Marinduque. He published a travel account of this in French (1887), which has been translated into English (1970). Most of his collections are now in the Musée de l'Homme in Paris, while a few artifacts are in the Museum of Madrid. A brief article was published on a few of the wood carvings in the Musée de l'Homme that he had recovered (Solheim and Gaynor 1978).

“Caves and open sites were casually explored in several localities in the Philippines by Feodor Jagor in 1860, J. Montano and Paul Rey from 1878-1881, and by Jose Rizal, Filipino national hero, and his party, in 1894. However, nothing significant resulted from these investigations” (Evangelista 1969, 99). Following Rizal's activities in Mindanao, until 1921 there was no further known archaeological activity. In 1921 henry otley beyer started gathering data on possible prehistoric finds. Up until this time it was believed that no “stone age” had existed in the Philippines.

From 1922 to 1924 Carl Guthe led an archaeological survey program, primarily in the Visayan Islands, on behalf of the University of Michigan. He had a boat to work from and as the result of about 15,000 miles of travel by sea and land about thirty-one tons of artifacts from 542 sites had been collected. He had been instructed to make only surface collections, but he was unable to follow these instructions at all times and, as a trained archaeologist, he made small test excavations at a few prehistoric sites. The expedition was focused on locating sites with Chinese and Southeast Asian porcelains and stonewares. Guthe published only three short reports on the expedition (1927, 1934, 1937; Solheim 1964a, 3).

Beyer, the father of Philippine anthropology and archaeology, first came to the Philippines in 1905 as a government ethnographer. He had no training in archaeology when he became interested in the prehistory of the Philippines. He did no fieldwork in archaeology before 1926. In late 1925 he was preparing to return to the United States to join the Department of Anthropology at Harvard when he fell

and broke his leg. While he was recuperating, work on the dam and reservoir at Novaliches, to provide water for Manila, began and archaeological sites were discovered. When he was able he went to visit the sites and thereupon decided to forgo Harvard and organize excavation at Novaliches (Solheim 1969b).

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Beyer was not a trained archaeologist and his methods were self taught, based on common

sense and a very organized mind. His methods would not be considered “good” archaeology today, and criticism in the Philippines has tossed out most of his conclusions. However the generalizations he made, without presenting the data on which he based them, were on the whole quite accurate. His reconstructions of “waves of migration” have been shown to be most unlikely, but the dating for these waves and the areas from which he said they came match very well the times and areas with which contact has been hypothesized. His 1947 publication presents a very detailed history of archaeological finds in the Philippines.

In 1940 Olov R.T. Janse came to the Philippines from Vietnam to see if there were Dongson connections between the two areas. Thinking that Beyer was an amateur collector he did not work through him, and as a result found nothing of interest (Janse 1941, 1944, 1946). During World War II Beyer was not interned until the final six months of the war due to the intercession of Tadao Kano, a Japanese archaeologist in charge of museums in the Philippines. While he was unable to do any fieldwork during this time, he did much research and writing.

Taiwan

Probably the best history of Taiwan archaeology was one by Takeo Kanaseki and Naoichi Kokubu (1950). Written in Japanese, it was translated into Chinese. A brief history of Taiwan archaeology by Wu (1969) is the primary source for this article.

Archaeological research in Taiwan has not followed the trajectory that it did in the other Southeast Asian countries because the traditions that developed in Taiwan were the result of Japanese colonialism rather than western colonialism. Archaeology developed in close relationship with ethnology and the early Japanese focus in archaeological research was to relate the ethnic groups that were being studied at the time with prehistoric cultures. There are few if any reports suggesting any archaeological activities in Taiwan before the Japanese occupation began there in 1895.

There was very little communication between Japanese and western archaeologists until after the end of World War II. All publications on the archaeology of Taiwan were in Japanese or Chinese, resulting in an almost complete ignorance in the western world of what went on in Taiwan prehistoric research until well after the end of World War II. The first effective contact between Taiwan archaeology specialists and western archaeologists was in 1953 at the Eighth Pacific Science Congress and the Fourth Far-Eastern Prehistory Congresses Combined, held in Manila, where both Chinese and Japanese archaeologists from Taiwan took part.

Reports on archaeological subjects started appearing immediately in 1895 in the form of field notes that appeared in the Japanese archaeological journal *Zenruiqaku Zasshi*. “Three kinds of work may be distinguished among the sources: (1) Simple field notes, which include travel reports, site reports, and the description of artifacts; (2) Reports on excavations; and (3) Interpretations, which include theoretical analyses of data, discussions on the relationship between artifacts and the peoples, and discussions on the connections between Taiwan and other areas” (Wu 1969, 106).

In early 1897 Moshinori Ino and others discovered the Yuan-shan shell mound, one of the most important sites in Taiwan. Ino was an ethnographer and was the first to report impressed geometric decoration on pottery of the Ping-pu ethnic group, a kind of pottery latter found in archaeological sites. “He was the first person to carry out excavations in Peng-hu Island, and found that prehistoric communication existed between Taiwan and the Ryukyus and between Taiwan and Micronesia” (Ino 1907a, 1907b; Wu 1969, 106).

Ryuzo Torii presented the idea that the Yuan-shan culture might be related to a non-Taiwan culture

(1897a). He was the first person to report the existence of the site of Pei-nan on the southeast coast of Taiwan (1897b), now the location of the largest excavation yet made in Taiwan. He also pointed out that there were prehistoric sites in the mountainous interior of Taiwan (1900). Torii authored one of the most important excavation reports of this early period (1911), and in his last paper (1926) he presented the first report on the megalithic culture in Taiwan.

PREV NEXT

It is not known under what authority or what source of funding this archaeological research took place. Wu has stated, however, that "a new trend, conducting organized excavations, had developed for the study of Formosan prehistory after the establishment of the Lecture Room of Folklore and Ethnology, Taihoku Imperial University" (1969, 107). Apparently, from about 1929 both authority and funding came through the Imperial University. New professional archaeologists became prominent in the field from this time. The most important of these were A. Matsumura, Takeo Kanaseki, Naoichi Kokubu, and Tadao Kano.

In about 1927 Matsumura discovered the Ken-ting site at the southern tip of Taiwan. Excavations were undertaken there in 1930, but other than brief preliminary papers, no final reports were published. In 1929 Kano listed 151 prehistoric sites that had been discovered and reported previous to that time. Many more were discovered in following years but little was published by other than those mentioned. The information on these sites comes from the Kanaseki and Kokubu report (1950). Kano was the most active, continuing fieldwork and publication until 1943, at which time he was moved by the Japanese military government to the Philippines to be in charge of the museums there. He worked closely with Beyer and informed him of Taiwan prehistory so that in later publications Beyer was the only English-writing archaeologist to be able to include data on Taiwan prehistory.

Adjustment Years, 1942-1959

Taiwan was the only country in Island Southeast Asia where fieldwork continued during World War II. In all the other countries fieldwork came to a virtual standstill with the beginning of the Japanese invasions. Unlike the abrupt beginning of this period at the end of the war, the ending varied for each country and was gradual in most cases. The year 1959 is an approximate average.

Indonesia

R. Soekmono, the director of the National Archaeological Institute of Indonesia in 1968, had this to say about the Dutch Archaeological Service after the end of World War II:

When the Dutch came back to Indonesia after World War II and found that the Archaeological Service had become an institution of the Republic of Indonesia, they established another archaeological service that was staffed with the expert personnel of the prewar period, but it lacked the needed resources. It was not until 1950 that the Archaeological Service became united again with its branches at Prambanan and Bali. Since then it has functioned normally under the direction of Professor Bernet Kempers.

(Soekmono 1969, 96)

Prehistoric research continued during the Japanese occupation, but at a much reduced pace. W. Rothpletz made a survey of the Bandung hill region in West Java, his report on which was published after the war (1951), as was the report by Bandi (1951) on the Bandung obsidian artifacts.

H. R. van Heekeren was the only prehistorian working with the Archaeological Service after the war. During the war he was a Japanese prisoner of war working on the Thai-Burma railroad, where he made archaeological discoveries. He returned to work in Indonesia in 1946, doing fieldwork in Central and South Sulawesi until the early 1950s on Paleolithic sites (1949a), Toala sites (1949b), and at Kalumpang (1950). D.A. Hooijer, the paleontologist, examined animal remains recovered by van Heekeren (1949). Van Heekeren continued working for the Archaeological Service until 1956, when he returned to the netherlands. He excavated in caves on Flores (1958b), on Patjitan sites in Java (1955a), in sites with stone sarcophagi in Bali (1955b), and urn burial sites in Java (1956b) and East Sumba (1956a).

The three generalized periods of archaeological activity in this region vary a bit for Sarawak because of one man, Tom Harrisson. Although he had visited Sarawak in the 1930s, his archaeological work there started after World War II, in 1947, and continued until his retirement in

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The three generalized periods of archaeological activity in this region vary a bit for Sarawak because of one man, Tom Harrisson. Although he had visited Sarawak in the 1930s, his archaeological work there started after World War II, in 1947, and continued until his retirement in

1967. His research on Sarawak archaeology continued from a distance until 1975 and was published, after his death, in early 1976 (Solheim and Jensen 1977). His primary activities, as the Director of the Sarawak Museum in Kuching, were at Santubong, near Kuching, and at the Niah Caves, far to the northeast.

Harrisson's first indicated interest in Sarawak archaeology started in 1946 or 1947 when he was still with the British military (Solheim 1977a, 4). He was involved in the mapping of iron deposits at Santubong using military mine detectors and trained military personnel. When he visited the Niah Caves in 1947 to check on birds-nest collecting he noted possible prehistoric material there. Actual excavation started in the Bao Caves in 1949, not so much for the data to be obtained but as part of the training of future Sarawak Museum staff and of Harrisson himself. Harrisson, with no archaeological training himself, brought in Michael Tweedie, the Director of the Raffles Museum in Singapore, to provide the archaeological background (Harrisson and Tweedie 1951).

Excavations at six main sites in Santubong were the main training in archaeology for both Harrisson and the Sarawak Museum staff. Santubong had been known since the nineteenth century for stray finds of gold ornaments, stone and glass beads and bracelets, porcelains and stone wares, and a large quantity of iron slag. Common Chinese coins dated between a.d. 976 and 984. “The first Santubong digging was in 1949 and the first excavation in 1952. The Santubong archaeology through 1956 could be considered the completion of the training period of Sarawak archaeology” (Solheim 1983, 36-37). Harrisson published on a wide variety of archaeological subjects, based primarily on library research, during this period (Solheim and Jensen 1977).

The primary site in Brunei to date is Kota Batu (two miles from Brunei town), the location of the first Brunei Sultanate capital, with beginnings well before Islam came to the area. Tom Harrisson started looking over the area in 1951, did some testing in 1952, and, with Barbara Harrisson, made a preliminary excavation in 1953 (Harrisson and Harrisson 1956).

Philippines

Much of Beyer's valuable archaeological and ethnological library in his two houses in Ermita was destroyed during the battle of Manila. While he was able to save most of the ethnographic collections of the National Museum during the battle, the section of the museum where the archaeological collections were stored was gutted, the shelves and cabinets burned, and the artifacts deposited in a midden up to two meters deep on the basement floor. Beyer's office in a building near the palace was not hurt, so a portion of his library and collections were saved (Solheim 1969b, 12). Following the hostilities he completed the writing of his two major archaeological reports on the Philippines, published in 1948. Most of his collaborators were gone and he had lost contact with most of his collectors in the provinces so there was no field activity until 1950. In 1953 the Philippines hosted the Eighth Pacific Science Congress and Beyer organized the Fourth Congress of Far Eastern Prehistorians, held jointly. This was a major event in Southeast Asian and Pacific archaeology (*see* Indo-Pacific Prehistory Association).

Solheim came to the Philippines in late 1949 and spent a month in the field in 1950 excavating in a jar burial site on the Bondok Peninsula in southern Tayabas, southeast of Manila (Solheim 1951). In 1951 and 1953 Solheim was again in the field with several Filipino archaeology students, surveying and excavating on Masbate (Solheim 1954, 1968). In 1951 the first survey and excavation was of Batungan Mountain in Masbate, one of the small Visayan Islands. Several cave and rock shelter sites were tested and pottery similar to the earliest pottery in Micronesia was recovered from two sites. From other sites, pottery was discovered that was similar to the pottery from the Kalanay Cave Site. From one of these sites the first C-14 dating in the Philippines was done, giving a date of 2,710±100 years ago (L274)

(Solheim 1968). The excavation of the Kalanay Cave site on Masbate, in combination with the study of the earthenware pottery recovered by Guthe in the 1920s, led to the presentation of the Kalanay Pottery Complex in the Philippines (Solheim

1957c, 1964c), and later to the Sa-huynh-Kalanay Pottery Tradition, found widely in Island Southeast Asia and Vietnam (1959a, 1967c). In addition, proposed in the 1964 publication was the Bau-Malay Pottery Tradition, also found widely in Island and Mainland Southeast Asia (1959b, 1967d). In 1952 Solheim surveyed on Fuga Island, one of the Babuyan Islands just north of Luzon, and found several burial jar sites. In 1953 he made a small excavation of a burial jar on Batan Island, in the Batanes Islands north of the Babuyan Islands. The Fuga and Batan burial jars led to a summary article on burial jars in Island Southeast Asia (Solheim 1960).

Robert Fox completed his Ph.D. in cultural anthropology at the University of Chicago, but when he returned to the Philippines he became involved in archaeology. The three primary areas of exploration, excavation, and publication undertaken by Fox were at Calatagan, Batangas, the Tabon Caves in Palawan, and the Cagayan Valley of northern Luzon. As the chairman of the Department of Anthropology of the National Museum for many years Fox was involved in much more than those areas. In 1956 Fox and Evangelista surveyed and made small excavations in two jar burial sites in Sorsogon and Albay Provinces on the Bicol Peninsula (Fox and Evangelista 1957a, 1957b).

The Calatagan peninsula is at the very southwestern tip of Batangas Province, about 100 kilometers south of Manila. It was known that fourteenth- and fifteenth-century porcelains had been found there in the 1930s and some small excavations had been made by Janse in 1940 and Solheim in 1952 through 1953. Major excavations of several extensive burial sites were started by Fox in 1958 and a report was published in 1959. A description of the Calatagan earthenware pottery was published in 1982 (Main and Fox 1982). More details can be found in the Philippine section of *Asian Perspectives* Volumes 1 through 3 (1957-1959).

Taiwan

The transition period saw a change in the archaeologists in Taiwan from Japanese to Chinese. No fieldwork of note happened after the end of World War II until 1949 when Professor li chi founded the Department of Archaeology and Anthropology. While the department was active in research on the prehistory of the mainland, the group of eminent Chinese archaeologists that had moved from the mainland and were either with the university department or with Academia Sinica were not greatly interested in Taiwan's archaeology.

The first change appears to have developed as a result of the number of Chinese and Japanese archaeologists and cultural anthropologists who took part in the Eighth Pacific Science Congress and Fourth Far-Eastern Prehistory Congress held in Manila in 1953. As noted by Beyer (1956, 271-272) in the proceedings of the Congress, the five papers presented on Formosan archaeology were all by Japanese archaeologists. Shortly after the Congress Beyer received two letters from Li Chi telling him of two newly started excavations undertaken by the Department of Archaeology and Anthropology in Taiwan.

The first general knowledge of Taiwan prehistory among non-Chinese reading archaeologists came with a short article by kwang-chi chang (1956). Chang edited a much more ambitious review of the archaeology of Taiwan in 1963, which presented a foundation for the real beginning of Taiwan archaeological research by Chinese in Taiwan. This review included a site report on Tap'enk'eng by Pin-hsiung Liu of excavations made in 1962. The review provided the launching platform for a rejuvenated and reoriented program of Taiwan archaeology.

Local Archaeologists Take Over

In the 1960s local archaeologists gradually took over archaeological research in most of the countries of

Southeast Asia. The training of local archaeologists was a major problem for all countries and the solution varied from country to country. None of the countries had a sufficient number of archaeologists to even approach extensive coverage for the total area of their country. Publication was and is another major problem, with the tradition of publishing final reports on excavated sites not yet established in Southeast Asia. Those reports that are

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Indonesian Archaeology, 1957-1994

Archaeological research in Indonesia was practically dormant during the late 1950s and 1960s, as Indonesia experienced political turbulence. The most important research conducted in the 1960s was that of R.P. Soejono at Gilimanuk in western Bali, a large site containing many late prehistoric burials. Excavations were undertaken in 1963, 1964, 1973, and 1977. In 1977 Soejono obtained his Ph.D. in archaeology with a dissertation on late prehistoric burial sites in Bali. Gilimanuk occupied a major

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The tempo of archaeological research picked up in the 1970s, particularly after 1975, when administrative restructuring transformed the old system inherited from the Dutch of a single institution in charge of both research and conservation. Research became the sole responsibility of the newly formed National Research

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of Borobudur, which was eventually completed in 1983. Other significant long-term projects were conducted in Trowulan, East Java, between 1976 and 1990 (fifteen years), and Banten Lama, West Java (1976-1985).

In the research strategy adopted for Trowulan, the center carried out a surface survey of an area 10 kilometers by 10 kilometers. The center's historical archaeologists then conducted excavations in several sectors: the Pendopo Agung (“Great Pavilion”), Pandan Sili, Klinterejo, Sentonorejo, Nglinguk, Sumurupas, Kejagan, Kedaton, Batok Palung, Wringin Lawang, and Blendren. Large quantities of artifacts were recovered, along with data on architecture, including nonreligious buildings. This site, the probable capital of the kingdom of Majapahit (thirteenth to sixteenth centuries) has been identified as the largest precolonial urban site in Indonesia.

Research has also been conducted sporadically in Sumatra. A branch office of the center has finally been established in Palembang, south Sumatra, and data are gradually accumulating on the kingdom of Srivijaya that was based there during the seventh to eleventh centuries (Manguin 1992), as well as later periods during which the site continued to be occupied. Other sites, including a trading post of the eleventh to thirteenth centuries at Kota Cina, north Sumatra, and a large complex of monuments at Muara Jambi of approximately the same period have also been investigated.

Research at the site of Banten Lama in West Java began in 1976 and continued for ten years. Banten continues the urban history of Indonesia from Trowulan, late classic period, into the early Islamic era. Excavation and survey here has succeeded in identifying units of activity within the site, including residential and occupational zones.

At all these sites, the work of analysis continues long after the excavations have been completed. Urban archaeology in Indonesia has made a promising beginning. Systematic surveys using standard sampling techniques are now employed, and there is reason to expect that the history of early complex society in Indonesia may soon become clearer.

Epigraphy, one of Indonesian archaeology's oldest subdisciplines, has contributed some important new information despite the small number of specialists in the field. Boechari, before his untimely death, contributed important new readings of Sumatran and Javanese inscriptions, as has Sukarto Kartoatmojo. J.G. de Casparis continues to add to his astounding output of valuable translations in a multitude of languages and scripts, facilitated by his incomparable experience in both South and Southeast Asia. In addition to new information provided by reading inscriptions discovered before 1957, new inscriptions continue to be found. One of the most important is the Wanua Tengah III inscription of a.d. 908. Discovered in November 1983 in Temanggung, Central Java, the find consists of two copper plates issued by King Balitung. The plates give a king list, the second of whom is said to have taken the throne in a.d. 746.

In the realm of spectacular discoveries, the Wonoboyo Hoard must assume a prominent place. In 1991 in this village near the site of the great Hindu complex of Prambanan, central Java, local residents discovered an enormous deposit of gold items, including coins and various other objects including jewelry and ritual accessories. The weight of gold recovered exceeds 30 kilograms. Although much gold of the Classic period is held in private and museum collections, this is by far the largest and best documented discovery. The fact that the gold was properly reported and delivered safely to the National Museum is an excellent indication of the level of awareness of modern Indonesians regarding the importance of archaeological studies and the pride that most Indonesians feel for their heritage.

John Miksic

Tom Harrisson continued as director of the Sarawak archaeology program for another ten years, having developed a much more ambitious program and a number of well-trained staff. The major program under way was the exploration and excavation of the Niah Caves (Harrisson, T. 1957, 1958, 1959). While he published many papers, very few of these were site reports, and the two that could be so considered were done with Barbara Harrisson (Harrisson and Harrisson 1957; Harrisson, T., 1968). For Niah, Barbara Harrisson(1958, 1965, 1967, 1977a) published more substantive reports than Tom Harrisson.

While one questionable date of 95 b.c. was reported, the body of the dates was between a.d. 600 and 1300. Tom Harrisson was one of the pioneers in Southeast Asia in the study of beads. He summarized a number of these papers in a report (1973) comparing the beads recovered in Brunei to those that had been recovered in Sarawak.

Because of peaty soil and a high water table, much organic material, including wood, has been preserved in the Kota Batu site, the only such archaeological site known in Southeast Asia. Tom Harrisson (1974) reported on the wood remains excavated the first season at Kota Batu. He divided his subject into five parts: tree wood-1,577 pieces, coconut shell-399, other “nuts”-42, dammar (resin)-1,103, and charcoal-2,232. The tree wood included whole or partial: trays, bowls, and covers-16; dishes or wheels-6; kitchen utensils-11; tools for splitting or securing wood-8; spinning and weaving apparatus-17; fishing gear and boat parts-6; and toys-3 (8-10) The richness of this material from the small test excavation points to the wealth of the material that can be recovered when extensive excavations are made.

A site on the Tanjong Batu beach, the northeastern tip of Brunei, sixteen miles from Bandar Seri Begawan, the capital of Brunei, was discovered in 1974. A total of 199 primarily basal shards of small bowls were recovered, suggesting the possibility of a nearby shipwreck (Omar 1975). The shards were all considered to be Sung period (a.d. 917-1279), making them earlier than the great majority of the ceramics at Kota Batu and Sungai Lumut. Museum staff continued inspecting the site regularly and late in 1975 they discovered a polished stone adze, the first to be found in Brunei. Within days after this first discovery three more stone tools were turned over to the museum. All three of these were from the same area and had been found at about the same time as the first one (Omar and Shariffuddin 1976).

A new site, Kupang, was excavated by Omar and resulted in his M.A. thesis (1978). Unfortunately it has not been published; it appears to have been an important report for its treatment of the locally made earthenware. A brief report on the earthenware is included in an article on trade patterns between Brunei and neighboring areas from a.d. 700 to 1500 (Bellwood and Omar 1980). The site was first occupied around a.d. 750 according to C-14 dating. The earthenware is very similar to that reported by Solheim (1965a) from Tanjong Kubor in Sarawak. Bellwood and Omar name this pottery complex Tanjong Kubor (TK) ware. While they agree with Solheim that the TK ware is similar to pottery excavated in Cebu City in the Philippines, at Johore Lama in southern Malaysia near Singapore, and reported from Hong Kong, they do not go along with Solheim's calling this Bau-Malay and saying that it is found widely from about a.d. 700 up to the recent past in Island Southeast Asia, including the central and southern Philippines.

Philippines

Robert Fox continued as the primary archaeologist in the Philippines until he had a stroke in 1978. As chairman of the Department of Anthropology at the National Museum for many years, Fox helped to develop a number of well-trained Filipino archaeologists on the staff. He and his staff cooperated with the Department of Anthropology of the University of the Philippines in training a number of young archaeologists.

A great deal of archaeological fieldwork has been done by the National Museum, but unfortunately the museum does not have a regular publication. Many of the publications are short reports, put out on glossy paper for sale at the museum, and these do not receive wide circulation. A look at Fox's bibliography, which is considerable, shows that many of his works were short pieces issued with special museum exhibits, newspaper articles, articles in trade journals, and articles in other sorts of publications that did not receive circulation outside the Philippines. Looking at references to papers by the staff of the

museum presented at international conferences you see that many references are to required reports to the museum on completed fieldwork. One Philippine journal that has carried a number of archaeological reports is *the Philippine Quarterly of Culture and Society,* published by San Carlos University in Cebu

at the Royal Captain Shoal, a coral reef west of Palawan, in 1985; the *Griffin,* an East India Company boat found in 1985 northwest of Basilan, south of Zamboanga, Mindanao; and the galleon *San Jose,* found in 1986 near Lubang Island, Mindoro Province. In 1991 a two-season underwater project was started on the Spanish warship *San Diego,* which sank near Fortune Island on 14 December 1600. Over 34,000 artifacts were recovered from this ship, including porcelains and stonewares, earthenware vessels, a navigational compass and a maritime astrolabe, and organic materials.

The National Museum is conducting survey and limited excavation, led by Dizon and Santago, of stone remains not unlike the castles found on Okinawa, on the Batanes Islands, the most northerly of the Philippines Islands. These sites are located on hilltops and have been dated to the twelfth century. The most recent article summarizing Philippine prehistory was published in Hawaii in 1992.

Taiwan

The first major interdisciplinary program on Taiwan prehistory was organized by K.-C. Chang and carried out from July 1964 to July 1965 by the Department of Anthropology, Yale University, and the Department of Archaeology and Anthropology, National Taiwan University. The team was made up of five archaeologists, a palynologist, and a geologist. The primary sites excavated were Pa-li (the name shifted later to Tapenkeng), near Taipei, and Fengpitou, in southwestern Taiwan (Chang et al. 1969).

Chang organized an even more interdisciplinary team for a second major project in 1972 through 1974, sponsored by the same two institutions plus Academia Sinica in Taiwan. The team included experts in botany and palynology, archaeology, cultural anthropology, geography, geology, geomorphology, soil sciences, and zoology. Concerning this breadth Chang said: “Its breadth is not only intradisciplinary (for example, the study of the archaeology, the ethnohistory, and the ethnography of the modern inhabitants) but also interdisciplinary. Ours is a 'saturation' approach; we investigate many natural and humanistic scientific aspects of a small region-two river valleys-and seek to examine their interaction through a study of the ecosystems throughout their recent history” (Chang et al. 1974, 40-41). The two river valleys fall midway between the two major sites of the earlier program so the project also aimed to discover the relationships between the different cultures found at those sites. One of the archaeologists from Yale in this program produced two reports that present much of the archaeological results of this project (Dewar 1977, 1978).

Wen-hsun Sung made a small excavation at O-luan-pi, at the very southern tip of Taiwan, in 1966 (Sung et al. 1967) and reported extended burials in stone cist coffins with many associated artifacts but no metal. Later than the cist burials came a culture, which may have had metal associated, with flexed burials not in coffins. Another site at O-luan-pi, called O-luan-pi site II, was excavated in part by Li (1983) in 1982. He found four distinct cultural layers: OLP Prehistoric Cultural Phase I, without pottery, dated at about 5,000 years ago; OLP Prehistoric Cultural Phase II, with the same culture reported by Sung et al. (1967), dated about 4,000 years ago; OLP Phase III, with painted pottery, dated to about 3,000 years ago; and OLP Prehistoric Cultural Phase IV, with plain pottery, dated to about 2,500 years ago (Li 1983, 79-81). This report has 169 full-page color plates.

Li, in 1977, excavated at a site that has been called K'en-ting, about eight kilometers northwest of O-luan-pi, which had been discovered in 1930. The final report was his Ph.D. dissertation at SUNY-Binghamton University and unfortunately has not been published. However, he did publish an article, “Problems Raised by the K'en-ting Excavation of 1977” (1983). In this article he raised questions about Chang's considering the fine red ware phase as an invasion of a Lungshanoid culture from the China mainland. He presented reasonable arguments that the fine red ware evolved out of the earlier Corded Ware culture. This suggestion has come to be generally accepted. One of the important

finds at K'en-ting was the impression of rice husks on several fine red ware shards. This gives the earliest date for rice in Taiwan. This date has been reported as ca. 3000 b.c. by Bellwood

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Israel

Archaeological fieldwork and research in Israel began long before the founding of the modern state in 1948. This article treats the history of archaeology in the region in nineteenth- and twentieth-century western Palestine in brief and then deals with developments in Israel after 1948 in greater detail.

The Formative Period in the Nineteenth Century

Archaeology in "the Holy Land," as Palestine under Ottoman Turkish rule was often called, began as part of the general rediscovery of the long-lost ancient Near East in the early to mid-nineteenth century. Discoveries of major monuments in Egypt and mesopotamia, as well as the recovery and decipherment of the earliest known written documents, beginning in the 1840s, soon galvanized interest in Palestine-especially as some of the most spectacular finds seemed to "prove the Bible."

Palestinian archaeology is generally said to have had its beginnings in the journeys of the Americans Edward Robinson and Eli Smith in 1838, pioneer mapmakers who first correctly

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identified more than 200 biblical and other ancient sites. The first actual clearance of ruins, however, was undertaken in 1850 by a French consular official, Felicien de Saulcy, who brought to light the so-called tombs of the kings in Jerusalem. The real archaeological turning point came with the great Survey of Western Palestine, which was sponsored between 1872 and 1878 by the British Palestine Exploration Society (PEF) and produced the first modern, reasonably accurate surveys and maps of western Palestine. The PEF also sponsored the first systematic below-ground explorations in Palestine, the soundings of C.W. Wilson and C. Warren near the Temple Mount in Jerusalem. The PEF's journal, the *Palestine Exploration Quarterly*, began publication in 1867 and is still published today. Other foreign archaeological societies for exploration and fieldwork in Palestine were founded at this time by the Americans (1870), Germans (1878), and French (1892).

The first real excavations, however, were those of the legendary sir william matthew flinders petrie at Tell el-Hesi in southern Palestine in 1890 (followed by the American F.J. Bliss in 1893). It was Petrie, long experienced in archaeology in Egypt, who intuitively laid the two foundations for all subsequent fieldwork: (1) stratigraphic excavation of multilayered tells or mounds and (2) comparative ceramic typology and chronology.

Twentieth-Century Palestinian Archaeology until World War I

The early twentieth century saw a flurry of large-scale archaeological projects in Palestine under several auspices. Excavations included those of Britain at Gezer (1902-1909); the United States at Samaria (1908-1910); and Germany at Ta'anach (1902-1904), Megiddo (1903-1905), Jericho (1907-1909), and Galilean synagogues (1905). Most of these excavations were amateurish when judged by more modern standards. Furthermore, results were often compromised by the typical combination of the excavators' colonialism, nationalism, adventurism, and above all by the "biblicism" that has been irresistible in this branch of archaeology. Only george reisner's work at Samaria in 1908-1910 rose above these limitations, but he was primarily an Egyptian archaeologist and the delay in the publication of his final report volumes until 1924 blunted his impact on the field. A final limitation on the development of Palestinian archaeology was the inefficient and even corrupt administration of antiquities and sites under Ottoman rule.

Archaeology from 1918 until 1948

The years between the two world wars constituted a "golden age" for Palestinian archaeology. The British Mandate government of 1918 established a modern Department of Antiquities and new antiquities laws. The department's journal, the *Quarterly of the Department of Antiquities in Palestine*, was published until 1950. The British themselves, often under the auspices of the PEF and the British School of Archaeology in Jerusalem, sponsored significant work at Ashkelon (1920-1922), Jerash in Transjordan (1923-1928), and the Carmel prehistoric caves (1925-1934) as well as work by Petrie at sites in the Gaza area (1926-1934), Jericho (1930- 1936), Samaria (1930-1935), Lachish (1932- 1938), Kh. el-Mefar (1935-1938), and other sites. In 1938, the Department of Antiquities, along with its collections and library, moved to a magnificent new facility, the Palestine Archaeological Museum, built in Jerusalem with funds from the Rockefeller family in the United States.

U.S. archaeology also flourished, largely under the aegis of the american school of oriental research, founded in 1900 and directed from 1920 to 1929 and 1933 to 1936 by william foxwell albright, the leading U.S. archaeologist of his era and considered by many the father of "biblical archaeology." Among the U.S. excavations were those by Albright himself at Tell el-Fûl (1922), Bethel (1934), and especially Tell Beit Mirsim (1926-1934); by others at Tell en-Nasbeh (1926-1935) and Beth-shemesh (1928-1933); and Nelson Glueck's explorations in Transjordan (1932-1947). Parallel to "the Albright

school" and its biblical orientation were large projects undertaken by secular U.S. institutions such as the University of Pennsylvania at Beth-Shan (1921-1933), the oriental institute of the university of chicago at

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The Beginnings of a National School

It was during the period between the two world wars that Jewish scholars began to do firsthand work on the historical topography and archaeology of Palestine, then undergoing several waves of Jewish settlement from abroad. The Jewish Palestine Exploration Society had been founded in 1914 and was succeeded by the Israel Exploration Society after 1948.

The former society conducted the first Jewish excavations at the Hammath Tiberias Synagogue in 1921-1922, but the real pioneer of Jewish archaeology in Palestine was Eliezer Lipa Sukenik, who founded the Department (now the Institute) of Archaeology at the Hebrew University of Jerusalem shortly after its opening in 1925. Sukenik excavated the synagogue at Beth Alfa (1929) as well as many Jewish burials in Jerusalem and at Tel Gerisa (Tell el-Jerisheh, 1927). He also participated in the joint expedition to Samaria led by J.W. Crowfoot (1930- 1935) alongside another pioneer of Jewish archaeology, Nahman Avigad. Another distinguished Jewish archaeologist and historian of the formative era was Benjamin Mazar (Maisler), who together with Avigad carried out extensive excavations in the Jewish necropolis at Beth Shearim (1936-1960). After joining the faculty of the Hebrew University, Mazar became the doyen of Jewish and later Israeli archaeology, training most of the next generation.

Other pioneer Jewish archaeologists of the British Mandate period were the prehistorian Moshe Stekelis; the classical archaeologist and art historian Michael Avi-Yonah; Ludwig A. Mayer, in Islamic art and archaeology; Immanuel Ben-Tor, Ruth Amiran, later chief archaeologist of the Israel Museum; and Shmuel Yeivin, later first director of the Israel Department of Antiquities. Other Jewish scholars in related fields of ancient Near Eastern, classical, and biblical studies were also active at this time, both at the Hebrew University and in the British-directed Department of Antiquities.

Although many publications appeared and interest in popular circles, especially among Jewish settlers in Palestine, grew enormously, no distinctive “Jewish school” emerged. Thus, foreign archaeologists continued to dominate the field under the colonialist regime in Palestine, as elsewhere in Transjordan, Syria, and Iraq. Nevertheless, by the eve of World War II, when all fieldwork came temporarily to an end, Jewish archaeologists were poised to come into their own. This pioneer generation-“the fathers of Israeli archaeology”-were deeply imbued with a love and firsthand knowledge of “the land of Israel” (Eretz-Israel), steeped in the classical academic tradition of European universities, influenced by the best of foreign scholarship and research (especially that of the Albright school), and experienced in field excavation.

Archaeology in the State of Israel

Almost immediately after the foundation of the state of Israel in 1948, Israeli archaeologists began work on their own even though they were now restricted to parts of western Palestine and even excluded from the Old City of Jerusalem. Israelis were also isolated from most foreign archaeologists, both archaeologists in Syria and jordan and archaeologists from the United States, Great Britain, france, Germany, and other countries, as nearly all of them now chose to work in the West Bank or Transjordan. All the foreign institutes of archaeology, as well as the Rockefeller Museum and its facilities and publications, and even the Hebrew University of Israel were beset by enormous difficulties, including the war of independence, the absorption of a massive influx of immigrants, and severe economic and social difficulties. Archaeology was accorded a low priority.

Despite overwhelming odds, Israel quickly established a Department of Antiquities, on the old British model, and continued the tradition of the quarterly publication of the Department of Antiquities in

Palestine with the launching of the *Israel Exploration Journal* in 1950. Limited salvage and excavation projects began, including Yeivin's work on many salvage projects, Mazar's excavations at Tel Qasile near Tel Aviv (1949-1950), and soon after the discovery and acquisition of some of the dead sea scrolls, pioneer work in the publication of those manuscripts.

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1960s-1980s, however, ranging from Paleolithic to Islamic, from north to south, and including the Israeli-occupied territories as well. In addition, the first systematic surveys were carried out in the latter regions, especially by younger archaeologists of the third generation, many of them from the Tel Aviv Institute of Archaeology carrying out the emphasis of their mentor, Aharoni, concerning regional archaeology. Particularly noteworthy were the intensive surveys of the Galilee (Z. Gal and Y. Frankel), of the Samaria region (A. Zertal and I. Finkelstein), the Judean highlands (A. Ofer), and the Sinai (E. Oren, Y. Beit-Arieh, and others). In Israel proper, surveys along the Mediterranean coast continued (R. Gophna and others), and there were very extensive surveys in the Negev (R. Cohen, M. Heimann, Y. Dagan, and others).

Classical archaeology was not neglected in the 1960s-1980s as there was a revival of interest in synagogues and Jewish settlements, with excavations by both local and foreign archaeologists. Other classical and later period sites included sites in the Golan Heights, Caesarea, Herodian, Jericho, and the Herodium, and several Byzantine sites in the Negev as well as early Christian monasteries and churches. Underwater and coastal archaeology also began in earnest, especially under the aegis of the Center for Maritime Studies of Haifa University. Finally, prehistoric sites were not overlooked; indeed research burgeoned.

In the 1990s, the Israeli school matured and several newer or intesified emphrases developed:

1. 1. In 1989, the old Department of Antiquities of the Ministry of Education and Culture was transformed into an independent body, the Israel Antiquities Authority, which has some 200 employees, and greatly expanded resources and responsibilities. It continues to publish the serial *Antigot* in both Hebrew and other languages as well as *Excavations and Surveys in Israel* and other materials.

2. 2. More modern stratigraphic methods, hotly debated in the 1970s and even into the 1980s, were now taken for granted by a younger generation of archaeologists.

3. 3. Some of the underlying socioanthropological theory and the emphasis on quantitative methods, advocated by “the new archaeology” of the 1970s-1980s in America, was finally adopted in Israel, although very selectively.

4. 4. New large-scale projects were undertaken, often with subsidies from the Antiquities Authority designed to restore and develop key sites for tourism. The largest such project was the massive clearance and restoration of Roman-Byzantine Beth-shan, which even surpasses another Decapolis city, Jerash in Jordan. Other sites that underwent large-scale restoration were Dan, Hazor, Caesarea, Lachish, Beersheba, and Arad.

5. 5. Both the Antiquities Authority and the several institutes of archaeology placed more emphasis on prompt publication, and the younger generation set a higher mark than their predecessors, both in preliminary and final reports.

6. 6. It may be said that “the third generation” of Israeli archaeologists had finally “come of age” with the creation of a self-conscious, highly professional national school, one that was well organized and well supported. This school easily dominated the scene, in comparison with the few remaining foreign-sponsored projects; few other than American projects persisted, and these were often joint Israeli-American enterprises.

Conclusion

Despite its rapid growth in just under fifty years and its complex character, Israeli archaeology throughout has had a certain consistent, distinctive character. First, it has been deeply grounded in traditional ancient Near Eastern scholarship. Second, it has taken the Bible (i.e., the Hebrew Bible or Old Testament) seriously, yet unlike American (and some European) "biblical archaeology," it has maintained a professional, specialized, and thoroughly secular character, utilizing the Bible, not as confessional literature, but largely as the foundation of national history and culture. Third, it has remained largely pragmatic, grounded in the realia, and has been preoccupied more with description and classification than with explanation and little concerned with anything but the most basic theory.

Fourth, Israeli architecture emphasized large-scale architectural exposure rather than

detailed stratigraphy and microphasing, and special emphasis has been laid on the clearance of living surfaces and exhaustive attempts to restore pottery assemblages. Fifth, Israeli archaeology (excluding prehistory) has been allied almost exclusively with the disciplines of history, philology, and comparative literature with anthropology playing a minor role, if any-in contrast to New World archaeology. Its adoption of aspects of the new archaeology has been slow, sporadic, and limited to such obvious practical strategies as ecological studies, regional surveys, and applied science in the analysis of certain materials. Deliberate, explicit research design is rare, and nomothetic approaches are almost unheard of. As Israelis argue, their connection with the land and its history is "direct and emotional," not theoretical; in any case, the urgency of salvage work and the necessities and hardships of so many excavations leave little time for reflection or comparisons with archaeology in other parts of the world. Thus, if archaeology in Israel is understandably somewhat parochial, it is also probably more intense, both professionally and popularly, than archaeology anywhere else.

A word should be added about foreign archaeology in Israel. Excavations sponsored by other nations have continued since the formation of the state of Israel, although on a relatively smaller and still-decreasing scale because of the dominance of the Israeli national school. The first postwar large-scale U.S. excavations were at Gezer (1964-1974, 1984, 1990); directed by G.E. Wright, W.G. Dever, and J.D. Seger, these excavations had a far-reaching significance in introducing methods of the new archaeology.

That tradition has continued largely with Gezer-trained excavators at Tell el-Hesi, a series of Galilean synagogue sites (E. M. and C. Meyers, J.F. Strange), at Lahav (J. D. Seger), at Tel Miqne/Ekron (S. Gitin, with T. Dothan), at Ashkelon (L. E. Stager), and other sites, both in Israel and Jordan. The old American School of Oriental Research, renamed the W.F. Albright Institute of Archaeological Research in 1968, continued its operations as a permanent in-country research institute. The British, French, and German institutes also continue to operate, although all transferred most of their fieldwork to jordan after 1948. Alongside the *Israel Exploration Journal,* the journals of the foreign schools disseminate important information about archaeology in Israel, namely, the *Bulletin of the American Schools of Oriental Research, Levant and the Palestine Exploration Journal, Revue Biblique,* and the *Zeitschrift des Deutschen Palastina-Vereins.*

Bill Dever

See also

Syro-Palestinian and Biblical Archaeology

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Italy

The history of Italian archaeology is dominated by the city of Rome, the grand imperial capital that was transformed into the seat of ecclesiastical power. Many Roman imperial buildings remained above ground and in use, and the description and exploration of these structures

J

J. C. Harrington Medal in Historical Archaeology

In 1981, the society for historical archaeology (SHA) created the J.C. Harrington Medal, the highest award offered in the discipline. Medalists are selected for a lifetime of contributions to the field centered on scholarship. The first copy of the medal was struck in silver and was presented in January 1982 in a surprise ceremony to jean carl (pinky) harrington at the annual SHA conference in Philadelphia. All other copies are in antique bronze.

The J. C. Harrington Medal. The face bears the quotation "…beyond the strictly historical…," from one of Harrington's famous articles; the obverse shows the ground plans of three of the most famous sites Harrington and his wife,Virginia, excavated: Raleigh's 1585 Fort,Washington's 1754 Fort Necessity, and the nineteenth-century Mormon temple at Nauvoo.

(Courtesy of the University of Pennsylvania Museum of Archaeology and Anthropology)

The list of recipients below reflects in a very general way the historical evolution of the discipline. To date, all medalists have been from North America (United States and canada), the region where the field has the deepest history going back to the 1930s, although the award is worldwide in scope. The names also in a vague fashion show the history of the discipline. The list includes researchers who were based in governmental agencies, museums, or similar institutions (cotter, fontana, Harrington, hume, kidd, Quimby, South, and Woodward), transitional figures who started in such settings but spent much of their career in the academic world (Fairbanks, Jelks, and Smith), people who were always academics (Bass, deetz, Gilmore, Salwen, and Sprague), and, finally, Roberta S. Greenwood, the first archaeologist whose major contributions to scholarship were grounded in what has become

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[* awarded posthumously]

Robert L. Schuyler

J. Paul Getty Museum

See Getty Museum

Jamestown, Virginia

Jamestown was the first North American community of European settlers to be the subject of a comprehensive, planned, and funded archaeological investigation. It was the first permanent English settlement in 1607, on Jamestown Island, Virginia, and is now part of Colonial National Historical Park. The archaeological work was begun in 1934 and was conducted in three campaigns, the last one continuing to 1997.

In 1934, work began with the objective of providing structure foundation plans for the newly established National Survey of Historic Sites and Buildings. This effort led to intractable differences between architects Henry Chandlee Forman and John Zaharov and archaeologists William John Winter, H. Summerfield Day, and Alonzo Pond. In 1936, order and firm direction were instituted by jean c. harrington, who was trained in both architecture and archaeology and had a grounding in data gathering. The project advanced under Harrington's effective direction with Civilian Conservation Corps labor until all work ended after the onset of World War II, which put an end to relief-supported archaeology in 1942. By then, Harrington's able staff of archaeologists, researchers, curators, and conservators had imposed orderly recording, data analysis, and conservation in the laboratory and had left a complete and extensive record of operations.

Investigations of Jamestown recommenced in 1954, with budgeted national park funds, under the

direction of john l. cotter and with the assistance of Edward Jelks, Joel Shiner, Bruce Powell, Louis Caywood, and the curator, Paul Hudson. The deadline of 1957 was set, the 350th anniversary of the founding of Jamestown, for Cotter to compile all data into a single volume, *Archaeological Excavations at Jamestown, Virginia,* to be published in 1958 by the National Park Service.

In 1992, a five-year archaeological survey was established to extend archaeological sensing and testing over the entire island and to conduct an intensive search for archival data. This survey, conducted by a consortium of researchers from the College of William and Mary and Colonial Williamsburg, Inc., and funded by the National Park Service, was to bring Jamestown research up-to-date for the 400th anniversary in 2007.

John L. Cotter

See also

Historical Archaeology

Japan

Each year from 1989 to 1999 more than 25,000 archaeological investigations took place in Japan, and the cost in the fiscal year of 1997 was over 132 billion yen (Center for Archaeological Operations 1999). The reasons for such scope and intensity of archaeological activities are the Japanese antiquarian tradition and the large number of amateur archaeologists, which creates a broadly based interest in archaeology; the assumed continuity of occupation of the archipelago and a strong affinity with those who left the archaeological remains; and the need to define the identity of Japanese people and their culture in today's global world. Archaeology in Japan, as in many other countries in East Asia, is national history that helps to define the present with reference to the past.

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Archaeological Sites in Japan

Premodern Interest in Archaeological Remains

Archaeological artifacts and features are mentioned in some of the earliest extant historical records (such as Kojiki 712, Fudoki 713, and Nihongi 720) that date to the early eighth century a.d. As elsewhere, these objects were attributed to supernatural origins, for example, stone arrowheads that often appeared after rainstorms were regarded as alarming signals from heaven that called for special rituals (Saito 1974, 1-12; Teshigawara 1988, 23, 26-28).

A rational approach to these remains beganduring the Tokugawa period (a.d. 1603-1868) when peace prevailed and arts and scholarship flourished. One of the intellectual traditions out of which the "almost archaeology" of the Tokugawa period (Bleed 1986) grew was neo-Confucianism, which provided the ideological support for the hierarchical regime. For example, Arai Hakuseki (1656-1725), who served as an adviser to the Shogun government, came to believe that stone arrowheads were not the weapons of a heavenly army that had fallen from the sky but had been manufactured by human beings in ancient times.

Another tradition on which the "almost archaeology" of the Tokugawa period was based was the *kokugaku* ("national learning") school, which rejected the secular rationalism of Confucianism and turned instead to studies of such ancient texts as the *Kojiki*. It has been suggested (e.g., Yazawa 1985) that the concept of the ethnic homogeneity of the Japanese nation, which would be advocated by the national government in later years and which forms the theme of popular archaeology books today, originated with this group of scholars. The reverence for ancient emperors that the *kokugaku* promoted led to field studies of burial mounds *(kofun),* with a view to their conservation and repair. Based on textual descriptions, but without firm evidence, many *kofun* were identified as imperial tombs. Although the identification had the positive effect of protecting the tombs from pot hunters, it also resulted in the current restriction on archaeologists' access to these remains.

Finally, there were a number of antiquarian groups active in Japan. One of these was the Rosekisha (Rock Fondlers' Club), of which the central figure was Seikitei Kiuchi (1728-1808), a wealthy official who lived near Kyoto. This group had several hundred members from various levels of society, including aristocrats, samurai, and Buddhist priests, who collected stones of unusual appearance, both natural and artifactual; held meetings to show their collections and compare notes; and published their findings with detailed descriptions and illustrations. These collectors represented the beginning of a broadly based amateur interest in archaeology, fostering the idea that archaeological inquiry was both fun and respectable. The club provided the necessary pool of human resources when, in response to threats to archaeological sites posed by the rapid economic development of the post-World War II years, a national system of salvage archaeology had to be put into place quickly.

Archaeology in the New Nation State

The political process that overthrew the Tokugawa Shogun government in 1868, reestablishing direct imperial rule (in theory at least), is referred to as the Meiji Restoration. The new Meiji government was committed to bringing Japan out of its isolation and to make it a modern nation state, and the introduction of archaeology as practiced in nineteenth-century Europe and America was a by-product of the arrival in Japan of scientists and technical experts whose special knowledge and skills were deemed useful by the new government. These experts included John Milne (1850-1913), an English seismologist who in 1876 became professor of geology at Tokyo University, where he remained until 1894; William Gowland (1843-1922), an English chemist who served as a consultant to the Mint from 1872 to 1888; and Edward Sylvester Morse (1838-1925), whose research trip to Japan in 1877 to study mollusks turned into a two-year appointment as professor of zoology at Tokyo University and who is generally credited, through his excavation of the Omori shellmound in Tokyo (Morse 1879a), as being the father of modern archaeology in Japan.

These scholars wrote books and articles about Japanese archaeology, most of which were published abroad in foreign languages and were read by very few Japanese. Nor did these men leave students who would become archaeologists. Being avocational archaeologists themselves, their impact on early Meiji Japan seems to have been through interaction with their Japanese counterparts, about whom it has been remarked "that there were more people interested in archaeology in Japan than anywhere else in the

world" (Morse 1879b). Some examples of the interaction, where benefits seemed to have flowed in both directions, are summarized in English by Peter Bleed (1986) and Fumiko Ikawa-Smith (1982).

Although the introduction of the methods and concepts of western archaeology was accidental, the Meiji government took some deliberate measures to preserve the nation's archaeological heritage. It issued a series of edicts in 1871, 1874, and 1881 to help preserve ancient objects and to restrict the excavation of ancient tombs. It introduced the Law for the Preservation of Ancient Temples and Shrines in 1899, which was to become the basis for the 1950 Law for the Protection of Cultural Properties. The government also initiated, as early as 1871, the process that resulted in the establishment of the imperial museum (today's Tokyo National Museum) as the depository of the nation's heritage.

Archaeology as Science and Archaeology as History

The first generation of Japanese professional archaeologists was led by Shogoro Tsuboi (1863-1913), and he, along with several other science students of the time, formed the Anthropological Society of Tokyo (the precursor of the Anthropological Society of Nippon) in 1884. Having been sent to England to study anthropology (1889-1892), Tsuboi was appointed professor of anthropology within the College of Science at the University of Tokyo in 1893. Tsuboi is said to have emphasized the fact that he had not studied anthropology under Morse and made disparaging remarks about him (Goto 1977; Kudo 1977). Yet Tsuboi believed that anthropology should be considered part of zoology, and his position in what was to be called the *Jinshu ronso* (“race controversy”) was the same as that of Morse.

The controversy was over whether the cord-marked *(jomon)* pottery from shellmounds was made by the ancestors of the aboriginal Ainu people who lived in northern Japan or by pre-Ainu inhabitants mentioned in Ainu legend. Morse, like Tsuboi, believed that the pottery makers were the pre-Ainu people while Heinrich von Siebold, John Milne, and Yoshikiyo Koganei (1859-1944) maintained that the pottery had been made by the Ainu. Koganei was a professor of anatomy at the University of Tokyo who had studied in Germany for five years (1880-1885). He based his arguments on anthropometric data while Tsuboi, dismissing such data as useless, promoted the use of archaeological remains and ethnographic analogies. This preoccupation with the ethnic identity of the prehistoric pottery makers was to continue until Tsuboi's death.

This group of archaeologists was referred to as “the race archaeology school” or “the university school,” in contrast to another group of archaeologists based at the Imperial Museum. Since the museum at that time employed scholars who continued the Tokugawa antiquarian tradition, the latter group was nicknamed “the museum school” or “the antiquarian school” (Terada 1980). Government policy at the time was to deposit the remains from prehistoric shellmounds in the Tokyo University Anthropology Department and those pertaining to the proto-historic and historic periods in the museum. The Anthropology Department of Tokyo University continued to be the major center for prehistoric research with a natural science orientation while more historically oriented work was conducted at the museum.

An additional major center for the latter kind of archaeology was created in 1913 when specialization in archaeology was formally recognized within the History Department of Kyoto University. Kosaku Hamada (1881-1938) was appointed professor of archaeology at Kyoto on his return from Europe in 1916. Most of his time in Europe (1913-1916) had been spent in England, where he studied with sir william matthew flinders petrie. Hamada's *Tsuron Kokogaku* (1922) is considered to be the first systematic statement in Japanese on the methods and theory of archaeology.

Stratigraphy, Typology, and Chronology

Hamada put archaeological methodology into practice at a series of excavations and in site reports, emphasizing the importance of stratigraphy and the need to define artifact types explicitly (e.g., Hamada 1918, 1919). At about the same time, Hikoshichiro Matsumoto (1919) used the stratigraphic principles

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of paleontology to argue that variations in ceramics were the result of chronological, rather than tribal, differences. From the 1920s until the end of World

War II in 1945, the separate disciplines of archaeology and anthropology were increasingly professionalized. In both cases, empirical evidence, based on stratigraphy, measurements, and typological classification and comparisons, were emphasized, with the ultimate goal of establishing a sound chronology.

It has been pointed out by many authors that the sociopolitical climate in the 1930s and 1940s favored such devotion to details rather than debate of any larger or more political issues. By this time, two kinds of prehistoric pottery, representing two separate cultures, were known. “Jomon,” the Japanese translation of “cord marking” was used by Morse as a descriptive term for the Omori shellmound pottery, and it became established as the name for pottery found in similar shellmounds and, by extension, the name for the culture and the Stone-Age people who made it. A different kind of pottery, first recovered in Tokyo in 1884, was understood to belong to the bronze-using rice growers of the Yayoi period, a period that lasted a few centuries before and after the beginning of the Christian era. The occupation of the archipelago by these groups could not be easily reconciled with the official version of national history based on the eighth-century history texts of *Kojiki* and *Nihongi,* which attributed the founding of the imperial state to the descendant of the Sun Goddess in 660 b.c. Scholars who persisted in using archaeological data to interpret prehistory and proto-history ran the risk of losing their jobs, or even being imprisoned. Given those circumstances, the excessive empiricism of chronology building, with no apparent reference to “national history,” was the prudent approach.

Early Post-World War II Years: Freedom of Inquiry

The end of World War II in 1945 meant the lifting of restrictions on historical inquiries, which made it possible to rewrite the history of Japan based entirely on archaeological evidence. The excavation of a Yayoi settlement site at Toro, near Shizuoka, between 1947 and 1950 dramatically underscored the new role that archaeology was to play in construction of national history in postwar Japan. Beginning shortly after the war, with severe shortages of such basic necessities such as shovels and food for the excavation crew, the Yayoi excavation was of a scale that had never occurred before in Japan, in terms of both expenditure and the number of participants. The investigation was both interdisciplinary and multi-institutional, with a large number of professionals and students and numerous local volunteers participating in unearthing the first rice paddies from an archaeological site as well as many artifacts, including wooden agricultural tools and building materials used for residential and storage structures. The excavation results were widely reported in the media, which raised the awareness of archaeology among the general public (Fawcett 1995). As W. Edwards (1991) notes, the image of the ancient, peaceful rice-growing village, re-created through archaeological investigation, supplied the new metaphor of continuity for the Japanese cultural and national identity, replacing the old mythological one made unacceptable by the war and defeat.

Another significant excavation took place in 1949, following the 1947 discovery of stone artifacts from an exposed Pleistocene formation by Aizawa Tadahiro (1926-1989), an amateur archaeologist, at Iwajuku about ninety kilometersnorth of Tokyo. The excavation by a team from the Meiji University provided the first convincing evidence for the existence of a Paleolithic period in Japan (Sugihara 1956). Within a few years of the excavation, the evidence for Paleolithic occupation had been confirmed at a number of other sites (Serizawa 1954; Serizawa and Ikawa 1960). The Iwajuku excavation not only added great temporal depth to the nation's history, it also gave the evidence a firm scientific basis: human occupation of the archipelago began in the geological past during the Ice Age, not in the mythical “age of gods.”

The “scientific” approach during the early postwar years also involved making generalizations about the nature of past societies with reference to the theoretical framework of historical materialism. Seiichi

Wajima (1909-1971) used the data and insights he had accumulated during the 1930s and 1940s to present an interpretative

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statement about prehistoric and proto-historic settlement systems, inferring social transformations that would have led to an early state with class differentiation (Wajima 1948). Similarly, Yukio Kobayashi (1911-1988) attributed class differentiation and state formation during the Kofun period (a.d. 300-600) to a rise in agricultural productivity that resulted from the widespread use of iron tools (Y. Kobayashi 1952). Such attempts at generalizations, however, were exceptional. For the majority of archaeologists, the particularist approach, with its emphasis on stratigraphic and typological evidence, which had been strongly entrenched in the 1930s, continued-and, in fact, continues to this day.

It was during this early postwar environment of freedom of speech, at a symposium in 1948, that Namio Egami first presented his thesis that the Japanese imperial family's ancestors had arrived relatively late in Japan and were the riders of horses from the continent (Egami 1962, 1964). Although this idea continues to be very popular with the reading public in Japan, and gained support of some foreign scholars (e.g., Hong 1988; Ledyard 1975), most Japanese archaeologists have dismissed it as being speculative and not worthy of serious rebuttal. It was only recently that one scholar decided to remedy the situation by presenting a counterargument (Sahara 1993).

A pottery jar from the Nagano-Ken jomon culture (3000-2000 B.C.), probably used for storing food

The Art Archive

International Contacts

Many Japanese archaeologists had studied abroad before World War II, and even during the early phase of the war, and a number of them had been engaged in archaeological investigations in the newly occupied areas of Manchuria, china, Indochina, and the Pacific islands. As the war progressed they became increasingly isolated, and this isolation continued in the early postwar decades when foreign travel and the importation of foreign books were severely limited by economic conditions. Isolation ended gradually when a small number of young archaeologists were given the opportunity to study abroad and a few senior scholars were able to attend international meetings. International interaction has increased rapidly since the 1970s, and Japanese archaeologists are once again engaged in overseas expeditions in places such as peru, Alaska, and the Middle East.

Newly developed archaeological methods and techniques were introduced. Soon after radiocarbon dating was developed, it was applied to samples from several Jomon sites, with occupation forces personnel and visiting U.S. archaeologists acting as intermediaries (Crane 1956; Crane and Griffin 1962; Libby 1951). These and subsequent determinations produced internally consistent, and surprisingly early dates, suggesting that Japanese pottery making was the earliest in the world.

A curious debate over the legitimacy of using radiocarbon dates in archaeological interpretation began. As noted elsewhere (Ikawa-Smith 1975,15-17), the debate had little to do with the reliability of the method itself but instead concerned the integrity of archaeology as a historical discipline whose expertise resided in its ability to construct a chronology based on the

study of artifacts rather than on technology. The resistance to the use of radiocarbon dating, however, was an exception. Other methods of dating were more readily accepted, as were various methods and techniques for identifying the sources of stones and clay, for enhancing artifact conservation, or for extracting more information about the use of plant and animal resources.

The periodical *Kokogaku to Shizen-kagaku* (Archaeology and Natural Science) was inaugurated in 1968, and the Association for Natural Science Approaches to Cultural Properties *(Bunkazai Kagakukai)* was formed in 1982. Its membership in 1998 was 830 and was evenly distributed between the natural sciences and humanities disciplines. A relatively large proportion of the work in this category is published in English (e.g., Akazawa 1980; Akazawa and Watanabe 1968; Koike 1979, 1986a, 1986b; Koike and Ohtaishi 1985; Matsui 1995, 1996; Minagawa and Akazawa 1992; Sato 1999; Yamamoto 1990).

In contrast to specific methods and techniques for analysis and conservation, theoretical and methodological concerns, particularly those of "the new archaeology" of the 1960s and 1970s, were not popular in Japan. This lack of interest was owing to North American archaeologists' concerns that archaeology should contribute to understanding the regularity of human behavior (Binford 1962; Longacre 1964; Taylor 1948)-a concern not shared by Japanese archaeologists. Archaeology in Japan had its roots in the Anglo-Saxon tradition of general anthropology in the 1880s, but early in the twentieth century it became a branch of history while *anthropology* came to mean biological anthropology alone.

One topical area in which the theoretical interests of both Japanese and Anglo-Saxon archaeologists overlapped was in the study of settlement systems. In the case of Japanese archaeology, however, this was the continuation of an interest that dated back to the 1930s (e.g., Akamatsu 1937; also see Sasaki 1999) rather than a new direction. North American settlement archaeology was presented in summary translations (Keally 1971) and its historical background explained (T. Kobayashi 1971). The large-scale excavations in Japan that began in the late 1960s provided an opportunity to put this methodology into practice. In the settlement pattern studies that developed as a result (T. Kobayashi 1980; T. Kobayashi, Oda, Hatori, and Suzuki 1971; Oda and Keally 1973), however, the emphasis was on the construction of settlement typology, in the empirical tradition of Japanese archaeology.

Economic Expansion and the Restructuring of Archaeological Operations

As the Japanese economy recovered through the 1950s and 1960s, large development projects threatened a number of archaeological sites. There was a popular movement to protect the nation's cultural heritage, which led to the revision of the 1950 Law for the Protection of Cultural Properties in 1959, making it mandatory to investigate sites, at the developer's expense, if the development project could not be modified to avoid site destruction. In the same year (1959), 345 notices of excavation were filed, of which 227 were purely academic in purpose and 118 were to investigate sites to be destroyed. The ratio of the academic to salvage excavations became reversed in 1963, when the former numbered 209 as opposed to 227 salvage operations. This reversal marked the beginning of a radical change in the nature and scope of archaeological operations in Japan.

Ten years later, in 1973, the figures were 203 academic versus 1,863 emergency excavation notices, for a total of 2,066. In 1983, academic excavations went down to 137 while emergency excavation notices shot up to 14,403. The figure for the fiscal year of 1997 was 409 academic excavations and 34,957 emergency operations, for a total of 35,366 notices (down from 41,555 in 1996, presumably the result of the economic situation). The total expenditure for emergency excavations in 1997-1998 was 132 billion yen (Center for Archaeological Operations 1975, 1989, 1999). The expenditure for the academic excavations is not known, but it would be miniscule by comparison.

Japan now has a very elaborate system of salvage archaeology involving three levels of government (national, prefectural, and municipal) and affiliated nonprofit corporations

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(Barnes 1990; Fawcett 1990, 1995; Habu and Fawcett 1999; T. Kobayashi 1986; Pearson 1992; Tanaka 1984; Tsuboi 1986; and Tsude 1995). According to the Center for Archaeological Operations (1999), the total number of people employed at the prefectural and municipal levels as administrative archaeologists in 1997-1998 was 6,872. There must have been an additional hundred or so working at the national level with the Agency for Cultural Affairs and its institutes in Tokyo, Nara, and elsewhere.

Hiroshi Tsude (1995), using figures from a few years earlier, estimates the total number of archaeologists in Japan at 5,700, of which 300 are in academic departments, 700 in museums, and the remaining 4,700 (or 82 percent) engaged in the administration of cultural resources management. In spite of their large numbers, cultural resources management archaeologists are always pressed for time, starting one operation after the other, conducting excavations, and preparing mandatory excavation reports, which are technically excellent but purely descriptive. They have little time to fully digest their findings and formulate any syntheses. Nor could the very small number of "academic" archaeologists keep up with the rapidly accumulating data and come up with syntheses and theoretical formulations. Japanese archaeologists are drowning in a flood of data.

The Archaeology of National Origins

The allocation of such huge resources to archaeological activities is feasible in Japan because of the high level of interest in the discipline by the tax-paying public. Spectacular results of excavations are widely reported on television and in newspapers and attract a large number of visitors to the sites. The Sannai Maruyama site, a very large Jomon period site at the northern end of Honshu, dating to about 3500-2000 b.c., featuring six enormous wooden structures and about 700 pit-house remains, received over 1 million visitors between 1994 and 1997 (Habu and Fawcett 1999). At the opposite end of the archipelago, some 160,000 visitors went to the Uenohara site to see evidence of settled village life as early as 9,500 years ago when the site was opened to the public over the summer holidays in 1997 (*Weekly Asahigraph* 1997, 17). These on-site interpretation events are some of the measures Japanese archaeologists have taken to keep the public informed of the significance of their activities, but they are, in fact, responding to the public's demand for information about the nation's past.

Public interest in archaeology in Japan is the legacy of long-term antiquarianism, but the level of the interest has risen in recent years, partly because of a series of spectacular finds, starting with the 1972 discovery of a painted tomb of Takamatsuzuka. There is also an increasing and perceived need for the Japanese people to define their distinctiveness as Japan takes its place the among the nations of the world. The interest in archaeology grew hand in hand with the growth of the discourse called *Nihonjinron* ("theory about the Japanese") and *Nihonbunkaron* ("theory about Japanese culture"), both of which purported to explain what was distinctly Japanese. Archaeological finds became relevant within this context because archaeological remains, even those of the 9,500-year-old Jomon villagers, are perceived as the remains of Japanese ancestors. A large number of archaeology books are published, some with beautiful photographic illustrations and others in convenient pocketbook format, bearing titles and subtitles like "The Origins of the Japanese," "Japan's Cultural Roots," and "Where Did the Japanese Come From?"

Archaeology thrives in Japan because it is perceived not as an abstract academic exercise but as a means to elucidate the nation's past, as a substantial contribution to increasing the Japanese peoples' understanding of who they are. In Japan, archaeology is national history, helping to define the present with reference to the past.

Fumiko Ikawa-Smith

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Jarmo

Most famous as the focus of robert braidwood's research into the history of the domestication of plants and animals, Jarmo is a Neolithic village site in the Zagros Mountains of Iraqi Kurdistan. The site was occupied for several centuries between 9000 and 8000 b.p., and the careful excavation of the site by Braidwood and his multidisciplinary team between 1948 and 1954 made it possible for archaeologists to examine evidence of plant and animal remains as well as more traditional information, such as artifacts and architecture.

Tim Murray

See also

Mesopotamia

Jefferson, Thomas

(1743-1826)

Statesman, president of the United States of America, diplomat, scientist, revolutionary, and architect, Thomas Jefferson was born on the frontier in Virginia, the son of a surveyor/explorer who had married into one of the best families in the district. He had a classical education and from 1760 to 1762 studied mathematics, science, and philosophy at the College of William and Mary. Jefferson began to study law and was admitted to the bar in 1767, working as a successful lawyer until the beginning of the War of Independence in 1776, when he began a full-time career in politics.

Jefferson had been left substantial property by his father, on which he began to design and build the

mansion of Monticello. In 1770 he was appointed county lieutenant and in 1773 surveyor of the county, and he soon became involved in local politics, being elected as a member of the county government and contributing to the framing of local legislation. He was elected by the Virginia convention to serve in Congress and was then elected along with others to draw up the Declaration of Independence. At the age of 33 Jefferson helped to found a new nation.

After some time as governor, congressman, and American diplomat in Paris, Jefferson became the first secretary of state under the constitution from 1790 until he retired briefly to Monticello in 1793, vice-president in 1795, and president from 1800 until 1809, with albert gallatin as his secretary of the treasury. The high point of his administration was the Louisiana Purchase, which added impetus to the proposed Lewis and Clark expedition. Jefferson was passionately interested in and supportive of this expedition, and wrote the biography of the explorer Meriwether Lewis, who had been his private secretary.

Jefferson was also involved in the intellectual life of the new nation. The American Philosophical Society (APS), based on the model of the Royal Society of London, had been founded in 1743 by a small group of eminent Americans. Under the presidency of Thomas Jefferson (1797-1815) the society became an intellectual influence on post-Revolutionary and newly nationalist

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America, a de facto scientific adviser to the government. The society wrote the charter for the government's great western exploratory expedition led by Lewis and Clark, and later contributed to the Lond Expedition of 1819 and the Wilkes Expeditions of 1838 and 1842, both of which were anthropological in objective. Under Jefferson's presidency the APS took an interest in archaeology, linguistics, and anthropology.

Thomas Jefferson

(Ann Ronan Picture Library)

Jefferson was a pioneer in the study of archaeology, paleontology, ethnology, geography, and botany in America and he amassed a collection of Indian vocabularies that were unfortunately lost. Through the APS Jefferson became associated with the important scientific societies of Europe and America. He was elected in 1801 to the Institute of France in recognition of his reputation in france as an intellectual-and not as a politician. He corresponded with a great many scientists across the world and across America and wanted the best of foreign knowledge to be available to Americans. After his final retirement from politics he helped to found the University of Virginia and he established a school of builders in Virginia and tried to establish formal instruction in architecture. He kept up with his voluminous correspondence and he continued to advise his political colleagues. To reduce his debts Jefferson sold his collection of some10,000 books to the new Library of Congress.

Tim Murray

Jenné and Jenné-jeno

Jenné and Jenné-jeno (ancient Jenné) are successive tell settlements in the upper inland Niger Delta of Mali, and together, they span over two millennia of continuous occupation on the floodplain. Both have been designated World Heritage Sites by the United Nations Educational, Scientific, and Cultural Organization. The forty-five-hectare tell of Jenné is inhabited today by a population of about 10,000.

Historical sources, such as the account of the French explorer Réné Caillié (1830) and local *tarikhs* (histories written in Arabic), detail the central role that Jenné has played in the commercial activities of the western Sudan during the last 500 years. In the famous “golden trade of the Moors,” gold from mines far to the south was transported overland to Jenné, then transshipped on broad-bottom canoes (pirogues) to Timbuktu, and then sent by camel to markets in North Africa and Europe (Bovill 1968; Levtzion 1973). Leo Africanus (1896) reported in 1512 that the extensive boat trade on the middle Niger involved massive amounts of cereals and dried fish shipped from Jenné to provision arid Timbuktu. Today, the stunning mud architecture of Jenné in distinctive Sudanic style is a legacy of the settlement's early trade ties with North Africa.

Systematic archaeological research at Jenné began in 1994 with a coring project (McIntosh et al. 1996) and continued with excavations in 1998 on the proposed site of the new Jenné museum. Cultural deposits descended over six meters and began with material dating to the early second millennium a.d.

Three kilometers to the southeast, the thirty-three-hectare mound of Jenné-jeno attracted little attention during the colonial period despite its thick surface carpet of broken pottery and numerous mud brick wall foundations. Scientific excavations in the 1970s and

1980s revealed that Jenné-jeno was founded ca. 250 b.c. by iron-using peoples who cultivated rice, millet, and sorghum; herded stock; and engaged in fishing and hunting (S. K. McIntosh 1995; S.K. McIntosh and R. McIntosh 1980). The deposits dating to this early period are almost six meters down from the highest part of the mound.

Careful evaluation of deposits from numerous other excavation units at Jenné-jeno and two other nearby sites provided evidence for the rapid growth of the mounds throughout the first millennium a.d. Jenné-jeno itself reached its maximum extent of over seventy-five acres by a.d. 850. Intensive surface survey of the mounds located within a four-kilometer radius of Jenné (sixty-nine in all) indicated that the majority were occupied by at least a.d. 800-1000, creating a remarkable concentration of population (10,000-27,000 people) within the integrated multisite system known as the Jenné-jeno urban complex.

Those discoveries marked the end of assumptions that urban settlements and long-distance trade in West Africa were secondary to the development of the trans-Saharan trade by North African Arabs after the ninth century. Settlement at Jenné-jeno declined after a.d. 1200, and the settlement was completely abandoned by a.d. 1400. Most of the nearby mounds followed the same pattern. Their demise was concomitant with the period of early settlement documented at Jenné, but the reasons for this shift in settlement location are not yet understood.

Susan McIntosh

See also

Africa, Sahara; Africa, Sudanic Kingdoms

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Jericho

See Israel; Jordan; Kenyon, Kathleen Mary; Syro-Palestinian and Biblical Archaeology

Jerusalem

See Israel; Kenyon, Kathleen Mary; Syro-Palestinian and Biblical Archaeology

Johnny Ward's Ranch

In late 1959 and early 1960, volunteer members of the Arizona Archaeological and Historical Society carried out excavations on eleven Sundays in a period site in southern Arizona designated Ariz. EE: 5:6 in the Arizona State Museum survey system. The efforts were directed by archaeologists bernard l. fontana and J. Cameron Greenleaf, but of the fifty-eight people who volunteered their efforts, only four or five had had previous archaeological experience.

Fontana had chosen the site because he mistakenly believed it represented the adobe ruins of San Ignacio de Sonoitac, a mid-eighteenth-century mission visiting station built and administered by Jesuit missionaries before their expulsion from New Spain in 1767. Excavations and subsequent documentary research indicated the site was instead one that had been occupied between 1859 and 1903 and had served variously as a ranch for the family of Johnny Ward and other English-speaking settlers, headquarters for a mining and milling company, a house and store, and a dwelling for Chinese gardeners.

Not wanting to disappoint the volunteers

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Jericho

See Israel; Jordan; Kenyon, Kathleen Mary; Syro-Palestinian and Biblical Archaeology

Jerusalem

See Israel; Kenyon, Kathleen Mary; Syro-Palestinian and Biblical Archaeology

Johnny Ward's Ranch

In late 1959 and early 1960, volunteer members of the Arizona Archaeological and Historical Society carried out excavations on eleven Sundays in a period site in southern Arizona designated Ariz. EE: 5:6 in the Arizona State Museum survey system. The efforts were directed by archaeologists bernard l. fontana and J. Cameron Greenleaf, but of the fifty-eight people who volunteered their efforts, only four or five had had previous archaeological experience.

Fontana had chosen the site because he mistakenly believed it represented the adobe ruins of San Ignacio de Sonoitac, a mid-eighteenth-century mission visiting station built and administered by Jesuit missionaries before their expulsion from New Spain in 1767. Excavations and subsequent documentary research indicated the site was instead one that had been occupied between 1859 and 1903 and had served variously as a ranch for the family of Johnny Ward and other English-speaking settlers, headquarters for a mining and milling company, a house and store, and a dwelling for Chinese gardeners.

Not wanting to disappoint the volunteers

who had worked so diligently on the excavation, Fontana and Greenleaf analyzed the artifacts, nearly all of them mass produced and machine-made, as carefully as if they had been hand-crafted objects of the pre-Industrial Revolution. The results of their analyses were published as “Johnny Ward's Ranch: A Study in Historic Archaeology” in the society's journal, *The Kiva* (28, no. 12, October-December 1962).

Johnny Ward's Ranch (January 16, 1961), Patagonia, Arizona. Excavation of this late nineteenth-century site by Bernard L. Fontana, J. Cameron Greenleaf, and members of the Arizona Archaeological and Historical Society helped to initiate an expansion in the type and age of historic sites worked on in the American West.

(Bernard Fontana)

The study was the first in the annals of U.S. archaeology to take seriously the products resulting from the ideas of interchangeable parts and mass production by machines. Pioneering descriptive and historical studies of square-cut nails, wire nails, tin cans, metallic cartridges, ironstone ceramics, machine-blown bottles, and similar artifacts were presented. The report became the first to give credence and respectability to what came to be labeled “tin can archaeology,” and as such it became a landmark in the history of archaeology in the United States.

Bernard L. Fontana

See also

United States of America, Prehistoric Archaeology

Jordan

The area known today as Jordan (Transjordan) lies between Palestine (Cisjordan or modern israel and the Palestinian Territories) and mesopotamia and is intimately connected to these surrounding regions of the Near East, in both geography and history (see map). This brief survey of the development of archaeology in Jordan will outline the major phases of exploration and the relationship of work in this region to the broader development of archaeology in the Middle East.

The Earliest Phase of Exploration, 1805-1918

“Who that has ever traveled in Palestine has not longed to cross the Jordan valley to those mysterious hills that close ever eastward view with their long horizontal outline, their overshadowing height, their deep purple shade?”

With these words from his 1856 travel log, Arthur Stanley, the dean of Westminster in London, summed up the relationship between Palestine and Transjordan for the earliest explorers

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and Amman/Philadelphia (Seetzen) and Petra (Burckhardt). Others followed, including the Americans Edward Robinson and Eli Smith, who, though their visits were brief, are considered to be the fathers of historical geography in the region. Unfortunately, their extensive work in Palestine (1837-1838, 1851-1852) was not duplicated east of the Jordan River.

One of the reasons why comparatively little exploration was undertaken through the 1800s was the political instability of the region. The population was a combination of settlers living in villages and Bedouin tribes, although under Ottoman Turkish rule, there was little protection or rule outside the more densely populated regions. The activities of the Bedouin, who were occasionally aggressive toward the villages and travelers, made exploration difficult and often dangerous. Foreigners' visits to Transjordan were therefore sporadic and usually directed to specific known sites, since their primary focus was on the “Holy Land” (Cisjordan or Palestine) and its historical geography.

By the mid-nineteenth century Ottoman dominance of the region began to increase, and Ottoman governors were eventually appointed at Irbid to oversee the district of Ajlun (1851) and at Salt to oversee the central district of Belqa (1868). One of the main reasons for this growing political dominance of Transjordan was the need to control the Haj route for Islamic pilgrims to make their way to Mecca between Damascus and the Hejaz. And one of its outcomes was an increase in the exploration of the region by westerners.

The Development of Jordanian Archaeology during the British Mandate, 1918-1946

After World War I came to a close, the Sykes-Picot agreement established a British mandate in Palestine and Transjordan in 1918, and the area came under the control of the British Empire. Appropriately, the authorities established a department of antiquities in Palestine in 1920, led by the English archaeologist john garstang, and three years later a department of antiquities was set up in Amman to oversee the region of Transjordan.

With the advent of British rule, archaeologists found the territory more accessible and safer to explore, and during the mandate period they laid some of the major groundwork for our understanding of the archaeology and history of these regions. Research was not, however, restricted to British interests: several international schools, including some from france, Germany, and the United States, carried out significant projects in the southern Levant in these years.

A great deal of the work was concentrated in Palestine, but some was also conducted at various major sites of classical antiquity in Transjordan, including Amman, Jerash/Gerasa, and Petra. At Petra the earliest systematic excavations were undertaken in 1929 by George Horsfield, the first director of the Transjordan Department of Antiquities. Horsfield, a student of Garstang, worked on several of the major tombs of Petra, including the Palace Tomb, al-Kazneh, the Urn Tomb, and the Tomb of the Roman Soldier. In 1924 he also initiated the first work at Gerasa/Jerash, where he devoted considerable energy to clearing and reconstructing several of the site's major monuments, including the south and north theaters, the Propylaeum of the Temple of Artemis, and the Nymphaeum. Four years later he was joined by an Anglo-American expedition from the British School of Archaeology in Jerusalem and Yale University, led by John Crowfoot; in 1930 a team from the american schools of oriental research (ASOR), under the direction of Clarence Fisher and later Nelson Glueck (in 1933 and 1934), also began to work with Horsfield. At Amman work on the citadel was carried out by the Italian Archaeological Mission beginning in 1927 and concluding in the 1930s, and from 1936 on other parts of the city were studied by the director of the Transjordan Department of Antiquities, G. Lankester Harding. Overall, these excavations revealed the exceptional state of preservation of many of the sites of classical antiquity. Efforts were begun to preserve them from the destruction that would ensue from

development and expanding populations in the region.

Other notable projects in the British mandate period included the discovery of Teleilat el-Ghassul,

by those working in Jordan, and although it contained some errors, it was, in general, remarkably accurate. His two popularizations of the archaeology of the region, *The Other Side of Jordan* (1940) and *Deities and Dolphins: The Story of the Nabataeans* (1966), brought the antiquities of Jordan to a wider readership. Glueck also undertook two excavations in Transjordan, first (1937-1938) at Khirbet et-Tannur, a Nabataean temple site in the Wadi al-Hasa, and later (1938-1940) at the site of Tell el-Kheleifeh, which he believed to be Solomon's seaport Ezion Geber. These two periods of the Iron Age and the Nabateans were to be the main focus of Glueck's career, which was inspirational to the generation of archaeologists that followed.

Archaeology in the Hashemite Kingdom of Jordan, 1946-1967

After 1946, when Transjordan became an independent kingdom under the rule of the Hashemites, the area underwent a period of steady growth in terms of the development of a national archaeology. The retreat of British sovereignty in the region did not mean an immediate withdrawal of British interests or support, and G.L. Harding continued as director of what was now the Department of Antiquities of Jordan until 1956. Harding served as director of this department for twenty years (1936-1956) and was instrumental in the formation of archaeological policies that helped to establish the national school of archaeology in Jordan. In 1951 he founded the *Annual of the Department of Antiquities of Jordan,* which reported on the yearly archaeological work in the country, and later he wrote the first major popularization of the archaeology of Jordan, *The Antiquities of Jordan* (1959).

During the Hashemite period and following the partition of Palestine and the formation of the state of Israel (in 1948), the Department of Antiquities of Jordan was also responsible for the archaeology of the portion of Palestine that came to be known as the West Bank. This region included many of the major biblical sites, among them Jerusalem. Many of the international schools preferred to continue to work in this region, and major excavations in the former Transjordan were less frequent than might otherwise have been expected.

Some of the best-known projects include those by English archaeologist kathleen kenyon, who carried out a series of excavations at Jericho from 1952 to 1958, when she was director of the British School of Archaeology in Jerusalem (BSAJ); later, from 1961 to 1968, Kenyon excavated in Jerusalem itself at the “City of David” (Ophel), working with a multinational team under the auspices of the Palestine Exploration Fund. The 1956-1968 fieldwork directed by G.E. Wright at Tell el-Balatah (Shechem), which was sponsored by Drew University and McCormick Theological Seminary (and later Harvard University) and affiliated with ASOR, was the principal U.S. excavation during this period. The École Biblique et Archéologique Française excavated the site of Tell el-Farah, associated with biblical Tirzah, under the direction of R. De Vaux from 1946 to 1960 and later conducted studies at Qumran (as will be discussed).

Outside of the West Bank and in Jordan proper, excavations began at the site of ancient Dhiban/Dibon under F. Winnett, W. Reed, and D. Tushingham (1950-1956) and at Deir 'Alla under H.J. Franken and a Dutch team from Leiden University (1960-1967). The German Evangelical Institute also began work at Umm Qeis, the Decapolis city of Gadara, in 1966. Other notable work included that by British archaeologist Peter Parr and U.S. archaeologist Philip Hammond, who led teams at Petra between 1954 and 1968, as well as renewed work at Teleilat Ghassul by R. North and the PBI (1960) and later Basil Hennessey under the auspices of the BSAJ (1967). U.S. work conducted with ASOR affiliation was also undertaken at 'Iraq el-Amir (1961-1962) and at Bab edh-Dhra (1965-1967) under Paul Lapp, then director of the American School in Jerusalem.

Perhaps the most spectacular archaeological achievement of this period was the discovery of the dead

sea scrolls. Local Bedouin found these biblical and extrabiblical texts dating to the first and second centuries a.d. in caves along the northwestern shore of the Dead Sea. This discovery led to a series of concentrated excavations

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at the various caves and later at Khirbet Qumran under the Jordanian Department of Antiquities, the Palestine Archaeological Museum, and the École Biblique et Archéologique Français under the direction of De Vaux (1951, 1953-1956). The finds from both the caves and the nearby site at Qumran (thought to be the complex associated with the writers of many of the scrolls, the Essenes) have significantly influenced modern research on the Bible, enabling insights into the early biblical communities in the region.

This period of archaeological research both in the West Bank and in Jordan itself established a pattern of archaeological fieldwork being conducted by schools from most of the major western powers; it also represented the longest phase of uninterrupted research in the region. The effects of this work are still being felt, with many of the principal researchers in the field of Levantine archaeology having "cut their teeth" during this time and on many of these projects; these individuals (who are only now retiring) have in turn been instrumental in establishing the study of Levantine archaeology in many countries. The 1946-1967 period also established the practice of having the Jordanian Department of Antiquities partner with of the international schools in the documentation, publication, and preservation of the rich archaeological heritage of Jordan.

Archaeology in Jordan, 1967 to the Present

Following Jordan's loss of the West Bank during the Six-Day War in 1967, Jordanian archaeology once again focused on land east of the Jordan River. Many of the international schools (British, U.S., German) set up "temporary" offices in Jordan (Amman) at this time, in order to continue archaeological research but avoid excavation in the Israeli occupied territories, which would have breached UN rules. The American Schools of Oriental Research in Jerusalem was the first institution to set up a "branch office" in support of research in Jordan in 1968, and British researchers soon followed suit. Within a few years, in 1971, the American Center for Oriental Research (ACOR) was founded, and somewhat later, in 1978, British archaeologists formalized their shift from Jerusalem to Amman via the establishment of the British Institute at Amman for Archaeology and History (now the Council for British Research in the Levant), under the direction of Crystal Bennett.

The founding of headquarters in Amman for many of the international schools at this time marked a transition or a break in the direction of archaeological research in Jordan and in Israel and the West Bank. From this point forward archaeological work in Israel and Jordan developed along independent lines, with increasingly little contact between the scholars of both countries. This situation was equally true for the indigenous archaeologists (Israeli and Jordanian) and for the archaeologists from the international schools. In particular, many of those formally working in Jordan were reluctant to jeopardize the situation by making contacts and pursuing active research west of the Jordan Rift. Consequently, archaeology in Israel developed on an independent trajectory and along specific national lines in a way that was distinctly different from the archaeology in Jordan.

The national school in Israel sought its roots in the archaeology of ancient Israel and Judah and in Jewish history in general, but archaeology in Jordan was less political. The populations in Jordan were largely Bedouin and were not particularly interested in developing a history of occupation for the region along the lines being pursued by Israeli biblical archaeologists: they claimed no distinctly historical links with either the Nabataeans or the Iron Age kingdoms of Ammon, Moab, and Edom. Given this move away from a focus upon a narrowly defined and specific culture-historical approach, archaeological work in Jordan was much more diverse, and a number of specific subfields of archaeology were free to develop.

Nonetheless, some Jordanian researchers were interested in biblical archaeology and the study of the Bronze and Iron Ages, as expressed in the excavations of Crystal Bennett in Edom at sites such as Tawilan and the ancient Edomite capital at Buserieh (1968-1974, 1980). There were, however, just as

many scholars who focused upon the world of classical and late Antiquity,

to) Adnan Hadidi, Ghazi Bisheh, Safwan Tell, and Fawaz al-Khrayshah.

The future of archaeology in Jordan is bright, with many Jordanians taking an active interest in the history and archaeology of their country, as evidenced by the thriving archaeology departments at the University of Jordan (Amman), Yarmuk University (Irbid), and Mutah University (Kerak). Many of the graduates in the field are employed in the Department of Antiquities and other aspects of Jordanian heritage. Often working in partnership with international research projects, they are now creating a distinctive Jordanian archaeology.

Russell B. Adams

See also

Syro-Palestinian and Biblical Archaeology

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Journal of Field Archaeology

The *Journal of Field Archaeology (JFA),* a quarterly periodical, was founded in 1974 by James R. Wiseman and has been substantially supported since that time by Boston University, whose trustees hold the copyright. Originally the journal was published at Boston University on behalf of the Association for Field Archaeology, but when that organization was dissolved in 1989, its remaining assets were

transferred to *JFA*. Three years earlier, the general editorship had passed to Creighton Gabel, who continued in that capacity until 1994. In 1995, Ricardo J. Elia became editor. During most of the *JFA*'s history, the managing editor has been Al B. Wesolowsky, another professional archaeologist, while David Ford, as the long-term art director, has contributed greatly to the quality of the graphics.

The stated purpose of the journal was, in particular, to provide a forum for the publication of field reports in recognition of the fact that such venues were becoming increasingly limited even as the discipline grew. At the same time, the *JFA* has welcomed submission of specialized technical and methodological studies, ranging from materials science and field techniques to ethno-archaeology and experimental archaeology. On occasion, survey articles providing historical perspectives on, or summarizing recent research in, major world areas also have been published. No restrictions have ever been placed on the geographical or temporal focus of contributions.

In addition to full-length articles and briefer research reports, some special feature sections have appeared for a number of years. One was "The Archaeometric Clearinghouse" edited by Curt W. Beck (Vassar College) from 1974 to 1993; with a new title, "Archaeological Science Review," this special section subsequently came under the editorship of Julian Henderson of Sheffield University in England. Reflecting the growing concern about the illicit trafficking in antiquities, "The Antiquities Market" section likewise began to appear in the first year of publication, with Karen Vitelli (Indiana University) assuming direct responsibility for it in 1976, replaced by Ellen Herscher of Washington, D.C., in 1984 and by Timothy Kaiser (University of

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David Frankel

Karnak and Luxor

The temples of Karnak and Luxor are located on the east bank of the Nile at the modern city of Luxor (ancient Thebes) in southern Egypt. The two temples formed the religious heart of the city of Thebes. The urban remains of ancient Thebes cluster around Karnak extending southwards toward Luxor temple. Much of the standing remains of these great stone temples were exposed through unscientific excavation during the nineteenth century. However, modern archaeological excavation and epigraphic recording of scenes and texts, as well as the analysis and interpretation of these massive buildings, is likely to continue for the foreseeable future. Conservation and reconstruction of the Karnak and Luxor temples continues to be a major activity of the Egyptian Supreme Council of Antiquities and numerous foreign projects conducting work at Luxor.

The majority of the visible architecture of the Karnak and Luxor temples dates to the New Kingdom (Dynasties 18-20, ca. 1550-1070 b.c.) and later periods. Alterations and additions to Karnak and Luxor temples did not cease until the beginning of the Christian Periodin the first century a.d. Karnak and Luxor temples are among the best-preserved temple sites in Egypt. Profusely decorated with scenes and texts, the temples provide an unparalleled glimpse into the religious life of ancient Egyptian society.

The main temple at Karnak (known in ancient Egyptian as *Ipet-Sut*) was dedicated to the god Amun(-Re), a deity who rose to prominence in the Middle Kingdom (ca. 2050-1750 b.c.) and who became the premier state god during the New Kingdom. Flanking the Karnak precinct of Amun-Re on its south and north side respectively are satellite precincts dedicated to Mut (the consort of Amun-Re) and Montu (a falcon god associated with warfare). Shrines and subsidiary temples dedicated to many additional gods (including Khonsu, Osiris, Maat, and others) are located within these three main precincts. The Luxor temple (which was known as *Ipet-Resyt*) is located two kilometers south of Karnak. The temple was dedicated to a form of the god Amun known as Amenope. In ancient times,

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Kastelic, Jožef

(1913-)

The Slovenian archaeologist, ancient historian, and poet Jožef Kastelic graduated in classical philology and ancient history from the University of Ljubljana in 1939 and completed his Ph.D. at the same university in 1943. Between 1942 and 1968, Kastelic worked at the National Museum in Ljubljana and became its director in 1945. He was also professor of classical archaeology, Roman provincial archaeology, and ancient history at the University of Ljubljana between 1968 and 1983 and professor of ancient history at the University of Maribor (Slovenia) between 1985 and 1989. Kastelic is a member of German Archaeological Society, the Institute of Etruscan and Italic Studies in Florence, and the Italian Institute of Pre- and Protohistory.

One of the most influential archaeologists in slovenia, Kastelic is credited along with colleague josip korošec for the revival of archaeological work in Slovenia and Yugoslavia after World War II. He continued the National Museum's long tradition as the central and national archaeological institution and established some of the important series and journals: *Arheoloski katalogi, Situla,* and *Argo.* Kastelic organized many influential exhibitions, such as *Umetnost alpskih Ilirov in Venetov* (Situla Art between Po and Danube) in Ljubljana in 1962. He was one of the founders of early Slavic archaeology in Slovenia after 1945. Between 1948 and 1949, he excavated at large early Slavic cemetery in Bled (see *Slovanska nekropola na Bledu* [Ljubljana 1950] and *Slovanska nekropola na Bledu* [Ljubljana 1960]). Kastelic excavated a large barrow in stična between 1946 and 1953 and participated in many joint Yugoslav research projects, among them research in Yugoslav Macedonia at the sites of Demir Kapija and Trebeniste. As the head of the Department of Archaeology at the University of Ljubljana, he decisively molded and defined its new and articulated structure in the 1960s and 1970s.

Bojan Djuric

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Keller, Ferdinand

(1800-1881)

Ferdinand Keller was the founder of the lake-dwellings theory, a member of the old bourgeoisie of Zurich, and an English teacher at the Technicum there, and he was the most prominent archaeologist in switzerland in the nineteenth century.

After studying theology and then natural science in Paris, Keller went to England where he was a private

tutor, and where he met sir richard colt hoare in Wiltshire. Colt Hoare was the owner of a rich collection of prehistoric relics, and although Keller was primarily fascinated by Celtic antiquities, he was strongly influenced by a visit to the Salisbury burial mounds and Stonehenge.

He returned to Zurich and discovered the Burgholzli mounds, which led him to found the Antiquarian Society of Zurich in 1832, the first organization of its kind in Switzerland. His interests went beyond prehistory to include all vestiges of the past, from Roman colonies to religious architecture, not forgetting medieval paleography. Thanks to his eclecticism, his mastery of languages, and his easy social nature, he was constantly in contact with a very large network of archaeologists and antiquarians both in Switzerland and abroad. His correspondence remains an extraordinary source of original information, and much of it is yet unpublished.

Despite the variety and quantity of his research, it was the discovery of the lake dwellings themselves that gave him exceptional fame. During the winter of 1853-1854, a record lowering of the water level in Lake Zurich led to the discovery, in Obermeilen, of pile fields accompanied

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by potsherds and tools of stone, antler, and wood. Informed of the discovery by a schoolteacher, Keller immediately recognized the significance of the find and interpreted the remains as dwellings on pile-supported platforms above the water. Thus, even though pile stumps had been observed a few years before on the shores of Lake Bienne, it was only when Keller got interested in them that research on the Swiss lake dwellings began to get real attention in Europe.

It is with regard to the lake dwellings that Keller's contribution to archaeological research in Switzerland can best be evaluated. Although his work was always serious and well documented, it was not intrinsically innovative; neither was he a master of archaeological excavation. Even if Keller did observe a three-age division in the remains, he did not attach much importance to it. In fact, he gathered all remains from the Neolithic to the Iron Age together and attributed them to a homogeneous Celtic population.

Keller's genius lay in his ability to extrapolatematerial from data on lake dwellings and other sites to provide coherent and global interpretations. The force of Keller's dynamism swept along numbers of specialist naturalists, geologists, botanists, and zoologists. He also managed to interest the public and to keep its interest without entering into or using ethnic customs and religion as explanations. Keller controlled and dominated Swiss archaeology, and his interpretations, however erroneous, remained almost irrefutable and encouraged research instead of blocking it. He can be seen as more of a learned nineteenth-century antiquarian, because of his background in the natural sciences, than as an archaeologist.

Marc-Antoine Kaeser

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Kendrick, Sir Thomas Downing

(1895-1979)

Kendrick was born in Birmingham, England, and won a scholarship to Oriel College, Oxford, in 1913. He joined the army and survived the fighting in France, although he was severely wounded. He returned to Oriel in 1919 and read anthropology and later studied and published on the prehistoric archaeology of

the Channel Islands.

In 1922 he began working at the british museum in the department of British and medieval antiquities. He became assistant keeper in 1928, keeper in 1938, and director and principal librarian from 1950 until his retirement in 1959. Kendrick's primary interest was in Anglo-Saxon art and he was responsible for the display of the great sutton hoo treasure to the public after the war. He also made the his area of expertise accessible, publishing *The Axe Age* (1925), *The Druids* (1927), *A History of the Vikings* (1930), *Anglo-Saxon Art to ad 900* (1938) and *Late Saxon and Viking Art* (1949). He ensured that the museum was as significant to scholars as it was popular.

Kendrick maintained his interest in archaeology, publishing *Archaeology in England and Wales 1914-1931* with christopher hawkes in 1932 and editing several volumes of *The County Archaeologies*. His greatest contribution to the history of archaeology was his magnificent *British Antiquity* (1950), which remains essential reading in this field. He was made a fellow of the British Academy in 1941 and was a fellow of the

Society of Antiquaries, of which he was secretary from 1940-1950.

Tim Murray

See also

Britain, Prehistoric Archaeology

Kent's Cavern

Kent's Cavern, a limestone cave on the Devonshire coast near Torbay, England, was first excavated in a systematic and serious way by John MacEnery, a local Catholic priest, in 1825, 1826, and 1829. MacEnery found what he considered to be clear evidence of the bones of extinct animals and ancient stone tools in the same strata. Geologist william buckland persuaded MacEnery that this could not be the case, and the publication of his memoir on the site had to wait until 1859, eighteen years after his death.

The site was excavated twice before 1859, in 1841 by R.A.C. Austen and in 1846 by william pengelly, who was later to gain fame as the excavator of brixham cave. Both excavators were persuaded of the association that Buckland had so strongly opposed. After the recognition of high(greater or longer) human antiquity, the British Association for the Advancement of Science funded Pengelly's return to Kent's Cavern between 1865 and 1878.

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Kenyon, Kathleen Mary

(1906-1978)

Kathleen Kenyon

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Kathleen Mary Kenyon, the eldest daughter of Sir Frederic Kenyon, was born on 5 January 1906 in England and died at the age of seventy-two on 24 August 1978 at her place of retirement in South Wales. Her father was keeper of manuscripts at the british museum. She attended St. Paul's Girls' School in London and her studies were so successful there that she became “head girl.” She then studied at Somerville College, Oxford University, and received her degree in history in 1929. As she had already decided to make archaeology her career, she seized the opportunity she was offered upon graduation from college to become a photographer and excavator with gertrude caton-thompson on a British Association expedition to great zimbabwe in southern Rhodesia (modern Zimbabwe).

Between 1930 and 1935, Kenyon continued her training and fieldwork with the legendary sir mortimer wheeler at the Roman town of Verulamium near St. Albans, England. Her important contribution was the uncovering of the Roman theater there, the only public monument of its kind in the British Isles.

Kenyon spent the summer months from 1931 to 1934 on her first Near Eastern archaeological project.

She worked on the Palestine Exploration Fund's Crowfoot expedition to Samaria. She applied and refined her Romano-British field-training techniques to her excavations at Samaria, which made her a pioneer along with sir william matthew flinders petrie, george a. reisner, and Clarence Fisher in the introduction of methods of stratigraphical digging to archaeological excavations, with drawn sections, at ancient Near Eastern sites.

In 1935, Kenyon helped Wheeler establish the Institute of Archaeology at London University.

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Khirokitia-Vouni

The world heritage site Khirokitia-Vouni is the most extensively excavated aceramic Neolithic settlement on cyprus. It was initially excavated by porphyrios dikaios between 1936 and 1946. Limited work was later carried out by Nicholas Stanley Price and Demos Christou, and since 1977 Alain Le Brun has continued excavations at the site. It is the type site for the Cypriot aceramic Neolithic period(early Neolithic or Khirokitia culture).

A very extensive area of the site has been cleared, revealing a closely packed array of circular houses of varied size. Most have very substantial stone foundations, with mud brick superstructure and flat roofs. In the larger examples, interior space may have been increased by platforms or mezzanine floors. A substantial stone "wall" running up the slope the full length of the excavated area has been variously interpreted, most recently as a formal boundary of the settlement marking off the safe interior from a hostile exterior. As the settlement grew, new houses were erected outside the wall, and a new wall, with a complex entry, was built. Intramural burials are a feature of the site. The economy of Khirokitia was based on an array of plants, many or which were imported to Cyprus at the beginning of the Neolithic period, and by a range of imported animals, primarily sheep, goat, pig, and deer.

David Frankel

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Unlike a number of his contemporaries in the United States, including j. c. harrington and john l. cotter, Kidd did not abandon prehistoric studies for Euro-American sites. His primary interest in the contact period kept him firmly committed to both types of archaeology. In 1948 he authored a significant report, "The Excavation of a Huron Ossuary," and that article was followed by a popular synthesis, *Canadians of Long Ago: The Story of the Canadian Indian,* published in 1951 (Kidd 1948, 1951). His career-long focus on contact situations drew him into a lifelong study of European trade goods, especially glass beads, and in 1970, he and his wife, Martha Ann Kidd, summarized years of museum and archival research in "A Classification System for Glass Beads for the Use of Field Archaeologists" (Kidd and Kidd 1970). This system, although weakened by his choice of an impressionistic color-coding typology, was the first important guide to an artifact category found in historic sites on

every continent.

In 1964, Kidd left the museum world to become the first holder of chair of the new Department of Anthropology at Trent University in Peterborough, Ontario, where he taught until his retirement in 1973. At Trent he made historical archaeology central to the curriculum and also established one of the first Indian-Eskimo studies programs in Canada.

Kidd was one of the few members of his pioneering generation who had a keen interest in the history of archaeology. He synthesized and surveyed Ontario archaeology in several articles across the decades and his article “Historical Site Archaeology in Canada” (Kidd 1969) is the only national history for that field in Canada.

In 1985, the Society for Historical Archaeology honored Kidd with its highest award, the j. c. harrington medal, and in 1993, he was presented with the Commonwealth Medal for the

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Kidder, Alfred Vincent

(1885-1963)

Kidder grew up in Cambridge, Massachusetts, and as a young man befriended many of Harvard's great scientists, such as geologists raphael pumpelly and Alexander Agassiz and anthropologists lewis henry morgan and frederic ward putnam from the peabody museum, through his family connections. Kidder began studying medicine at Harvard in 1904, but changed to archaeology after participating in edgar lee hewett's field school and meeting Alfred Marsten Tozzer, professor of archaeology.

In 1909 Kidder entered graduate school at Harvard to begin work on his doctorate in anthropology under the supervision of Egyptologist george reisner, art historian George Chase, and anthropologist Franz Boas. Kidder continued to excavate during the summer, in 1910 in Newfoundland, and in 1912 at historic Pueblo ruins in the Gobernador and Largo canyons in New Mexico. In 1914 Kidder received his Ph.D. on the style and decorative motifs of Pueblo pottery, suggesting that ceramic materials could be used as a gauge of cultural development in the American Southwest, similarly to what was being done by archaeologists at Old World sites in Europe, Africa, and Asia.

Kidder is best remembered for his pioneering approach to the study of Pecos Pueblo (1915-1924) in New Mexico, which had been occupied in both prehistoric and historic times. The connection between potsherds and stratigraphic excavation would be the hallmark of Kidder's work at Pecos Pueblo, conducted on a massive scale. His use of stratigraphy not only introduced this method of relative dating to archaeology but also brought a sense of the spatial distribution of territory under the control of a specific prehistoric culture. Moreover, Kidder established the value of stratigraphy to Americanist archaeology. While waiting to be inducted into the army in 1917 Kidder spent two months living at the First Mesa in Hopi Indian country and traveling around Hopi territory. Using ethnographic data from cultural anthropology and melding it with excavation data into a workable whole, Kidder's data from this period raised the science of archaeology to a new interpretive level. In 1920 Kidder was able to return to Pecos Pueblo, where he employed a multi-disciplinary approach to resolve its archaeological problems-physical anthropologists, pottery analysts, ethnographers, engineers, and agronomists were

some of the members of the team that studied the Pecos Pueblo material-the first long-term and multi-disciplinary project in North American archaeology.

In 1929 Kidder began the second half of his archaeological career by becoming the director of the Carnegie Institute's Division of Historical Research in Washington, D.C. Kidder now turned his attention for the most part to the maya of Central America, and introduced his “pan-scientific”/multi-disciplinary approach to resolving Mayan archaeological problems. While this approach was never fully realized, it did succeed in collecting data about the Mayan habitat, agricultural base, technology, and living descendants. Kidder and Charles A. Lindbergh worked jointly on the aerial discovery of Mayan sites throughout the Yucatán and in other locations and began to use the airplane as a tool to trace possible trade routes between Mayan cities. Kidder employed longtime friend and colleague sylvanus g. morley to continue his groundbreaking work deciphering Mayan hieroglyphics. Kidder himself excavated the Kaminaljuyu

mounds in guatemala, and encouraged the careers of two Mayan archaeologists: Anna O. Shepard and tatiana proskouriakoff. During this time Kidder was also concerned with the importance of the environment and its influence on human culture. He included a concentration on environmental factors in his program of Mayan archaeology, a far-sighted move in 1953, since today's archaeology considers this type of research as routine for most field/site analysis.

After World War II the Carnegie Institution began to allocate more of its resources to the "hard sciences" and less to the human and social ones, eventually closing down the Division of Historical Research, but not before Kidder proposed that the institution underwrite the use of radiocarbon dating for archaeology. Kidder retired in 1950, but until his death he continued to act as mentor for many archaeology students and colleagues and he taught a graduate course in archaeology at the University of California at Berkeley. As a reflection of the esteem in which he was and is still held, the Alfred Vincent Kidder medal was created by the society for american archaeology, and is awarded every three years to an outstanding Americanist.

Douglas R. Givens

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For references, see *Encyclopedia of Archaeology: The Great Archaeologists, Vol. 2,* ed. Tim Murray (Santa Barbara, CA: ABC-CLIO, 1999), pp. 357-367.

Kings Bay Plantations

Because of construction of the Kings Bay Naval Submarine Base, researchers from the University of Florida investigated six plantations on the southernmost part of the Georgia coast from 1977 to 1985-Cherry Point, Kings Bay, Harmony Hall, Marianna, Point Peter, and New Canaan. These plantations were small, middle, and large according to land- and slave-holdings categories developed by historians. Charles H. Fairbanks and Robin Smith conducted the testing from 1977 to 1980, while William H. Adams directed the testing and data recovery phases from 1981 to 1985. Thomas H. Eubanks directed the excavation of the McIntosh Sugarhouse in 1981 and 1985, and in 1981, this project was the first to make field use of microcomputers linked as smart terminals to the mainframe. In 1985, the project also made the first use of video camera/computer interfacing to produce artifact illustrations successfully.

The Kings Bay project was unique because it investigated all the plantations located between Crooked River and St. Marys River, a distance of over eight miles, and these were historically linked into a single community. Previous plantation archaeology had generally focused on big plantations, but at Kings Bay small and middle-sized ones were also investigated.

Because these plantations were geographically close, the environmental differences were largely nil, an especially important point for the zooarchaeological study. The faunal analysis done by William Richard Adams at Indiana University was by far the most detailed for historical sites on the coast-27,353 bone fragments from planter sites and 10,552 fragments from slave sites. Using calculations of meatweight, it was found that planters ate considerably more wild food than slaves did and utilized a wider variety of wild species.

Ceramic analysis, coupled with analogous historical documentation, suggests that slaves on task-system plantations like these had the ability and capital to engage in the market economy to support themselves. This greater economic freedom and market participation by slaves provided them with a means to control much more of their own lives than on the more-paternalistic gang-system plantations.

William H. Adams

See also

Flowerdew Hundred Plantation

Kitchenmidden Committee

The Danish zoologist japhetus steenstrup began researching the shell banks of northern denmark in the 1820s in order to understand sea- and land-level changes. Initially, he believed that the enormous mounds of shells were the result of geological change-that they had been washed up by the sea. However, in the course of his excavations he found artifacts, bones, and hearths that he dated to the Stone Age period.

mounds in guatemala, and encouraged the careers of two Mayan archaeologists: Anna O. Shepard and tatiana proskouriakoff. During this time Kidder was also concerned with the importance of the environment and its influence on human culture. He included a concentration on environmental factors in his program of Mayan archaeology, a far-sighted move in 1953, since today's archaeology considers this type of research as routine for most field/site analysis.

After World War II the Carnegie Institution began to allocate more of its resources to the "hard sciences" and less to the human and social ones, eventually closing down the Division of Historical Research, but not before Kidder proposed that the institution underwrite the use of radiocarbon dating for archaeology. Kidder retired in 1950, but until his death he continued to act as mentor for many archaeology students and colleagues and he taught a graduate course in archaeology at the University of California at Berkeley. As a reflection of the esteem in which he was and is still held, the Alfred Vincent Kidder medal was created by the society for american archaeology, and is awarded every three years to an outstanding Americanist.

Douglas R. Givens

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For references, see *Encyclopedia of Archaeology: The Great Archaeologists, Vol. 2,* ed. Tim Murray (Santa Barbara, CA: ABC-CLIO, 1999), pp. 357-367.

Kings Bay Plantations

Because of construction of the Kings Bay Naval Submarine Base, researchers from the University of Florida investigated six plantations on the southernmost part of the Georgia coast from 1977 to 1985-Cherry Point, Kings Bay, Harmony Hall, Marianna, Point Peter, and New Canaan. These plantations were small, middle, and large according to land- and slave-holdings categories developed by historians. Charles H. Fairbanks and Robin Smith conducted the testing from 1977 to 1980, while William H. Adams directed the testing and data recovery phases from 1981 to 1985. Thomas H. Eubanks directed the excavation of the McIntosh Sugarhouse in 1981 and 1985, and in 1981, this project was the first to make field use of microcomputers linked as smart terminals to the mainframe. In 1985, the project also made the first use of video camera/computer interfacing to produce artifact illustrations successfully.

The Kings Bay project was unique because it investigated all the plantations located between Crooked River and St. Marys River, a distance of over eight miles, and these were historically linked into a single community. Previous plantation archaeology had generally focused on big plantations, but at Kings Bay small and middle-sized ones were also investigated.

Because these plantations were geographically close, the environmental differences were largely nil, an especially important point for the zooarchaeological study. The faunal analysis done by William Richard Adams at Indiana University was by far the most detailed for historical sites on the coast-27,353 bone fragments from planter sites and 10,552 fragments from slave sites. Using calculations of meatweight, it was found that planters ate considerably more wild food than slaves did and utilized a wider variety of wild species.

Ceramic analysis, coupled with analogous historical documentation, suggests that slaves on task-system plantations like these had the ability and capital to engage in the market economy to support themselves. This greater economic freedom and market participation by slaves provided them with a means to control much more of their own lives than on the more-paternalistic gang-system plantations.

William H. Adams

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In 1848, the Danish Academy of Sciences established a multidisciplinary committeeto study shell middens, or kitchen middens, and geological and sea-level changes. Steenstrup, the geologist Forchammer, and the archaeologist jens jacob worsaae reexamined the shell banks. In 1850, they discovered the enormous shell bank at Melgaard and recovered numerous implements and bones from it. Although it was Worsaae who suggested that the enormous piles of shell represented the remains of meals eaten by Stone Age people over a long period, Steenstrup coined the name *kitchen middens*.

All three men studied and recorded over fifty shell banks habitation sites in Jutland and Zealand in Denmark and in Scania in sweden. In the early 1850s, they published six volumes of reports on these kitchen middens, demonstrating that they were of human origin and mapping patterns in accumulation. They also proved that the middens were occupied seasonally, and this fact, along with the distributions of hearths and artifacts, provided evidence of human behavior and activities.

Steenstrup disagreed with Worsaae about the age of the middens, believing that they were Neolithic or Stone Age but that they were contemporaneous with the builders and occupants of the Megalithic tombs. Worsaae rightly believed them to be earlier. In lectures in 1857, Worsaae argued for a chronological division of the Stone Age into two periods; the shell bank kitchen middens were from the earlier period, and the Megalithic tomb period was later.

Steenstrup's successful collaboration with Forchammer and Worsaae was the first of many successful collaborations between archaeologists, geologists, and biologists in Scandinavia and elsewhere. Steenstrup proved the importance of understanding the paleoenvironment to the study of archaeology, and his pioneering study of post-glacial flora was among the first of many significant contributions by biologists to archaeological chronology-with palynology, dendochronology, and carbon-14 dating reaching their apogee in the twentieth century.

Tim Murray

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Archaeometry

Klemenc, Josip

(1898-1967)

The Slovenian archaeologist and ancient historian Josip Klemenc graduated in archaeology in 1920 and in history and geography in 1921 from the University of Zagreb, Croatia. He received his Ph.D. in archaeology from the same university in 1929 for his thesis on the dislocation of the Roman Army in Pannonia in the first century a.d. Between 1922 and 1942, he worked in the Archaeological Museum in Zagreb, where he became a curator. In 1946, Klemenc was appointed professor of classical archaeology and ancient history in the newly established Department of Archaeology at the University of Ljubljana, slovenia, which produced the first generation of Slovenian archaeologists after World War II.

Klemenc's professional interests focused principally on the ancient topography, epigraphy, and numismatics of the Roman provinces of Noricum and Pannonia. In pre-World War II Yugoslavia, he initiated the study of archaeological topography, and between 1936 and 1939, he published three volumes of *Archaeologische Karte von Jugoslawien: Blatt Ptuj* (1936), *Blatt Zagreb* (1938), and *Blatt Rogatec* (1939), the first and the third with B. Saria. However his most influential work is associated with his discovery of Roman funerary art in Slovenia. In the Roman cemetery in Sempeter near Celje, the Roman colony of celeia, he discovered and studied sculptural remains that today

represent the best examples of high-quality provincial art in Noricum.

Bojan Djuric

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Knossos

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the site existed by about 1900 b.c. Evans's excavation of Knossos began in 1900, and the task was to tax his excavation and conservation skills until 1929. Although there has been considerable discussion of the conservation strategies followed by Evans and his associates, and about his emphasis on the "Minoan" civilization as being of Indo-European origin, there is no doubting the magnificent achievement of his major publication of the site, *The Palace of Minos at Knossos* (four volumes between 1921 and 1935). At Knossos, Evans had "found" the Minoan civilization, and, following Schliemann, he had further enhanced the links between myth and history.

Palace in ancient Knossos with reconstructed balustrade and fresco

(Image Select)

Tim Murray

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Kondakov, Nikodim Pavlovich

(1844-1925)

The son of a freed serf and steward of princely estates, Kondakov went to school in Moscow, and in 1861 was sent to study at the University of Moscow with Slavic historian, philologist, and folklorist Ivonvich Buslayev. In deference to his teacher's dislike of Darwinism and prehistoric archaeology, Kondakov studied Classical and Byzantine art, graduating in 1866 and becoming a teacher at his old school.

In 1871, after traveling abroad to study classical monuments, Kondakov was appointed to the professorial chair of the theory and history of art at Novorossiysk University in Odessa. Scholars at this university were actively studying the local classical monuments of the Northern Black Sea coast and Kondakov participated in the excavation of the necropolis of the ancient Nimphaeum in Kerch, in the Crimea, where members of both the Greek and Scythian aristocracy were buried-the best excavated, researched, and recorded necropolis in the ancient world. Between 1873 and 1884 Kondakov traveled to major centers in Europe and the Near East, visiting libraries and museums and writing a monumental synthesis on the history of Byzantine art, his doctoral thesis *The History of Byzantine Art and the Iconography of the Miniatures of Greek Manuscripts.* This won the Gold Medal of the Russian Archaeological Society

and resulted in his appointment to the influential Emperor's Archaeological Commission, whose three members were in charge of all archaeological activity in russia.

In 1888 Kondakov became professor of art history at Petersburg University and principal curator of medieval antiquities at the Imperial Hermitage Museum. In 1889 he became an academician (member of an imperial academy of eminent academics). He published six volumes of *Russian Antiquities in Monuments of Art* and a work on Russian archaeology, *Russian Hoards,* in 1898. In the latter Kondakov researched burial mounds, hoards, and other finds "in all aspects of their style, typical form of subjects, (and) its historical changes," using the iconographic typology developed in his thesis and transforming it into an archaeological typology. Kondakov continued to travel extensively and to publish his research on Byzantine art, which he described as the result of three different cultural and aesthetic traditions and influences-Hellenism, Greek-Egyptian-Near Eastern Orientalism, and the nomads from the steppes of the Black and Caspian Seas, Central Asia, and Southern Siberia.

At the end of the nineteenth century Russian prehistoric archaeology came of age. In 1899 aleksander spitsyn's *The Settling of Ancient Russian Tribes According to Archaeological Data* and gorodcov's "Russian Prehistoric Ceramics" were published, the latter becoming the basis of all typological work by Russian archaeologists. Kondakov returned to the analysis of Byzantine art, writing *Iconography of Our Lady, Connections of Greek and Russian Icon-Painting with Italian Painting of the Early Renaissance* in 1911 and the two-volume *Iconography of Our Lady* in 1914-1915.

Kondakov's work, which redefined Russia and Russian culture as an expression of the Orthodox East as distinct from the cultural traditions of the West, also argued for Byzantium as the prototype for the contemporary Tzarist Russian empire. Both had unified Europe and Asia, and both justified Orthodoxy and autocracy. However this meant that liberal intellectuals and revolutionaries identified Byzantine influence with the maintenance of the monarchy and the social and political order. Kondakov was socially and politically conservative despite his background; closely connected with the church, he was readily admitted to the palace of Tsar Nicholas II as the court's expert on icon-painting.

Kondakov was 73 when the Russian Revolution began. During the Civil War (1918-1920) he lived in Odessa in territory occupied mainly by anticommunist White Russians and by supporting troops of the European powers. When they lost he went into exile in Istanbul, Sofia, and finally in Prague in Czechoslovakia in 1921, where his pupils organized what became the Kondakov Institute after his death in 1925. The institute became important for the study of czech Byzantine art and Slav philology and history, moving to Belgrade, Yugoslavia, after the German invasion, where it was destroyed in 1944 during a German air raid. Kondakov's numerous pupils have occupied leading positions within Soviet academe. He is now recognized as the founder of Russian archaeology.

Leo Klejn

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Korea

Archaeological research on Korean Peninsula has about 100 years of history, which can be roughly divided into two halves. During the first half, Japanese scholars had exclusive access to, and control of, archaeological research and interpretation in the few years before the Japanese annexation of Korea in 1910 and during their colonial rule of the peninsula from 1910 to 1945. The second half started with the

defeat of japan at the end of World War II and the division of the Korean Peninsula into North and South Korea in 1945. Archaeological developments in the divided Korea have taken place with very little interaction between the two Koreas.

Archaeological Research before 1945

Before the modern discipline of archaeology was introduced to Korea, a number of Korean writers provided their own interpretations of archaeological sites and artifacts such as dolmens,

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South Korean Archaeology after 1945

After the defeat of Japan in 1945, the Korean Peninsula was divided into southern and northern halves by the Allied forces. In South Korea, which was controlled by the U.S. forces, the newly founded National Museum in Seoul started archaeological activities in 1946 with the excavation of a Silla tomb in Kyongju. Kim Jae-won was appointed as the first director of the museum. He had received his postgraduate education in archaeology in Europe during the colonial era, but he had no experience of excavation in Korea. Excavations of tombs of the historical period continued, but the museum's work was soon halted by the outbreak of the Korean War (1950-1953).

In the 1950s, the National Museum and a few university museums excavated prehistoric and historical sites of various kinds. The people who participated in the excavations include some of the first generation of Korean archaeologists, such as Jin Hong-seop, Yun Mu-byeong, Kim Won-yong, and Kim Jeok-hak, most of whom had no formal training in archaeology. However, the organization of an exhibition of Korean art that toured major museums in the United States and Europe between 1958 and 1960 resulted in limited archaeological excavation because of the limited number of museum staff members who were available for fieldwork.

In 1961, the Department of Archaeology and Anthropology was established at Seoul National University, and Kim Won-yong, who had recently received his Ph.D. from New York University, became the senior member of the faculty, marking a new era of formal education in Korean archaeology. A doyen of Korean archaeology, Kim Won-yong played the most significant role in training young archaeologists and establishing the basics of Korean prehistory and art history. Graduates from this department have become the major players in Korean archaeology and art history as professors in universities, curators in national and private museums, and bureaucrats in government offices in charge of managing cultural properties.

During the 1960s and 1970s, most archaeological fieldwork was conducted by university museums, the National Museum, and the newly established Institute of Cultural Properties. Excavations of two royal tombs of Silla, the Tomb of Heavenly Horse and the Great Tomb of Hwangnam, in Kyongju and the discovery of the Tomb of King Muryeong, the only intact royal tomb of a great king of Baekje, in Gongju, were of great significance during this period. In addition, the first examples of Acheulean hand-axes in East Asia were discovered in Jeongokni. A Neolithic shell midden site at Yeoncheon in Busan, and a number of Bronze-Age settlement and burial sites were excavated, all of which filled significant gaps in Korea's prehistory.

One of the major accomplishments of Korean archaeology during this period was to overcome the colonial legacy of Japanese archaeologists. In both North and South Korea, archaeologists discovered a number of Paleolithic sites that confirmed a long sequence of cultural development on Korean Peninsula. They also proved that the Japanese interpretation of the so-called Chalcolithic age was wrong by confirming the existence of Neolithic and Bronze Ages in successive chronological order. As archaeological data accumulated, it became apparent that the Korean Peninsula was neither a backward nor a stagnant area of prehistoric cultural development, as the Japanese scholars had tried to portray it. On the contrary, newly discovered archaeological data in both Korea and Japan suggested that the major sources of stimulus for new cultural development in the Yayoi and Kofun periods of Japan were often the ancient societies of the Korean Peninsula.

Since the 1980s, enormous economic development has caused the destruction of numerous archaeological sites, and in order to protect the cultural heritage, legal codes were revised to require mandatory archaeological fieldwork before public and private construction projects could begin. In an

attempt to meet the increasing demand for archaeological fieldwork, a number of new archaeological institutions for cultural resource management (CRM) were launched. These institutions took much of the CRM burden from the university museums, which had conducted most of the archaeological excavations until the 1980s. In order to cope with the changing environment of archaeological

research, a number of new scholarly associations were organized in the late 1980s around research areas and topics. These included the Yeongnam Archaeological Society, the Honam Archaeological Society, the Hoseo Archaeological Society, and the Society for the Study of Korean Neolithic Age. These associations continue to help develop more-detailed studies of each area and thematic topics, but they could lead to an overspecialization and minimal scholarly communication across regional or thematic boundaries.

In recent years, an enormous amount of new archaeological data has been produced each year from hundreds of excavations by CRM projects. As a result of this explosion in archaeological fieldwork, a new picture of Korean prehistory and early history is slowly emerging. Chronological and geographical blanks in the archaeological data are being rapidly filled in, and new archaeological information has forced scholars to reexamine the traditional views of Korean pre- and proto-history.

North Korean Archaeology after 1945

In North Korea, the archaeological and historical interpretation of the past has always been closely intertwined with the political and ideological currents of the North Korean regime. After the Soviet forces took control of the northern half of Korean Peninsula at the end of World War II in 1945, the socialist authorities paid immediate attention to archaeological and historical heritage. In 1946, the Provisionary People's Committee of North Korea promulgated laws and regulations for the preservation of national treasures, ancient sites, scenic spots, and natural monuments. The authorities also established historical museums and organized the Committee for the Preservation of Ancient Sites in Pyongyang and in each province. In the same year, a Neolithic shell midden in Songpyeongdong, Unggi, was excavated by North Korean archaeologists, the first recorded case of an excavation by Koreans. The excavation of a number of prehistoric sites continued until the outbreak of the Korean War.

After that war, archaeological fieldwork was actively carried out in conjunction with national reconstruction and industrialization projects. The leader of the archaeological team was Do Yu-ho, who had studied prehistory at the University of Vienna in Austria during the colonial period. He trained a number of other scholars, including Kim Yong-gan, Hwang Gi-deok, and Kim Yong-nam. Archaeological surveys and excavations in the 1950s accumulated new archaeological data and made it possible for North Korean archaeologists to establish a basic chronology for Korean archaeology, confirming the existence of Paleolithic and Bronze-Age cultures in Korea and overcoming the colonial legacy of Japanese archaeologists.

With this new body of accumulated archaeological data, North Korean scholars began to develop their own interpretations of early Korean history in the 1960s. Their attention focused on the issue of Gojoseon (Old Joseon, or Korea) and its location, territory, cultural sphere, time of formation, and nature of its social organization. The location of Gojoseon on the Liaodong Peninsula in northeastern China was accepted in the 1960s. This period was a golden age for North Korean archaeology, and it was much more advanced than that of South Korea. The most important cultural and historical archaeological theories were Marxism, historical materialism, and unilinear cultural evolutionism.

In the early 1970s, a new state doctrine of *juche,* or self-reliance, was established as the pillar of political ideology and propaganda in an attempt to idolize the North Korean leader Kim Il-sung. As a result, archaeological interpretation was under the direct influence of the ideology of the state and the ruling Workers' Party, and consequently, archaeology and historiography in North Korea became stagnant. In the 1980s and 1990s, archaeological research in North Korea was not as active as it had been in the 1960s, primarily because of the poor economic conditions of the country. The number of archaeological sites that were discovered and excavated decreased. Archaeological research in North

Korea became dormant, with few archaeological discoveries reported and few original archaeological studies published.

In the early 1990s, a new framework for Korean prehistory was developed by North Korean

archaeologists after the alleged discovery of the so-called tomb of Dangun in the Pyongyang area. This was scientific evidence of the existence of the mythical first Korean ancestor, born as the result of a union between a she-bear and the son of heaven according to various written sources of the twelfth century a.d. In order to emphasize the importance of the cultural accomplishments of Dangun and his successors, the earlier chronological framework of the 1960s was abandoned and a totally new picture of prehistoric Korea presented, but without any objective evidence. Archaeology in North Korea has now become a tool of state doctrine, part of the political propaganda of a chauvinist nationalism, and it can no longer be regarded as an independent scientific discipline.

Korean Archaeology in the New Millennium

Korean archaeologists will face many daunting challenges in the early decades of the new millennium. There is so much new archaeological data reported each year in South Korea that it has almost become impossible for even a Korean archaeology specialist to digest and make sense of it all. It is becoming more difficult to synthesize data and provide consistent and comprehensive interpretations of Korean prehistory and early history. This task will only be possible if there is cooperative work among specialists from different periods and themes.

Korean archaeology will need an independent framework of interpretation for both prehistoric and historical archaeology. Archaeological interpretation in Korea remains superficial, with most research being focused on typological studies and the periodization of artifacts and sites, with rudimentary explanations based on diffusion and migration. Historical archaeology does not provide alternative explanations. Historical records are considered to be of primary importance, and this attitude limits and dictates the interpretation of archaeological data. Korean archaeology must become more independent in its theory and methodology so it will be no longer considered a subdiscipline of historiography.

In both North and South Korea, archaeological research was almost exclusively practiced by Koreans in the last half of the twentieth century. Foreigners are still not allowed to excavate an archaeological site in South Korea, and in North Korea, there is no known case of foreign archaeological research. Except for only a few Japanese scholars and still fewer western scholars, Korean archaeology is still very much isolated from the outside world. In order to internationalize Korean archaeology, reports and papers must be published with English abstracts, cooperative fieldwork with foreign institutions should take place, and Koreans should be trained in foreign archaeology. There is still only a single monograph on Korean archaeology in English, and that by a western scholar (Nelson 1993).

The last, but hardly the least, challenge to be faced by Korean archaeologists may be the possible reunification of the two Koreas. Between North and South Korea there are huge differences in theory, methodology, empirical data, and the very practice of archaeology. Even before unification there should be some kind of constructive engagement among archaeologists from the two Koreas, which should include joint field surveys and excavations as well as the exchange of personnel and archaeological collections.

Yangjin Pak

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Korošec, Josip

(1909-1966)

The Slovenian archaeologist Josip Korošec was involved with Neolithic, Eneolithic, and early Slavonic archaeology in slovenia in the first

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Korean Archaeology in the New Millennium

Korean archaeologists will face many daunting challenges in the early decades of the new millennium. There is so much new archaeological data reported each year in South Korea that it has almost become impossible for even a Korean archaeology specialist to digest and make sense of it all. It is becoming more difficult to synthesize data and provide consistent and comprehensive interpretations of Korean prehistory and early history. This task will only be possible if there is cooperative work among specialists from different periods and themes.

Korean archaeology will need an independent framework of interpretation for both prehistoric and historical archaeology. Archaeological interpretation in Korea remains superficial, with most research being focused on typological studies and the periodization of artifacts and sites, with rudimentary explanations based on diffusion and migration. Historical archaeology does not provide alternative explanations. Historical records are considered to be of primary importance, and this attitude limits and dictates the interpretation of archaeological data. Korean archaeology must become more independent in its theory and methodology so it will be no longer considered a subdiscipline of historiography.

In both North and South Korea, archaeological research was almost exclusively practiced by Koreans in the last half of the twentieth century. Foreigners are still not allowed to excavate an archaeological site in South Korea, and in North Korea, there is no known case of foreign archaeological research. Except for only a few Japanese scholars and still fewer western scholars, Korean archaeology is still very much isolated from the outside world. In order to internationalize Korean archaeology, reports and papers must be published with English abstracts, cooperative fieldwork with foreign institutions should take place, and Koreans should be trained in foreign archaeology. There is still only a single monograph on Korean archaeology in English, and that by a western scholar (Nelson 1993).

The last, but hardly the least, challenge to be faced by Korean archaeologists may be the possible reunification of the two Koreas. Between North and South Korea there are huge differences in theory, methodology, empirical data, and the very practice of archaeology. Even before unification there should be some kind of constructive engagement among archaeologists from the two Koreas, which should include joint field surveys and excavations as well as the exchange of personnel and archaeological collections.

Yangjin Pak

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Korošec, Josip

(1909-1966)

The Slovenian archaeologist Josip Korošec was involved with Neolithic, Eneolithic, and early Slavonic archaeology in slovenia in the first

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decades after World War II. He graduated in classical philology in Belgrade in 1936 and specialized at Karl's University in Prague (receiving his Ph.D. in 1939). Between 1939 and 1945, he was curator of archaeology in the Provincial Museum in Sarajevo, between 1945 and 1947, he was curator in the City Museum at Ptuj, and beginning in 1947, he was at Ljubljana University where he founded the Department of Archaeology and was professor of prehistoric and early Slavonic archaeology.

In 1948, Korošec was one of the initiators of the Institute of Archaeology at the Slovenian Academy of Arts and Sciences. He founded the central national archaeological journal *Arheoloshi vestnik* in 1950, and in 1964, he founded the journal for Paleolithic, Neolithic, and Eneolithic archaeology, *Porocilo o raziskovanju paleolita, neolita in eneolita v Sloveniji.* He was also a correspondent member of the Yugoslav Academy of Arts and Sciences in Zagreb, the deutsches archäologisches institut (German Archaeological Institute) in Berlin, and the Institute for Pre- and Protohistory in Florence.

Besides academic and organizational work, his contribution to field archaeology was significant. Korošec conducted several excavations, of which the most important were the prehistoric and early Slavonic site of Ptuj, the Ljubljana marshes, and the Neolithic site of Drulovka, all in Slovenia. In the other republics of the former Yugoslavia, Korošec excavated Danilo near Sibenik and Bribir near Zadar (both in Croatia) as well as Amzabegovo in Macedonia. He collaborated on fieldwork and analyses with his colleague and wife, Paola Korošec.

Korošec introduced vere gordon childe's concept of culture into Slovene archaeology. According to Korošec, culture could be divided into the material and spiritual. The cultural group was determined culturally, geographically, chronologically, and ethnically, providing an entity with a certain degree of common economic and social organization. In 1947, Korošec published his first large synthesis on the history of Slavs in Slovenia, *Staroslovenska grobisca v severni Sloveniji.* This work was opposed to Nazi archaeology, which had also sought support for German ethnogenesis in sites in Slovenia in order to justify German geopolitical appetites. Paradoxically, the conceptual framework of gustav kossinna's *Siedlungsarchaeologie* (settlement archaeology), the basis of German expansionist theses, was nevertheless applied to Korošec research on early Slavonic sites. However, Korošec 's work on the theoretical considerations and definitions of archaeology, and its relationships with other social and humanist sciences and history, set the pattern for the future development of archaeology in Slovenia. He published numerous works-13 books, 116 discussions, 106 book reviews, 20 surveys-and his synthesis *An Introduction to the Material Culture of the Slavs in Early Medieval Period* (1952) is still one of the cornerstones of Slovenian national archaeology.

Irena Mirnik Prezelj

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Kossinna, Gustaf

(1858-1931)

Born in East Prussia, the son of a secondary school teacher, Kossinna absorbed the German nationalist ethic prevalent in the education system of the time-the direct result of contemporary politics when Prussia was leading German unification. He attended the Universities of Gottingen, Leipzig, Berlin and

Strasbourg. In Berlin Kossinna studied German philology, history and geography, but it was lectures on German and Indo-European linguistics that particularly interested him, and the problem of the location of the original Indo-German homeland (Urheimat) was to preoccupy him for his entire life. In 1881 he received a doctorate for his thesis on the linguistic subject “Ancient Upper-Frankian Written Monuments.” In 1892 he started to work as a librarian at the University of Berlin.

Kossinna's interests in the original German homeland, and the roots of the German language and its ancient vocabulary sparked his interest in the material culture of ancient Germans.

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Kostenki

First excavated in 1879 by Russian archaeologists A. Polyakov and a. spitsyn, Kostenki was the focus of long-term excavation for much of the twentieth century. Extending about 10 kilometers on the banks of the River Don to the south of Voronezh, Kostenki is in fact a complex of twenty-five surface and stratified open sites, which in some instances extend up to 2 kilometers away from the river.

The excavation of these sites has produced a large assemblage of items of material culture for the period 35,000 b.p.-11,000 b.p., including stone and bone tools, ivory Venus figurines, animal figurines carved from bone and stone, and features that have been interpreted as rectangular long houses. Although that interpretation is now being questioned on the basis that what was thought to be contemporary evidence now seems more likely to be the result of multiple occupations. The other "dwellings"-small houses made of mammoth bone-continue to be accepted as evidence of single occupations.

Tim Murray

See also

Russia

Kostrzewski, Józef

(1885-1969)

Józef Kostrzewski was an outstanding Polish prehistorian. He initially studied medicine at the University of Wroclaw, but in 1909-1910 he took two semesters of archaeology under Wlodzimierz Demetrykiewicz at the Jagiellonian University in Cracow. He continued prehistoric studies in Berlin under gustaf kossinna and received his Ph.D. in 1914. The first year of his studies was spent in London, engaged in self-education at the british museum. In 1912, the first year of his independent research, Kostrzewski excavated a site in Siedlemin, near Jarocin (Wielkopolska) in poland. In 1914, his first book, *Wielkopolska w czasach przedhistorycznych* (Wielkopolska in the Prehistoric Period), was published. A second edition was published in 1923, the same year he became an assistant in the prehistory section of the Museum of the Society of Friends of Sciences in Poznan. He defended his postdoctoral dissertation on prehistory, written under the supervision of the anthropologist Jan Czekanowski, the classical archaeologist Edmund Bulanda, and the geologist Jozef Siemiradzkion, at Jan Kazimierz University in Lvov in 1919.

Józef Kostrzewski

(Arkadiusz Marciniak)

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In 1924, Kostrzewski successfully combined the collections of the two Poznan museums: the Polish one, or Mielzynskis's Museum, and the German one, or Wielkopolskie Museum. A prehistoric section located in the Wielkopolskie Museum was established with Kostrzewski as its head, and it came to

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synthesize particular fragments of the prehistory of Polish territories.

The second edition of his *Wielkopolska w czasach prehistorvcznych* (Wielkopolska in the Prehistoric Period), published in 1923, was considered the fundamental model for all approaches to the synthesis of the prehistory of the territories of Poland. Kostrzewski was particularly interested in synthesizing long periods in the prehistory of Poland, for example, from the Neolithic Age to the great migration period, considered in *Prehistoria ziem polskich* (1948; Prehistory of the Polish Lands) and *Pradzieje Polski* (1965; Prehistory of Poland). He was also the author of regional syntheses: the one already mentioned about Wielkopolska as well as others about Pomerania and Silesia.

Arkadiusz Marciniak

Koumbi Saleh

The forty-four-hectare tell of Koumbi Saleh is one of the great urban sites of Africa. In the eastern Hodh, several miles from Mauritania's border with Mali, the site comprises over sixty mounds, delimited by large streets, of debris from collapsed buildings constructed with plaques of locally available schist. A main attraction of the site since its discovery in 1914 by Bonnel de Mezières, a French civil servant, has been its putative identification as the capital of the Empire of Ghana as described by the Arab chronicler al B'akri in 1068. Virtually all pre-1970s archaeological work at the site, by Bonnel de Mezières, Raymond Mauny, and others, was undertaken primarily to evaluate this identification.

The archaeological material encountered in the course of these early, quite extensive excavations was given only summary treatment, and no full excavation reports were ever published. Beginning in 1975, French archaeologist Sophie Berthier's excavations, by contrast, considered the site in archaeological rather than historical terms and focused on the study of architectural evolution at the site and the characterization of material culture through time. Berthier's work was undertaken as part of more extensive excavations at and around the Koumbi Saleh mosque that were directed by Serge Robert. To date, Berthier's work is the only publication to have emerged from that extensive project.

Berthier conducted excavations during four field seasons on a single building in the north central part of the site not far from the Grande Place, a large public area. She concluded that of the thick deposits encountered, half belonged to a period of “grand urbanization,” dated by twelve radiocarbon determinations on charcoal to the eleventh-fourteenth centuries. Architecture at that time was very distinctive and commonly included rectangular and triangular wall niches, the use of paving stones on floor, step, and terrace surfaces, and the use of painted schist wall plaques. By the late fourteenth century, the buildings had been abandoned.

Strongly focused on architectural evolution, Berthier's work is thin with regard to analyses and interpretations that illuminate the changing nature of subsistence and trade at the apparent capital of the empire. The extensive areas of Koumbi Saleh that lack stone ruins still remain to be investigated, and among these may be the remains of the indigenous town in which the pagan king (ghana) lived, described by al-Bakri as separate from the stone-built town inhabited by Muslims and northern traders.

Susan McIntosh

See also

Africa, Francophone

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Kourion

Kourion (Curium), an Iron Age and Roman site on the south coast of cyprus, has been the target of numerous projects. Some of the best-known finds by luigi palma di cesnola (including much gold jewelry now in the Metropolitan Museum in New York) came from his work on Iron Age royal tombs in 1873. Additional recent work by Demos Christou (Department of Antiquities, Cyprus) has clarified details of those tombs and of Cesnola's activities.

There have been numerous and extensive excavations of the classical city by a series of archaeologists. Between 1933 and 1954, George McFadden and others excavated on behalf of the Pennsylvania University Museum. The Department of Antiquities has been conducting excavations on the Acropolis since 1964, and A.H.S. Megaw worked on the early Christian basilica for Dumbarton Oaks in Washington, D.C. Between 1980 and 1983, Diana Buitron and David Soren excavated at the Sanctuary of Apollo. The site has well-preserved Roman buildings, including a theater, many of which are decorated with mosaics. The theater and many other structures have been substantially restored.

David Frankel

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Soren, D., and J. James. 1988. *Kourion: The Search for a Lost Roman City.* New York: Doubleday.

Kozłowski, Leon (1892-1944)

Leon Kozłowski was one of the most important Polish archaeologistsof the first half of the twentieth century, and he represented a generation of archaeologists who, for the first time, had professional careers in archaeology. He was a student of Erazm Majewski, studied archaeology under Wlodzimierz Demetrykiewicz at the Jagiellonian University in Cracow in 1912-1913, and continued under the supervision of R. Schmidt at the University of Tübingen in Germany. In 1921-1939, he was professor of archaeology at the Jan Kazimierz University in Lvov.

Kozłowski was the author of very modern syntheses about the Paleolithic, Neolithic, and Bronze Ages in poland. These are *Starsza epoka kamienna* (1922; Palaeolithic or Early Stone Age), *Mlodsza epoka kamienn*a (1924; Neolithic or Late Stone Age), and *Wczesna, starsza i srodkowa epoka bronzu w Polsce w swietle subborealnego optimum klimatcznego i jego wplyw na ruchy etniczne i zaludnienie Polski* (1928; Early and Middle Bronze Ages in Poland in the Light of Subboreal Climatic Optimum and Its Influence on the Ethnic Movements and Population of Poland). In his work on the Neolithic period, he distinguished many archaeological cultures that have remained correct until the present, and he presented a very clear chronological division for the period.

Leon Kozłowski

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Kozłowski s works are characterized by methodological correctness. He would define the notions present in archaeological discourse, for example, that of archaeological culture, and his work contained geological backgrounds, hydrographic conditions, climate and soil characteristics, and an assessment of their impact on prehistoric settlement systems. While analyzing flint assemblages he focused his attention

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Kozłowski was active politically. In the 1930s he was minister for agriculture and agricultural reforms, undersecretary in the Ministry of Finance, and prime minister of the Polish government from 1933 to 1934.

Arkadiusz Marciniak

Kromdraai

Kromdraai is a South African site containing evidence of early hominids. In 1938, R. Broom recovered a hominid from the site and named it *Paranthropus Robustus*-it is now thought to be an australopithecine. The site was reexcavated by C.K. Brain between 1955 and 1956 and by Elizabeth Vrba between 1977 and 1985. A total of thirteen hominid fossils have been recovered.

Tim Murray

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Africa, South, Prehistory

Krukowski, Stefan

(1890-1982)

Stefan Krukowski was an influential Polish archaeologist and a great personality. His only teacher of prehistory was Erazm Majewski, and he never completed any formal studies in archaeology, being completely self-taught. He was commissioned to conduct his first fieldwork by Majewski in 1908. In 1911, he published his first paper, on studies carried out in the Kielce district. In 1914, he started working in the anthropology workshop of the Warsaw Scientific Society, and this event marked the beginning of his almost total devotion to the Stone Age. At the same time, he also began important studies of the caves in the Cracow-Wielun range, such as Okiennik Cave. During World War I, he continued his research in Russia, in the Caucasus, on the Paleolithic site of kostenki.

Krukowski's professional career and research were especially intense between 1919 and 1939. From 1918 to 1925, he worked in the prehistory section of the Institute of Anthropological Studies of the

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Of great importance was his collaborations with the outstanding geologist Jan Samsonowicz. Their work led to the discovery of a unique mine of striped flint in krzemionki opatowskie in 1922, shallow mines of chocolate-colored flint near Lysogory, and grey-white spotted flint in Swieciechow near Annopol. In 1928, he took up the study and protection of the mine in Krzemionki Opatowskie, and in 1939, he published *Krzemionki Opatowskie,* a research questionnaire in which the author described the standard features of the mine such as the mining field, shafts, underground headings, dumps, and mining tools. He also discussed the organization of the work, the spatial relations between mines and the settlements they were connected to, and the social aspects of the distribution of flint axes.

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Krukowski was a researcher of Paleolithic cave camps such as Ciemna and Okiennik, of loess and sand sites, and of mines. He examined the locations of the sites in poland of Piekary, Gora Pulawska, Grzybowa Gora, Swidry Wielkie, Wieliszew, and Oronsko. He also organized and led a research campaign to Rydno, in which he focused on the systematic identification of a settlement complex in connection with the oldest mine, hematite processing and distribution, and a chocolate-colored rock bed.

After World War II, he had trouble finding a permanent position. In 1956, he received the title of professor extraordinarius.

Stefan Krukowski

(Arkadiusz Marciniak)

The first part of his first work, synthetic in character, *Pierwociny krzemieniarskie gornictwa transportu i handlu w holocenie polskim* (Beginnings of Flint Mining, Transportation, and Trade in Holocene of Poland) was published in 1920, and the second part was published in 1922. In this work, Krukowski was concerned with the origins of material used for flint tools. He described his search for siliceous rocks in the territory of Poland, drew differences among them, and illustrated their influence on the morphological diversity of flint inventories. He examined the possibility and mechanics of studying raw materials distribution and the possible ways that prehistoric societies obtained them. His work matched the highest standards of the day.

He was also the author of an overview of the Paleolithic age of Poland, published in 1948 as the synthesis *Prehistoria ziem polskich* (Prehistory of the Polish Lands), written jointly with jozef kostrzewski and Roman Jakimowicz. In 1976, Krukowski published another synthesis of the Polish Paleolithic and Mesolithic ages entitled *Skam 71*, in which he presented his theory of genetic prehistory. It was an original study, but because of its complicated terminology and hermetic language, its reception was limited. He also created a dictionary of concepts to be used in archaeology.

Genetic prehistory, Krukowski's original contribution, was an attempt to provide new directions in Stone Age archaeology, and developed toward the end of the 1960s, it was hoped it would provide an alternative to traditional Paleolithic prehistory. Krukowski pointed out the necessity of studying all flint assemblages, such as raw material, blanks, and waste, not just tools. The objective of genetic history was to determine the origin, formation, and purpose of stone tool industries. A crucial aspect in its determination was the study of flint blanks, which enabled him to recognize the unintended effects of the producers on the basis of a detailed analysis of all artifacts making up a given inventory. Genetic prehistory and the flint blank method permitted the separation of industries in mixed inventories.

Arkadiusz Marciniak

Krzemionki Opatowskie

The site of Krzemionki Opatowskie is located about ten kilometers southeast of Ostrowiec Swietokrzyski, Tarnobrzeg voivodeship, in poland. It is the best known as “the black and white striped flint mine,” within an agglomeration of some excellent and characteristic flint mines in the northern and northeastern parts of

between 1924 and 1927. stefan krukowski and Zygmunt Szmit started their researches in Krzemionki Opatowskie in 1928. In the same year Krukowski became the curator of the mine. The mine has been protected by law since 1928. Krzemionki Opatowskie is an open archaeological museum at present, and it is still a center of archaeological interest, mainly from the State Archaeological Museum in Warsaw.

Arkadiusz Marciniak

Kuwait

See Arabian Peninsula

L

La Madeleine

La Madeleine is the type site of the Magdalenian industry of the Upper Paleolithic period in Europe, about 16,000-10,000 b.c. The rock shelter lies on the outskirts of Les Eyzies in the Perigord region of southwestern france and was excavated in the mid-nineteenth century by édouard lartet and henry christy . The site yielded stone and bone tools of distinctive form, but it is most notable for producing evidence of mobiliary (portable or parietal) art in the form of carved and incised bone, antler, stone, and ivory. The people who made these are referred to as Magdalenian and they hunted deer or ibex.

Tim Murray

See also

Breuil, Henri; Lithic Analysis

References

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La Tène

The eponymous site of the later phase of Iron Age civilization (500 b.c. until the Roman Conquest) of La Tène, switzerland, covers the whole of Celtic Europe. Discovered in 1857 by Hans Kopp, who "fished" for Friedrich Schwab, the archaeologist of Bienne, the site was first considered to be a lake dwelling based on examples of Stone and Bronze Age villages on the Swiss lakes. Such an interpretation had the advantage of extending the custom of lake dwelling, which was felt to be specifically Swiss, until the Roman occupation.

In no time, La Tène achieved international fame. In 1872, hans hildebrand suggested giving the name to a specific culture of the Iron Age, and the definition was ratified by an international congress held in Stockholm in 1874. Hildebrand, however, attributed the differences between the two cultures that he had defined, Hallstatt (early Iron Age) and La Tène (later Iron Age), to geographical variation. It was edouard desor, an archaeologist and geologist from Neuchâtel, who deserves all the credit of having, as early as 1865 (and more explicitly in 1868), clearly established a chronological succession for the Iron Age. This feat was achieved by means of comparisons with Tiefenau (Bern), Alesia (France), and the Celtic site of Marzabotto (northern Italy) on the one hand and the burial mounds of the Swiss Neuchâtel area and the Austrian burial place of Hallstatt on the other.

The site of La Tène includes two bridges, named Vouga and Desor after the early excavators. The bridges crossed a lateral, little active (or maybe dead) arm of the river Thielle, which was totally filled in when discovered. The bridges are near the Thielle's egress from Lake Neuchâtel, which is linked by this river to Lake Bienne. The river separates the foothills of the Jura mountain chain from the Swiss plateau, and this archaeologically rich site has seen successive excavations. Unfortunately, some of the work has not been a credit to Swiss archaeology. During the fifty years following La Tène's discovery, looting of the site was more common than archaeological research, particularly during the first Jura Surface Waters Regulation Scheme (1869-1883), which lowered water levels by 2.70 meters and left the surface of the site exposed.

The difficulty of excavating the site, by dragging or fishing and then by excavating in the water,

PREV NEXT

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La Venta

A major Olmec site in Tabasco, mexico, near the southern coast of the Gulf of Mexico, La Venta is located on top of a salt dome and is surrounded by swampy terrain. The site was discovered in 1925, when large earth structures and massive stone monuments were found. It was once thought to be a “vacant” ceremonial center, with little cultivable land in the immediate environs and the surrounding rural populace using the uninhabited site for public rituals. Recent excavations, however, have revealed that this view was in error. We now know that by 2000 b.c. there were already farmers in the region, subsisting on its maize and rich estuarine and marine resources. The prized land for farming was along river levees, annually renewed with rich silt.

The farming hamlets gradually grew into larger villages, and signs indicate a developing social stratification. By 1150 b.c. construction had begun on the large earth mounds that formed the ritual heart of the site. After the downfall of the nearby olmec site of San Lorenzo, about 900 b.c., La Venta became the most important site in the region. The ceremonial center of La Venta includes dozens of earth mounds and platforms. Its largest pyramid, over 30 meters high, has been argued by some to have the form of an effigy volcano. Another earth platform, possibly the royal palace compound, is over 320 meters long, 260 meters wide, and up to 7 meters high.

Jade Olmec carved head

(Image Select)

Excavations in La Venta in the 1940s revealed additional huge stone monuments that are among the hallmarks of Olmec civilization. Some eighty monuments have been found to date, weighing up to 35 tons. They include colossal heads (probably the portraits of rulers), thrones, and a wide variety of other sculptures. Later in La Venta's history, probably after 800 b.c., a more narrative art was executed. Monuments called “stelae” portray scenes of several interacting figures, carved in low relief.

Among the most dramatic discoveries at La Venta are the appropriately called “massive offerings.” One of these offerings involved the digging of a huge pit, which was then filled with twenty-eight layers of roughly shaped serpentine blocks, weighing 1,000 tons in total. The offering was covered with a mosaic mask, also made of serpentine blocks, and different-colored clays.

La Venta's heyday was between 900 and 400 b.c. The site displays many of the hallmarks of later Mesoamerican civilization: an extensive ceremonial heart for the enacting of public rituals, rich dedicatory offerings, carved stone monuments, elaborate burials, writing, objects carved in jade, and so on.

Some time around 400 b.c. the site was destroyed. Many of its stone monuments were smashed or defaced, and the ceremonial center was abandoned. Offerings made after the site's abandonment indicate that it may have remained a place of pilgrimage for centuries; even a Spanish colonial olive jar has been found at the site, apparently buried as an offering.

Stone Olmec carved head

(Gamma)

Peter Mathews

See also

Mesoamerica

Laetoli

Lying on the edge of the African Serengeti to the south of olduvai gorge in northern Tanzania, the site of Laetoli was discovered by louis leakey and mary leakey in 1935. The area was subsequently worked on by Ludwig Kohl-Larsen (1938-1939), and its status as a fossil locality was confirmed. Mary Leakey returned to the area (particularly the nearby Garusi River valley) in 1974 and recovered hominid fossils that have been classified as *Australopithecus afarensis* or *africanus.* These are the remains of small, lightly built human ancestors. *Afarensis* is dated 3.75-3 million years ago, while *Africanus* lived about 3-2 million years ago. More exciting was the 1978 discovery by Paul Abell of trails of hominid footprints left in the volcanic ash, which made it clear that these hominids walked upright.

Tim Murray

See also

Africa, East, Prehistory; Africa, South, Prehistory

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help archaeologists to test hypotheses regarding social and political change and regional interactions, to explain the distribution of intrusive archaeological assemblages and changes in settlement patterns, and to identify the linguistic structure and identity of ancient texts.

Archaeology and historical linguistics also intersect when written texts survive for or about the culture under study. Although written texts may provide a rich source of information, historical references can be vague, inaccurate, or culturally biased. Oftentimes hypotheses tested without them can be equally productive.

Historical Linguistics

Nineteenth-century European linguists working at the University of Leipzig, referred to as Neogrammarians by their elders, developed principles and a method of comparison that successfully accounted for linguistic change over time. They demonstrated that the linguistic processes that produced change in prehistoric languages are observable and operative in transforming living languages. They showed how most of the modern linguistic groups in Europe and some others in the Near East and India developed from a common ancestral language, Indo-European. Neogrammarians were able to reconstruct a basic vocabulary and associated cultural traits for a proto-language they called Proto-Indo-European and to propose a geographic homeland for the Indo-European people (Labov 1994).

Research in the past twenty-five years has demonstrated that the degree of regularity and the mechanical principles of the Neogrammarians are essentially correct. Refinements in typological classifications and linguistic geography and advances in sociolinguistic methods of data collection and quantitative analysis have all helped to illuminate some features of the past that previously remained unexplored and beyond explanation (ibid.).

Combining Archaeology and Language

European scholarship conceived the seminal theoretical and methodological models for archaeological, historical, and linguistic investigations that continue to be reworked, discarded, and rediscovered today. Europe has also provided the proving ground for interdisciplinary debates (Trigger 1989). In the early twentieth century, European archaeologists combined the reconstructions of historical linguists with their own empirical evidence to propose locations for an Indo-European homeland and to reconstruct the lifeway of Indo-Europeans (Mallory 1991).

As the number of excavated sites increased and the stratigraphic and geographic distributions of artifacts became clearer, disputes arose among archaeologists over the origins of specific European cultures. Fueled by nationalist and regional fervor of the early twentieth century, archaeologists like gustaf kossinna insisted upon a local origin for the succession of artifact types while Carl Schuchhart identified materials from different areas with separate ethnic groups whose migrations could be identified by their material remains (Mallory 1991). vere gordon childe favored continuous diffusion of cultural traditions from outside Europe (Renfrew 1987). The active role that interdisciplinary scholarship played in these debates lessened considerably after World War II as a result of the misuse of combined archaeological and linguistic findings by Nazi Germany to substantiate Nazi racial beliefs and to justify German territorial expansion (Mallory 1991).

The debate over independent local innovation versus cultural diffusion (see Childe's theory above) has been ongoing in archaeology since the turn of the century, and similar debates have also set the course of research in linguistics. By the 1960s the importance of internal factors as the cause for change took precedence in some research over external factors (Trigger 1989). Those scholars whose results were

partly based upon diffusion, migration, and interdisciplinary data found it necessary to argue their case on several fronts. Such a defense was necessary in 1987 after the publication of Collin Renfrew's book, *Archaeology and Language: The Puzzle of Indo-European Origins.* Scholarly response to Renfrew's proposal linking the spread of agriculture into Europe with the arrival of Indo-Europeans raised both strong objections and support from other scholars and his use of linguistic data has made a

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Lapita Complex

See Polynesia; Papua New Guinea and Melanesia

Lartet, Édouard

(1801-1871)

Lartet studied law in Toulouse before going to Paris in 1821 as a young lawyer, where he became interested in archaeology and paleontology. He returned to work as a lawyer in southwestern france and was paid by his clients with fossil bones and prehistoric tools, which they knew were his passion. He began to study the local Tertiary deposits, and in 1834 discovered the rich fossil site of Sansan.

Further encouraged by famous scientists at Paris's National Museum of Natural History, Etienne Saint Hillaire and, later, Adrien Jussieu, Lartet continued to search the fossil deposits of France. In 1837 he found the remains of a fossil ape called Pliopithecus, and in 1856 remains of another fossil ape-Dryopithecus. In 1853 he returned to Paris to undertake full-time paleontological research, where he met jacques boucher de perthes. Lartet began to believe that animals and humans had evolved over a much longer period of time than was thought, and that Boucher des Perthes's discoveries in the Somme gravels were proof of this. Lartet also presented his finds from the Aurignac rock shelter in the French Pyrenees as evidence of humans being contemporary with extinct animal species, and, like the work of Boucher des Perthes, it was rejected by the Academies des Sciences in Paris.

In 1861 Lartet proposed a chronology for human skeletal and cultural remains based on fossil animal bones found with them in cave sites. While his chronology eventually proved to be limited, it established him as one of the founders of human paleontology. Sponsored by English prehistorian and banker henry christy, he began to explore cave sites in the Perigord and Dordogne regions of France, where he discovered the famous Paleolithic sites of la madeleine, Les Eyzies and le moustier, providing further evidence of phases of human development based on archaeological stratigraphy. Lartet also published on the development of the human brain in fossil mammal species.

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Lapita Complex

See Polynesia; Papua New Guinea and Melanesia

Lartet, Édouard

(1801-1871)

Lartet studied law in Toulouse before going to Paris in 1821 as a young lawyer, where he became interested in archaeology and paleontology. He returned to work as a lawyer in southwestern france and was paid by his clients with fossil bones and prehistoric tools, which they knew were his passion. He began to study the local Tertiary deposits, and in 1834 discovered the rich fossil site of Sansan.

Further encouraged by famous scientists at Paris's National Museum of Natural History, Etienne Saint Hillaire and, later, Adrien Jussieu, Lartet continued to search the fossil deposits of France. In 1837 he found the remains of a fossil ape called Pliopithecus, and in 1856 remains of another fossil ape-Dryopithecus. In 1853 he returned to Paris to undertake full-time paleontological research, where he met jacques boucher de perthes. Lartet began to believe that animals and humans had evolved over a much longer period of time than was thought, and that Boucher des Perthes's discoveries in the Somme gravels were proof of this. Lartet also presented his finds from the Aurignac rock shelter in the French Pyrenees as evidence of humans being contemporary with extinct animal species, and, like the work of Boucher des Perthes, it was rejected by the Academies des Sciences in Paris.

In 1861 Lartet proposed a chronology for human skeletal and cultural remains based on fossil animal bones found with them in cave sites. While his chronology eventually proved to be limited, it established him as one of the founders of human paleontology. Sponsored by English prehistorian and banker henry christy, he began to explore cave sites in the Perigord and Dordogne regions of France, where he discovered the famous Paleolithic sites of la madeleine, Les Eyzies and le moustier, providing further evidence of phases of human development based on archaeological stratigraphy. Lartet also published on the development of the human brain in fossil mammal species.

In 1865 he became a member of the Société d'Anthropologie de Paris, and in 1869 its president and professor of paleontology at the National Museum of Natural History. Ill health caused his early retirement from both these positions.

Tim Murray

See also

Lithic Analysis

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Wangernez, J. 1986. Édouard Lartet, 1801-1871: “Le Gersois Fondateur de la Paléontologie Humaine.” *Le Mois Scientifique Bordelais* 66: 1-3.

Lascaux

Lascaux, a cave occupied during the Magdalenian period in the Dordogne region of france, was discovered by four boys in 1940, and it remains among the most spectacular collection of Paleolithic wall art yet found. It is best known for its 600 magnificent paintings of aurochs (wild cattle), horses, deer, and signs of various kinds, but it also contains almost 1,500 engravings dominated by horses. The best-known feature is the great Hall of the Bulls, which contains several great auroch figures, some of them five meters in length, the largest figures known in Ice Age art. The hall also contains an enigmatic figure, called “the unicorn.” A shaft features a painted scene of what seems to be a bird-headed man with a wounded bison and a rhinoceros, and the scene has often been interpreted in shamanistic terms, though with little justification.

Archaeologist exploring Lascaux Caves

(Gamma)

Stone tools for engraving were found in the cave as well as many lamps, 158 fragments of pigment, and color-grinding equipment. Scaffolding was clearly used in some galleries to reach the upper walls and ceiling. Much of the cave floor was lost when the site was adapted for tourism, but it was probably never a habitation-it is more likely it was visited only briefly for artistic activity or ritual. Charcoal fragments from the cave floor have provided radiocarbon dates around 17,000 years ago and in the ninth millennium b.p.

The cave was closed to tourists in 1963 because of pollution that resulted in a “green sickness,” consisting of a proliferation of algae, and a “white sickness” of crystal growth. It was possible to reverse the effects of the green sickness and arrest the development of the white, but to ensure the survival of the cave's art, the number of visitors had been drastically reduced. As compensation, a facsimile cave, a complete copy of the original cave and its details, Lascaux 2, is now open nearby.

Paul Bahn

See also

Rock Art

Latvia

The Main Periods in the History of the Archaeology of Latvia

For a long time after World War II the traditional subdivision of time concerning the investigation of the history of archaeology in the main publications and surveys (Moora 1952; Graudonis 1967; Šnore 1974) was into four periods. This division is based on the political situation in the Baltic states during the eighteenth through the twentieth centuries. The *first period* of archaeological study, from the middle of the

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artifacts. Surveys of Old Town Rīga (1998) and the castles of the Archbishop of Rīga during the Livonian period and later (1999) were detailed and included architectural studies across the territories of present-day Latvia. Publication of the compiled works of the talented Latvian archaeologist Fēliks Jākobsons (1896-1930) is the best example of the strong interest in Latvian cultural heritage (1999). A connoisseur of Eastern Prussian archaeological materials, Jākobsons, who graduated from the Albertus University in Koenigsberg, described and illustrated the archaeological material lost during World War II in Eastern Prussia (now the Kaliningrad district of Russia).

The organization of international conferences in Latvia-especially for discussing themes concerning the Baltic Sea during the Stone and Bronze Ages (1995) and in the Middle Ages (1992)-helped to make contacts between archaeologists from opposite sides of the Baltic. Such important changes mark new approaches in the development of the archaeology of Latvia. New projects, such as the excavation of a Neolithic ritual place of the inhabitants of Litorina littoral of 5000 b.c. and a study of the influence of Stone Age people on the environment in the Lake Lubāna Wetland, began. Another prospective project is in the area of the Dubna River system (a tributary of the Daugava), which includes the excavation of the hillfort Jersika, inhabited during the Iron Age and early Middle Ages. Two stone and brick castles of the Livonian period-Turaida and Cēsis (1974-1999)have been excavated. The archaeological excavations in Old Town Rīga continue. Special attention is being paid to the "Black-heads building"-the only secular building that has survived since the fourteenth century. A special work about the "Black-heads building" project is scheduled for publication.

Personalities

Archaeologist *Jānis Apals* (1930-) received his doctorate in history from the State University in Rīga. He is a senior researcher in the Department of Archaeology at the Institute of History of Latvia and pioneered investigations of underwater Viking age monuments in the lakes of Latvia, where remains of ten underwater fortresses were discovered. He was an organizer of the excavations at Lake Āraiši-the primary extensively excavated and reconstructed monument of the Viking age in the Baltic states.

Professor Dr. Francis Balodis (1882-1947) was the first academically educated Latvian archaeologist and the founder of the Latvian National School of Archaeology. Balodis studied in Dorpat (Tartu), Moscow, and Munich Universities and is a specialist in the archaeology of the Iron and Middle Ages, Egyptology, and the History of Art. Balodis was a professor at the universities of Moscow and Saratov (Russia) from 1918 to 1924, the chair of Archaeology and the dean of the faculty of Philosophy and Philology in Rīga (1924), the pro-rector of the State University in Rīga (1931-1933), head of the Monument Protection Board (1932-1940), and the editor of the periodical *Senatne un Māksla* (*Antiquity and Art*) from 1936 to 1940. Balodis excavated the Middle Age hillfort Jersika (Gersike) and the Raunas Tanisa hillfort. Beginning in 1940, he worked in Sweden as an Egyptologist.

Ernests Brastiņš (1892-1941) studied at the Art School in Saint Petersburg. During World War I he worked in the Russian Army as a topographer. Brastiņš was a pioneer in the field of, and the author of a topographic survey of, Latvian hillforts with the remains of wooden constructions, surveying in total 282 sites between 1922 and 1927. He was the director of the Museum of War in Rīga, where a Department of Latvian Hillforts was organized. He was arrested and deported by Soviet political bodies to Astrakhan (Lower Volga), where he was sentenced to death in 1941.

Voldemārs Çinters (1899-1979), a Ph.D., studied at the state universities in Rīga and Koenigsberg. Çinters was the director of the State Museum of History in Rīga from 1934 to 1945. He specialized in the archaeology of the Middle Ages and was one of the best methodologists of excavations. Çinters organized investigations at hillforts in Daugmale and Mežotne (1938- 1939; 1942). At the end of World

War II Ginters emigrated to Sweden, where he became a researcher at the State Museum of History in Stockholm.

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and castle (thirteenth-seventeenth centuries), and the Salaspils stone castle of the Livonian order (thirteenth-seventeenth centuries). Stubavs was the foremost specialist in the classification and elaboration of the main types of Latvian hillforts.

Professor Dr. *Eduards Šturms* (1895-1959) studied at the State University in Rīga and at Koenigsberg. Šturms was the pioneer of systematic investigations of Stone and Bronze Age monuments in Latvia (1927-1940, 1943), including the Sārnate peat bog settlement, Pūrciems dune dwellings on the littoral of the Litorina sea, an Iča settlement in the Lake Lubāna wetland, and Rēznas barrows of the Bronze Age. At the end of World War II Šturms emigrated to West Germany. He led the Latvian Department of the Institute of Investigations of Baltic States from 1953 to 1955 and was guest professor at the University of Bonn from 1955 to 1959 and a corresponding member of the deutsches archäologisches institut (German Archaeological Institute) from 1954 to 1959.

Vladislavs Urtāns (1921-1989) received his doctorate in history at the State University in Rīga. Arrested and deported to Siberia by Soviet political bodies in 1941, Urtāns returned to Rīga in 1946, and graduated from the State University in 1949. Urtāns was a researcher in the Archaeology Department at the Museum of the History of Latvia from 1947 to 1950 and at the Museum of History and Art in Madona from 1951 to 1958 and senior researcher at the Museum of the History of Latvia from 1958 to 1976. Specializing in the archaeology of the Iron and Viking Ages, Urtāns was one of the best specialists of typology studies of the Iron Age of Latvia. He led large-scale excavations in the flooded zones of the Pļaviņas and Rīga hydro-stations, and at the Daugmale, Aizkraukle, and Madalāni hillforts of the tenth through the twelfth centuries (1966-1987).

Lūcija Vankina (1908-1989) received a doctorate in history at the State University in Rīga and then became head of the Department of Archaeology of the Museum of the History of Rīga from 1946 to 1986. Vankina specialized in the Stone Age Archaeology of Latvia and excavated at the Sārnate wetland settlement from 1949 to 1959.

Anna Zariņa (1921-) studied at the Latvian Academy of Agriculture. Zariņa is a pioneer and a primary specialist in the investigation and reconstruction of the archaeological textiles of the ancient Livs and Letgallians. She led large-scale excavations in the flooded zones of the Pļaviņas, Rīga, and Daugavpils hydro-stations from 1963 to 1986.

Archaeological Monuments

Latvian hillforts are fortifications on hills that had special wooden palisade defensive systems and a high rampart and ditches on one side. Dwellings and buildings for special crafts were located inside the plateau and the outer fort. Chronologically hillforts can be dated to a wide period, from the beginning of the first millennium b.c. until the tenth through thirteenth centuries a.d. A topographic survey of these forts was done by E. Brastiņš in the 1920s and the work was continued by specialists from the State Inspection of Monument Protection beginning in 1950 under the guidance of J.T. Urtāns.

Abora is the main permanent settlement of the Late Neolithic Corded Ware Culture (CWC) in the Lake Lubāna Wetland of Latvia, where remains of material culture from 4490 to 3770 b.p. were preserved in peat. The wooden dwelling constructions, fishing devices, and some burials of flexed individuals of the CWC were discovered between 1964 and 1965 and in 1970 and 1971. Abora is the main location where amber is processed in present-day Latvia. From there amber artifacts and ornaments were exchanged across Eastern Europe-in the basins of the Volga and Dnieper Rivers (4490-3770 b.p.). Abora is the main source of information on the subsistence strategies of CWC people in Latvia, who were hunter-gatherers, and there is evidence of farming and stock breeding.

Āraiši Lake Fortress is a Viking Age fortress on an island on the Āraiši Lake in eastern Latvia, discovered by Count C.G. Sieverss in 1876 and excavated by Latvian archaeologist Jānis Apals from 1965 to 1969 and from 1975 to 1979. The fortress was the subject of extensive discussions as to whether it was a pile dwelling in the lake

PREV NEXT

later Rex Nameisis renewed the hillfort, but in 1280, because it was so difficult to fight against the very active invaders, the Semigallians burned down their own wooden castle and went to the southern part of northern Lithuania.

Turaida was the brick castle of the archbishop of Rīga in the thirteenth and fourteenth centuries. The remains of the Livs hillfort (eleventh-twelfth centuries) were discovered under the cultural layers of the remains of the castle. The Turaida castle of the Livonian period, situated on the high bank of the river Gauja in the eastern part of Latvia, was investigated fully and reconstructed partly between 1974 and 1999.

Zvejnieki, a Stone Age burial field in the northeastern part of Latvia, is the biggest in Northern Europe. It was excavated by Francis Zagorskis (1929-1986) during the period from 1965 to 1971. Single, double, and group burials of the late Mesolithic and early, middle, and late Neolithic periods (6775-5100 b.p.)-totaling 308 individuals-were discovered. Rich bone, flint, and slate implements represented the funerary inventory. Red or blue clay masks with amber disks and rings in the eye sockets were discovered in some graves of people of the Comb and pit ceramic cultures. Figurines of elk heads, birds, male faces, and female figures were ritual objects.

Zvidze, in the Lake Lubāna Wetland, is a Neolithic settlement of the first farmers in the eastern Baltic region that is situated on the border of moraine plain and the ground of the old Lake Lubāna basin. Zvidze was excavated from 1973 to 1975 and from 1981 to 1984. The archaeological evidence of farming-wooden tools; spades; mattocks; cereal and grain processing tools; spinning and weaving implements; and tools for processing hemp, nettles, and flax-were discovered inside the remains of the wooden dwellings, which were of standing pole construction with ridged roofs. It was suggested that these people adopted agriculture as a result of diffusion between 5000 and 4700 b.p.

Baltic Nationalities

Curonians-Western Baltic people (*kurši*) described in early written chronicles such as Heinrici Chronicon and Livlandische Reimschronik as *curones,* who lived in the eighth through the thirteenth centuries a.d. in the territory of the western part of Latvia and the northwestern part of Lithuania.

Lettgalians-Eastern Baltic people (*latgaļi*), described in Heinrici Chronicon and Livlandische Reimchronik as *Letti* or *Letthigalli,* who lived in the eighth through the thirteenth centuries in the territory of the eastern part of present-day Latvia, east of the river Daugava.

Livs-Finno-Ugric people (*lībieši*), described in Livlandische Reimchronik as *Līven* or *Līwen,* who lived during the tenth through the thirteenth centuries in the lower flow of the rivers Gauja and Daugava, as well on the littoral of northwestern Latvia. The main excavated monuments are two villages and a cemetery dating to the tenth through the thirteenth centuries, Salaspils Laukskola in the lower part of the river Daugava. A rich inventory included bronze ornaments, tortoise-shaped fibulas, and remains of textiles including small bronze ornaments on the edges of the villaine, a special cape worn by women (Zariņa).

Selonians-Baltic people (*sēļi*), described in Heinrici Chronicon as *sēlen,* who lived in the ninth through the thirteenth centuries in the territory of the southeastern part of present-day Latvia, to the south of the river Daugava, and in the northern part of present-day Lithuania.

Semigallians-Baltic people (*zemgaļi*), described in Heinrici Chronicon and Livlandische Reimchronik as *Semigally,* who lived in the basin of river Lielupe and in the northern part of present-day Lithuania during the ninth through the thirteenth centuries. The main excavated archaeological monuments are the

hillforts Mežotne (excavated by Voldemārs Ģinters) and Tērvete.

Institutions

Latvian Board of Antiquities (1923-1940)-A protection, registration, documentation, coordination, and administration center for archaeological monuments in Latvia. The Monument Protection law was accepted in the independent republic of Latvia in 1923 and supplemented in 1932, when professor Francis Balodis became the head of the board. More than 1,412 monuments

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Laugerie Haute and Laugerie Basse

First dug in 1868 by édouard lartet as part of his Dordogne campaign with henry christy and subsequently explored by denis peyrony and françois bordes, these two adjacent rock shelters in the vicinity of Les Eyzies in the Dordogne have, between them, yielded a complete sequence of Upper Paleolithic industries in southwestern france. The Laugerie sites are type sites for the Aurignacian, Gravettian, Solutrean, and Magdalenian periods, and there is a particularly fine representation of Magdalenian art objects in Laugerie Basse.

Tim Murray

See also

Lithic Analysis

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Layard, Sir Austen Henry

(1817-1894)

Born in Paris and raised in switzerland, Layard studied law and then practiced for six years, at the end of which he set out to ride overland to Ceylon. He got no further than iran, where he spent a year with a group of nomads. Arriving in Baghdad in 1842 he was sent back to Constantinople (later Istanbul) to brief the British Ambassador on his travels. On the way he visited what was thought to be the ancient city of nineveh, at Khorsabad, where French diplomat paul emile botta was excavating.

Austen Henry Layard

(Ann Ronan Picture Library)

After several years as a diplomatic agent in Turkey Layard persuaded the British Ambassador Sir Stratford Canning to sponsor his excavation of the mounds in northern mesopotamia-in competition with the French. In 1845 at the mound of nimrud Layard discovered several Assyrian royal palaces, one of which was that of Ashurnasirpal II, and bas-reliefs similar to those discovered by Botta at nearby Khorsabad. Both Layard and Botta were only interested in the most spectacular finds of statuary and portable architectural remains to be displayed in their national museums. Tunneling and trenching around these larger pieces destroyed much other archaeological information and smaller or fragile artifacts.

In 1847 Layard began shipping his finds back to London where reports of them had already caused a sensation. They were put on display in the british museum where they aroused not only great public interest but also further sponsorship

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Laugerie Haute and Laugerie Basse

First dug in 1868 by édouard lartet as part of his Dordogne campaign with henry christy and subsequently explored by denis peyrony and françois bordes, these two adjacent rock shelters in the vicinity of Les Eyzies in the Dordogne have, between them, yielded a complete sequence of Upper Paleolithic industries in southwestern france. The Laugerie sites are type sites for the Aurignacian, Gravettian, Solutrean, and Magdalenian periods, and there is a particularly fine representation of Magdalenian art objects in Laugerie Basse.

Tim Murray

See also

Lithic Analysis

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Layard, Sir Austen Henry

(1817-1894)

Born in Paris and raised in switzerland, Layard studied law and then practiced for six years, at the end of which he set out to ride overland to Ceylon. He got no further than iran, where he spent a year with a group of nomads. Arriving in Baghdad in 1842 he was sent back to Constantinople (later Istanbul) to brief the British Ambassador on his travels. On the way he visited what was thought to be the ancient city of nineveh, at Khorsabad, where French diplomat paul emile botta was excavating.

Austen Henry Layard

(Ann Ronan Picture Library)

After several years as a diplomatic agent in Turkey Layard persuaded the British Ambassador Sir Stratford Canning to sponsor his excavation of the mounds in northern mesopotamia-in competition with the French. In 1845 at the mound of nimrud Layard discovered several Assyrian royal palaces, one of which was that of Ashurnasirpal II, and bas-reliefs similar to those discovered by Botta at nearby Khorsabad. Both Layard and Botta were only interested in the most spectacular finds of statuary and portable architectural remains to be displayed in their national museums. Tunneling and trenching around these larger pieces destroyed much other archaeological information and smaller or fragile artifacts.

In 1847 Layard began shipping his finds back to London where reports of them had already caused a sensation. They were put on display in the british museum where they aroused not only great public interest but also further sponsorship

of Layard's work by the English government. Returning to Mesopotamia in 1849 Layard excavated the mound of Kuyunjik opposite Mosul, which was in fact Nineveh (and not Khorsabad as Botta had claimed). He found Sennacherib's palace, and the royal library and archives, which contained thousands of clay tablets. Layard continued to dig the mounds around Mosul and then moved into southern Mesopotamia where he tested the sites of Babylon and Nippur. In 1851 he supervised the packing of another hundred or so cases of Assyrian artifacts and returned to England where he published *Discoveries in the Ruins of Nineveh* and *Babylon and the Monuments of Nineveh* (1853), both of which were bestsellers. The exhibition of these extraordinary finds generated an Assyrian fashion and style in contemporary jewelry, hair and beard styles, theatrical productions, decoration, painting, poetry, and architecture, and provoked much controversy among scholars about biblical credibility and progress.

Layard himself left archaeology and took up politics and diplomacy. He became a member of Parliament and English ambassador to Madrid and Constantinople. In the latter position he was to encounter and help heinrich schliemann. The British excavation of Mesopotamia was continued by Hormuzd Rassam and William Kennett Loftus until 1855, and sponsored by the British Museum and a private Assyrian Excavation Fund. Scholars such as henry rawlinson began to decipher the cuneiform tablets that Layard had shipped home, although it was to take another thirty years to complete the task.

Tim Murray

See also

French Archaeology in Egypt and the Middle East

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Le Mas D'Azil

Le Mas D'Azil, a cave system with occupation deposits, is the type site of the Azilian industry dated to the Mesolithic/Epipaleolithic period (about 11,500-9500 b.p.) in france. Located in the Ariège region in the French Pyrenees, this huge and complex site, first dug by French historian eduoard piette in 1887, is also rich in Aurignacian and Magdalenian artifacts, particularly

carved and incised antler and bone art works as well as painted pebbles.

Reconstruction of a pierced staff with a carved heath cock found at Le Mas d'Azil

(Gianni Dagli Orti/Corbis)

Tim Murray

See also

Lithic Analysis

References

Gamble, C. 1986. *The Paleolithic Settlement of Europe.* Cambridge: Cambridge University Press.

Le Moustier

Le Moustier is the type site of the Mousterian industry (from the Middle Paleolithic period, 180,000-30,000 years ago) found in Europe and northeastern Africa and into central Asia. The rockshelter site was first excavated by édouard lartet and henry christy as part of their work in southwestern france, which began in 1863. Although there is still debate about the nature of Mousterian assemblages, it is often assumed that there is an association between Neanderthal remains and the Mousterian. Difficult problems related to the explanation of variability within Mousterian assemblages remain and were at the center of celebrated exchanges between prehistorians françois bordes and lewis binford.

Tim Murray

See also

Lithic Analysis

References

Gamble, C. 1986. *The Paleolithic Settlement of Europe.* Cambridge: Cambridge University Press.

Leakey, Louis Seymour

(1903-1972)

Leakey was born in Kenya, East Africa, to missionary parents and grew up among the tribal Kikuyu. He went to secondary school in England and then to St John's College Cambridge in 1922 where he studied languages, archaeology, and anthropology. In 1926 he returned to East Africa and began to investigate the prehistory of the Rift Valley, which he published in *Stone Age Cultures of Kenya Colony* (1931). He married the artist and archaeological draftsperson Mary Douglas Nichol in 1936.

Between 1936 and 1962 many examples of Australopithecus (small-brained, bipedal hominid fossils, extant between five million and one million years ago) were found in South Africa (at the sites of Sterkfontein, kromdraai, Makapansgat, and swartkrans), firmly establishing the study of the earliest archaeological records in the world. Unlike many of his European contemporaries Louis Leakey

believed that Africa, and not Central Asia, was where humanity had originated. During the 1940s Louis and mary leakey pioneered Paleolithic “living-floor” archaeology at olorgesailie, investigating fossil pollens and paleo-environmental data in an attempt to more fully interpret the stone tools from the same levels. They also began looking for the makers of the Oldawan stone tools they had found in the ancient deposits of the olduvai gorge, an ancient lake basin in northern Tanzania in the East African Rift Valley. In 1959 the hominid cranium, called *Zinjanthropus* (East African man) *boisei* or OH 5 was found. “Zinj” was the first hominid to be dated by the potassium-argon (K/Ar) method, a new technique, and was found to be 1.7 million years old. *Zinjanthropus* was also the first hominid to be excavated on television, and event that not only captured public imagination but also grabbed the attention of the American National Geographic Society, who were to provide ongoing financial support for the Leakeys' work. “Zinj” also caused some scientific controversy.

Louis Leakey first concluded that OH 5 was *the* ancestor of modern humans and not another ancestral form of the South African Australopithecines-which in fact it subsequently became. Then the remains of another, more advanced hominid (i.e., with a larger brain capacity) were found close by, and in 1964 Leakey claimed that this find, *Homo habilis,* superceded OH 5 as *the* early human ancestor, directly connected to *Homo sapiens.* While Leakey's simplistic views on human evolution have now been generally rejected, his finds were a significant contribution to the knowledge of fossil human evolution. International funding for research in this area increased and archaeologists and Paleo-anthropologists from America and Europe began to work in Africa searching for the origins of the whole of humanity. Leakey's work had shifted interest from Europe and Asia

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Reconstruction of a pierced staff with a carved heath cock found at Le Mas d'Azil

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to the southern hemisphere, and to the development of world archaeology and prehistory.

Louis and Mary Leakey excavating in Tanganyika, 1961

(Bettmann/Corbis)

In addition to the Olduvai material, Louis Leakey's work on the Miocene fauna of western Kenya and the early hominid remains from Rusinga Island, Songhor, and Fort Ternan were great contributions to African prehistory. He spoke Kikuyu fluently and his 1937 to 1939 detailed study of the people and their culture was published in 1977 by his wife. Louis Leakey became curator of the Coryndon Museum in Nairobi in 1940, and he established the Centre for Prehistory and Paleontology in 1962, which became the International Louis Leakey Memorial Institute for African Prehistory after his death.

Tim Murray

See also

Dart, Raymond Arthur; Africa, East, Prehistory; Africa, South, Prehistory; Laetoli

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Leakey, Mary Douglas

(1913-)

Mary Leakey is the daughter of the landscape painter Erskine E. Nichol and the great-great-great-granddaughter of john frere, the antiquarian squire who argued for the antiquity and human origins of stone tools at the end of the eighteenth century. Mary Douglas Nichol had an informal education and was a talented artist with an interest in archaeology. She illustrated gertrude caton-thompson's book *The Desert Fayum* (1934), and, impressed by her talents, louis leakey asked her to illustrate his popular book on prehistory, *Adam's Ancestors* (1934). They were married in 1936 and worked together in East Africa for more than thirty years.

Before 1972 it is almost impossible to separate Mary's contributions to East African archaeology from Louis's-they were an archaeological field team. Mary was there at Rusinga, olduvai, and olorgesailie, and she contributed to and wrote many of the scholarly publications on their work. She seems to have left the publicity, funding, and the big-picture debates to Louis and to have preferred to continue

with and supervise the painstaking analysis required by every find at every excavation.

After Louis Leakey's death in 1972 Mary began to work at the Pliocene site of laetoli, southeast of Olduvai. From 1974 to 1981 she and her collaborators found numbers of new mammalian species, among which, dated to about 3.7 million years ago, were the hominid fossils of what was called *Australopithecus afarensis.* In 1976 a trail of fossil animal footprints were found, some of which were hominid, and in 1978 two long trails of fossil hominid footprints were uncovered and dated to about 3.5 million years ago. These footprints confirmed what had only been inferred from skeletal remains, that the small-brained *Australopithecus* hominids were bipedal.

Mary Leakey also contributed to the practice of field archaeology through her paleo-environmental "living floor" work and through her development of field museums, where finds were left in-situ. She also conducted a major study of rock art at Kondoa-rangi in Tanzania, published in her book *Africa's Vanishing Art: the Rock Paintings of Tanzania* (1951).

Tim Murray

See also

Dart, Raymond Arthur; Africa, East, Prehistory; Africa, South, Prehistory

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Lepinski Vir

Excavated by Serbian archaeologist Dragoslav Srejovic' between 1967 and 1971, Lepinski Vir lies in the Djerdap Gorge of the Danube River in Serbia. Lepinski Vir has an interesting and long sequence of occupations from hunter-gathering/foraging/agricultural societies. Although there are disagreements about the dating of the site, it is generally believed that it was occupied around 7000 b.c. by people foraging in the forests for game and in the river for fish, and that by 5000 b.c., the occupants of the site were managing cattle, sheep, pigs, and goats. Lepinski Vir is also notable for the remains of houses found on the site and the presence of limestone sculptures found in the remains of the houses. There is some speculation that the site was in fact occupied by the local farming Starcero cultures.

Tim Murray

Lepsius, Karl Richard

(1810-1884)

Lepsius was born in Germany and educated at the universities of Leipzig, Gottingen, and Berlin. After completing his doctorate in Classical archaeology in 1833 Lepsius went to Paris to further his studies. jean françois champollion's new ancient Egyptian grammar had just been published and Lepsius became interested in Egyptian hieroglyphics. He supported and defended Champollion's system of decipherment and he contributed to further understanding of ancient Egyptian through his recognition of syllabic signs and their similarities to Coptic.

Lepsius spent many years visiting the European collections of Egyptian antiquities before traveling to Egypt in 1842 with the Prussian Expedition (1842-1845). He was accompanied by a number of

Prussian scholars and skilled draftsmen to survey and record monuments and collect antiquities. The expedition sent back more than 15,000 artifacts, papyri, and plaster casts, drawings, plans, and maps to Prussia. Between 1849 and 1859 Lepsius published *Monuments in Egypt and Ethiopia,* the results of the expedition, in twelve folio volumes. The Swiss Egyptologist edouard naville completed another five volumes in the series after Lepsius's death.

In 1865 Lepsius became keeper of the Egyptian collections in the Berlin Museum. He returned to Egypt the following year to record the monuments of the eastern Delta and the Suez regions, during which he discovered Tanis, the capital of Egypt during the twenty-first dynasty. Here he excavated the Canopus Decree, a useful linguistic adjunct that helped to prove that the Rosetta Stone was translated correctly. Lepsius edited the principal German journal of Egyptology, which is still published today, for over twenty years and completed over 142 publications on ancient Egypt. His last visit to Egypt was for the opening of the Suez Canal in 1869.

Tim Murray

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Tim Murray

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Leroi-Gourhan, André

(1911-1986)

André Georges Léandre Leroi-Gourhan was born in Paris on 25 August 1911. He acquired his education almost entirely outside any conventional context. Although he did attend the seminars given by the sociologist Marcel Mauss and the sinologist Paul Granet during the 1930s, Leroi-Gourhan remained proudest of the autodidactic and eclectic periods of his life, probably because they allowed him to stay outside an academic system that did not impress him.

After World War I, the Durkheimian school, under Marcel Mauss, opened up to oriental studies, to linguistics, and to a comparative approach. Leroi-Gourhan founded a school of prehistory in its own right, countering the existing culture-historical and typological vision of archaeology with the synthetic, anthropological, and semiological approach of "prehistoric ethnology."

During the 1930s, Leroi-Gourhan was in charge of reorganizing the Arctic section of the Trocadéro Museum (later the Musée de l'Homme) in Paris, and this daily involvement with artifacts and collections was to have a lasting effect on him. It was during this period that he became conscious that the comparative method could be substituted for the standard approach of the "hard" sciences, i.e., that he would be able to validate his interpretation of archaeology only when it could be based on an abundance of data and a range of varied regularities so that no other interpretation could account for all of them.

Leroi-Gourhan laid the foundations for the ethnology of stone toolmaking techniques, a very original approach that combines a systemic analysis of comparative syntheses with the development of methodological tools to be used for particular case studies. The publication of *évolution et techniques* (Evolution and Techniques) in 1943 established the specific epistemology for this technological approach and announced the concept of *chaîne opératoire* (chain of operation). *Évolution et techniques* is in fact an *inventaire raisonné* (reasoned inventory) that allows us to appreciate the physical effectiveness and the relative complexity of a tool or a toolmaking technique as well as to identify possible substitutes for it. Moreover, this inventory allows us to discern the principles shared by the techniques used in a community and to understand their ethnicity.

Leroi-Gourhan presented his *inventaire raisonné* in the form of tree-like diagrams, or dendrograms. Those ubiquitous and recurrent instances of solutions that were physically functional were brought together under the term *tendance* ("tendency"), and he broke each technical process or artifact down into a group of attributes he included in the category he called *faits* ("instances of techniques"). Between the two extremes of *tendance* and *faits,* the dendrogram represents a hierarchical classification of artifacts and technical processes according to their *degrés de fait* ("degrees of specificity"). If we move from the trunk (the *tendance,* or the invariant aspect of technique) toward the branches, the technical characteristics retained in the diagram are further and further apart, i.e., they are increasingly culturally different from one another. But reading it the other way around, we gradually move from the different instances to what these different phenomena have in common.

In proposing the notion of "favorable environment," Leroi-Gourhan also indicated how the "continuity of the technical environment" plays a role in the adoption or rejection of a borrowed item or an innovation: the intellectual assessment of this novelty should be compatible with the mental representations that the group has of its techniques. The criteria distinguished by Leroi-Gourhan to establish technical

classifications were those he thought would be able to elucidate the evolution of human technical behavior, and those that would allow him to understand the logic of transformations that accounted for the existence of forms of techniques judged to be increasingly effective.

He believed that the study of techniques had to be linked to the question of the technicity of living beings, “dealing simultaneously with” organic structures, neuro-motor equipment and manifestations of the mind. This fundamental

Lhwyd, Edward

(1660-1709)

Lhwyd was born into a well-established Welsh family and educated at Jesus College, Oxford, where he became a friend of Dr. Robert Plot, philosopher, antiquarian, and first keeper of the ashmolean museum. Lhwyd assisted with the development of the natural science collections of shells and botanic specimens and became interested in the study of fossils, or "formed stones." He was convinced they were the petrified remains of organisms that had died long ago, and like the eminent Oxford scientist Robert Hooke thought they might be evidence of huge changes to the earth. Lhwyd identified, classified, and published a large range of fossils in the Ashmolean's collection in 1691.

Lhwyd's interests broadened from fossils to include stone implements and British antiquity in general, and he became friends with the antiquarian john aubrey. He was recruited in 1693 to contribute to Edmund Gibson's revised edition of william camden's *Britannia,* the first attempt at an update of this great work since it had been translated into English in 1610 and gone out of print in 1637. Lhwyd eventually becameresponsible for researching and writing about the whole of Wales, and he undertook an antiquarian tour in support of this task during the summer of 1693.

Lhwyd's additions to the Welsh sections of *Britannia* were outstanding. Indeed, his additions transformed the Welsh sections from a rather inadequate sketch of unfamiliar terrain to the most rewarding part of the new volume when it was published in 1695. In his contributions Lhwyd did more than any of his predecessors to enlarge the understanding of the societies that inhabited Britain before the Romans. He formed a picture from material remains supplemented by folklore and Classical reports, and drew attention to the high degree of social organization and technical prowess needed to erect the great stone complexes. He made it clear, too, that the Britons had considerable metalworking skills, noting the discovery of several caches of weapons, axe-heads, bolts, daggers, and swords.

Lhwyd's research for *Britannia* inspired him to undertake a work that would bring together his knowledge of Celtic languages and ancient British antiquities and his interest in natural history. In 1707 he published his *Glossography,* the first part of the projected larger *Archaeologia Britannica,* which confirmed Lhwyd's preeminence as a Celtic scholar. The *Glossography* was a substantial folio and a remarkable achievement of comparative philology. Lhwyd demonstrated the relationship between the Celtic languages surviving in western Europe, and he included Welsh and Irish dictionaries and a Cornish grammar. He was able to make some progress in reconstructing the ancient Gallic language spoken in Gaul in Roman times. Lhwyd's travels between 1697 and 1701 were an impressive testimony to the thoroughness of his research. He made the first antiquarian tour of the Scottish highlands and visited Scottish antiquaries. He collected Gaelic manuscripts and local customs and folklore. He recorded local dialects and details of towns, villages, and local place names. He sought information about barrows, burial chambers, standing stones, and inscribed stones. He looked at coins and brass utensils, flint arrowheads, and prehistoric implements and fossils.

Unfortunately much of the vast store of information Lhwyd accumulated was lost. After the *Glossography* his heath failed and he never completed the second part of the *Archaeologia Britannica,* the proposed great compendium of the Celtic culture of western Britain. He died in 1709 and his papers were dispersed, and many of them were later destroyed by fire. Because of the limited appeal of the *Glossography* and its incomplete status Lhwyd's reputation was not as great as it should have been. Yet his work is a lasting record of his exceptional powers as an interpreter of prehistoric remains and proves his worth as an incomparable topographer and local historian. His philological research effectively laid the foundations for all later study of the Celtic languages of the British Isles and Brittany.

Graham Parry

See also

Britain, Prehistoric Archaeology

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For references, see *Encyclopedia of Archaeology: The Great Archaeologists, Vol. 1*, ed. Tim Murray (Santa Barbara, CA: ABC-CLIO, 1999), p. 37.

Li Chi

(1895-1979)

Li Chi was born in Hubei province in china into a wealthy family. In 1918 he went to the United States to study psychology and sociology at Clark University in Massachusetts, and then to Harvard University, where he earned a Ph.D. in anthropology in 1923, after which he returned to China and taught at Nankai University.

Between 1925 and 1926 Li excavated a Neolithic Yangshao Culture site in southern Shanxi province, making him the first Chinese scholar to undertake modern archaeological fieldwork. In 1928 he became the first head of the department of archaeology at the Academia Sinica, established to excavate the three-thousand-year-old capital of the Shang culture at anyang. These excavations shaped modern archaeology in China through their recruitment and training of young Chinese archaeologists (including xia nai, later director of the Institute of Archaeology) and their use of modern field archaeology techniques in combination with traditional Chinese historiography and antiquarianism. The site also yielded oracle bone inscriptions that proved to be the first written documents in China, and the ceramic and bronze vessel nomenclature and typology used by Li at Anyang still dominates the archaeology of China. His book *The Formation of Chinese People: An Anthropological Inquiry* was published in 1928.

The Sino-Japanese War in 1937 and then World War II put an end to all archaeology in China. In 1949 Li went to Taiwan with the Nationalist government, and he did not work on mainland China again. He founded the Department of Archaeology and Anthropology at National Taiwan University, the first university program in China to train professional archaeologists, and published his synthesis of archaeological and historic material *The Beginnings of Chinese Civilization* in 1957. Li spent most of his time on the conservation and publication of the Anyang material, which was completed as *Anyang Excavations* in 1977.

Tim Murray

See also

Island Southeast Asia

Libby, Willard Frank

(1908-1980)

Born in Colorado and raised in California, Willard Libby was a farmer's son. He began studying mining engineering at the University of California, Berkeley, in 1927 and changed to chemistry, which interested him more. He received a Ph.D. in 1933 after studying low-energy radioactive nuclei. From 1933 to 1941 he taught chemistry at Berkeley.

In 1941 Libby joined the Manhattan Project (the development of a nuclear bomb) at Columbia University in New York City, where he worked on gas diffusion techniques for separating uranium isotopes into fissionable material. In 1945 he became professor of chemistry at the University of Chicago and began working at the Institute of Nuclear Studies. It was here that Libby proved that the amount of radiocarbon in all living plants and animals begins to decay at death at a known rate-so that it would be possible to measure the amount of time since the organism has died by measuring the amount of radiocarbon remaining in it. The accuracy of this technique was tested by comparison with proven other dating techniques such as tree-ring dating, and the first actual C-14 dates appeared in 1949.

Radiocarbon dating revolutionized archaeology in the twentieth century. It began a new era-no longer did archaeologists have to spend so much time developing and testing chronologies for their material-they had an accurate method for dating any organic material from the last 70,000 years and they could now pursue other imperatives and new ideas and new directions in their discipline. In 1959 Libby became professor of chemistry at the University of California, Los Angeles, and in 1960 he received the Nobel Prize for chemistry for his work on radiocarbon dating.

Libby was one of the United States' major postwar nuclear scientists. In 1954 he was appointed by President Eisenhower to serve on the Atomic Energy Commission, the first chemist to do so. He was mainly interested in the effects of nuclear fallout and was also involved in international efforts for peaceful uses of nuclear power, serving as vice-chairman of the American delegation to the First International

Li Chi

(1895-1979)

Li Chi was born in Hubei province in china into a wealthy family. In 1918 he went to the United States to study psychology and sociology at Clark University in Massachusetts, and then to Harvard University, where he earned a Ph.D. in anthropology in 1923, after which he returned to China and taught at Nankai University.

Between 1925 and 1926 Li excavated a Neolithic Yangshao Culture site in southern Shanxi province, making him the first Chinese scholar to undertake modern archaeological fieldwork. In 1928 he became the first head of the department of archaeology at the Academia Sinica, established to excavate the three-thousand-year-old capital of the Shang culture at anyang. These excavations shaped modern archaeology in China through their recruitment and training of young Chinese archaeologists (including xia nai, later director of the Institute of Archaeology) and their use of modern field archaeology techniques in combination with traditional Chinese historiography and antiquarianism. The site also yielded oracle bone inscriptions that proved to be the first written documents in China, and the ceramic and bronze vessel nomenclature and typology used by Li at Anyang still dominates the archaeology of China. His book *The Formation of Chinese People: An Anthropological Inquiry* was published in 1928.

The Sino-Japanese War in 1937 and then World War II put an end to all archaeology in China. In 1949 Li went to Taiwan with the Nationalist government, and he did not work on mainland China again. He founded the Department of Archaeology and Anthropology at National Taiwan University, the first university program in China to train professional archaeologists, and published his synthesis of archaeological and historic material *The Beginnings of Chinese Civilization* in 1957. Li spent most of his time on the conservation and publication of the Anyang material, which was completed as *Anyang Excavations* in 1977.

Tim Murray

See also

Island Southeast Asia

Libby, Willard Frank

(1908-1980)

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Conference on Peaceful Uses of Atomic Energy in Germany in 1955.

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Douglass, Andrew Ellicot

Lindenschmidt, Ludwig

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German prehistorian and scholar who helped to found the Romisch-Germanische Zentral Museum at Mainz, where he was director until his death.

During the first half of the nineteenth century Germany, like England, was full of enthusiastic antiquarians eagerly excavating and founding museums and equally eager to establish a significant and ancient German past. This latter obsession was the result of contemporary German political fragmentation, which would persist until the 1870s. Political fragmentation was reflected in the fragmentation of collections of archaeological material-of find contexts and artifacts and scholarship-unlike in Scandinavia, where christian j. thomsen, bror hildebrand, and hans hildebrand were beginning to organize and study large, national, and lengthy homogenous archaeological collections and consequently develop theories, such as the three age system, about European prehistory.

In 1866 Lindenschmidt was one of the founding editors of the periodical *Archiv fur Anthropologie*, which became the forum for German anthropologists who lacked any formal and national organizations. In 1870, the same year as German political unification, the German Society for Anthropology, Ethnology and Prehistory was founded. The *Archiv* became its journal, and continued to be published until World War II. Lindenschmidt, like his fellow prehistorians, was interested in "archae-geography," the elucidation of ethnic questions via archaeological evidence, issues that occurred in the work of rudolf virchow and continued with gustaf kossinna. This preoccupation explains their critical stance toward, and even rejection of, the Three-Age theory. Until the 1880s Lindenschmidt refused to accept the idea of separate Bronze and Iron Ages and continued to emphasize the importance of southern Europe and the Mediterranean for the development of prehistoric metallurgy in central Europe.

Tim Murray

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German Prehistoric Archaeology

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Linear A/Linear B

The Linear B script was in used in Minoan Crete and Mycenaean greece in the period between 1450 and 1200 b.c. An earlier script, called Linear A, had been devised in Crete in the period between 1700 and 1450 b.c. Linear B has been translated, but Linear A still provides a challenge.

The story of the decipherment of Linear B really begins with English archaeologist sir arthur evans at knossos, the royal city of Crete, at the beginning of the twentieth century. During his excavations at that site, Evans discovered many small clay tablets covered with linear script. These were different from the hieroglyphs, which he had also observed carved into seals and small gems, found by himself (and others) on Crete and in Greece. Beginning in 1909 with the publication of *Scripta Minoa I,* Evans was able to publish only a small fraction of the tablets he had excavated by the time the fourth volume of the *Palace of Minos* was published in 1935. The point has often been made (not least by those most directly responsible for the translation of Linear B) that this slow rate of publication may have delayed the eventual decipherment of Linear B, but it is equally true that subsequent discoveries such as American archaeologist carl blegen's 1939 recovery of the Mycenaean archive at the Palace of Nestor at Pylos in Greece provided vital clues.

Building on work by A.E. Cowley, Alice Kober, and E.J. Bennett, Jr., a young English architect Michael Ventris (1922-1956)-at first working essentially alone but later with the Cambridge philologist John Chadwick-was able to overcome the problems posed by the shortage of published texts to produce the fundamentals of a decipherment of Linear B in

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1952. The most significant element of his decipherment was the argument that Linear B was, in fact, an ancient form of Greek. Ventris and Chadwick went on to complete the task of decipherment in the years before the former's untimely death in a road accident.

It is not without some irony that the first major test of the Ventris-Chadwick decipherment was provided by none other than Carl Blegen, who had returned to Pylos in 1952 and discovered a further 300 tablets. The fact that these could be read, even though they (and other Linear B documents) are primarily invoices and the "paperwork" involved in the administration of palace business, at once brought history closer to the Minoan and Mycenaean world. The fact that the last kings of Crete were Greek speakers has led to a reevaluation of Evans's argument that the Minoans had conquered the Mycenaeans. It is now thought that the reverse is true and that around 1450 b.c. Knossos was conquered by the same people who ruled at Pylos and Mycenae.

Early Minoan writing

(AAA)

Tim Murray

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Lithic Analysis

Stone artifacts are studied by archaeologists because they are durable and frequently found on archaeological sites of almost every age. Consequently, much has been written about their analysis and interpretation. This article considers the history of three approaches to the study of stone artifacts: (1) factors contributing to variation in the composition and characteristics of stone artifact assemblages, (2) functionalist interpretations of artifact assemblages, and (3) idealist interpretations of material remains.

Functionalist and idealist approaches reflect a fundamental debate in archaeology about whether humans are passive participants or active agents in their worlds. Functionalist approaches seek to explain the role of artifacts in the evolution and/or behavior of different groups. Idealist approaches seek to understand the knowledge and belief systems of the makers of artifact assemblages. Fundamental to both approaches is an understanding of why recurring artifact forms (i.e., types) exist, as well as the factors contributing to variation in the composition of artifact assemblages.

Dimensions of Artifact Variability

For much of the twentieth century, archaeologists attributed the similarities and differences between artifact assemblages to a single variable: the cultural idiosyncrasies, or traditions, of different groups of people. The best known work in this regard is françois bordes's study of variation in Lower and Middle Paleolithic assemblages from southwest France (Bordes 1961). Bordes formulated a typology to describe the sixty-three different tool types (i.e., artifact forms) recognized as regular components of Lower and Middle Paleolithic assemblages. He then characterized the artifact assemblages recovered from the various layers of different rock-shelter deposits in terms of the relative proportion of each made up by those sixty-three tool types. Comparison revealed repeated patterns

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particular features of artifacts as indicative of specific cultural traditions.

Different researchers hold quite varied views about the role played by style in human societies, about the types of information that style conveys, and, therefore, about how style can be identified. Some archaeologists, such as Wiessner, regard style as a form of nonverbal communication that conveys information about both individual and group identity. For cognitive archaeologists (such as Ian Hodder) style is a symbolic expression of social relations, and the aim of analysis is to investigate the meaning of the symbols that style embodies. However, there is no general agreement that style is always symbolic or that it is always intended to convey specific information. For example, J.R. Sackett (1982) distinguishes between style as symbol (iconological style) and style that simply reflects the choices that individual artisans made in producing functionally equivalent objects (isochrestic style). He also distinguishes between passive style (regularity in artifact form, arising from shared traditions) and active style (intended to convey specific information).

Attempts to refine the concept of style and make it more amenable to archaeological analysis and interpretation do not actually resolve the archaeologist's dilemma about whether stylistic causes and effects operate independently of functional causes and effects. The obvious solution is to hold one source of variation constant in order to identify the effects of another. However, this approach assumes that it is possible to identify functionally equivalent artifacts and/or that it is possible to identify the options from which the prehistoric knapper made his or her choices during artifact manufacture. This notion is not as straightforward as it might at first seem. Types or attributes that appear to be functionally redundant in one context may not be so in another. Furthermore, what is functionally redundant in any context is actually in the mind of the maker, and it is therefore impossible to assess interpretations of patterned variation as isochrestic style. Consequently, techniques for identifying the contribution of style to differences (and similarities) in the composition of artifact assemblages are not well developed, and they rely on reductive analytical strategies, which presuppose the independence of the different dimensions of artifact variability.

In the final analysis current arguments about style are based on different ideas about the information contained in patterned archaeological data. On the one hand, the debate involves a return to the dispute between Bordes and Binford: whether artifact assemblages are cultural markers or markers of functionally distinct tool kits. On the other hand, much has been learned about the interdependence of different dimensions of artifact variability in different contexts. Reductive analytical techniques cannot incorporate all the potential contributors to stone artifact assemblage variability, but there can be no doubt that these have enhanced archaeologists' understanding of the factors contributing to the similarities and differences between artifact assemblages from different time periods. Archaeologists can now pursue a broader array of interpretative approaches, depending on the information they choose to generate from the artifact assemblages under investigation.

Functionalist Approaches

Functionalist approaches use ecological and evolutionary theory, together with paleoenvironmental information, to investigate the interrelationships between ecological and environmental variables and aspects of a society's economic, social, and political structures-in particular, the role these institutions played in the survival and success of different human societies. Debate about the causes of Middle Paleolithic artifact variability underscored how little was known about the relationship between stone artifact assemblage composition, site function, site layout, and seasonal variation in foraging activities. As a consequence, Binford, JohnYellen, and others initiated ethno-archaeological research during the 1960s designed to identify in human behavior those regularities that can be assemblages.

Binford's study of the activities of the Nunamiut people of Alaska ultimately provided the theoretical underpinning for an approach to stone artifact analysis and interpretation that became known as technological organization (Nelson

from each other in terms of the amount of planning involved in their execution.

Curated technologies are those that involve anticipation of future needs, which may include the acquisition, transport, and stockpiling of raw materials and/or finished tools. Time is invested in preparing and transporting raw materials and in making, maintaining, and transporting tools. The reward for this is the immediate availability of usable tools when the need for them arises. Expedient technologies are those in which tools are made and repaired at the place of use. In contrast to curated technologies, expedient technologies involve an expenditure of minimal time and energy on the manufacture, reshaping, and resharpening of tools. Finally, opportunistic technologies are those that involve no forward planning at all. The acquisition of raw materials and the manufacture and maintenance of tools are flexible and reflect immediate responses to unanticipated conditions. Typically, artifacts are manufactured from whatever materials are at hand and are discarded immediately after use.

Attempts have been made to relate these different types of technologies to the forms of particular tools and to the composition of entire artifact assemblages through two interrelated concepts: tool design and site function. Archaeologists whose artifact assemblages contain tools that were used in food procurement (as opposed to those used to make other tools) have expended some effort in trying to develop ways of analyzing tool design. These researchers argue that tools used at the moment that a prey item is captured or harvested are subject to the greatest design constraints. As a consequence, most of the relevant studies have focused on various forms of weapons, such as spear points and other types of projectiles.

A number of researchers have used the concept of risk to analyze patterns of group mobility, insofar as mobility can be reconstructed on the basis of the distribution of artifacts made from raw materials of known origin. It is suggested that highly mobile groups tended to accumulate artifact assemblages containing a wide range of raw materials, collected from various raw material sources visited in the course of other subsistence activities (i.e., the collection of raw materials was an embedded activity). This collecting strategy would have reduced the risk of being without a raw material when it was needed for tool manufacture. Assemblages associated with highly mobile groups also tend to contain only small numbers of artifacts: tools and tool blanks made from large blocks of durable and easily worked materials that could be readily fashioned into functionally specific tools (thus, the risk of being without a particular tool when it was needed was also minimized). Less-mobile groups tended to make more use of local material because distant sources of stone were visited only rarely. These groups also economized on the use of exotic stone by resharpening as much as possible tools made from the less accessible materials.

In sum, functional studies have continued to emphasize investigating the multiple causes that give rise to artifact form. Various approaches to modeling the reasons for variable artifact form and assemblage composition have been undertaken, integrating aspects of technology, tool design, resource acquisition, and mobility. The common theme of these studies is the desire to understand the role stone artifacts played in the evolution and/or behavior of different human groups.

Idealist Approaches to Artifact Analysis

Discussions about the art, religion, and beliefs of ancient peoples have been present throughout the history of the discipline of archaeology, but the development of formal analytical and interpretative frameworks for the study of these phenomena dates only to the early 1980s. Just as there are a variety of ways of investigating the functional (or evolutionary) significance of artifacts, there are also a variety of ways of investigating what artifacts can reveal about the cognitive abilities of our ancestors or about the conceptual frameworks of past human societies. Some researchers have applied concepts and methods

developed in linguistics or psychology to the problem of interpreting artifact assemblages in cognitive terms, but the most influential of the current approaches to this problem of gaining insight into the prehistoric mind

about the value past societies placed on different activities. Such inferences can be made on the basis of an examination of the distribution of artifacts marking different stages in the production and use of tools.

Conclusion

The history of approaches to the study of stone artifacts charts the enrollment of an increasing number of variables to explain variation in artifact form and assemblage composition. The early- to mid-twentieth-century preoccupation with artifact form as a means of accessing information about past cultures has been replaced by a broader array of approaches that investigate both the reasons for the existence of different artifact types and the variations in their patterns of co-occurrence. These approaches investigate the impact of raw material properties, techniques of artifact manufacture, the uses to which artifacts were put, and the effects of resharpening on artifact form and assemblage composition, in addition to style. Both functionalist and idealist approaches recognize the importance of analyzing stone artifacts in relation to other artifacts and in relation to other categories of archaeological data, including their position on a landscape. Attempts are made to integrate information generated from the analysis of different categories of archaeological data in order to assess the behavioral information that can be gleaned from the stones themselves. The ubiquity and durability of stone artifacts means that they will always be an important source of information about past human behavior.

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Lithuania

The history of archaeology in Lithuania mainly began in the nineteenth century. The first information about single archaeological objects was obtained during the sixteenth century, while Lithuania was a grand duchy, but during the period when Lithuania and poland formed a single state (1569-1795), there was little interest in the past, and only a few mentions about stray finds survive from that era.

Lithuania as Part of the Russian Empire (1795-1918)

It was while Lithuania was part of the Russian Empire that the study of archaeology began, with the main feature being the search for the oldest roots and evidence of states and nations. Archaeology in Lithuania started in a small local museum in Barzdz˘iai in western Lithuania in 1812. The museum was founded by the landowner

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Lithuania

The history of archaeology in Lithuania mainly began in the nineteenth century. The first information about single archaeological objects was obtained during the sixteenth century, while Lithuania was a grand duchy, but during the period when Lithuania and poland formed a single state (1569-1795), there was little interest in the past, and only a few mentions about stray finds survive from that era.

Lithuania as Part of the Russian Empire (1795-1918)

It was while Lithuania was part of the Russian Empire that the study of archaeology began, with the main feature being the search for the oldest roots and evidence of states and nations. Archaeology in Lithuania started in a small local museum in Barzdz˘iai in western Lithuania in 1812. The museum was founded by the landowner

of his work. In 1884, Fiodor Pokrovskij (1855-1903) was appointed director of the Museum of Antiquities in Vilnius. He revived the study of archaeology at the museum, excavated burial mounds in eastern Lithuania, and published reports of these excavations. He questioned and interviewed local people about archaeological sites and finds and collected and published all of this information in archaeological maps (Pokrovskij 1893, 1899). In 1893, the Ninth Congress of Russian Archaeology was held in Vilnius, and this meeting presented the achievements of archaeology to the local people and encouraged their further support of it.

At beginning of twentieth century, the Russian Imperial Archaeological Commission in Saint Petersburg began to take some interest in, and control of, archaeological excavations in Lithuania. It issued permits and demanded reports and information concerning finds. Large excavations were begun and photographed. The commission sent archaeologists to investigate burial mounds and hill-forts, and it supported the work of interested amateurs. One of these was Ludwik Krzywicki (1859-1941), who, during his summer vacations between 1900 and 1913, surveyed and excavated hill-forts and published information concerning their artifacts. From 1911 to 1914, the local archaeological commission in Vilnius registered artifacts from a medieval-new age town, and this information was published in Russian, Polish, and Lithuanian. At the end of nineteenth and during the early years of the twentieth century, private archaeological collections and amateur excavations to enrich them became popular. World War I terminated the work of non-Lithuanian archaeologists and was responsible for the destruction of the majority of extant archaeological collections.

First Lithuanian Republic (1918-1940)

The main feature of the history of archaeology during the period of the first republic was the creation of a national school of archaeology. In 1919, the State Archaeological Commission was established to protect sites of cultural significance, but the initial activities of the commission were not productive because of conflict over different methods of conservation and protection.

In fact, archaeology in Lithuania was primarily the work of individuals. In the 1920s, the Russian aleksander spicyn (spitsyn) (1858- 1931) was invited to write the first general work about the antiquities of Lithuania using prewar data (Spicyn 1925), which had been already divided into different archaeological cultures. At the same time, Colonel Petras Tarasenka (1892-1962) collected information about different archaeological sites and finds, and between 1926 and 1928 he published three books about archaeological knowledge and the protection of archaeological heritage. His most important c ontribution in these books was the first comprehensive archaeological map of Lithuania (Tarasenka 1928). In 1930-1934, General Vladas Nagevičius (1881-1954) excavated the hill-forts of Apuolė and Impiltis in western Lithuania, and with the support of specialists from different sciences, he used aerial photography and film-making and completed many different analyses of the material found. The 1920s also saw the foundation of many regional museums in Lithuania to house collections of finds from destroyed archaeological sites.

In 1934, the State Archaeological Commission was reorganized, and the protection and registration of archaeological sites was improved, with guards placed at various sites to stop their destruction by plough. In 1936, the new museum of Vytautas Great was established in Kaunas. It strove to create separate laws of cultural values to protect and rescue sites from destruction by excavation. The head of prehistory department in this museum, Jonas Puzinas (1905-1978), became the first professional Lithuanian archaeologist. Having taken an archaeology degree in Germany, Puzinas divided all the archaeological material in the museum into the common Baltic periods and chronological order. In 1938, the museum opened a new archaeological exhibition, the study of which was published (Puzinas 1938) and became the first scientific manual of Lithuanian archaeology. Puzinas trained a new generation of

Lithuanian archaeologists. In 1939, the capital of Lithuania, Vilnius, which had been occupied

by the Polish since 1920, was returned, and the center of Lithuanian archaeology was transferred there.

Part of the U.S.S.R. (1940-1991)

World War II and the subsequent Soviet occupation of Lithuania interrupted any further archaeological work, and publications stopped. In 1940, the occupation government passed a law of cultural monuments protection, which had been prepared by an independent Lithuania and was really only a piece of political propaganda. Archaeology was centralized in order to achieve greater Soviet control. In 1941, the Academy of Sciences was created; in it, was an Institute of History and within that, a Department of Archaeology. During fighting in Lithuania, many parts of archaeological collections in local museums were destroyed. In 1944, to escape repression, Puzinas and his best student, Marija Gimbutienė (or Gimbutas, 1921-1994), went to western Europe. Gimbutienė completed her thesis in Germany in 1947, writing on Lithuanian grave-field data and separating it into cultural-chronological groups linked to some historic Baltic tribes. In Lithuania, the field archaeologist Pranas Baleniūnas (1900-1965) was arrested and imprisoned in northern Russia.

The main features of Lithuanian archaeology during the years the country was a Soviet socialist republic were the accumulation of archaeological sources and the investigation of the ethnic genesis of the Baltic tribes. In 1945, Lithuania had only four archaeologists left, and they had sole responsibility for re-creating and developing the discipline. The training of archaeologists never stopped, testimony to the work of Pranas Kulikauskas (b. 1913) and Regina Kulikauskienė (b. 1916). Marxism was compulsory, and its impact on Lithuanian archaeology directed research into areas of socioeconomic formation, productive forces, and relations to production. The Russian language was used, and the works of former investigators were ignored. The center for archaeology in Lithuania became the Institute of History, which issued the permits for excavations. Archaeology at Vilnius University consisted only of producing students.

Archaeological surveys and excavations of grave fields began in 1948, and before long, excavations became large and rapid-however, there were no journals in which to publish archaeological articles in the first postwar decade in Lithuania. In 1949, P. Kulikauskas finished his thesis on a grave field at Kurmaic˘iai in western Lithuania. At the beginning of Soviet rule, archaeologists copied prewar work but included the necessary Marxist changes. This work was narrow and purely historical in treatment, written according to preconceived social evolutionary schemes created by the Communist Party, and there was only one way to investigate and publish results. The highest achievement of this Stalinist style of Marxism in archaeology was the preliminary edition of the *History of Lithuanian SSSR* (*Lietuvos TSR istorija* 1953), which divided prehistory into the stages of development of primitive society.

After the death of Joseph Stalin in 1953, the Soviet states started to become more liberal, and so did archaeology. During this time, new humanitarian directions were created, and archaeological investigations were included in economic development projects. A new postwar generation of archaeologists started to work. Excavations took place at new building sites and large infrastructure building projects, such as the building of the Kaunas water reservoir in 1953-1957, excavations at Castle Trakai in 1951-1962, and work on the Vilnius lower castle in 1955-1961, which led to the adaptation of some of these buildings as museums. However, the law for the protection of cultural monuments was often ignored at the time, and many archaeological sites were destroyed. Still, new kinds of archaeological monuments, such as Stone Age settlements, were excavated. The liberalization of archaeology spread to the analysis of archaeological material using traditional chronological-typological methods, more choice in the direction of investigations, and the creation of larger archaeological generalizations, which could include the material of former investigators.

The first books on Lithuanian archaeology since World War II were published, including those dealing with archaeological finds, hill-forts

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(Tarasenka 1956), and archaeological stones (Tarasenka 1958). Marxist interpretations of prehistory were consolidated in the *History of Lithuanian SSR* (*Lietuvos TSR istorija* 1957, 5-37), and the main achievement of this period in archaeology was a synthesis of Lithuanian prehistory (Kulikauskas, Kulikauskienė, and Tautavičius 1961). This book built on the prewar work of Puzinas and used new information from archaeological investigations and thirteenth-century materials and earlier. Written in Lithuanian, it consolidated the periodization of prehistory and the main typology and chronology of its artifacts.

After 1961, Lithuanian archaeology began a period of systematization of archaeological materials. In 1962, the leader of Lithuanian archaeology was Adolfas Tautavičius (b. 1925), a graduate of Soviet times. Archaeological conferences were held every two years, and since 1966, a scientific-information edition was published every two years (*Archeologiniai*, eighteen issues before 1999). A general work concerned with trade relations was published (*Lietuvos gyventoju prekybiniai rysiai* 1972), and the results of the period of systematization of archaeological materials in 1974-1978 were published in four volumes of collective work by ten people (*Lietuvos TSR archeologijos atlasas* 1974-1978), which describes Stone Age settlements, hill-forts, grave fields, burial mounds, and some artifacts.

There were many different innovations in archaeology, such as plastic facial reconstruction, the filming of excavations (from 1965 by Vytautas Urbanavičius), investigations of the Bronze Age (from 1967 by Algimantas Merkevicius), and investigations of iron smelting (from 1969 by Jonas Stankus). In 1965, radiocarbon analysis began, and human skeletal material has been collected and investigated since 1970. Large-scale excavations of medieval-new age grave fields began in the oldest Lithuanian towns. R. Kulikauskienė and Rimutė Rimantienė completed the first doctorate in archaeology (Rimantienė 1971; Volkait-Kulikauskienė 1970), and a list of state-protected archaeological sites (3,367 objects) was prepared and published (*Lietuvos TSR istorijos ik kultûros paminklu sarasas* 1973).

In 1979, Lithuanian archaeologists began to investigate ethnic genesis. There was a huge amount of accumulated archaeological material that required new qualitative research and synthesis, so interrepublic conferences concerning ethnic genesis and ethnic history were organized in 1979, 1981, and 1991. Investigations became complex and included historians, ethnologists, linguists, and anthropologists. Also in 1979, the first volume of nonperiodical archaeological information was published (*Lietuvos archeologija* 1979-1999), which opened up the market for larger publications about excavated materials and for separate investigations. The first synthetic studies for different prehistory periods were published-the Stone Age (Rimantien 1984) and the old Iron Age (Michelbertas 1986)-as well as a general work about Lithuanian ethnic genesis (*Lietuviu etnogeneze* 1987).

In 1988, a short but eventful period of perestroika, which took the shape of a national independence movement in Lithuania, began. This policy was manifest in archaeology by the creation of new organizational structures. For instance, a separate group of archaeologists was organized by the Society of Lithuanian archaeologists and founded within the Institute of History in 1989, the result of excavations in Vilnius lower castle, and a chair of archaeology was founded at Vilnius University in 1990. Also in 1990, the inspection of cultural heritage, a serious attempt at protecting archaeological heritage, was established. In 1989, the first archaeological museum in Kernavė opened. Existing archaeological organizations were enlarged, and new archaeologists were allowed to be independent. In science, censorship was abolished, and computers began to be used. Relations among the archaeologists in the various Soviet socialist republics were broken up, and the search for new contacts in archaeology from the West started-with Poland and Sweden.

Second Lithuanian Republic (1991-)

After the putsch of August 1991 in Moscow, Lithuania, which had proclaimed its independence in 1990, became a recognized independent state, and after liberation from Marxist fetters, archaeology returned to fundamentals. New directions

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Ljubljansko Barje

Ljubljansko Barje, known also as the Ljubljana Marsh or the Laibacher Moor, is a complex of prehistoric pile-dwelling sites in slovenia. The term *Ljubljansko Barje* is frequently used as a synonym for Copper- and Bronze Age pile dwellings in the marshland south of Ljubljana in a Pleistocene tectonic depression of approximately 170 square kilometers. It is presumed that a shallow lake existed there before the formation of marshes in about 2000 b.c.

The first pile dwellings were discovered by dragotin (karl) dezman, curator of the Provincial Museum of Carniola, Ljubljana, in 1875 near the village of Ig, fifteen kilometers south of Ljubljana. Between 1875 and 1877, he conducted several excavation campaigns in which he researched an area of more than 10,000 square meters. Archaeological excavations revealed very rich, ornamented pottery; clay figurines; stone, wooden, and bone implements; and some of the earliest metal finds in Slovenia. These finds made the Ig pile dwellings one of the most various and attractive prehistoric sites of central Europe at the time. Nevertheless, Dezman succeeded in publishing only brief notices and some interim excavation reports.

Initially, the pile dwellings were attributed to the Stone Age, but later they were thought to be Bronze Age in origin. The first more-detailed cultural attribution of the dwellings was given by M. Hoernes in 1898, who placed the finds from Ig into the context of the Bandkeramik culture. European archaeologist vere gordon childe, in *The Danube in Prehistory* (1929), associated the Ig pile dwellings with Slavonian culture and placed them in the Copper Age (Danubian IV phase). The Slovenian archaeologist rajko lozar attributed "the Ljubljana pottery" to the northern cultural circle, especially to the Globular Amphora culture of the late Neolithic period.

After World War II, from 1953 to 1981, the Department of Archaeology at the University of Ljubljana (consisting of josip korošec, Tatjana Bregant, and Zorko Harej) organized several larger excavations on newly discovered sites in the Ljubljansko Barje. The results of these excavations demonstrated the existence of a long-lived settlement system extending from the late Neolithic to the early Bronze Age. The first catalog of finds from the Ig dwellings was published by the Slovenian archaeologists Josip Korošec and Paola Korošec in 1969. They classified the pottery from Ig into two cultural and chronological groups originating from the Slavonian (Vucedol) culture complex. The first Ig phase was placed in the early Copper Age, and the second, in the late Copper Age and transition to the Bronze Age.

The most complete chronological and cultural study of pottery from Ljubljansko Barje was published by Hermann Parzinger (Parzinger 1984). He defined seven phases (from the end of the Neolithic to the early Bronze Age) and placed the Ljubljansko Barje pile dwellings in the context of the middle Danubian cultural region (Lengyel, Baden, Vucedol cultures). However, he also demonstrated the presence of cultural elements associated with northern Italian cultures (Lagozza, Remedello, and Polada).

Tatjana Greif

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Louvre

Established in 1793, the Musée du Louvre in Paris, france, originally included the royal collections and artifacts seized from émigré royalists and the church after the revolution. The museum's collection (which included a large number of pieces derived from the Classical Roman and Greek cultures) was dramatically increased when art works looted from italy by the victorious French armies were sent back to Paris after 1794. Although many of these works were returned after Napoleon's fall in 1815, the nucleus of the great museum called the Louvre was firmly established. Although it is justly famous for its collection of paintings, the Louvre also houses major collections of antiquities, particularly those drawn from the classical world, Egypt, and ancient Assyria.

The classical collection had its roots in the royal collections of François I and Henri IV, and it was supplemented by purchases of materials originally looted by the French armies. After 1815, the collection was expanded by donations (such as *Venus de Milo* in 1821), by purchase, and by pieces retrieved from excavations. The Egyptian collection has a long history as well. Founded by jean-francois champollion in 1827, the collection was greatly expanded through the efforts of French collectors and excavators in Egypt, the most notable being auguste mariette working at Saqqara. Of almost equal importance is the Assyrian collection founded in 1847, which is based around the work of paul-emile botta and Ernest Renan. Staff members of the Louvre continue to be active in archaeological research all over the world.

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Lozar, Rajko

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Lozar was predominant in Slovenian archaeology in the period between the two world wars, mainly owing to the fact that he was the only professional archaeologist in slovenia at the time. This research and museum work encompassed archaeology, art history, and ethnography as well as the protection of cultural monuments and university teaching. As a scholar with a background in Classical and humanist sciences, he was influenced by the culture-history approach in central European archaeology during the first decades of the twentieth century. He applied the specific approach that he had developed first as an art historian to his archaeological studies in prehistory, to the Roman and early medieval archaeology of Slovenia, and to the study of the evolution of style and key forms. He partly ignored typological studies based on discretely delimited units and contexts, considering form as the general expression and synthesis of individual and local cultural development, not as a manifestation of the spiritual culture only. His major works in this area are “Ornamenti noriskopanonske kamnoseske industrije” (1934a;

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systematization of pottery from Slavic sites in Slovenia. At the end of his professional career in archaeology in Ljubljana, he published the first historical and critical synthesis of Slovenian archaeology: "Razvoj in problemi slovenske arheoloske vede" (1941a; Development and Problems of Slovenian Archaeological Discipline). As an ethnographer, Lozar edited and contributed important texts to the *Narodopisje Slovencev* (*Ethnography of the Slovenes*) published in 1944.

After 1945, Lozar left Slovenia for political reasons. He lived in Austria until 1950 when he moved to Manitowoc, Wisconsin, where he worked as the director of local city museum. After leaving Slovenia, he lost all professional contacts with contemporary Slovenian archaeologists.

Predrag Novakovic

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Lyell, Sir Charles

(1797-1875)

Born in Scotland, Lyell studied geology at Oxford University with william buckland. In 1819 he moved to London to study law and was admitted to the bar, but never practiced. Instead he took up the study of geology and scientific writing, supporting himself financially through private means and from the sale of his enormously influential books. Lyell was professor of geology at King's College, London, between 1831 and 1833 and was knighted in 1848.

His three-volume *Principles of Geology* (1830-1833) described modern and uniform long-term geological changes and argued against the prevailing catatstrophism of his time as unscientific and based on biblical chronology. Lyell also contributed to the development of paleontology and Tertiary studies and helped to establish the Eocene, Miocene, and Pliocene periods, based on animal extinctions.

While Lyell rejected Lamarck's evolutionism, he argued that extinction was the normal course of nature. He gradually accepted Charles Darwin's theories after the publication of *On the Origin of Species* (1859) but the question of human origins and human-ape connections remained a problem for him. In his book *Geological Evidence of the Antiquity of Man* (1863) he promoted arguments for the long antiquity of human history, convinced by evidence, provided by william pengelly and hugh falconer from brixham cave and other sites, of man-made tools being found with extinct fauna. In 1859 Lyell and the rest of the committee of the Geological Society of London followed joseph prestwich and john evans to

Abbeville in France to pass judgment on the validity of the fossil and tool finds in the

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Machu Picchu

Located to the northwest of Cuzco in peru, the site of Machu Picchu is spectacularly situated on a ridge high in the Andes. The settlement comprises temples, tombs, houses, and agricultural terracing made from local stone with the same high-quality techniques that were so common among the inca. A place of considerable mystery, this "lost" city was brought to the attention of the outside world in 1911 by Hiram Bingham, an American explorer. He photographed the site and returned the next year to complete the job of mapping and undertaking limited excavations-in part funded by the national geographic society. Subsequent research has dispelled much of the mystery surrounding the site. It is now quite generally accepted that the site was not unknown to the Spanish and that it was built during the reign of the Inca king Pachacuti (a.d. 1438-1471).

An aerial view of the ruins at Machu Picchu.

(CFCL)

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Madagascar

Madagascar, situated in the western Indian Ocean, is the fourth-largest island in the world. About 400 kilometers from Africa, which lies to the west, the island is itself a small continent with diversity in all aspects of the environment: physical, climatic, and biological. Archaeology is the main discipline that can help to reconstruct the past in Madagascar. Apart from an Arab script of perhaps the fourteenth century, written sources are available only from the nineteenth century, and oral traditions go back no further than the fifteenth century.

A brief review of the philosophical approaches to understanding Madagascar's past from an archaeological point of view is useful. Madagascar is about 1,580 kilometers north to south and 580 kilometers east to west and covers some 587,000 square kilometers. Human settlements, right from the beginning, seem to have adapted to its different physical environments. The arid southern and western part, the cool central highlands, and the humid eastern forests have developed societies with economies comprising, respectively, gathering and hunting, herding, irrigated rice cultivation or swidden (slash and burn) cultivation. Although Madagascar is not far from Africa, the language used throughout the island is of Southeast Asian origin, an Austronesian language close to the one spoken on Borneo. Nevertheless, some African vocabulary does exist, and this linguistic synthesis has defined the much-studied problem of the first human settlement of Madagascar, which has fascinated researchers, including archaeologists, for more than a century.

The origin and settlement of Madagascar have been key research problems since the beginning of the twentieth century. Based on evidence, settlement is believed to be less than 2,000 years old. Who were the first inhabitants and when did they arrive? Folktales record myths about first inhabitants and past environments. These myths, for example, refer to “the Lalomena,” “the red beast,” perhaps the pygmy hippopotamus, and “the Vorombe,” “the big bird,” perhaps the Aepyornis, both of which are indigenous to Madagascar.

Interest in the past is important for the Malagasy people themselves, and the Malagasy concept of the past and its periodization are consistent across the island. Six main periods, sometimes with subdivisions, characterize this concept of the past: faha-gola (“faha, in the Malagasy concept, states the period, and “gola” is used to point very old times, the unknown first settlement), faha-vazimba (the vazimba are said to have been the first inhabitants met on the island by new migrants around the fifteenth century), faha-gasy (the period when the ancestors of actual inhabitants settled on the island), faha-mpanjaka (the period when the kings reigned), faha-vazaha or faha-zanatany (the period of colonization), and faha-leovantena (the period of independence). This periodization also comes down from oral traditions.

Linguistic and historic studies provide some chronological points of reference that are useful in understanding the settlement of Madagascar. The seventh to the tenth centuries a.d. marked the coming of migrants from Southeast Asia via Africa. In the eleventh century, Shirazi migrants reached the Comoros and the northern part of Madagascar, and in the twelfth and thirteenth centuries, Islamized groups, the Zafiraminia, arrived in the southeastern part of the country. The thirteenth and fourteenth centuries saw the arrival of two other Islamized groups, the Zafikazimambo and the Anakara, in the same region. About 1500, the supremacy of the Arab traders in the Indian Ocean declined and the Europeans arrived.

The past has always fascinated all Malagasy people, and each family has traditions about its own history. Among the better known nineteenth-century scholars who began to record the history of Madagascar was Raombana, secretary to Queen Ranavalona I (1828-1857). When very young, Raombana and his twin brother Rahaniraka had been sent to England by King Radama I to be educated, and they stayed

there for ten years. Because Raombana was descended from a former king and princes in the highlands and because of his English education, he developed an interest in the past of his country. He visited and described house foundations and other archaeological features at Ifanongoavana,

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Magdalenska Gora

Magdalenska Gora is an early-Iron Age site in Dolenjska (lower Carniola) in slovenia. It comprises a hill-fort settlement covering an area of about thirteen hectares. Some forty earthen burial barrows have been documented in its immediate vicinity, and twenty-two of them, containing at least 1,000 graves, were the subject of extensive excavations at the end of the nineteenth century and the beginning of the twentieth by the Narodni Muzej or National Museum; the Naturhistorisches Museum, Vienna; and the peabody museum, Harvard University. Burial was largely inhumation, although a considerable number of cremation graves in the barrows have been found as well. The number of graves in the barrows varies from 2 to more than 350, but the average number of graves per barrow is between 20 and 60.

The burials cover a period of approximately 500 years, from the eighth to the fourth century b.c., with the majority of graves belonging to fifth or fourth century. Numerous rich princely and warrior graves make Magdalenska Gora one of the important centers for the Dolenjska group of the Hallstatt (early Iron Age) culture. The graves are characterized by ornamented bronze vessels of the situla type, different types of helmets, horse-riding equipment, weapons (axes, spearheads, arrowheads), great quantities of personal ornament (fibulae, pendants, necklaces, bracelets), and elaborate ceramic vessels. The site was not completely abandoned after the fourth centuryb.c., as some la tène (later Iron Age) cremation graves were found in the cemetery as well.

Peter Turk

See also

Austria; Celts

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Maghreb

The study of prehistoric archaeology in the Maghreb (Morocco, Algeria, Tunisia) has been dominated

by French archaeologists. The earliest were primarily avocational (Sheppard 1990), and they maintained close ties with archaeological and anthropological societies of metropolitan France and often published their findings in journals such as *L'Anthropologie,* although they also developed active local societies with a strong archaeological focus (e.g., La Société de Géographie et d'Archéologie de la Province d'Oran, La Société Archéologique de Constantine, and La Société de Préhistoire de Tébessa). In the late 1920s and 1930s and again in the 1970s, research by North Americans brought different perspectives to the interpretation of the later prehistory of the region (Sheppard 1990).

From its inception, the study of prehistoric archaeology in the Maghreb has concentrated on later prehistory (i.e., late Pleistocene and Holocene). This trend began with one of the earliest of the avocational archaeologists, Duprat, who first remarked in 1894 on the distinction in stone artifact size at various landsnail shell middens (called escargotières, see Gobert 1937). For the next forty or fifty years, archaeological research and debate in the Maghreb centered on these materials and those that either immediately preceded or succeeded them.

In 1910-1911, in a serial article, De Morgan, Capitan, and Boudy reported stratified assemblages

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Mallowan, Sir Max

(1904-1978)

Born in London and educated at New College, Oxford, Max Mallowan claimed to have first excavated Victorian china shards when he was four years old in Bedford Gardens, Kensington. In 1925, after finishing university and hoping to avoid a career in the Indian Civil Service, he was taken on as a field assistant at the Iraqi site of Ur of the Chaldees by English archaeologist sir leonard woolley. It was there that Mallowan met the novelist (Dame) Agatha Christie, whom he married in 1930.

Mallowan worked in mesopotamia with Woolley for five years and became field director for joint excavations by the british museum and the British School of Archaeology in Iraq, which had been founded by a legacy from gertrude bell. He excavated at the Quyunjik mound at nineveh, at the village site of Arpachiyah, and

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then in Syria at Chagar Bazaar and Tell Brak, where he discovered third-millenium shrines and the Palace of Naram-Sin.

Between 1940 and 1945, he served as a liaison officer with the Allied forces in North Africa. In 1947, Mallowan took up the chair of western Asiatic archaeology at London University and returned to Iraq as director of the British School, where he began to excavate sir austen henry layard's great site of nimrud. Over the next twelve years the site provided a wealth of architectural remains, artifacts, and texts, which were published in the monumental two-volume work *Nimrud and Its Remains* (1966). In 1962, he returned to Oxford as a fellow of All Souls College, was vice-president of the British Academy in 1961-1962, and trustee of the British Museum from 1973 to 1978. He was editor of *Iraq* (1948-1971) and an advisory editor of *antiquity*. He became a commander of the Order of the British Empire in 1960 and was knighted in 1968.

Max Mallowan and his wife, Agatha Christie, leave their home in London at the start of their journey to northern Iraq for archaeological research.

(Bettmann/Corbis)

Tim Murray

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Malmer, Mats P.

(1921-)

Malmer was born in Scania, sweden, and studied prehistory at Lund University, receiving his Ph.D. in 1962. Malmer moved to Stockholm to become head of the Stone and Bronze Age Department at the Museum of National Antiquities in 1959, where he began to publish on archaeological methodology and theory while continuing extensive excavations. In 1970 he became professor of archaeology at Lund University, and in 1973 he was appointed to the chair of archaeology at the University of Stockholm.

Malmer is a key figure in discussions within Scandinavian archaeology on quantitative and taxonomic methods and the interpretation of archaeological data. His most significant influence has been to introduce and argue for the rational replacement of the predominant inductive

approach with a rational use of hypothesis and verification, a method in line with the hypothetico-deductive methods of logical positivism.

Malmer has also published in the area of rock carvings and museum studies, and his excavations of sites, and papers and reports on these, range from the Mesolithic to the medieval.

Marie Louise Stig Sørensen

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Mariette, Auguste

(1821-1881)

Auguste Mariette was born in Boulogne, France, and briefly lived and taught drawing and French in England. He developed an interest in Egyptology through the illustrations and notes of his cousin Nestor L'Hote, who had been a draftsman on jean-françois champollion's expedition to Egypt between 1828 and 1829. Mariette taught himself hieroglyphics from Champollion's grammar and dictionary, studied Coptic, and began working at the louvre Museum, where he completed an inventory of all of the Egyptian inscriptions in the collection.

In 1850 the Louvre sent him to Egypt to collect papyri but instead he began excavating the Saqqara Serapeum, the huge subterranean gallery containing the sacred Apis bulls. He also located the Fifth Dynasty tomb of Ti at saqqara. In 1855 the Louvre appointed him Assistant Conservator and he returned to Egypt to excavate at Giza, Thebes, abydos, and Elephantine.

The Temple of Horus at Edfu, one of the most complete extant temples in Egypt and one of the many sites excavated by Auguste Mariette

(Marilyn Bridges/CORBIS)

In 1858 Mariette was appointed the first director of the new Egyptian Antiquities Service by the joint ruling Pashas of Egypt. The National Museum in Cairo was founded in that same

year, the first museum of its kind in the Near East. As director of the service Mariette was in charge of all the excavations in Egypt, preventing the wholesale pillaging and plundering of sites, and ensuring that the museum began collecting, conserving, and preserving antiquities.

Mariette himself excavated more than thirty-five sites in Egypt over the next thirty years, which included 300 tombs at Saqqara and the clearance of the temples of Luxor, Medinet Habu, Dendera, and Edfu. Despite later criticism by william matthew flinders petrie and george reisner for his unscientific excavation techniques, Mariette's contributions to Egyptian archaeology were enormous. He published five volumes on *Dendera* (1875), and a catalogue of finds from *Abydos* (1880). He helped with the libretto for Verdi's great Egyptian opera *Aida,* which celebrated the opening of the Suez Canal. He was succeeded by Gaston Maspero.

Tim Murray

See also

Egypt, Dynastic; French Archaeology in Egypt and the Middle East

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Marr, Nikolay

See Russia

Marshall, John Hubert

(1876-1951)

John Hubert Marshall became director-general of the Archaeological Survey of India in 1902 and relinquished the position in 1928, although he continued to work for the survey in nonadministrative positions until 1934. When the English viceroy of India, Lord Curzon, arrived in India in 1900, he felt it necessary to formulate an integrated archaeological policy on the part of the government of India rather than depending on a few "surveyors" in the provinces for archaeological investigations and the Public Works Department for monument conservation. Curzon chose Marshall as the director-general for the formulation and execution of this policy.

Conservation policy was laid down in an official resolution in 1903 and subsequently incorporated in a manual (Marshall 1923), which still remains the bible of conservators in India. The main emphasis was on the preservation of the originality of the monument. The Ancient Monuments Preservation Act of 1904 empowered the government to acquire nonliving monuments (i.e., monuments not being used for current religious worship) for conservation, to prohibit traffic in antiquities both to and from British India, to provide for keeping antiquities in situ or in site museums, and, finally, to prohibit the excavation of ancient sites by irresponsible persons.

In 1906, the Archaeological Survey of India became a permanent central government department with an elaborate and well-controlled hierarchy of officials, various administrative circles, and a "branch" of epigraphy. What has happened since then is an increase in the number of "circles" and "branches" with consequent changes in territorial jurisdictions and responsibilities. However, the basic pattern laid down by Marshall has remained intact. The work of excavation and exploration was divided among circles,

and reports appeared in the survey's Annual Reports, the publication of which-for the year 1902-1903-began in 1904. There was a well-defined policy regarding the basic research based on the exigencies of Indian conditions and best expressed by Marshall himself:

From the time of its reorganization in 1902 it has been the design of the Department to take in hand the excavation of the great buried cities of antiquity; but, before this design could be carried out, it was deemed advisable to re-examine some of the Buddhist sites which had already been partially uncovered, in order to co-ordinate the results obtained by earlier excavators and to check the often unreliable conclusions which they had drawn. For all practical purposes this part of the program was completed in 1910, by which time much solid work had been done at Charsada, Rajgir, Saheth-Maheth, Kasia, Sarnath, and other spots, and secure foundations laid for operations in another and more difficult field. Then followed the exploration of the town of Bhita, a small and well-defined site near Allahabad. Here, for the first

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time in India, well-preserved remains of houses, shops and streets, dating as far back as the Mauryan epoch, were laid bare, and numerous minor antiquities recovered, which help us materially to visualize the everyday life of the towns-people in those early days. These discoveries gave a promise of a still richer spoil awaiting the spade at the more important centers of ancient civilization; and this promise has since been amply fulfilled. At Taxila the results obtained have been epoch-making.

The site of Pataliputra, the capital of the great Mauryan empire, which was singled out for excavation simultaneously with that of Taxila, offers to the digger a far less favourable field than the latter; for it has been inundated for centuries past by the waters of the Ganges, and its monuments, if they have not altogether perished, are buried at a depth of 20 feet or more below the surface.

(Marshall 1916, 24-27)

After 1924, the focus of archaeological effort shifted to indus valley civilization sites and to the excavations at Taxila, where Marshall himself excavated until the early 1930s. The method of excavation adopted by him and his officers may simply be described as excavating stratum by stratum, the component of each stratum being structures. Several publications by Marshall will always be regarded as being among the great volumes of Indian archaeology: the report of his detailed work at the Buddhist monument site of Sanchi (Marshall and Foucher 1983), the report of his work at Taxila (Marshall 1951), his analysis of Indus civilization (Marshall, ed. 1931), and last, but not least, his *Conservation Manual* (Marshall 1923).

Marshall also wrote two guidebooks on Sanchi, which contains Buddhist stupas from the third century b.c. onward, and a third guidebook on Taxila, which contains the ruins of Indian cities from pre-third-century-b.c. levels to early centuries a.d. The modern Archaeological Survey of India, and to some extent its counterparts elsewhere in south asia, have continued this tradition of producing definitive guidebooks on various monuments and sites under their care. The main emphasis of Marshall's interpretation of the Indus civilization was on its indigenousness and its intimate blending with the later Indian historic tradition.

The impact of John Marshall on the Indian archaeological scene will be clear from the tribute paid to him by a nationalist Indian archaeologist more than fifty years after his departure from the Indian archaeological scene:

The large exposed and conserved sites we see, the gardens around the monuments which we appreciate, the museums we enter and the objects we admire, the objects on which much of our own perception of our past is based-these are all intimately linked with the period which we here have called “the John Marshall period” in the history of Indian archaeology. It was an orderly and secure archaeological universe which, despite threats of retrenchment and financial stringency, went about its own way, building up the archaeological image of and ancient India in its manifold colours and nuances.

(Chakrabarti 1988, 169-170)

Dilip Chakrabarti

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Mason, Otis Tufton

(1838-1908)

Mason was educated at Columbian College (now George Washington University), from which he graduated in 1861. Mason worked as the principal of a primary school and then in 1872 was appointed to the Department of Ethnology in the smithsonian institution. He became one of the founders and leaders of American museum science and in 1902 was appointed head curator of anthropology.

Mason was especially interested in the technological aspects of human culture, and his papers on Native American basketry, textiles, and weapons were invaluable contributions to ethnology

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and are still important sources of information. He was also the author of two popular science books: *Woman's Share in Primitive Culture* (1894) and *The Origin of Inventions* (1895). In 1879 he was one of the founders of the Anthropological Society of Washington and he made many contributions to its journal *American Anthropologist.*

Tim Murray

See also

United States of America, Prehistoric Archaeology

Masson, V. M.

See Russia

Maya Civilization

One of the great cultures of mesoamerica, Maya civilization extended throughout southern mexico and northern Central America. The Maya territory included what are now the southernmost Mexican states of Yucatán, Campeche, Quintana Roo, Tabasco, and Chiapas, as well as all of belize and guatemala and the westernmost parts of Honduras and el salvador.

In terms of geography the Maya area is often divided into three regions. The northern two regions (called the northern and southern lowlands, respectively) are formed by the low, limestone shelf that is the Yucatán Peninsula. Here the natural vegetation is tropical forest, featuring true high-canopy "jungle" in the south but becoming increasingly low and thorny as one moves to the northwest of the peninsula. Because of the porous limestone bedrock, there are few rivers in these regions. Particularly in the northern lowlands, access to water has traditionally been from *cenotes,* or natural sinkholes, in the limestone formations. The third region, the southern highlands, is much more mountainous, formed in large part by a string of volcanoes that lie along the Pacific coast.

The florescence of Maya civilization was the classic period, from a.d. 250 to 900, and it was centered in the Maya lowlands. Before this time, however, there was a long period of cultural development, both in the lowlands and in the southern highlands.

The history of human occupation in the Maya area stretches back at least 12,000 years, as shown by the scattered remains of hunting camps. A subsistence based on hunting and gathering lasted for millennia, but evidence suggests that by about 2000 b.c. there were farming villages in some parts of the Maya area and that by 1000 b.c. most of the Maya area was inhabited by village agriculturalists.

Until very recently, it was thought that the earliest development of more complex cultures in the Maya area began in the south-along the rich terrain of the Pacific piedmont and in the adjacent highlands of Guatemala and Chiapas-with temple-pyramids and carved stone monuments, as well as settlement and burial evidence indicating an increasingly stratified society. Although there certainly was impressive development in the southern highlands, it is now clear that there was also very early cultural development in the southern lowlands. In northern Guatemala, excavations at sites such as Nakbe and El Mirador have uncovered the remains of huge temple-pyramids built in the late centuries b.c. and possibly extending back as far as 600 b.c. By the late centuries b.c. there were numerous cities with massive public architecture in the southern Maya lowlands, and by the early centuries a.d. society was becoming increasingly stratified under hereditary rulers who probably gained most of their power initially through their reputations as spiritual leaders and their ability to mediate with the supernatural world on behalf of

their people. Huge mask panels modeled in stucco adorned the front facades of many pyramids: these incorporated symbols of kingship on heads that were surrounded by cosmological symbolism. The stage was set for the greatest florescence of Maya civilization-the classic period.

The classic period was initially defined by the span of time during which carved stone monuments incorporating hieroglyphic dates were erected at a host of Maya cities. Conventionally, the period ranges from a.d. 250 to 900. During this time dozens of cities grew up, each with its own hereditary kings and each controlling a territory usually not more than about 50 kilometers in diameter. These city-states, as they have

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peninsula in cities that had flourished for hundreds of years.

Over the decades many causes have been proposed to explain this societal and demographic collapse, from earthquakes, hurricanes, floods, or droughts to peasant revolt or civil war. Recent research has revealed that the collapse was probably the result of a combination of factors that snowballed to the point at which they overwhelmed classic Maya society. Ecological problems and warfare seem to have been foremost among these factors.

Evidence shows there were massive ecological problems in the Maya lowlands during the eighth and ninth centuries a.d., when deforestation appears to have caused sheet erosion in some regions; no doubt, changes to rainfall patterns occurred as well. Skeletal evidence indicates that dietary deficiency (reflecting both a growing population and an inadequate supply of food resources to support that growth) was an increasing problem by the beginning of the eighth century. The situation was critical by the ninth century.

There is now evidence that warfare was endemic in the Maya lowlands, especially during the second half of the classic period. In large part this was due to the fierce rivalry between polities, but it also seems that an increasing factor in the violence was competition over resources, including food. Evidence even suggests there were fortified maize fields by late in the classic period.

Some scholars have argued that the word *collapse* is, in fact, inappropriate for describing the momentous events of the ninth century in the Maya lowlands. It is clear that the century saw the demise of the ruling elites who had dominated Maya society for the previous 700 years or longer: stone monuments documenting royal histories were no longer carved, and some palaces were sacked. In certain sites, such as Tikal, there is also evidence of massive population loss, but whether this was due to warfare and such factors as endemic disease or to out-migration is not clear. What is clear, however, is that in many parts of the Maya lowlands, life continued. In Belize the effects of the “collapse” do not seem to have been so severe, but it is northern Yucatán where most of the dramatic postclassic developments took place.

In late-classic times there were many large cities in northern Yucatán. One of them, chichén itzá, would come to dominate most of the northern part of the peninsula for the terminal classic period, and some scholars extend this site's dominance as far as a.d. 1200. After the decline of Chichén Itzá, politics in the northern peninsula were again factionalized until a new city arose to dominate the area. This was the city of Mayapan, which flourished between about a.d. 1280 and 1450. Following the collapse of Mayapan, which documentary sources of the sixteenth century ascribe to internal revolt, the peninsula again reverted to petty competing kingdoms. This was the situation that the Spaniards encountered when they arrived on the scene in the early 1500s. It was also a factor in the Spaniards' conquest of Yucatán. It took the Spaniards over twenty years to gain a secure foothold in northern Yucatán, and one kingdom in the central part of the peninsula remained independent, practicing traditional Maya ceremonies (including human sacrifice) until 1697.

The heritage of classic Maya civilization is still very much alive. Approximately seven million Maya people still live in their ancient homeland, and two dozen Mayan languages continue to be spoken today. In some cases Maya people continue to practice traditional rituals, such as house dedication ceremonies, that are almost identical with those described in ancient hieroglyphic texts.

Peter Mathews

See also

French Archaeology in the Americas; Maya Epigraphy

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Maya Epigraphy

Among the many achievements of maya civilization was the development of a writing system. Maya writing, which was probably stimulated by the slightly earlier olmec script, was the most

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Knorosov, but even since the 1960s tremendous advances have been made. Syllabic readings of some 150 signs have been deciphered, and the majority of logograms can also be read, in large part because they are often accompanied by "phonetic complements" that give partial phonetic clues to their reading. Most of the Maya inscriptions in stone, wood, and other media can be almost completely read in ancient Mayan and translated. Although many contain erudite references to long-lost rituals and esoteric ceremonies, they are increasingly understood with the aid of archaeological findings, ethnohistorical and ethnographical parallels, and, in some cases, knowledge of the practices of contemporary Maya.

The Maya hieroglyphs were written over almost 2,000 years. The script contains about 800 different signs, some 400 of which were in use at any one time. Of these, between one-quarter and one-third were syllabic signs, the rest being logograms. Inscriptions were generally arranged in a system of double columns, in which the material would be read from left to right and top to bottom within two columns of text, before proceeding to the next two columns on the right. The script is written predominantly in one language (called Eastern Cholan), which is most closely related to a subgroup of Mayan languages still spoken across the base of the Yucatán Peninsula. The script was later adopted and used for inscriptions in at least one other language (Yucatec Mayan, still spoken in the northern half of the peninsula).

Most of the surviving Maya inscriptions are historical in general content, although they also contain a wealth of information on sociopolitical and geopolitical structure as well as details of ceremonies and rituals. Four Maya bark-paper books survive; they deal principally with astronomical and astrological matters. Various sixteenth-century commentators said the script was used to record information on history, genealogy, prophecy, maps, trade and tribute, astronomy, astrology, ritual and religious ceremonies, mythology, songs and poetry, and disease and medicine. Most of these topics are at least touched upon in the corpus of Maya hieroglyphic inscriptions that survives as testimony to the wonderful achievements of this ancient American civilization.

Peter Mathews

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McBurney, Charles

(1914-1979)

Charles McBurney was a distinguished Paleolithic archaeologist who spent his entire professional career at Cambridge University, apart from his war service in North Africa-an experience that led him to return to Libya, where he did much of his fieldwork.

McBurney was born in the United States and lived in Stockbridge, Massachusetts. He was privately educated in Europe before going to Cambridge in 1933, where he studied under dorothy garrod, Miles Burkitt, and grahame clark. After graduating he began a doctoral dissertation on the Lower Paleolithic of Europe, embracing the major geographic study of the distribution of the Acheulean or hand-axe industries. The principal conclusions of this work were published in 1950.

World War II shaped much of McBurney's career. After its conclusion he returned to Cyrenaica, in Libya, to work with the geologist Richard Hey, and he discovered numbers of Mousterian, Aterian, and Upper Paleolithic sites. Henceforth, his interests were firmly fixed on this period, covering the last 150,000 years, although he remained highly conversant with problems of the Lower Paleolithic. In Cyrenaica McBurney first excavated the open site of Hajj Creiem and the cave of Hagfet et Dabba,

where he found a new industry that he named the Dabban. Then, in 1948, he found the great cave that most attracted his attention: the haua fteah near the coast in northern Cyrenaica. This vast sinkhole, 60 meters in diameter, was large enough to contain the whole camp. Excavations proceeded to a depth of 13 meters. The Haua Fteah became one of two very major pieces of fieldwork in McBurney's career, and it presented a classic archaeological sequence through the last glaciation. Its publication in monograph form in 1967 was a signal achievement. The site

since the beginnings laid by jacques boucher de perthes and édouard lartet; his greatest achievement is not so much to have taught a fourth generation but to have sewn ideas and strongly inspired a successor generation that is broadly scattered around the world.

John Gowlett

See also

Africa, Francophone; Africa, Sahara; Africa, Sudanic Kingdoms; Britain: Prehistoric Archaeology

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For references, see *Encyclopedia of Archaeology: The Great Archaeologists, Vol. 2*, ed. Tim Murray (Santa Barbara, CA: ABC-CLIO, 1999), p. 726.

McCarthy, Fred D.

(1905-1997)

Although Fred McCarthy spent the bulk of his career at the Australian Museum in Sydney, his interests extended beyond museum work to include foundational studies in Australian prehistoric archaeology, comparative archaeological research in indonesia, ethnographic fieldwork in Arnhem Land and Cape York (both in Australia), and the key administrative role of first principal of the Australian Institute of Aboriginal Studies. McCarthy is most famous as the excavator of the Lapstone Creek rock shelter in the Blue Mountains outside of Sydney (1935-1936), where the reality of cultural change in prehistoric Australia was demonstrated, and as a stone tool typologist with the publication (with Elsie Bramell and H. V. V. Noone) of *The Stone Implements of Australia* (1946). McCarthy was awarded an Honorary Doctor of Science by the Australian National University in 1980.

Tim Murray

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Meadowcroft Rock Shelter

Meadowcroft is a rock shelter in southwestern Pennsylvania (United States) with a long series of stratified, multicomponent deposits spanning a period from 14000 b.c. to ca. a.d. 18. Fortunately, Meadowcroft is not subject to weathering degradation due to freezing and thawing, which can either preserve or destroy the archaeological record, as limestone rock shelters often are. Meadowcroft is oriented east-west with a southern exposure about 15 meters above Cross Creek, a tributary of the Ohio River. The overhang is 13 meters above the present floor. Local springs are abundant and the prevailing wind across the shelter opening ventilates smoke and insects.

The environment surrounding Meadowcroft was favorable to both occupation and preservation 16,000 years ago. The site was occupied intermittently by groups representing all major cultural stages in North America and has some of the earliest reliable evidence of people in North America. The climate indicated by pollen studies suggests an open spruce/pine forest with some open tundra and little hardwoods for occupation at around 16,000 years ago. Elsewhere in similar environments caribou and mastodon would be subsistence mainstays, but there are no extinct Pleistocene fauna at Meadowcroft.

This raises the question of whether the age of the site dates to the Holocene or whether it was used during a warmer climate that supported different species.

Meadowcroft is the oldest documented site for Paleo-Indian occupation. The site contains lithic blades dating to 14,000 years ago, following migration over the Bering Strait. Excavation begun in 1973 by Adovasio et al. began with mapping and trenching; all artifacts were processed and labeled on site. The most common cultural features found were firepits, ash and charcoal lenses, firefloors, and refuse or storage pits. A total of seventy samples were prepared for radiocarbon dating from the excavation at that time, and some forty more have been obtained since. The radiocarbon dating confirms an early (pre-Clovis) occupation of 14,000 years ago. Other artifacts recovered include lithic, bone, wood, shell, basketry, cordage, and ceramic materials. The lithic collection is not only the earliest securely dated collection of tools in eastern North America, but also among the earliest reliably dated assemblages recovered in the Western Hemisphere.

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Lithic production at the site shows evidence of highly skilled craftsmen in the manufacture of flaked stone implements. In addition to lithics, faunal remains include animal bone (deer, elk, bear, raccoon, and the nocturnal flying squirrel), mollusk shells, feathers, claws, insect carapaces, egg shells, and fish scales-up to 117 species in all.

All of the data recovered from Meadowcroft suggest its use as a station for hunting, collecting, and food processing. The significance of the rock shelter in North American archaeology has necessitated close scrutiny of the available data, particularly the concern of contamination of radiocarbon samples. Consensus calls for ongoing clarification of dating the rock shelter, yet the general antiquity of the site is not in question. While numerous studies compare Meadowcroft to related assemblages across North America, a final report has yet to be published.

Danielle Greene

See also

Lithic Analysis; United States of America, Prehistoric Archaeology

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Medieval Archaeology in Europe

Introduction

Medieval archaeology as a subject with its own identity is a relatively recent phenomenon, but the study of the material culture of the Middle Ages has a much longer history, set in the context of a series of cognate disciplines. This fact is important for understanding the development of the subject as many of the areas of concern and types of research questions have derived from these other disciplines. Moreover, just as Roman archaeology was often undertaken by people who had a background and interest in classical sources, with the inevitable biases in the evidence collected and researched, the same is the case with medieval archaeology. Medieval archaeology as a distinct academic discipline taught through defined modules and courses in universities is an even more recent phenomenon, as yet present in only some European countries, with the result that much of medieval archaeology is practiced by people trained in other branches of archaeology or in cognate disciplines. This situation continues to affect the research questions and priorities in the subject, although medieval archaeology has matured considerably over the last half century.

Many of the major structures and sites of importance in medieval archaeology have never been abandoned or forgotten and continue in use, albeit often in a very different context. These range from churches and cathedrals to castles and palaces and more mundane structures such as water mills,

bridges, and field systems. Moreover, many portable artifacts, which tend to have belonged to the elite, have never entered the archaeological record but have continued to serve a function to the present day. These include religious items such as illuminated manuscripts, reliquaries, and church plate and secular objects such as royal regalia, armor, and weaponry. A great deal of the study of the material culture of the Middle Ages has been undertaken by architectural historians, art historians, historical geographers, and historians of particular activities such as naval or military historians, and numismatists. To varying degrees these scholars have incorporated the primary study of material evidence into their research and even have carried out excavations to reveal such remains.

Medieval archaeology has two separate traditions, early and late. The first is associated with the early Middle Ages, also often called the migration period, which ran from the end of the Roman period in those areas affected by the Roman Empire until the eleventh to thirteenth centuries a.d. depending on the region. The second is concerned with the late Middle Ages when the power of the international church and

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often they are limited in their range of subject matter), which means that much prejudice still remains concerning the archaeology of this period. For example, in Belgian-Dutch bibliographical reviews, archaeology is included only up to the ninth century a.d. In many countries, medieval archaeology refers only to the later Middle Ages, though gradually the term *medieval* is being applied to both early and late periods.

The development of early and later medieval archaeology needs to be distinguished given the diverse attitudes to each held in the past. Different traditions developed in each country, often related to the relative visibility of remains and the associations of structures and artifacts with the development of nation states and national identities, although sometimes traditions have been shaped by the influence of particular individuals and their concerns. Nevertheless, each subject area can be followed through a series of phases that, with roughly the same chronologies, can be traced across much of Europe.

Early Descriptions and Investigations

Medieval archaeology in one sense began in the Middle Ages when excavations were made to recover the physical remains and associated belongings of saints, although both the methods and motivations would be alien to archaeologists today. Most early antiquarian records deal with prehistoric and Roman antiquities, but some early medieval material was noted. In England, the works of John Leland, william camden, and william stukeley all included a small amount of medieval ecclesiastical material. Scandinavian scholars, including Henrik Rantzau, johan bure, and ole worm, recorded runestones and burial monuments.

One of the most notable discoveries was that of the Frankish King Childeric's grave, found in 1653 in Tournai, Belgium, at the church of St. Brice. A range of artifacts, including the king's seal ring, were recovered and published by Jean-Jacob Chifflet in 1655. Unfortunately, much of the material was stolen in 1831 and has never been recovered. It was in the eighteenth and the first part of the nineteenth century that medieval archaeological remains became of increasing interest, although the period of the Enlightenment in the eighteenth century encouraged an emphasis on classical ruins at the expense of those from the Middle Ages.

In early medieval archaeology, the focus was on the recovery of grave goods, largely from chance discoveries of unmarked cemeteries on the Continent, and recovery was sometimes followed by more systematic digging. Barrows attracted the attention of antiquarians, and while many had prehistoric origins, some were early medieval in date and others had been reused at that time and contained early medieval burials. Some of the earliest excavations conducted with some scientific rigor were those by the antiquarian and scholar Professor Olaf Rudbeck at Old Uppsala, sweden, in the late-seventeenth century. In England during the early eighteenth century Saxon barrows were unearthed in Kent; at the time they were considered casualties of Caesar's invasion. Later in the century the antiquarians Bryan Faussett and James Douglass were active in excavating barrows and tumuli; they also kept excellent records, and their archives and some finds are now in British museums. Work in Wiltshire was subsequently carried out in style by william cunnington and richard colt hoare.

With the rise of the Romantic movement during the early nineteenth century, medieval ruins attracted much more attention than ever before, although this attention did not often lead to greater study. Rather, the neglected structures were to create an impact and stir the emotions, and some were modified by additions or selective demolition to heighten their effect, although some clearance of rubble did take place, as with the Cistercian abbeys of Tintern in Wales and Fountains in England. This increased awareness did lead to more serious research in some cases, such as the discovery of architectural fragments and grave slabs, and made such sites well known to subsequent generations. More obviously,

archaeological interest relating to later medieval evidence at this time was also engaged with regard to remains, either ruins or buildings, still in use. In denmark, churches were recorded by N.L. Høyen, and in Sweden, P. Härnquist made a study of a Franciscan convent before a new building was constructed on

top of it, but such work was exceptional for the time. In England, Britton and Rickman identified the major styles of architecture and placed them in chronological sequence.

An Antiquarian Structure

Two important parallel developments in the nineteenth century affected the development of the various strands of medieval archaeology. One was the establishment of national and local societies with an interest in archaeology, and the other was the development of legislation to protect monuments and (of special importance for later medieval archaeology) buildings such as abbeys and castles. Universities did not develop a great interest in medieval archaeology at this stage, although a chair in the archaeology and history of medieval art was established at the University of Cracow (in Poland) in 1866.

More national societies developed to enlarge the small number, such as the society of antiquaries of london, that had been founded in the later eighteenth century, and many of them included early and later medieval archaeology within their interests. Examples include the British Archaeological Association for the Encouragement and Prosecution of Researches into the Arts and Monuments of the Early Middle Ages, founded in 1843, which soon had 1,200 members. The following year, the Society for the Preservation of Norwegian Antiquities was established, marking the change in that country to a more organized attitude to medieval archaeology. The joint German historical and antiquarian societies agreed in 1852 to found two museums, an act that institutionalized the divide between early and late medieval archaeology. Early medieval archaeology was within the purview of the Central Roman and Germanic Museum in Mainz, which also dealt with prehistoric and Roman material, and late medieval evidence was the responsibility of the Germanic National Museum established in Nuremberg for Christian German material with an emphasis on high art linked to architecture.

By the middle of the nineteenth century, many regions across Europe had or were establishing local museums and antiquarian societies. Members of the landed gentry and minor aristocracy, professional classes, and the more intellectual of the merchant and industrial classes were able to share their interest in the past, of which the medieval was a part and often a very visible one. Much of the archaeology had direct links with the present ecclesiastical structures and the estates and castles of the elite; other elements related to earlier medieval evidence associated with ethnic groups that had migrated and established the precursors of the developing nation states. In Germany, local societies began to emerge in the 1820s, and the Christian Middle Ages became a popular subject of interest in antiquarian circles, following on from developing interests in classical and prehistoric archaeology. Local societies in Italy began to form in the later nineteenth century, though medieval material was of only marginal interest in that country.

Merovingian cemeteries were excavated across france, often because of accidental discoveries caused by building work, and the finds were recorded by local antiquarian societies and sometimes partially published in their proceedings. Despite the seventeenth-century Childeric find, there was much doubt as to the dates and cultural attributions of the graves until the middle of the century. Major row-grave cemeteries were excavated at Nordendorf and Oberflacht in Germany in the 1840s, and the dating of such graves was ascertained through associated coin finds at Selzen, near Mainz, published in 1848. In eastern Europe, most attention was also given to early medieval material, particularly from cemeteries.

Barrow digging continued as an antiquarian pursuit throughout the nineteenth century. In russia, barrow cemeteries of the ninth to thirteenth centuries a.d. were investigated, most notably at Gnezdovo near Smolensk. Bateman, Atkinson, and Mortimer worked extensively in northern England, and by this time Anglo-Saxon burials were being clearly distinguished from prehistoric ones. Finds in all countries were often reported at local and national meetings; some finds were put in local museums at this time while

others remained in private hands either to be lost, sold on the antiquities market, or later deposited in an institution. Some burials

Poland, work began at Kobiernice in the 1880s as well as on the castle hill of Halich (now in Russia).

Urban archaeology received some attention at this time, but it was patchy. The institutional buildings of Göteborg, Sweden, were studied by Berg, but when he extensively excavated at the town of Kunghälla, he did not note structural evidence from the town itself, despite the many finds, but he did report on a monastery and castle adjacent to the settlement. An unusual example of continuous research on an urban center from the later nineteenth century can be seen at Lund, Sweden, where Karlin collected finds and recorded structures and stratigraphy while sewers were being dug. He later carried out excavations in various parts of the city. During the construction of railway works in Oslo, Norway, the architects recorded finds and deposits revealed by that construction.

Intermittent Interest

In the early twentieth century, there was a shift in activity associated with later medieval archaeology, and the clearance of ruins and their display for the public became common at this time. In England, the Office of Works carried out many programs. For instance, the visible ruins of the late medieval town of Old Sarum near Salisbury were excavated and consolidated before World War I, and after the war there was a program to work on abbeys such as Fountains, Byland, and Whitby. Even poor-quality excavation recovered significant amounts of early medieval material, though its context remains difficult to interpret.

In spain, the study of medieval archaeology was largely architectural, such as Asturian, Visigothic, and Mozarabic buildings of various kinds. Later medieval studies of castles and churches were also carried out. In Bohemia, the Benedictine abbey on Ostrov Island in Prague was excavated by Davle. A study of castles was carried out by the architect G. Fischer for Norway, and work began on the Prague castle, which has been continuously investigated since 1925. British official interest in recording archaeological and architectural heritage was reflected in the establishment of royal commissions for England, Wales, and Scotland, and county volumes appeared steadily after 1908.

The discovery of timber buildings through the identification of postholes by Carl Schuchhardt in the first decade of the twentieth century would lead in due course to tremendous changes in research interests and interpretation, but at the time, such discovery was not widely appreciated. The first large-scale excavation of a medieval settlement was in the 1930s when P. Grimm excavated Hohenrode, in Germany, which was occupied from the tenth to the fourteenth centuries a.d. The resulting wide-ranging report indicated the potential of such studies, but the excavation was not emulated. Rescue excavations on Frankish settlements included Gladbach and an Alemannic settlement at Merdingen, in Germany. One of the great discoveries of the period was that of the Viking Oseberg ship and its contents in Norway in 1904.

There was some important academic consolidation, and some important museum studies were undertaken on the collections assembled during the nineteenth century. Notable examples of such work for early medieval material include the typological classification of Germanic art styles by B. Salin, typologies of Anglo-Saxon brooches by. E.T. Leeds, and corpora of Viking material across Europe by Shetelig. Work on classification was stimulated and continued, with coin-dated Austrasian material published by Werner. Cemetery evidence was dominant, and it was often used to indicate settlement patterns, with variables of time, space, and ethnicity. Examples include K. Schuhmacher for the Rhineland and Leeds for England. The possibility of understanding Slavic material culture was appreciated by L. Niederle, who published a series of volumes on such evidence over a period of fifteen years. Later medieval artifact studies developed in some areas at this time, such as on Bohemian ceramics and on a range of finds in London, which were cataloged and published extensively for the first

time.

Urban archaeology continued at Lund, Sweden, but the efforts in this city were not emulated elsewhere. Instead, evidence was collected by amateurs, often local government officials, clergymen, or architects. Such piecemeal recording

was widespread in Scandinavia, examples being the work of O.A. Digre, who examined many development sites in Trondheim, Norway, and P. Fardelin, who did the same on the island of Gotland, Sweden. Research excavations by H. Jankuhn began at Hedeby, in southern Denmark, in the 1930s and was continued after World War II.

A range of specialities developed during this period. These are most obvious in early medieval archaeology, where subdivisions based on regional and chronological units, often linked to ethnic groups, were established. These still continue to this day, and since World War II have been supported by specialist societies or conferences, which may also incorporate multidisciplinary work by literary, toponymic, historical, and art history scholars.

Post-World War II Expansion

The massive urban destruction in many parts of Europe during World War II resulted in an unrivaled opportunity to examine urban evidence for medieval towns, though the possibility was not always seized with great enthusiasm. Great progress was made in northern Europe and to a certain extent in Britain, but in other countries, such as France, rebuilding took place without excavation. It was in this period that the full potential of urban archaeology began to be realized, although often the organizational structure and methods of funding were adequate in only a few regions. Elsewhere much evidence was lost, but at least the loss was noted, and in subsequent decades better facilities could be established for urban excavation.

In eastern Europe, state archaeological services were founded that accepted the importance of medieval archaeology. Each country established an academy of sciences, and within such a framework research programs were established and linked to nationalist and political themes. These included examination of the great Moravian state in Czechoslovakia and the Old Russ in Russia. In Poland, a center for the study of the Polish state was established in 1948, and about a third of all excavations in that country up to the mid-1960s were on medieval sites. The massive destruction of Warsaw and many trading cities on the Baltic coast gave opportunities for excavation before reconstruction or redevelopment.

In Britain, a pressure group called Rescue lobbied for excavation on many threatened medieval sites, and the importance of urban archaeology was highlighted by Carolyn Heighway. Excavations of the city of Winchester by Martin Biddle of the University of Pennsylvania were influential in Britain and some areas of Europe for indicating the potential for large open-area excavation in towns and for the examination within one town of various elements that, together, allowed for overall urban development to be understood within a historic framework. Methodological developments such as the design of recording forms and the elaboration of the Harris matrix for the elucidation and display of stratigraphic sequences also had widespread repercussions for medieval archaeology and beyond.

In France, the University of Caen has been the leading academic center for medieval archaeology, particularly through its Medieval Research Center, established in 1951 by Michel de Bouard. It has stimulated a number of initiatives, including biennial Chateau Gaillard conferences on castles, studies of pottery production, and urban archaeology. It was through the center that the journal *Archéologie Medievale* was first published in 1971.

Castle excavations have continued, and in Germany information concerning significant assemblages of pottery and other finds began to be published in the 1960s; previously only architectural details and sequences of structures had received much attention. In England, the origin of earthen castles was the focus of a concerted research campaign in the 1960s, and a similar study was undertaken in Northern Ireland. Castles of native princes have more recently been subjected to excavation in Wales to

complement the already extensive studies of those built by the English. The changing interests and priorities of castle archaeology can be appreciated on a European level through *Château Gaillard*, the proceedings of the conference held every two years since the 1960s.

It was not until the beginning of the 1950s that rural medieval archaeology developed in

any significant way, and this interest was inspired by the development of open-area settlement excavation in Denmark by Hatt and Steensberg. In England, the fieldwork identifying medieval villages as earthworks by Maurice Beresford was a vital step, and it was consolidated by a long-term research project at Wharram Percy by Beresford and John Hurst. Partly because of this work, the Medieval Village Research Group was established, and it was followed by the Moated Sites Research Group. The recognition of other forms of medieval settlement in the countryside led to the eventual merger of the two groups to form the Medieval Settlement Group.

From a British origin, such special interest groups have taken on a wider European dimension, and their annual reports have included frequent short reports and some longer papers on Continental material. One of the landmarks of medieval archaeology was the establishment of the Society for Medieval Archaeology in England in 1956 and the publication of the first volume of its journal, *Medieval Archaeology*, the following year. The European scale of medieval archaeology was indicated by a conference held at Rotterdam in the Netherlands in 1966, and a review of urban archaeology was later distilled at an Oxford, England, conference in 1975; the proceedings of both conferences were subsequently published and had considerable impact.

Early medieval studies continued have an ethnic basis, but social questions began to be considered and grave goods were used to establish patterns of ranking. The use of documentary sources to provide a social structure expected in the burial finds was widespread. An early example was W. Veeck in the 1930s, but most studies were undertaken in the 1960s and 1970s by R. Christlein and H. Steuer in Germany and J. Shepherd and C. Arnold in England. In eastern Europe, the role of the Slavs was a major early medieval theme, one that combined both burial and settlement archaeology. The International Union of Slavonic Archaeology was established in 1965 at Warsaw, and subsequent conferences have been held every five years in other cities in eastern Europe.

Typological studies continued for the early medieval material, with examples including the K. Böhner refining chronologies for the Trier region in Germany and sir john myres's extensive studies of Anglo-Saxon cremation urns. Early medieval cemetery studies have also developed with greater care and consideration being given to skeletal remains, other evidence from the graves and their fills, and structural features around the graves. Cremation cemeteries have also been studied with regard to cremation pyres and the cremated remains within the vessels. Several major rich burial sites were excavated during the twentieth century under high-quality archaeological conditions. Two Frankish graves were recovered from under Cologne Cathedral in Germany and one from Saint-Denis in France, all in 1959. The boat burial and impressive assemblage of artifacts from Mound 1 at sutton hoo were recovered in 1939, and there were further archaeologically significant but less spectacular findings at the site in the 1980s and 1990s.

Recent Developments

Medieval archaeology has continued to expand across Europe, although the amount of rescue excavation has often declined as planning procedures have reduced the amount of destruction. Moreover, a reduction of state funding, replaced by developer funding, has meant that mitigating strategies are often favored by developers. A trend for conservation that started in Britain has now spread to Scandinavia and is becoming increasingly favored in other areas. In contrast, the study of standing remains in a fully archaeological sense has become far more important.

The application of scientific methods in medieval archaeology has been rapid in recent decades. For some early medieval archaeological sites radiocarbon dating offers some potential, although in most situations its precision is too crude to improve on artifactual dating. More success has been obtained

with archaeomagnetic dating, and dendrochronology has been of particular importance. The latter has been applied to structural timbers in standing buildings and in waterlogged situations such as wrecks and waterfronts, and the method has provided dates similar in precision to those in

documented sources across much of northern and western Europe. In ceramics, the use of thin sections has been effective in identifying clay sources and trade patterns, and x-ray florescence and other analytical techniques have also been applied.

In some regions and countries, medieval archaeology has only developed as an activity with a separate identity in recent decades. A good example of this is Italy, where apart from nineteenth-century interests associated with major ruins, the Roman past was the dominant concern. The full development of medieval archaeology there has come about through a few significant academics and opportunities for rescue archaeology, and the publication of the national periodical *Archeologia Medievale* since 1974 has provided a vehicle for much innovative and important work. An even later start can be identified in Spain. Although some aspects were developed in the early part of the century, it was the foundation of the Spanish Association of Medieval Archaeology in 1980 that defined the subject, with *Acta Medievalia* being published from that year. Since 1985, a biennial conference has been held in Spain, and *Boletin de Arqueologia Medieval* has appeared since 1987.

The increasing European identity of medieval archaeology, confidence in its intellectual integrity, and the development of wide-ranging research themes have been manifested by several relatively recent developments. One initiative was the establishment of the European Symposium for Teachers of Medieval Archaeology, first held in Lund, Sweden, in 1990 and held regularly since. Another was the innovative international conference Medieval Europe held in york, England, in 1992. With a series of seven parallel thematic sessions, each headed by keynote papers, case studies and overviews were offered from all over Europe. A subsequent medieval Europe conference was held in Bruges, Belgium, again with major thematic strands, and it demonstrated the expanding and increasingly sophisticated nature of medieval archaeology.

As yet there is no substantial Europe-wide synthesis of early or late medieval archaeology, and even national syntheses have only recently appeared in a few countries. Medieval archaeology is a young aspect of archaeology in its present form, and a great deal was achieved in the last half on the twentieth century, but it is in the twenty-first century that it will mature into a coherent and fully confident section of the discipline.

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Melanesia

See Papua New Guinea and Melanesia

Mercati, Michele

(1541-1593)

Although Greek and Roman writers had been aware that some people had made and used stone tools, this knowledge was lost during the Dark Ages after the fall of Rome. It was rediscovered during the Renaissance as scholars began to have access to ancient documents and to question medieval oral and written knowledge.

Michele Mercati was superintendent of the Vatican Botanical Gardens in Rome and physician to Pope Clement VII. He also created one of the first mineralogical collections in Europe, which distinguished between minerals and metals in its display. A contemporary of the antiquarians william camden, johan bure, and ole worm, Mercati was interested in new interpretations of evidence rather than the acceptance of traditional explanations of it. And like them, too, he was interested in chorology and geography.

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In 1570, Mercati wrote *Metallotheca Vaticana, opus posthumum,* in which he argued that before the use of iron, stone tools might have been made out of flint to be used "in the madness of war." Mercati believed that fossils were organic in origin and that many of the flints called *ceraunia,* or "thunderstones," had been fashioned by hand and not by natural forces such as lightning. He cited biblical and classical sources, such as Lucretius, for the use of stone tools. In making these arguments he would have been familiar with the ethnographic specimens from the New World sent as presents to the vatican.

Mercati's ideas were not accepted by the learned world, and his book was not published until over 100 years after his death. Its appearance prompted the French scholar Antoine de Jussieu to write a paper to the Académie des Sciences on the possible human origins of stone tools and ethnographic comparisons in 1723. Mercati's ideas were echoed by English aniquarians william dugdale in the seventeenth century and john frere in the late eighteenth century.

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Mesoamerica

Coined in 1943 by the scholar Paul Kirchoff, the name *Mesoamerica* is used to describe the culture area of the ancient civilizations of central and southern mexico and northern Central America. The name was partly based on analogy with the term *mesopotamia*, since the geographic region involved lies between the great landmasses of North and South America.

Mesoamerican Archaeological Sites

More than a geographic entity, however, Mesoamerica was a cultural entity. The peoples inhabiting the area shared a great many cultural traits that very clearly separated them from the peoples to their north and south. These traits included subsistence based on agriculture (the Mesoamerican cultigens maize, beans, and squash being the most important crops); cities with ceremonial precincts containing temple-pyramids; a fatalistic religion with a largely shared cosmology and pantheon of gods; the practice of human sacrifice; a ritual calendar of 260 days; and a ballgame played with a solid rubber ball.

Although Mesoamerican cultures shared many cultural traits, there were also differences among them. First and foremost of these differences was language: dozens of different languages were spoken by the various peoples of Mesoamerica, including Nahuatl (the language

of the aztecs), about thirty different Mayan languages, the Zapotec and Mixtec languages of Oaxaca, and the Tarascan or Purépecha spoken in western Mexico.

The olmecs, who flourished between about 1200 and 400 b.c., are considered to have had the first complex society in the area, and it appears that they developed many of the cultural patterns that later became the hallmarks of Mesoamerican civilization. Other Mesoamerican groups adopted these patterns, adding their own distinctive characteristics.

Peter Mathews

See also

Belize; Guatemala; Maya Civilization

Mesolithic Europe

See Europe, Mesolithic

Mesopotamia

History of Excavation

The origins of Mesopotamian archaeology lie in nineteenth-century adventurism, tempered by the practical intelligence and broad learning that was the Victorians' defining hallmark. A handful of intrepid travelers (notably Pietro della Valle, L'Abbé de Beauchamp, and Karsten Niebuhr) had ventured through Mesopotamia in earlier centuries, stopping at nineveh, Babylon, and other sites whose identification survived in local folklore. Some brought back occasional inscriptions and other artifacts but, despite legends of buried treasure, none attempted any significant excavations.

A major turning point came in the first decades of the nineteenth century when Babylon, Nineveh, and a number of other Mesopotamian sites were systematically inspected and surveyed by Claudius Rich, a talented linguist who was the East India Company's resident in Baghdad (in what is now Iraq). Rich's accounts of his discoveries (1813, 1818, 1836, and 1839), and the collection of his finds bought by the british museum in 1825, inspired the first generation of Mesopotamian explorers. First in the field were the French, under paul-émile botta, who after brief soundings at Nineveh in December 1842 spent two seasons (1843-1844) excavating the Palace of Sargon II at Khorsabad (ancient Dur Sharrukin), the third of four Assyrian capitals (the others being Ashur, Kalhu [nimrud], and Nineveh). Botta was relatively well financed by the louvre Museum and approached his task with the discipline of a trained surgeon and naturalist, although not yet with any understanding of the principles of stratigraphy. Botta was succeeded by Victor Place, who led from 1852 to 1854.

The first British excavations were made by austen henry layard, who had set out overland from England in 1839 intending to reach Ceylon, but having been captivated by the Assyrian sites resolved to stay and dig. Eventually gaining the financial support of the British ambassador in Istanbul, Sir Stratford Canning, Layard, aged only 28, began excavating at Nimrud (ancient Kalhu, which he believed to be Nineveh) in November 1845. There he immediately came upon the palace of the ninth-century b.c. Assyrian King Ashurnasirpal II. During the next eight years Layard and his assistant Hormuzd Rassam uncovered no less than eight royal palaces, as well as temples and other imposing structures, whose sculpted bas-reliefs, ivory carvings, and cuneiform tablets (written in the then-still-undeciphered Assyrian language) were a revelation to Victorian Britain, whither the major finds were shipped.

Layard's priorities, as prescribed by the British Museum, were “to obtain the largest possible number of

well-preserved objects at the least possible outlay of time and money." His method was equally direct: he dug trenches along the sides of the palace rooms to expose the whole of the carved stone slabs without removing the earth from the center. Consequently few of the chambers were fully explored and many small objects and other evidence were left or lost. There was no recognition in this method of the stratigraphic principles-rudimentary as they still were-now beginning to be observed in the excavation of European prehistoric sites. It did however provide enough trophies of art (including some three kilometers of sculpted wall reliefs), architecture, and inscriptions to sustain the British Museum's grudging and inadequate support.

The initial phase of Assyrian excavation by

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The origins of Mesopotamian archaeology lie in nineteenth-century adventurism, tempered by the practical intelligence and broad learning that was the Victorians' defining hallmark. A handful of intrepid travelers (notably Pietro della Valle, L'Abbé de Beauchamp, and Karsten Niebuhr) had ventured through Mesopotamia in earlier centuries, stopping at nineveh, Babylon, and other sites whose identification survived in local folklore. Some brought back occasional inscriptions and other artifacts but, despite legends of buried treasure, none attempted any significant excavations.

A major turning point came in the first decades of the nineteenth century when Babylon, Nineveh, and a number of other Mesopotamian sites were systematically inspected and surveyed by Claudius Rich, a talented linguist who was the East India Company's resident in Baghdad (in what is now Iraq). Rich's accounts of his discoveries (1813, 1818, 1836, and 1839), and the collection of his finds bought by the british museum in 1825, inspired the first generation of Mesopotamian explorers. First in the field were the French, under paul-émile botta, who after brief soundings at Nineveh in December 1842 spent two seasons (1843-1844) excavating the Palace of Sargon II at Khorsabad (ancient Dur Sharrukin), the third of four Assyrian capitals (the others being Ashur, Kalhu [nimrud], and Nineveh). Botta was relatively well financed by the louvre Museum and approached his task with the discipline of a trained surgeon and naturalist, although not yet with any understanding of the principles of stratigraphy. Botta was succeeded by Victor Place, who led from 1852 to 1854.

The first British excavations were made by austen henry layard, who had set out overland from England in 1839 intending to reach Ceylon, but having been captivated by the Assyrian sites resolved to stay and dig. Eventually gaining the financial support of the British ambassador in Istanbul, Sir Stratford Canning, Layard, aged only 28, began excavating at Nimrud (ancient Kalhu, which he believed to be Nineveh) in November 1845. There he immediately came upon the palace of the ninth-century b.c. Assyrian King Ashurnasirpal II. During the next eight years Layard and his assistant Hormuzd Rassam uncovered no less than eight royal palaces, as well as temples and other imposing structures, whose sculpted bas-reliefs, ivory carvings, and cuneiform tablets (written in the then-still-undeciphered Assyrian language) were a revelation to Victorian Britain, whither the major finds were shipped.

Layard's priorities, as prescribed by the British Museum, were “to obtain the largest possible number of

well-preserved objects at the least possible outlay of time and money." His method was equally direct: he dug trenches along the sides of the palace rooms to expose the whole of the carved stone slabs without removing the earth from the center. Consequently few of the chambers were fully explored and many small objects and other evidence were left or lost. There was no recognition in this method of the stratigraphic principles-rudimentary as they still were-now beginning to be observed in the excavation of European prehistoric sites. It did however provide enough trophies of art (including some three kilometers of sculpted wall reliefs), architecture, and inscriptions to sustain the British Museum's grudging and inadequate support.

The initial phase of Assyrian excavation by

of Babylon's earlier grandeur, when it was the capital of the dynasty of Hammurabi in the eighteenth and seventeenth centuries b.c.

After an exploratory season in 1884, the first major American excavations began under H.V. Hilprecht, J.P. Peters, and J.H. Haynes at the Sumerian cult center of Nippur in 1887 and continued intermittently up until the 1980s. The thousands of texts from this site, mostly school exercises in Sumerian, form the backbone of our knowledge of Sumerian literature. Four Sumerian and Akkadian sites of the third and second millennia b.c. were excavated in the Diyala region in the 1930s by a Chicago expedition under henri frankfort, whose close analysis of the ceramic typology and glyptic and sculptural art found formed the basis of the first systematic periodisation of third-millennium Mesopotamia (1929, 1931).

A hiatus in excavation during World War I was followed by the creation of the nation of Iraq and the establishment of a department of antiquities under gertrude bell. Expeditions returned to earlier Assyrian (Khorsabad, Nineveh) and Sumerian (Tello, Kish, Jemdet Nasr, Fara) excavations, and started at many new sites. The most important of these was the joint U.S.-British expedition (1922-1934) under c. leonard woolley to the Sumerian city of Ur. This was the first British expedition to emulate the care and precision of the Germans, to which Woolley added his own talent for inspired improvisation (as in his use of plaster to recover the forms of perished wooden objects). Woolley recovered important remains of Neo-Babylonian and Isin-Larsa period housing, and established a deep stratigraphical sequence for early Sumer, but the most celebrated finds then and since were the richly furnished “Royal” Tombs of ca. 2600 b.c. (in fact probably priestly burials). This was the first and only time Mesopotamia has yielded “treasure” that ranks in the popular conception with the finds of Bronze-Age Greece and Egypt. Woolley's excavations at nearby al-Ubaid (1923- 1924) recovered evidence of the earliest (fifth millennium b.c.) settled presence in the alluvium, known since as the Ubaid culture.

The period up to World War II also saw an expansion of activity in the hilly uplands surrounding the Tigris-Euphrates valleys at sites like Tepe Gawra, Tell Brak, Arpachiyeh, hassuna, Samarra, and Tell Halaf, where rain-fed agriculture had supported pre-Ubaid village communities. Continuing discoveries in this “fertile crescent” (extending beyond Mesopotamia from Palestine through Syria and Turkey and down western Iran), especially by American archaeologist robert braidwood in the 1950s at jarmo, have documented this region's crucial role in the early domestication of plants and animals, and, at some Samarran sites, early irrigation. Evidence of Paleolithic activity in the Kurdish mountains was found in the 1920s by English archaeologist dorothy garrod.

The broad chronological and cultural outlines of Mesopotamian archaeology having now been defined, the period after World War II saw a proliferation of excavation at sites of nearly all periods and regions, some continuing long-established expeditions (Uruk, Nippur), others recommencing at earlier excavations (Tell Brak, Nimrud, Sippar, Babylon), and others starting on new sites. In the 1970s and 1980s a large number of rescue excavations were undertaken in areas designated for flooding by the Hamrin, Haditha, and Eski Mosul dams in Iraq (and for dams in Syria and Turkey), some with startling results. The German and Dutch excavations at Habbuba Kabbira and Jebel Aruda in Syria uncovered hitherto-unsuspected outposts of early Sumerian culture (“colonies”) along the Upper Euphrates. Survey and limited excavation along the Arabian side of the Gulf from the 1950s on has indicated an Ubaid-period Mesopotamian presence (fifth millennium b.c.) along this littoral, a prelude to the well-documented Gulf trade with Meluhha (Indus Valley) of the third through the second millennia b.c. A number of area surveys of Babylonia by American archaeologist robert mccormick adams in the 1960s and 1970s illuminated demographic patterns that have had a significant impact on models of early state development.

Intellectual History

The great popular and scholarly interest in Mesopotamian archaeology in the nineteenth century was sustained both by the historical-scientific

impact on the field. More inhibiting have been a variety of internal factors, in particular ignorance of key aspects of how art was conceived and made in Mesopotamia: the lack of virtually any basis for attributing works to individual hands or names, which has forced the reconstruction of broader styles, schools, and traditions; ignorance of the functional priorities of the artist (ritual, propagandistic, apotropaic, etc.) vis-à-vis any artistic/aesthetic ambitions; ignorance of the degree of artistic latitude allowed to artists (minimal?); ignorance of the aesthetic and other categories in which they conceived the success or failure of a work of art (an area now being profitably investigated by I. Winter); and, perhaps most compromising of all, an inability in most contexts to define criteria for distinguishing conscious difference of style from unintentional difference of quality (or conception or execution). This leads to arbitrary and subjective value judgments, as in the common postulate of "crude" or "schematic" styles, when it is not clear that style is involved at all, but rather competence.

Gold helmet, Mesopotamia, ca. 2500 B.C.

(Image Select)

Most of what goes under the name of art history in Mesopotamian studies has been in the nature of iconographical and typological analysis, often with a view to defining period, cultural, ethnic, or regional styles, and thence to tracing patterns of influence and diffusion. Under the circumstances this is often all that can be done, and it has yielded many significant results. But it is considerably coarser-grained and often more speculative than art history in the sense that this discipline is generally understood.

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See also

Bell, Gertrude

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Mexico

Archaeological research in Mexico has a long, complex history covering over 150 years and the careers of hundreds of archaeologists. Part of this history has been summarized in fairly recent surveys (Bernal 1979; García Mora et al. 1987-1989; Willey and Sabloff 1980), but much of it remains to be written. This article examines some of the central developments in Mexican archaeology with an emphasis on the work since 1940 when the quantity and types of investigations increased at an accelerated pace.

The evolution of Mexican archaeology as a scientific discipline generally has been closely

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connected with the development of archaeology and anthropology in the rest of the world and with specific processes in the historical, political, and social configuration of Mexico. During the twentieth century, archaeology related directly to the political and ideological needs of the Mexican national state. Starting with the dictatorship of Porfirio Díaz, which was ended by a revolution in 1911, and continued by subsequent postrevolutionary movements, the monuments of the pre-Hispanic peoples have been utilized as an ideological base for an ethnic and cultural identity to fortify the growing nationalist sentiments needed by the new groups in power. Since the nineteenth century, Mexican nationalist governments have promoted a series of laws and regulations to conserve and protect historical and archaeological patrimony, and these laws and regulations were truly advanced for the time. The first of these, a law prohibiting the export of antiquities, dates to 1827, shortly after Mexico's independence from Spain.

Nationalist movements have largely determined and defined one of the major traditions of archaeological research in Mexico: archaeology centered on the exploration, restoration, and reconstruction of ancient buildings and monumental sites or "zones." This tradition started at the end of the nineteenth century, and although there have been changes in key concepts, techniques, and goals, it is still the major type of archaeology today, stimulated and maintained by the state because of the political and ideological functions of archaeological monuments.

The Beginnings of Archaeology in Mexico

The beginning of archaeology in Mexico can be divided into two periods: the first starting around 1840 and ending in 1880; the second extending between 1880 and 1910, during which time there was a notable increase in the number of scholars interested in the pre-Hispanic cultures of Mexico.

The most influential scholarly work that mentioned ancient Mexico and was published before the first initial period were the studies of the naturalist and philosopher Alexander von Humboldt (1814). Other important contributions were the books recording visits to maya ruins written by john l. stephens (1841) and illustrated by frederick catherwood. These do not indulge in speculations typical of the time proposing migrations of peoples from the Old World to explain the origins of American civilizations. Both Stephens and Catherwood attributed the ruins of Yucatán, Chiapas, and Central America to the ancestors of the contemporary Maya, and this conclusion helped change the interpretations of many scholars in the Americas and Europe concerning the cultures of pre-Hispanic Mexico.

Between 1840 and 1870, the French priest Abbé Brasseur de Bourbourg established himself as the first general Mesoamericanist. His contributions were mainly in linguistics and ethnohistory, but he also advanced archaeological knowledge considerably through his effort to establish ties between contemporary indigenous peoples and pre-Hispanic cultures using Spanish colonial documents and native histories from the sixteenth century. He learned several Maya languages, made some of the first attempts to translate Maya hieroglyphs, and edited the first published edition of the *Popol Vuh* (the most important surviving Maya epic cycle). He also discovered and edited an encyclopedic sixteenth-century account by Bishop Landa of Maya culture in Yucatán at the time of the Spanish conquest. The Landa manuscript contains descriptions of some of the hieroglyphs that eventually made possible the first successful phonetic translations of ancient Maya writing.

During the same period, early syntheses of ancient highland Mexican history were made by Garcia Icazbalceta and Orozco y Berra. Their work is especially important because, in some cases, it is based on native codices and other original manuscripts that have since disappeared. In 1858, the geographer García Cubas published a geographical and statistical atlas of Mexico that included a number of archaeological sites, and in the 1870s, he produced important descriptions of teotihuacán and Tula.

The French archaeologist-explorer Désiré Charnay arrived in Mexico in 1858 and continued his investigations there until the 1880s. His contributions include the introduction of photography to record monuments in the Maya area

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of codices, religions, and calendars are classics (Coe 1993). Seler made numerous field trips to Mexico and Central America and published descriptions of sites and monuments in regions as diverse as guatemala, Chiapas, Oaxaca, Los Tuxtlas (Veracruz), and Zacatecas, among others. His study of the areas influenced by the major city of Teotihuacán, based mainly on the analysis of museum collections, was the direct precursor for the concepts of cultural unity that would be used to define Mesoamerica (Bernal 1979, 142). Seler knew several of the major pre-Hispanic languages and also made key contributions in ethnology and ethnohistory.

The Expansion of Mexican Archaeology

In 1911, at the beginning of the armed conflicts of the Mexican Revolution, the Escuela Internacional de Arqueología y Etnografía Americana (International School of American Archaeology and Ethnography) was founded in Mexico City. On the basis of agreements between the Mexican government and universities and museums in Germany, France, and the United States, the school functioned as a research institute. Even though it existed formally only until 1920, the institute's activities were of such importance that its foundation clearly marked a new period in the development of Mexican archaeology. Directors included some of the greatest anthropologists in the Americas-Eduard Seler, Franz Boas, Alfred Tozzer, and manuel gamio-and the programs were truly anthropological, with important studies in ethnology and linguistics in various regions of Mexico, despite the violence of the revolution (Rivermar 1987). Heroic linguistic investigation was done by Boas (1917) in studying speakers of archaic Nahuatl (the language spoken by the Aztecs) in the remote Oaxaca coastal town of Pochutla, but such work may have been routine for a man who was studying the Eskimos of central Greenland in the 1880s.

The school's central contribution to archaeology was the introduction of stratigraphic excavations in Mexico. In 1912, Gamio conducted a series of stratigraphic excavations at San Miguel Amantla (Azcapotzalco), which provided the basis for the first ancient culture sequence in the basin of Mexico. Boas and Gamio also extensively studied the collections of the national museum from sites in the basin of Mexico and published a catalog based on this work. Tozzer excavated Teotihuacán-period residences at Santiago Ahuizotla in the west-central basin near Azcapotzalco and identified a new ceramic complex called Coyotlatelco. It was eventually shown that this complex was part of a cultural tradition that appeared between the collapse of the Teotihuacán state and the rise of the Tula.

The sequence for the basin of Mexico proposed by the members of the International School consisted of three different cultures: archaic (which is now called formative), Toltec (related to the culture of Teotihuacán), and aztec. This chronological framework was partially modified by Alfred Kroeber in 1925, and in 1938, George Vaillant, on the basis of numerous stratigraphic excavations, published a more detailed chronology. The cultural sequence for the basin that is currently used was formulated by Pedro Armillas in 1950 on the basis of excavations at Teotihuacán along with the investigations of Vaillant and Sigvald Linne and the work of Acosta at Tula. Despite these modifications, it is fair to state that the investigations of the International School correctly identified the principal cultures of the basin of Mexico in the proper chronological order.

The outstanding figure in Mexican archaeology during the revolution and the decade of the 1920s was Manuel Gamio (González Gamio 1987), who had been one of Boas's students at Columbia University in 1910-1911. Gamio was the last director of the International School, and between 1917 and 1922, supported by funds from the Mexican government, he planned and directed the first multidisciplinary anthropological project in the Americas on the population of the Teotihuacán Valley. The program comprised archaeology, ethnography, demography, geology, and environmental and agricultural studies and investigated the people of the Teotihuacán Valley from pre-Hispanic times to the twentieth century. The project's findings were published in five volumes, and it was one of the most successful large-scale

anthropological projects ever attempted, with a very advanced level of research for its time. The project's most important

dates established the first absolute chronology in Mesoamerica, and the projects of Maudslay, Maler, Morley, and others who discovered and recorded a preliminary corpus of Maya inscriptions made possible the subsequent breakthroughs in the deciphering of this writing system.

Consolidation

In some ways, the 1940s constituted a period of consolidation and critical reviews of previous investigations in Mexico. During the second half of the decade, however, a series of projects began that had new kinds of objectives and new fields of study.

In 1940, the social anthropologist Clyde Kluckhohn published a severe criticism of archaeological investigation in Mexico and Central America. He was especially critical of the tendency of archaeologists to study pre-Hispanic cultures in terms of isolated elements such as architecture, ceramics, and inscriptions, and he argued that there was little commitment to produce syntheses concerning the totality of a culture similar to the analyses that ethnologists were making of living peoples. These criticisms were expanded and essentially codified by his archaeologist student walter taylor (1948), whose work was a forerunner of some of the concepts "the new archaeology" of the 1960s. Pedro Armillas similarly criticized traditional Mesoamerican archaeology in Mexico during the same period.

The 1940s began with debates among archaeologists concerning two poorly understood cultures: the Toltecs and the Olmec. The Toltecs were mentioned in many pre-Hispanic chronicles as the ancestors of the Aztecs and some other peoples. Their empire, which was said to have reached its apogee during the tenth or eleventh century a.d., had its capital city called Tula, or Tollan, somewhere in the central highlands. Charnay (1885) and others had proposed that the center called Tula in the state of Hidalgo was the legendary Tollan, but many early-twentieth-century archaeologists, including Gamio and Vaillant, thought that Teotihuacán was the Toltec capital.

In 1941, the distinguished ethnohistorian Jiménez Moreno had analyzed the place-names and geographical regions mentioned in the chronicles concerning the location of ancient Tollan and had showed that most of the places were clearly identified with the area of Tula, Hidalgo. In 1940, with the support of the newly founded National Institute of Anthropology and History, Jorge R. Acosta began the first of nearly twenty archaeological field seasons at Tula, and the first roundtable conference of the Mexican Society of Anthropology was organized the next year with Tula and the Toltecs as its theme. Over thirty archaeologists discussed the significance of the findings of Jiménez Moreno and Acosta and concluded that Tula, Hidalgo, was the Tollan described in the chronicles of central Mexico.

The Olmec were the subject of the second roundtable conference of the Mexican Society of Anthropology, held in 1942 with Caso, M. Stirling, M. Covarrubias, and Jiménez Moreno as key participants. Discussions centered on Stirling's recent investigations of Olmec centers in Veracruz and Tabasco, especially his discovery of Stela C at Tres Zapotes, Veracruz, which had an inscribed date corresponding to 32 b.c. The iconographic studies of Caso and Covarrubias, and the ethnohistorical syntheses of Jiménez Moreno, all presented cases for the great antiquity of the Olmec. On the basis of these investigations, the majority of the roundtable participants concluded that, as Caso had proposed, the Olmec were "the mother culture" of Mesoamerican civilizations such as the classic Maya, Teotihuacán, and Zapotecs of Monte Alban. The chronological placement of the Olmec was debated until the 1950s when radiocarbon dating showed that this culture existed at least as early as 1000 b.c., during the formative period.

During the 1940s, many Mayanists, including Morley and Thompson, did not accept that the Olmec were older than the Maya of the classic period (a.d. 300-900). In 1941, Thompson published a

complex analysis that tried to demonstrate that the Olmec were a postclassic culture of the fourteenth or fifteenth century a.d. Stirling continued excavating Olmec sites during the 1940s at La Venta, Tres Zapotes, and San Lorenzo, and Covarrubias (1943, 1946a, 1946, 1949) excavated Tlatilco in the basin of Mexico where he found evidence for the early

without much historical content. The importance of Knorosov's phonetic analyses was not fully accepted until nearly twenty years later.

Major projects along the Gulf coast of Veracruz and Tabasco included García Payón's excavations at El Tajin and Zempoala and his surveys in various regions (1954, 1955). Medellín Zenil established ceramic sequences in the Totonicapán and other areas of south-central Veracruz (1953, 1960), and in extensive excavation at La Venta, Tabasco, by Drucker, Heizer, and Squier 1959) many offering and monuments were uncovered. This work obtained the first radiocarbon dates for the Olmec culture, placing it tentatively between 1000-400 b.c., thus confirming the Olmec chronology proposed by Caso and Covarrubias.

In the Valley of Oaxaca, Bernal and Paddock excavated various centers as part of the investigation program for the newly founded Universidad de las Americas, and in the basin of Mexico, Piña Chan excavated formative sites while investigating some of the problems relating to early cultures there that had previously been defined by Vaillant, Noguera, and Covarrubias. In surveying the northern basin, Tolstoy (1958) refined ceramic typologies for some phases of the classic and postclassic periods, and Sejourné (1959) made controversial nonstratigraphic excavations in Teotihuacán that uncovered many murals and provided information concerning the planning and internal structure of residential buildings.

Richard MacNeish's (1958) project in Tamaulipas in northeastern Mexico was significant because it attempted to investigate the early domestication processes for basic food plants such as maize and beans, a problem MacNeish would study more thoroughly later in his multidisciplinary project in the Tehuacán Valley.

The 1950s produced some ambitious general syntheses of Mesoamerican archaeology. In Marquina's (1951) encyclopedic study of pre-Hispanic architecture, still an indispensable work in Mesoamerican studies, he cited and analyzed numerous unpublished reports from the archives of the Department of Pre-Hispanic Monuments in enriching his coverage of poorly known cultures and regions. Two book-length essays on cultural definitions of Mesoamerica were published by Olivé (1958) and Piña Chan (1960).

Contemporary Mexican Archaeology

Most of the concepts and theories currently in use by Mesoamerican archaeologists emerged, close to their present form, during the 1960s and 1970s. In some cases, the theoretical and methodological goals of new projects are so ambitious that there are lapses of as much as ten to twenty years between the beginning of fieldwork and the publication of the detailed “final reports.”

Mexican archaeology experienced some radical changes during the 1960s with numerous debates concerning the validity of the theory, methods, and objectives of traditional archaeology. Some of the debates were influenced by the development of “the new archaeology” in the United States, especially by the ideas and theories of lewis binford. Among younger Mexican archaeologists there was an even stronger interest in Marxism and the use of historical materialism to study social process and attempt to discover general “laws” of social development. This shift toward Marxism was part of a much larger intellectual and political process that eventually resulted in the student movement of 1968 that changed key aspects of the contemporary Mexican political system. So far, the best Marxist analyses have been produced by social anthropologists such as Bonfil and Olivera, and although numerous archaeological projects have used Marxist interpretive frameworks, no rigorous materialist syntheses have appeared similar to the ones that Childe produced for ancient peoples in the Old World. Some of the best materialist studies using archaeological and ethnohistorical data concern the development of social

stratification and state-level societies (Batra 1969; Carrasco, ed., 1976; Carrasco and Broda 1978).

Starting in the 1960s, the National Institute of Anthropology and History steadily grew and diversified, and there was a considerable increase in the number of archaeologists on its staff. Laboratories for geological, biological, and ecological analyses were set up in the Department of Prehistory, and the Departments of Salvage Archaeology and Subaquatic Archaeology

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Minoan Civilation

See Evans, Sir Arthur; Knossos; Linear A/Linear B

Moche

Moche is the name of the dominant culture on the north coast of peru from the first to the seventh centuries a.d., known as the early intermediate period. The culture was first identified in the Moche Valley and was centered on the

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Minoan Civilation

See Evans, Sir Arthur; Knossos; Linear A/Linear B

Moche

Moche is the name of the dominant culture on the north coast of peru from the first to the seventh centuries a.d., known as the early intermediate period. The culture was first identified in the Moche Valley and was centered on the

large pyramid sites of huaca del sol and Huaca de la Luna. During the course of Moche history, a distinctive pottery style developed, one that emphasized accurate observation of everyday life. Moche culture was also rich in other areas of the decorative arts.

A typical Mochica pottery effigy jar picturing a mother and child

(Burstein Collection/Corbis)

Uncertainty still surrounds the political organization of the Moche culture, which appears to have been based around social stratification. The erection of large pyramids, first at Huaca del Sol and later at Galindo and Pampa Grande, indicates that although the core territory of the Moche culture may have retreated from the coast in the early seventh century a.d., some continuity in forms of political organization may have continued. The cause of the downfall of the Moche is also widely debated. It has been argued that adverse weather patterns generated by the El Niño current attacked the fundamentals of the Moche economy; other people have suggested that Moche was adversely affected by the rise of the Huari state. Whatever the reason or reasons, it is clear that the Moche culture had been influenced by the earlier Chavín cultural forms and that it in turn influenced the Chimú and other cultures that followed it.

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Sipan

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Mohenjo Daro

See Indus Civilization; South Asia

Monte Albán

A major site and center of Zapotec civilization in southern mexico, Monte Albán is a huge hilltop site adjacent to the modern city of Oaxaca. Monte Albán is located in the center of the three major arms of the Valley of Oaxaca and is surrounded by rugged mountains. The Zapotecs are members of an ethnic group that is still widespread in Oaxaca today, and there is no doubt that their ancestors built Monte Albán.

Prior to 500 b.c., the Valley of Oaxaca had seen a long period of cultural development that had given rise to a number of chiefdoms, each containing a central town with several hundred inhabitants and public ceremonial buildings surrounded by smaller agricultural villages. The settlement and demography of the valley changed radically in 500 b.c., however. Monte Albán was founded on top of a 400-meter-high hill on what had previously been bare land. The hill was leveled, and settlement began in three discrete localities on the hilltop. From this fact some scholars have argued that Monte Albán represents the coming together in a central place by the people of the three arms of the valley, and certainly, the valley and its preexisting towns and villages saw a temporary reduction in population after

the founding of Monte Albán.

Over the following centuries, Monte Albán grew enormously in population and power, and it came to dominate the entire Valley of Oaxaca as well as lands beyond. There are some indications

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by a.d. 900 Monte Albán was declining into ruin. Perhaps as many as 4,000 people were still living on the flanks of the hill, but the great palaces and temples were in disrepair. When Mixtec peoples invaded the Valley of Oaxaca during the fourteenth century, they settled at the base of the hill. They did find and use some of the earlier Zapotec tombs, scooping the old Zapotec inhabitants to one side and burying their own elite members there. One such tomb, with the prosaic designation Tomb 7, was particularly rich. The burial was that of a fourteenth-century Mixtec prince, and he was accompanied by several sacrificed servants as well as magnificent works of art in gold, silver, and precious stones.

Peter Mathews

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Maya Civilization

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Blanton, R. 1978. *Monte Albán: Settlement Patterns at the Ancient Zapotec Capital.* New York: Academic Press.

Montelius, Gustaf Oscar Augustin

(1843-1921)

Born in Stockholm, sweden, and educated at Uppsala University, Montelius finished his Ph.D. in 1869. From 1863 to 1880 he worked at the Museum of National Antiquities in Stockholm in various capacities, and finally as senior executive officer. From 1907 to 1913 he was state antiquarian, head of the Central Board of Antiquities and the Museum of National Antiquities. Montelius was a fellow of the Swedish Academy and a member of its Nobel Prize Committee.

When Montelius started as a prehistorian in the mid-1860s knowledge of chronological details in European archaeology was almost nonexistent. In spite of a long research tradition, Scandinavian archaeology had not yet advanced beyond a division of the Stone Age into an earlier (Mesolithic) and a later (Neolithic) phase. There was a similar division of the Bronze Age into two stages, and a division of the Iron Age into three periods. In most other parts of Europe, prehistoric research had not even reached that level of chronological understanding. Consequently archaeologists were limited in their ability to interpret prehistoric life and society in any depth. Montelius clearly recognized this problem and throughout his career as an archaeologist he was engaged in creating reliable time scales for prehistoric Europe. No other single researcher did so much to develop traditional archaeological dating methods as Montelius. Largely because of his efforts and methodological examples, prehistoric archaeology in northern Europe by the end of the century had access to a fairly detailed and reliable chronology, both in relative and absolute terms. In fact, Montelius's work left its mark on the development of prehistoric chronology in other parts of Europe as well as in the Near East.

As a prehistorian, Montelius did not have much interest in theory. He was primarily an empiricist and his strength lay in his supreme ability to collect information; to systematize, digest, and generalize great quantities of archaeological data; and to present his results in a clear and convincing way. Given his systematic nature, energy, and curiosity, it is remarkable that Montelius did not become a prominent excavator.

Aside from chronologies, Montelius was also interested in issues of prehistoric culture. He was an energetic popularizer. Many of his scientific works were edited for the general public, with less emphasis

on chronological problems and more discussion of general cultural and social perspectives. He became a central figure in European archaeology. Many of his works were published in major European languages, and his extensive international network of contacts was facilitated by his proficiency in German, French, Italian, and English.

Bo Gräslund

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From 1698-1701 de Montfaucon worked in the Vatican Library in Rome, publishing his travels and experiences in *Diarium Italicum.* For the next twenty years he prepared his monumental fifteen-volume *L'antiquité expliquée et representée en figures* (1722-1724), comprising an enormous amount of source material and iconographical data from the ancient world. His aim was to illustrate and describe the monuments of antiquity in order to explain them and attempt to reconstruct the past. It was both a scientific and an educational work-and de Montfaucon suggested that a serious student could take up to two years to do it justice. His work was to have an enormous impact on subsequent antiquarian studies and the beginnings of an archaeology based on illustration and interpretation.

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Morgan, Lewis Henry

(1818-1881)

Born in New York State, Lewis Henry Morgan studied law at Union College in Schenectady and moved to Rochester in 1844. He became wealthy through investments in railways and iron smelting and was thus able to devote all of his time to his scholarly interests after 1860. Morgan took part in the literary and scientific societies of his day, joining the American Association for the Advancement of Science in 1856, presiding over the newly created anthropology section in 1873, and becoming the association's president in 1879. He was made a member of the National Academy of Sciences in 1875.

Morgan's passion was for Native American Indian ethnology, and his first book, *League of the Iroquois* (1851), is still the best ethnography on the subject. He undertook fieldwork among the Ojibwa in Michigan, out of which grew modern kinship studies such as those outlined in *Systems of Consanguinity and Affinity* (1871). In *Ancient Society, or Researches in the Line of Human Progress from Savagery through Barbarism to Civilization* (1877), the influence of the evidence of human antiquity recently discovered in Europe moved Morgan in the direction of evolutionism.

The impact of his work was enormous-Karl Marx, Frederick Engels, John Lubbock, and Charles Darwin all read and considered it, and in the next generation, Lorimer Fison, the Australasianist; Adolph Bandelier, Mesoamerican and southwestern archaeologist and historian; and john wesley powell, head of the Bureau of American Ethnology and leading classifier of Native American languages in his day, were all Morgan's students and successors. He was also a major influence on the outstanding anthropologists W.H.R. Rivers, A.R. Radcliffe-Brown, and Claude Lévi-Strauss.

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PREV NEXT

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In 1907 Morley participated in edgar lee hewett's field-methods school in archaeology in the Southwest, along with alfred v. kidder. His engineering training in areal survey proved to be invaluable, and he continued to work for Hewett until 1915, when he was hired by the Carnegie Institution's new Department of Central American Archaeology. His first book, *Introduction to the Study of the Maya Hieroglyphs,* a synthesis of what was then known about maya epigraphy, was published in the same year. In the *Supplementary Series in the Maya Inscriptions* (1916) Morley brought together drawings of all lunar glyphs, thereby allowing John Edward Teeple to solve the riddle of the lunar count.

Over the next decade Morley searched and surveyed some of the most inaccessible parts of Mayan territory. Traveling by mule and camping with few creature comforts, surrounded by jungle, suffering from malaria, and surviving Mexican bandits, Morley visited Copan, Tulum, and Uaxactun. The artist william henry holmes and archaeologist Samuel Lothrop were part of his field team. From 1917 to 1919 he worked for U.S. naval intelligence in Washington, D.C., before returning to the field in 1919. Until 1922 Morley spent most of his time in the Petén looking for Mayan date inscriptions, and he visited costa rica and guatemala to study Mayan influences there. In 1920 he completed the *Inscriptions of Copán,* the first book to discuss in detail all the texts of a single site.

Morley's available time for deciphering glyphs was seriously eroded by the constraints of field trips and lecture tours for the Carnegie Institution. He still managed to provide a number of the meanings for glyphs and demonstrated that almost every Mayan monument was erected to "mark the close of a katun (a period of time in the Mayan calendar) or one of its quarters." Perhaps as important to Mayan archaeology as his scholarly work was his insistence that the public become aware of the achievements of the Maya. He delivered lectures throughout the United States and wrote popular articles on the maya civilization.

Morley's plan of making a thorough study of the Maya at Chichén Itzá, which was why the Carnegie Institution had employed him, was never realized, for it was overtaken by his desire to find and decipher Mayan glyphs. As early as 1925 the institution began to consider a leadership change and a reorganization. Kidder was appointed as director of the new Division of Historical Research in an attempt to introduce a multidisciplinary strategy to the Mayan project. Morley continued his pioneering work on Mayan glyphs until 1947, when he became director of the Museum of New Mexico in Santa Fe.

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Morocco

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a conservator at the Musée des Antiquités Nationales at Saint-Germain-en-Laye in 1868. There, he drew up the classification of stone-tool technology whose denominations have remained standard until the present day; this work represents his major contribution to the science of prehistory in the nineteenth century. Mortillet argued against édouard lartet's classification of Paleolithic material based on faunal assemblages and argued for classification based on stone-tool types.

From 1880 onward Mortillet was one of the prime movers of a group of scientists, mostly anthropologists, who called themselves "scientific materialists," and between 1884 and 1887 he founded and ran the review *L'Homme,* in which their arguments and positions were promulgated. Mortillet became anticlerical and denounced the Catholic Church for its interpretations of scientific data, arguing for the separation of science and religion that became a political struggle for the separation of church and state. After 1870 and the defeat of France by the Prussians, his arguments took on a nationalist tone.

Mortillet also participated in the debate over the existence of an intelligent human ancestor in the Tertiary period, provoked by the discovery of incised bones and apparently worked flints in Tertiary soils. Some prehistorians, such as jean louis armand de quatrefages, argued for an intelligent human being created by God in the beginning. Mortillet, faithful to his concept of evolution, deduced from the flints the existence of a transitional creature between man and ape-the missing link, which he called *anthropopithecus* and to whom he devoted many pages in his book *Le préhistorique* (1883). His creation was replaced by eugene dubois's *Pithecanthropus erectus,* discovered in Java in 1894, which destroyed the concept of evolution promulagated by Mortillet, suggesting that the transformation of species was neither as linear nor as simple as the French prehistorian had thought.

Mortillet's philosophical beliefs also had a strong impact on the debate about prehistoric art and religion. He was certain that Paleolithic peoples were primitive and, as savages, on a lower rung of the ladder of biological and cultural development, far removed from modern people. However, discoveries of art objects, funeral practices, and cave-art galleries inevitably raised a few problems for a priori ideas about primitive beings. Mortillet refused to see any symbolic value in Paleolithic art and denied the existence of anything abstract. Eventually, as the evidence accumulated, Paleolithic art was recognized by other prehistorians such as emile cartailhac, breaking down the equation of the primitive with the barbarian.

In key academic positions for half a century, Mortillet was both a great theoretician and the leader of a school. A controlling influence, he helped to train, through his writing and teaching, a large proportion of the French prehistorians of the second generation and significantly assisted in establishing the discipline of prehistory in France.

Nathalie Richard; translated by Judith Braid

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Most na Soči

Most na Soči, also known as Sveta Lucija or Santa Lucia, is an early-Iron Age site in the subalpine area of western slovenia at the confluence of the rivers Soča (Isonzo), Idrijca, and Baca. The cemetery was extensively excavated between 1884 and 1902 by Carlo Marchesetti, the curator of the Trieste City Museum, and by Joseph Szombathy, the curator of the Naturhistorisches Museum in Vienna.

More than 6,400 graves were discovered during the excavations, making Most na Soči one of the

largest prehistoric cemeteries in this part of Europe. The burial rite was almost exclusively cremation in a flat grave; only 10 percent of the cremation graves were deposited in urns. Grave goods comprised personal ornaments (fibulae, pins, bracelets, pendants, necklaces, etc.).

The cemetery is divided chronologically into six phases between the eighth and fourth centuries b.c. Weapons (spearheads and axes) were absent throughout most of this period, only appearing in the last phase, i.e., in the fourth century.

PREV NEXT

Culturally, the community living in Most na Soči had strong ties with Paleovenetic groups in northeastern italy (especially with the Este group) and with the Dolenjska (lower Carniola) group in Slovenia.

The settlement was partially excavated between 1971 and 1982 by Drago Svoljsak, the curator of the Regional Museum in Nova Gorica. These excavations revealed thirty early-Iron Age houses as well as some later structures. In the early Iron Age, Most na Soči was an open settlement-which means that no defensive structures were recorded-divided into dwelling and craft sections (the latter including metallurgical activities).

Peter Turk

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Moulin Quignon

Second only to the piltdown forgery, Moulin Quignon is one of the most celebrated frauds of prehistoric archaeology. By the end of 1859, the argument about whether human beings had a high antiquity (certainly extending back to the time of extinct animals) had been won by jacques boucher de perthes, hugh falconer, and others through the patient excavation of sites such as brixham cave and the reexamination of the English sites of kent's cavern and Hoxne and the Somme River gravels in france. However, at none of those sites had the excavators been able to locate the bones of the oldest humans, and they based their arguments on the presence of artifacts in very old deposits.

Boucher de Perthes sought to solve this problem by offering his workmen the sum of 200 francs or the first human bones to be retrieved from his sites. On 23 March 1863, one of his workmen recovered a human tooth (in association with two axes). A week later, Boucher de Perthes's joy knew no bounds when another tooth and the right half of a human lower jaw were retrieved from the same deposit.

Many of the scientists most directly concerned with the debate about high human antiquity flocked to the site, in particular armand de quatrefages, Falconer, john evans, and joseph prestwich. Early conviction that Boucher de Perthes had made a significant discovery was (on the English side at least) replaced by skepticism when Prestwich and Evans announced that some of the stone artifacts recovered from the site were fakes.

Falconer reexamined the tooth and the jaw and pronounced them modern, a conclusion that sparked a storm of controversy. In an attempt to resolve the dispute, édouard lartet proposed a committee of inquiry that would provide each side with the opportunity to state its case in open discussion. This event took place on 9 May 1863 and was attended by most of the disputants (with the exception of Boucher de Perthes). Argument raged about whether the stone tools were fakes (resolved in the negative after the committee visited the site on the 13 May and observed the excavation of more artifacts that Prestwich thought were genuine) and about whether the jaw was modern and had been introduced to the deposit (the argument favored by Falconer but not endorsed by the committee).

The matter did not end there. Returning to England, Falconer urged Prestwich and Evans to return to the site and excavate under controlled conditions. Evans arranged for Henry Keeping (the excavator of Brixham Cave) to visit the site (between 3 June and 6 June), and his assessment, reported by Evans and supported by Evans's continued analysis of the previously excavated tools, was highly negative. Evans closed the circle by making a strong case that the jaw had been taken from the nearby site of Mesnières, which had been visited by one of the workmen from Moulin Quignon.

There was never any admission (certainly not by Boucher de Perthes) that there had been any fraud. Nonetheless, the evidence mounted by Falconer, Evans, and Prestwich about the jaw and the associated artifacts effectively consigned the remains to obscurity in the store of the

Musée de l'Homme in Paris. Interesting questions continue to be unanswered. Who was to have profited from the fraud? Was it the workmen to get their 200 francs, Boucher de Perthes to obtain a crowning achievement and recognition, or Quatrefages (an opponent of Darwin), who could now demonstrate that from the time of earliest human occupation of the earth the physical form of human beings had hardly changed? Perhaps it was simply that both Boucher de Perthes and de Quatrefages seized an opportunity provided by the quarry workers, nothing more.

Tim Murray

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Moundville

Moundville, a site comprising twenty large mounds distributed around a central plaza, is located in Alabama. Considered by many people to be among the largest of such sites in the Mississippian culture, Moundville has been explored by antiquarians and archaeologists since the late 1860s. The first extensive excavations, undertaken by U.S. archaeologist Clarence B. Moore, occurred in 1905 and 1906.

The Great Mound at Moundville in Alabama

(Hulton Getty)

The site has proved to be exceptionally rich in material culture and in food remains, and these have, in conjunction with evidence of house plans and site layout, allowed archaeologists to construct a viable site history. Moundville was first occupied around a.d. 1050 and gradually grew in size, complexity, and importance over the next 350 to 400 years. The site is thought to have been abandoned around a.d. 1550, and it is now interpreted as being the most important residential, religious, and political center of the surrounding region.

Tim Murray

See also

Atwater, Caleb; United States of America, Prehistoric Archaeology

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Müller, Sophus Otto

(1846-1934)

Sophus Müller was born in Copenhagen, denmark, the son of a numismatist and museum director. Enrolling at Copenhagen University in 1864 to study classics, he attended jens jacob worsaae's lectures on archaeology and read the work of English geologist charles lyell. After graduating in 1871 Müller worked as a teacher, but he gradually became associated with the collections in Copenhagen and with Worsaae, the curator of the Royal Museum of Nordic Antiquities (after 1892 the National Museum).

Müller begun to publish articles on the Danish Iron and Bronze Ages and traveled to the major museums and collections in central, western, and northern Europe. In 1878 he was employed as a scientific assistant to his father in the Department of Numismatics at the museum. He kept in contact with Worsaae and his group and participated in the activities of the museum. He also began publishing the *Nordic Journal* in Stockholm. In 1880 he received a Danish doctoral degree for his dissertation on animal ornamentation in Scandinavia.

In 1885 he became a curator at the Royal Museum and seven years later was named codirector of the new National Museum, with responsibility for prehistoric, ethnographic, and classical collections. During his tenure the National Museum assumed all the main tasks arising from archaeology's emergence as a discipline: publications, the preparation of finds for exhibition or storage, excavations, inspections, conservation, and the training of the next generation of archaeologists. The teaching of archaeology disappeared from the university and was taken over the by National Museum. Remaining at the museum until his retirement in 1921, he effectively dictated and controlled Danish archaeology during this period.

Müller also had extensive excavation experience, and the context of the finds he worked on always played a paramount role in his analysis and interpretations. He was at times a publicist, and he was also well traveled. He was therefore familiar with much of the prehistoric material then known and housed in the main European museums and collections. From 1881 on he was secretary of the Royal Nordic Antiquaries Society and editor of its journal, *Yearbook for Nordic Archaeology*.

Müller is one of the key figures in the nineteenth-century development of the methods and theories of archaeology. His dispute with oscar montelius about typology has been characterized as the first methodological debate on such issues-an illustration opposing an essentially objective and subjective methodology and how each methodology could affect the discipline. Müller also defined several significant cultural sequences in Danish prehistory and laid a solid foundation for future studies. His works include various illustrated manuals, such as *The Arrangement of Denmark's Prehistoric Object*s (1888-1895). Much of this work still constitutes the backbone of the discipline in Denmark, and researchers actively draw upon it today. Müller can be credited with establishing the fundamental themes of Danish archaeology-wide-ranging research, penetrating analysis, and a profound respect for source material.

Marie Louise Stig Sørensen

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Mulvaney, John

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John Mulvaney is an Australian archaeologist who trained at Cambridge University after completing a history degree at the University of Melbourne. On his return to Australia Mulvaney followed the pioneering work of norman tindale and fred mccarthy at Fromm's Landing and Kenniff Cave (among other sites). He noted that there was clear evidence for cultural change in prehistoric Australia, and his work at Kenniff Cave revealed conclusive evidence (through radiocarbon dating) of the Pleistocene occupation of Australia.

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Mycenae

See Greece

Myres, Sir John Linton

(1869-1954)

John L. Myres attended Winchester School and then New College, Oxford. After completing his undergraduate degree he became a fellow of Magdalen College, Oxford, and visited the Mediterranean in 1892, where he worked with sir john evans on Crete. By comparing Cretan vases with vase fragments found by sir william matthew flinders petrie in Egypt, Myres was able to argue for trade links between the ancient civilizations of Crete and Egypt. He joined the British School's excavation of Palakastro and Petsofa on Crete and published his finds.

In 1894 Myres began excavating on cyprus at Kition, and with a German colleague, he wrote the catalog of the Cyprus Museum. In 1907 he became a professor of Greek and a lecturer in ancient geography at Liverpool University, but three years later he returned to Oxford as the new Wykeham Professor of Ancient History, a position he held until 1939. He wrote the popular study *The Dawn of History* in 1911 and contributed several chapters to the Cambridge Ancient History. During World War I his detailed knowledge of the geography and people of the eastern Mediterranean was put to use when he led raiding operations from a former royal yacht onto the coast of turkey. He was made a commander of the Royal Navy and was awarded the Order of the British Empire and the Greek Order of George I.

In 1927 on the death of sir arthur evans, Myres took on the task of completing the editing and publishing of the Linear B tablets from knossos, and he was pleased that when Michael Ventris deciphered it in 1952, Linear B proved to be Greek. In 1930 Myres's best-known work-*Who Were the Greeks?*-was published, followed by *Herodotus, Father of History* and *Geographical History in Greek Lands* in 1953. In all these works he used not only the classics but also a multidisciplinary approach, combining ancient history, archaeology, geography, and anthropology. He was knighted in 1943 and won the Victoria Medal of the Royal Geographic Society in 1953. During World War II, once again using his great geographic knowledge of the eastern Mediterranean, he edited handbooks for naval intelligence. He was president of the Royal Anthroplogical Institute from 1928 to 1931, president of the Hellenic Society from 1935 to 1938, and chairman of the British School at Athens from 1934 to 1947.

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Childe, Vere Gordon; Greece: Linear A/ Linear B

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Notwithstanding its strong support of the archaeology of more recent periods, the society has made its greatest impact in the field of paleoanthropology. The most famous recipients of society funding since 1959 were louis leakey and mary leakey and, through Louis Leakey's influence, the primatologists Jane Goodall and Diane Fossey.

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Tim Murray

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The museum was to be the central cultural and scientific institution in the province of Carniola, so it

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stane gabrovec, head of the Archaeological Department at the National Museum (1948-1988) and an eminent prehistorian, began to research late-Bronze and Iron Age sites in Slovenia in the late 1940s. He also initiated a large-scale program, documenting numbers of Slovenian sites excavated during the Austro-Hungarian period and deposited in foreign museums. In less than two decades, Gabrovec succeeded in developing the chronology and cultural-history synthesis of the Bronze and Iron Ages of Slovenia and neighboring lands, and the prehistoric collection, once again, became the pride of the museum.

Developments after 1950s reflect a gradual rise in the complexity of the museum. Its rich archaeological collections were divided into prehistoric, Roman, and early mediaeval units, with each unit having specialized curators. Peter Petru, director of the National Museum from 1970 to 1983, continued and completed the organizational structure of the museum and also contributed much to the development of Roman archaeology in the museum. In the last decades of the twentieth century, the numismatic cabinet developed into one of the major regional reference centers for Celtic and Roman coinage.

Predrag Novakovic

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Nautical Archaeology

The term *nautical archaeology,* as in the archaeology of ships, comes from the Greek word for ship (naos) and is used in preference to the terms marine or underwater archaeology.

Beginnings

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Developments after 1950s reflect a gradual rise in the complexity of the museum. Its rich archaeological collections were divided into prehistoric, Roman, and early mediaeval units, with each unit having specialized curators. Peter Petru, director of the National Museum from 1970 to 1983, continued and completed the organizational structure of the museum and also contributed much to the development of Roman archaeology in the museum. In the last decades of the twentieth century, the numismatic cabinet developed into one of the major regional reference centers for Celtic and Roman coinage.

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Early inventors of diving equipment in England soon became involved in nautical archaeology. In 1836, John Deane and William Edwards found the remains of Henry VIII's warship *Mary Rose,* which sunk in 1545 off Portsmouth, England. During the next four years, they salvaged numerous artifacts, including a variety of armaments and some wooden hull remnants, many of which they recorded in exquisite watercolors.

Not all early nautical archaeology required diving. Remains of an earlier battleship, Henry V's *Grace Dieu,* which had been launched in 1419, were reported in the mud of the Hamble River in Harold J. Osborne White's *1859 Hampshire and Isle of Wight Directory* but were not properly identified before the twentieth century. After an amateur's crude excavation of the site in the 1870s, perhaps with explosives, the Hampshire Field Club in the last year of the nineteenth century removed some of the ship's timbers to a museum in Winchester, England, where they were displayed as being from a "Danish galley."

Other European discoveries followed that of the *Grace Dieu.* In 1864, part of a Roman hull of the second or third century a.d. was salvaged from the harbor in Marseille and fancifully named "Caesar's galley." Other parts of the hull, raised in the 1950s, showed its planks to be fastened edge-to-edge by mortise-and-tenon joints in the shell-first kind of construction now known to have been in fashion in the Mediterranean from at least the fourteenth century b.c. until around the eleventh century a.d. Most modern wooden hulls are built in the frame-first manner, in which planks are simply nailed to a pre-erected framework of keel, stem, sternpost, and frames (ribs).

A different tradition of shell-first hull construction existed in Northern Europe, and a great deal of research was conducted there in the nineteenth century. Instead of being joined edge to edge, the planks of these hulls overlapped one another like shingles, and in this case were fastened together by long metal nails driven through them from the outside and clenched over inside, coining the term *clinker built.*

The clinker-built hull of a great open war vessel from the second half of the fourth century a.d., deposited as an offering to the gods in a bog at Nydam in Schleswig, germany, was, in 1864, the first ancient ship excavated by an archaeologist. Less than two decades later, in 1880, a clinker-built, ninth-century ship found at Gokstad became the first of a number of Viking ships recovered from royal burials in Norway, where the clay soil remarkably preserves wood and iron. A replica of this ship crossed the Atlantic in 1893, an early example of experimental archaeology.

Far away in Africa, hot desert sands preserved hull timbers equally well. Five funerary boats from about 1,850 b.c., intentionally buried near the pyramid of Sesostris III at Dashur, were discovered in 1894 by the French archaeologist Jacques De Morgan. The planks of the ten-meter hulls were held together by mortise-and-tenon joints. Two of the hulls are now in the Cairo Museum, one is in the Field Museum in Chicago, and one is in the Carnegie Museum in Pittsburgh; one is missing, perhaps reburied at Dashur.

1900-1960

The first half of the twentieth century saw a dramatic increase in salvage by helmet divers. Although a Roman wreck found in 1900 by Greek sponge divers off the Aegean island of Antikythera gained notoriety mainly because of spectacular discoveries of bronze and marble Greek statues, and a unique astronomical instrument, a few planks were raised that showed mortise-and-tenon joinery. Concentration on statuary and pottery rather than hulls continued in the salvage of artifacts by Greek and Turkish sponge divers from another Roman wreck, at Mahdia off the coast of Tunisia, in the six years following its discovery in 1907. Although fragments of wood were raised in 1928 by the Greek sponge divers who salvaged famed bronze statues of Zeus or Poseidon and a jockey and horse off Cape

Artemision, they were never properly studied. Nor were the fragments of wood netted by a fisherman three years earlier along with the bronze statue of a nude youth in the Bay of Marathon in the Aegean.

Detailed records of a hull of the Roman period had already been made at this early date,

Perfection of a self-contained underwater breathing apparatus (scuba) by Jacques-Yves Cousteau and Emile Gagnan in france in the 1940s revolutionized the study of ancient and historic shipwrecks by providing divers with the mobility they needed for the careful excavation of delicate ships' hulls. A number of pioneering efforts conducted in the 1950s along the coasts of France and Italy introduced the regular use of airlifts (suction pipes) for removing overburden, air-filled lifting balloons for raising heavy objects to the surface, underwater photography, and even underwater television. In 1958, to aid in photographic mapping, Gianni Roghi, working with Nino Lamboglia, laid a tape grid over a Roman wreck at Spargi, a small island north of Sardinia; the tape was replaced in 1959 by rigid pipes.

Mistakes were unavoidably made along the way. Because careful archaeological plans were not kept, the site at Grand Congloué near Marseilles in France was thought to be that of a single Roman wreck whereas it is now recognized that it is instead one Roman wreck lying atop another of earlier date. Philippe Taillez, after his exemplary excavation of a Roman wreck near Le Titan in the same region, bemoaned the fact that diving archaeologists were not part of such excavations. Nevertheless, the nondiving archaeologists, especially Lamboglia in Italy and Fernand Benoit in France, who received finds and assessed information from the professional and amateur divers under their direction, began to pay close attention to the construction techniques of ancient ships. It became accepted that Roman ships were generally edge-joined with mortise-and-tenon joints and that hulls frequently were sheathed in lead.

Salvage mistakes were also made in North America. In 1956, the historian Edwin C. Bearss and colleagues, using a simple magnetic compass to detect a mass of iron, located the American Civil War ironclad *Cairo* in the Yazoo River, Mississippi, where it had lain in perfect condition since becoming, in 1862, the first vessel ever sunk by an electrically detonated mine. Beautifully preserved artifacts and what is left of the hull, which was mostly destroyed by misguided salvage methods in 1965 and a lack of prompt conservation, are displayed in the Vicksburg National Military Park.

Other wrecks, like those in the York River, were found by dragging. The Swedish engineer Anders Franzén, knowing that the Baltic Sea does not support ship worms, dragged the bottom of Stockholm's harbor from 1953 until 1956 in a successful search for what he rightly guessed would be a perfectly preserved warship, the *Vasa,* which sank on its maiden voyage in 1627.

1960s

After 1960, the field of nautical archaeology expanded rapidly in a number of new directions. “Whitewater archaeology” began in Minnesota and canada when amateur divers found goods lost by fur traders who had unsuccessfully tried to shoot rapids in their canoes. These finds led to a long-term survey for other such goods by Robert C. Wheeler of the Minnesota Historical Society and Walter A. Kenyon of the Royal Ontario Museum.

Archaeologists explore an ancient shipwreck in the Mediterranean, June 1969.

(Hulton Getty)

At the end of the 1960s, Michael and Susan Katzev from the University of Pennsylvania Museum team located and excavated a fourth-century classical Greek ship off Kyrenia, cyprus. They advanced the field of nautical archaeology by raising and preserving, for the first time in the Mediterranean, the ship's hull, its planks fastened with pegged mortise-and-tenon joints. The hull was then reassembled for display and study by Richard Steffy, a task that lasted into the early 1970s.

Waterlogged wood, unless properly treated, will shrink and warp out of recognition when exposed to air. The Kyrenia ship was conserved with polyethylene glycol, as had been the restored Viking ships from Roskilde Fjord, the *Vasa* in Sweden, and three colonial bateaux raised at the beginning of the decade from Lake George, New York.

Survey techniques also improved. Many shipwrecks in the Mediterranean were initially spotted by local sponge divers, but in 1967, sonar and underwater television were used successfully for the first time to locate an ancient wreck, later examined from the submersible *Asherah*, eighty-five meters deep off the coast of Turkey. In England, Alexander McKee, working with Harold Edgerton's subbottom sonar, relocated the *Mary Rose*, its position having been lost after the nineteenth-century salvage of some of its cannons. Magnetometers, which detect iron, proved equally successful in searches for more modern ships, which, even if built of wood, often carried large iron objects such as cannons and anchors. Unfortunately, scuba equipment and better search techniques also caused an increase in underwater treasure hunting and the looting of wrecks in the 1960s, especially in the waters around florida and the caribbean islands.

1970s

In the 1970s, surveys and excavations of high quality were conducted around the globe, starting in 1970 in England with the discovery and excavation of a clinker-built boat of around a.d. 950 at Graveney in Kent. Beginning in 1972, archaeologists from the Western Australian Museum, led by Jeremy Greene, not only excavated, published, and restored Dutch East Indiamen from their own waters, notably the *Vergulde Draeck* lost in 1656 and the *Batavia* in 1629, but traveled farther afield to study wrecks from Kenya to Thailand. Another Dutch East Indiaman, the *Amsterdam*, sunk deeply in sand in 1749 just off Hastings, England, was examined and sampled by Peter Marsden after its 1969 discovery-on those few days each year when it was revealed by exceptionally low tides.

The *San Esteban*, one of three ships driven aground on Padre Island, Texas, by a storm in 1554, was, between 1972 and 1976, the first Spanish treasure ship excavated archaeologically. One ship had already been destroyed by dredging operations in the 1940s, and another had been partly exploited by treasure hunters in 1967 before the Texas Antiquities Committee was formed to take on the job of excavating, under Carl Clausen, and conserving, under Donny Hamilton, what remained. These events led to a state law of protection for historic shipwrecks.

Veterans of the University of Pennsylvania team founded the Institute of Nautical Archaeology (INA) in 1972 and began projects on four continents. Excavation of a cargo of pottery lost around 1600 b.c. near Sheytan Deresi in Turkey was followed by the excavation of a ship sunk in the natural harbor of Serçe Limanl on the southwestern Turkish coast around a.d. 1025. The latter ship produced the largest collection of medieval Islamic glass in the world and is the earliest known example of a seagoing hull built in the frame-first manner. Elsewhere in the Mediterranean, INA, with the assistance of Sub Sea Oil Services of Milan, conducted the first excavation using saturation diving of a Hellenistic wreck off the island of Lipari north of Sicily.

In North America, under the direction of David Switzer, INA undertook the excavation of two ships,

one American and the other British, sunk during the War of Independence. The American privateer *Defence* was excavated in Penobscot Bay, Maine, by Switzer in a joint project begun in 1975 with the Maine Maritime Academy and the Maine State Museum. An INA investigation in 1976 of a British ship scuttled by General Cornwallis at Yorktown led to the proposal that such ships should be excavated within coffer dams in which the murky water of

the York River could be clarified by industrial filters, an idea Norman Scott had earlier suggested for other sites with zero visibility.

Elsewhere in the United States, the famed "cheesebox on a raft," the Civil War ironclad *Monitor,* the first gunboat with a revolving turret, was located in 1973 seventy meters deep about seventeen miles off Cape Hatteras, North Carolina, by a Duke University team using sonar. Two years later, the archaeologists Gordon Watts, John Broadwater, and others visited the *Monitor* in the Harbor Branch Foundation's *Johnson-Sea-Link I,* a submersible from which they could be launched into open water to swim around and examine the site.

The 1968-1969 dryland excavation of the steamboat *Bertrand,* sunk in 1865 twenty-five miles north of Omaha, Nebraska, in the Missouri River (which had since changed course), was supervised by U.S. National Park Service archaeologists. The project yielded not only a well-preserved hull but nearly 2 million artifacts, including bottles with their paper labels intact.

In Canada, the amateur archaeologist Daniel A. Nelson, after searching with side-scanning sonar in an area narrowed by archival research to thirty-two square miles, in 1973 located two warships sunk during the War of 1812, the *Hamilton* and the *Scourge,* ninety meters deep in Lake Champlain. Inspected and recorded from a research submarine and by a remotely operated vehicle (ROV), the ships proved to be almost perfectly preserved with upright masts, figureheads in place, and skeletons of the crew on the decks.

Pioneering work on ships in the Far East was conducted both on land and under water in the 1970s. At the port city of Quanzhou, china, a thirty-four-meter ship of the thirteenth century a.d. was discovered and excavated in 1973, and a fourteenth-century wreck with an immense collection of Chinese ceramics was excavated by the Korean navy after the ship was discovered near Shinan, Korea, by a fisherman in 1975. Both ships offered the surprise of V-shaped hulls from a time when scholars assumed that all Chinese ships were flat-bottomed.

In Mombasa, Kenya, Robin Piercy of INA began, in 1977, the first full-scale shipwreck excavation in East Africa on the remains of the *Santo Antonio de Tanna,* a Portuguese ship built at Goa and sunk in 1696 while trying to help relieve a siege of the Portuguese fort, Fort Jesus, by Omani Arabs. During the same period, Colin Martin continued excavating two Spanish ships-*El Gran Grifón* and *La Trinidad Valencera*-that had fled north around Scotland and Ireland following the defeat of the Spanish Armada in 1588.

1980s

A number of projects in the 1980s proved that wrecks could be found and at least partly recovered from any depth and at any temperature. In the first year of the decade, using sonar, a team led by Joe MacInnis discovered the well-preserved *Breadalbane* under two meters of surface ice at a depth of a hundred meters in Canada's Northwest Passage. The British bark had been sunk by ice in 1853 while on a rescue mission for the ill-fated Franklin expedition of 1846. MacInnis's team was able to explore the site in a one-person submersible, the *WASP*, lowered through a hole in the ice.

In 1985, a French-American team, searching an area of the North Atlantic 350 miles southeast of Newfoundland and 150 miles square, was able to locate and examine, at a depth of 4,000 meters, the "unsinkable" *Titanic,* a ship sunk by an iceberg on its maiden voyage in 1912 with a loss of 1,522 lives. Preliminary images of the wreck were seen via television from ROV, and in 1986, Robert Ballard of the Woods Hole Oceanographic Institute visually inspected the site from the submarine *Alvin.* After the discovery, amid some controversy, artifacts were raised from the ship by a French group for display.

Equally impressive was the discovery in 1987 of the SS *Central American,* lost 200 miles off Charleston, South Carolina, in 1857 in water a mile and a half deep. The Columbus-America Discovery Group, admittedly after the gold bullion the ship was known to be carrying, surveyed 1,400 square miles of ocean floor with sonar to locate the vessel and then retrieved much of the cargo and other artifacts with advanced robots. In the muddy York River, John Broadwater of the Virginia Department of Conservation and Historic Resources showed that

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archaeologists could work with excellent visibility by building a coffer dam around another of Cornwallis's scuttled ships and filtering the water inside.

These spectacular tours de force did not mean that controlled excavations at lesser depths did not continue. In Red Bay, Labrador, Robert Grenier of Parks Canada directed the excavation, between 1980 and 1984, of the sixteenth-century Basque whaler *San Juan* and several small boats, including one of the ship's whaleboats, probably the oldest and best specimen of an early boat used to hunt whales. To the south, Kevin Crisman and Arthur Cohen created a specialty of studying ships sunk during the War of 1812 in Lake Ontario and in Lake Champlain for the Champlain Maritime Society and the Vermont Division for Historic Preservation.

Anders Franzén returned to nautical archaeology in 1980 with the discovery of another well-preserved seventeenth-century Swedish warship, the Kronan. The *Mary Rose,* carefully excavated under the direction of Margaret Rule since 1979, was finally raised in 1982 but must undergo decades of chemical conservation before the remains of the hull are fully restored for public viewing. In the meantime, a stunning array of artifacts, including rare examples of English longbows, have already been conserved and are on display in Portsmouth, England; many have also been shown around the world in a traveling exhibit.

The most careful underwater excavation in the Caribbean was begun in 1982 when Donald H. Keith of the Institute of Nautical Archaeology undertook the excavation and conservation of what was then the oldest wreck known in the New World, presumably a Spanish vessel of the early fifteenth century, at Molasses Reef in the Turks and Caicos Islands. Keith explored other fifteenth-century wrecks in the Caribbean for INA before forming his own group, Ships of Discovery, which has established a museum for the Molasses Reef wreck on Grand Turk Island.

Also in 1982, Mensun Bound of MARE at Oxford University excavated a probable Etruscan wreck of around 600 b.c. at Giglio, an island off the southwestern coast of Tuscany in central Italy. In Turkey, the Institute of Nautical Archaeology, in a project that continued from 1983 into the 1990s, surveyed and excavated a fourteenth-century b.c. wreck that has produced fifteen tons of raw goods. These include the oldest known tin ingots, glass ingots, a wooden writing tablet, ebony logs, a fragmentary seagoing hull, ten tons of copper ingots, a unique gold scarab that once belonged to Egypt's Queen Nefertiti, and pottery, seals, jewelry, and stone objects from half a dozen ancient civilizations. Twenty-four stone anchors were carried in the fifteen-meter hull made of fir planks fastened with pegged mortise-and-tenon joints. Lying between forty-four and sixty-one meters deep off Uluburun, near Ka in Turkey, it is the deepest site yet excavated by scuba divers.

Israeli archaeologists and divers had long been finding and mapping artifacts from the Bronze Age onward in the Mediterranean, including the bronze ram of a Hellenistic warship off Atlit on the coast of israel. A severe drought in 1985 lowered the level of the Sea of Galilee sufficiently to expose a fishing boat from the time of Christ. It was removed for conservation and study in early 1986 by Shelley Wachsmann.

In Egypt, a covered pit next to the great pyramid of Cheops was opened to reveal a second dismantled boat. And in 1987, the Abandoned Shipwreck Act, which was signed into law in the United States, removed historic shipwrecks in states' waters from the jurisdiction of admiralty salvage law.

1990s

By the last decade of the twentieth century, nautical archaeology had become a respected subdiscipline of archaeology, and there were graduate programs devoted to training future specialists at St. Andrews

University in Scotland; Texas A&M University, with which INA affiliated in 1976; East Carolina University in North Carolina, studying not only local wrecks but wrecks in Bermuda; Haifa University in Israel; the University of Copenhagen; and Bilkent University in Ankara, Turkey. Courses in nautical archaeology were also being offered from Australia to Oxford to the University of Texas.

Proceedings of conferences and journals devoted to the field have become commonplace.

Laws to protect ancient and historic wrecks have been passed by an increasing number of states and nations, and an increasing number of state and national programs have been developed around the globe.

Splendid museums of nautical archaeology attract an increasing number of visitors. Noteworthy are those devoted to single ships (such as the *Vasa*, the *Mary Rose*, the Bremen cog, and the Molasses Reef Wreck) or groups of ships (for instance, in the Roskilde Museum in Denmark, the Bodrum Museum of Underwater Archaeology in Turkey, the Viking Ship Museum in Oslo, and the National Maritime Museum in Greenwich, England).

Results of fieldwork in progress were eagerly awaited from projects such as the Greek excavations of a Bronze Age wreck at Iria and an unexpectedly large fifth-century b.c. amphora carrier in the Northern Sporades in the Aegean Sea. There was also ongoing work on dozens of vessels revealed through land reclamation in the Netherlands, the excavation of early dynastic Egyptian boats found by the University of Pennsylvania in the sands at abydos, the conservation with sugar rather than polyethylene glycol of an early Spanish hull excavated in Cuba, and surveys conducted by INA from the Red Sea to the Persian Gulf to the Black Sea and by the Western Australian Museum throughout the Far East.

George Bass

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Naville, Henri Edouard

(1844-1926)

Born in Geneva, switzerland, and educated at the University of Geneva; King's College, London; and the universities of Bonn, Paris, and Berlin, Henri Edward Naville was a biblical scholar and philologist who studied under the great Egyptologist karl richard lepsius. Naville first visited Egypt in 1865 and copied the Horus texts at Edfu, a site in Upper Egypt. He later worked on the Solar texts and published four volumes of the Book of the Dead. The decipherment of these ancient texts and inscriptions enabled a chronology and history of ancient Egypt to be devised.

Naville was the first archaeologist to be employed by the egyptian exploration society (at that time the Egypt Exploration Fund), and he excavated at Tell el-Makhuta in 1883 and the Wadi Tumilat in 1885-1886, the western end of which was identified as the biblical land of Goshen. Between 1886 and 1889, Naville excavated at Bubastis on the southeastern Nile Delta and brought back many artifacts from there to the british museum, including a huge granite head of the pharaoh Amenemhat III. He then excavated another ten sites in the Nile Delta, including Herakleopolis, Mendes, and Tell Mukdam.

From 1893 to 1896, Naville worked in Upper Egypt finishing the excavation of Hatshepsut's mortuary temple at Deir el-Bahari begun by auguste mariette, and his field assistants there included david hogarth and howard carter. In 1903, Naville returned to excavate the temple's mounds, discovering tombs and

the temple of King Menthuhotep II from the eleventh dynasty. Naville was the successor of earlier archaeologists such as heinrich schliemann, Mariette, and Gaston Maspero, who were interested in architectural ruins and large monuments, not in the smaller details or the kind of painstaking work of the younger generation of archaeologists in Egypt such as sir william matthew flinders petrie. Naville's last excavation was at abydos in 1909, where he cleared the Osireion, which had been discovered by Petrie in 1902.

Naville was awarded many honors and distinctions from most European countries including his own, Switzerland, and he published many articles, reviews, and books on his work in Egypt.

Tim Murray

See also

Champollion, Jean-François; Egypt, Dynastic; French Archaeology in Egypt and the Middle East

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Nelson, Nels

(1875-1964)

Nels Nelson was a pioneering American archaeologist who was a great advocate and developer of new approaches to stratigraphic excavation. Taught by the great New World archaeologists max uhle and Alfred Kroeber, Nelson learned his craft excavating shell mounds on the California coast and participating in the excavation of Paleolithic cave sites in France and Spain. He undertook stratigraphic excavations in the southwestern United States after 1914, especially at San Cristobal Pueblo.

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United States of America, Prehistoric Archaeology

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Netherlands

According to Dutch archaeological lore, archaeology became a scientific endeavor in the early years of the twentieth century when a young zoology graduate, albert egges van giffen, studied faunal remains unearthed during a study of *terpen* as indicators of prehistoric economies. *Terpen* (“terps”) are artificial mounds on the coastal wetlands of the Netherlands on which Iron Age and early medieval villages were built, and after the area was diked after a.d. 1000, they were exploited as sources of manure.

At the time, the only archaeological institution in the country was the State Museum of Antiquities in Leiden where the traditionalist Jan Hendrik Holwerda dominated Dutch archaeology. Inevitably, he and Van Giffen became enemies, and after some years of struggle, Holwerda and his museum faded away to be superseded by Van Giffen and the archaeological institute he had founded at the University of Groningen in the north of the country, right in the middle of terp-land. Because of Van Giffen, Dutch archaeology won international status, especially because of its meticulous excavation techniques, use of auxiliary sciences (botany, zoology, geology), and settlement excavations. Later, Van Giffen's students ran archaeological institutes at every university in the country as well as staffing the State Archaeological Service. Today, almost all archaeological research in the Netherlands is directly or indirectly related to Van Giffen's exploits.

In the late 1990s, that was still the majority view of the modernization of Dutch archaeology (e.g., Slofstra 1994), because when Van Giffen's students became dominant in the late 1940s and early 1950s, their view of the discipline's history became the founding myth of Dutch archaeology. However, the myth is mainly a repeat of Van Giffen's arguments that he used in his attempt to bypass Holwerda between 1910 and 1915-a construct used in the battle for academic positions. Van Giffen and his students have retired or died now, so perhaps it is time to sketch a different picture.

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At the universities, the number of students started to increase rapidly in the 1950s with growing participation of middle-class groups after 1960. At first, that swell generated new academic jobs and ever more participation, but after 1970-1975, academic job opportunities tended to decrease, resulting in misemployment first and later substantial underemployment of later university trainees. The number of archaeological jobs closely followed suit, as did the number of academic and nonacademic archaeological institutes. Presently, heritage and rescue archaeology fare much better than academic archaeology in this respect.

An Institutional History

The State Museum of Antiquities in Leiden (Rijksmuseum van Oudheden, hereafter RMO) was the first public archaeological institution in the Netherlands, and its foundation in 1818 marked a shift from traditional to positivist thinking about the past. The museum has been and is active as a collector of antiquities from the Old World and in fieldwork in the Netherlands and abroad. The first director of the RMO, Caspar J.C. Reuvens, was also appointed professor of archaeology at Leiden State University in 1818, but that appointment was not a recognition of the subject in the Netherlands. “[Archaeology is] not so much a distinct, useful science, as it is a pleasant pastime… when not useless, then not really necessary” as one obituary of Reuven put it after his untimely death in 1835 (Byvanck-Quaries van Ufford 1984).

By and large, that was the dominant attitude toward archaeology in the Netherlands until well into the twentieth century. Accordingly, the chair was left vacant until A.E.J. Holwerda (1845-1923) was appointed to the chair of Archaeology, Ancient History, and Greek Antiquities. Later, Holwerda also became director of the RMO (1903-1919), and from there, he revived contact with the university. In 1907, Holwerda founded the *Oudheidkundige Mededelingen van het Rijksmuseum van Oudheden* as an outlet for the publications of the museum's investigations, but even then, there was no continuity, and Holwerda's successor at the university was an ancient historian who had no use for archaeology except as an illustrator of early events. In 1922, Alexander Byvanck, who had studied with Holwerda, succeeded to this chair. Byvanck pushed the appointment of assistants whose major interests were in classical archaeology, and that subject rapidly became well entrenched at Leiden University. In 1921, archaeology had been legally acknowledged as a separate discipline, and only then could a degree in archaeology be obtained.

Meanwhile, at the University of Utrecht, two classical philologists had been lecturing on archaeology. One of them, G. van Hoom, also lectured at Groningen from 1919 onward, thus paving the way for a chair of classical archaeology at that university in 1951. C.W. Vollgraff, the other Utrecht philologist, excavated the acropolis of Argos from 1903 until 1930 in a joint project with the French Archaeological School at Athens. He also participated in excavations of the Roman core of the city of Utrecht led by Van Giffen between 1934 and 1938. One of Vollgraff's students, H.G. Beyen, became the first professor of classical archaeology at the University of Groningen.

When Leiden University was reopened in 1945 after its forced closure by the Germans in 1941, a separate chair of classical archaeology was finally established, and it was held by Byvanck until 1954. There were good and varied relations with the chair of art history (which is still named Art History and Archaeology) at the same university, and contact with the material products of the ancient world was maintained through yearly student excursions to the Mediterranean's monumental sites. Only when H.A. A.P. Geertman was appointed in 1979 did interest in fieldwork reemerge.

At the University of Groningen, Van Giffen founded the Biological Archaeological Institute (hereafter BAI) in 1920. He also became an active consultant of local antiquarian committees and exercised great

influence in the archaeological field in the northern Netherlands. Van Giffen was appointed professor of prehistory and Germanic archaeology in 1939, and in the 1950s he convinced the Groningen physicist and

by the museum, and articles range from Dutch prehistoric excavations to discussions on Coptic grammar. Van Giffen's BAI also began issuing an archaeological journal, *Palaeohistoria,* in 1953. It contains research reports on activities by the staff of that institute, both in the Netherlands and abroad-for example, in the Middle East and indonesia.

An important backbone of classical archaeology has been the Vereeniging tot Bevordering der Kennis van de Antieke Beschaving (Society for the Furtherance of Knowledge of Antique Civilization). From 1925 onward, the *Bulletin* of this society (presently called *Bulletin Antieke Beschaving,* or *BABesch*) has appeared yearly and is the major journal of Mediterranean archaeology in the Netherlands. There are more archaeological journals with a Dutch background, the larger ones being *Berichten ROB* (which reports on the research by the ROB), *Helinivm* (which caters to Dutch and Belgian audiences, mainly prehistory), *Iranica Antiqua, Persica, Anatolica,* and *Bibliotheca Orientalis* (concerned with Middle Eastern philology and archaeology), and *Tijdschrift voor Mediterrane Archeologie* (archaeology in the Mediterranean). Of the others, *Analecta Praehistorica Leidensia* (which appears irregularly) and *Archaeological Dialogues* (which has a theoretical orientation) should be mentioned.

Major Collections and the Archaeological Record

The major archaeological collection of the Netherlands is in the RMO. The origin of this collection lies in the first systematic display of antiquities in the Netherlands, begun in the early years of the sixteenth century, when the Baron of Wassenaar looted the Roman fortress of Brittenburg, which had emerged at the ancient mouth of the Rhine owing to natural excavations by the North Sea. In a contemporary chronicle, the Wassenaar lineage was said to have descended from the fortress's Roman lord (Aurelius 1517), and almost two centuries later, that attribution was echoed and extended (Pars 1697). To further substantiate his claims, the baron also bought Roman artifacts from other places. The Wassenaar collection remained in the family's Duivenvoorde Castle in Voorschoten (south of Leiden) and was enlarged over later centuries. Part of it is still there, but another part is now in the RMO in Leiden.

The antecedents of Batavian (the native Germanic dialect) were eagerly sought after the sixteenth and seventeenth centuries. The years of insurrection against the Hapsburg's centralism and taxation resulted in the foundation of the Republic of the United Provinces of the Netherlands, and territorial claims were bolstered by reference to a mythical past. Reconstructions of Batavian society were published or painted, and the collection of antiquities kept pace with the political situation, tacitly forgoing local, native remains for objects from classical civilization that exemplified humanist and Renaissance ideas. One example among many stems from the early-seventeenth-century Antwerp painter Peter Paul Rubens who assembled classical statuary, which, after a detour to the collection of the Duke of Buckingham in London, was obtained by the Rotterdam brewer Reiner van der Wolff in 1660; today, part of the collection is in the RMO. In 1647, the Nehalennia sanctuary-the temple of a Romanized local goddess near the mouth of the river Scheidt-was exposed by the sea, and several altars were found on the beach. Ultimately, they ended up in the RMO.

Dutch collectors were also active in classical countries: a set of antique statues ultimately attributable to a Venice collector was bought by the Council of Holland in 1660, and early in the following century, an important collection of 150 classical *marmora* was bought by Gerard van Papenbroek at auction and bequeathed to Leiden University in 1743. This “cabinet of antiquities” was put on display in a specially constructed pavilion in that university's Botanical Gardens, probably the first public exhibition of antiquities in the United Provinces. The Papenbroek collection is remarkable for its relatively complete documentation, and it, too, is now in the RMO. In the same period, another important collection was begun when the Duke of Thoms, a Dutch diplomat in Italy, published an extensive catalog of his large collection of gems and coins in 1740. This collection was purchased by the Prince of Orange in 1751,

who passed it on to his heirs. Looted by the French in 1795 and later

repatriated to the Netherlands, it constitutes the core of the collection of the newly founded Royal Numismatic Cabinet in the Hague.

There have been more private and public collections of classical artifacts, and most of them have found their way to the RMO or to local museums. Some of the Dutch merchant dynasties amassed extensive private collections of ancient and contemporary art, which are still kept in their city palaces. Occasionally, such collections are put into public trust, most notably the collections of Allard Pierson and Lunsingh Scheurleer, which have been handed over to the archaeological museum of the University of Amsterdam (now the Allard Pierson Museum), and the important Van Beuningen collection of medieval pottery, which has been donated to the Van Beuningen Museum in Rotterdam.

A few examples of the forgery and fraud that have existed throughout the history of archaeology in the Netherlands are in order. For instance, the reason for the collection of the sixteenth-century finds from the Brittenburg fortress was to construct a Roman pedigree for an aristocratic lineage, a fraudulent enterprise. In the 1840s, Janssen of the RMO excavated a "Neolithic" pit village near Hilversum, and it took a century for the finds to be recognized for what they were, nineteenth-century forgeries, perhaps by one of Janssen's laborers. Famous among prehistoric fraud is Holwerda's misidentification of late Bronze Age tree coffins as the wall blocks of wooden "dome graves," based on a supposed analogy with Mycenaean *tholoi* (chamber tombs).

Several World War II finds that were later identified as probable forgeries by a Nazi bureau active in the Netherlands include "the Viking treasure" of Winsum (Elzinga 1975; Maarleveld and Pieper 1983). In the 1970s, news media ran stories about "the Vermaning hoax"-the Drenthe museum at Assen had for years been buying Paleolithic tools from the amateur archaeologist Tjerk Vermaning that were later recognized as forged. It was rumored that Vermaning was acting in good faith and that a conspiracy against official archaeology was behind the affair.

In the Netherlands-as elsewhere-interest in the archaeological record has never been very extensive. As Johan Picardt wrote (1660): "In the investigation of these antiquities of our home country, I do not find our compatriots very curious. They used to heed foreign, and external, more than indigenous histories. Yet I cannot understand or perceive that there are rarities or particularities in external histories, which we would not have, too, within our own country." Indeed, both the general public and the government have been rather unconcerned. Only megalith graves have been protected since 1734, as a result of a provincial law to prevent their destruction during the construction of roads and dikes, and grave barrows, Celtic fields (late Bronze Age-early Iron Age field systems), and other early sites have been destroyed in agricultural reallotment schemes. The legacy of the Middle Ages-such as city houses and in places whole city quarters, sixteenth- and seventeenth-century city defenses, and even old windmills and dikes-have only recently been or are still threatened by city construction. Only the Monuments Act of 1961 provides a means to preserve selected parts of the archaeological record.

A Gallery of Dutch Archaeologists

Dutch names are mentioned in few of the overviews of archaeological history (for example, Hodder 1991; Trigger 1989), a reflection of the importance that Dutch archaeology has been accorded by the world. Nevertheless, from this local archaeology some names can be proposed as worthy of international stature, if only because of their impact, long after their death, on Dutch archaeology. Of particular importance are Caspar Reuvens, Jan Hendrik Holwerda, Albert Egges van Giffen, and Hendrik Beyen, but some lesser figures have played important roles as well.

Casper J.C. Reuvens (1793-1835) studied law and defended his dissertation at the University of Paris in

1813. A professor of classical art at the (now closed) college of Harderwijk, in 1818 he became the first director of the RMO and also the first professor of archaeology at Leiden University. His first excavations (1826-1834) were at Arentsburg near Voorburg on an estate bought by the government especially

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between prehistorians and art historical archaeologists increased. The former considered themselves to be the "real" scientific archaeologists while the art historical archaeologists regarded the prehistorians as newcomers who threatened funds and opportunities. The foundation of ARCHON, a government subsidizing agency (one of the suboffices of the Netherlands Organization for the Advancement of Pure Scientific Research), in 1981 was a major step toward easing these tensions. Classical, prehistoric, and other archaeologists met on commissions where research proposals were judged, and this work fostered a mutual understanding. The economic slump of 1980s set ceilings on university budgets, and this fact also resulted in closer cooperation as the various groups shared the burdens of student training.

A History of Dutch Archaeological Discussion

Most archaeologists are rather provincial in outlook, with little knowledge of problems elsewhere, and it is possible that nowhere has the universal ideology of positivism been achieved. Dutch archaeology is no exception, and historic-humanitarian ("culture historical") rather than scientific leanings have been dominant. In the Netherlands, the study of the relation of material culture to society has involved a study of the relation of the Dutch archaeological record with previous Dutch cultures, and those Dutch archaeologists who worked elsewhere (Middle or Far East, Mediterranean) have related to their particular problems elsewhere in the same way. This situation held true until at least the 1970s.

In addition to the general provincialism of Dutch archaeology, there is the scientific influence of politically dominant neighbors. Thus, when France was dominant during much of the nineteenth century, references to French archaeology were frequent, and texts were written in French. With Germany in the political ascendancy, references (if any to non-Dutch texts) were to German writings, German congresses and training programs were attended, German ideas were copied, dedications were to German scholars, and texts were sometimes published in the German language. After World War II, when England and then the United States dominated the political scene, former German references were gradually replaced by English ones, and the general orientation, especially in prehistoric texts, became Anglo-Saxon and there was an almost complete ignorance of other-for example, French, Italian, or Russian-developments.

In Dutch classical archaeology, with its art history orientation, the same trend is present although slightly attenuated. The number of English references surpassed that of German texts only in 1980, and in prehistoric archaeology that index changed around 1970. Perhaps the languages in which the Dutch research is reported is even more eloquent. Before World War II, more than 90 percent of articles were in Dutch; during the war, only Dutch texts were offered; after the war, the percentage dropped from 60 percent in the 1950s to 15 percent in the 1990s, and in the same years, German texts decreased from 25 percent to 5 percent, and English texts rose from 10 percent to over 60 percent.

Whenever ideas of non-Anglo-Saxon scholars are discussed in the Netherlands, they have been introduced through English translations, even though the study of at least two foreign languages is compulsory in the universities. Thus, Italian archaeologist Bianchi-Bandinelli's ideas are understood by only a handful of classical archaeologists, and French archaeologist andré leroi-gourhan and philosophers Foucault, Derrida, and Bourdieu only became known to prehistoric archaeologists when they were translated into English. The Russian archaeologist Leo Klejn is referenced only for his *Current Anthropology* contributions. Postmodernism is understood in its U.S./U.K. variant, with Ian Hodder and Michael Shanks as major leaders; Marxist (and other nondominant) archaeology are referenced rarely, if at all.

In Dutch mainstream prehistoric archaeology after the 1960s, the old (Childean) normative paradigm of archaeological culture as a recurrent set of archaeological traits was gradually replaced by a more anthropologically informed model of a systematically networked set of organizing subsystems of

archaeological attributes (Bloemers and Van Dorp 1991; Slofstra 1994). A

repertory. It remained in vogue in Dutch archaeology for many years, even with different epistemological props. In these larger ventures, ever more diverse phenomena were incorporated (ecology, locational analysis, historical traditions), and discussion thus moved on to more abstract levels.

In the 1970s, several young archaeologists produced less narrow texts: Bloemers and Willems and their work on Romanization have already been mentioned; Sander Van der Leeuw did comparative work on pottery production (Van der Leeuw and Pritchard 1984); and Jan Slofstra (1994) and Van de Velde argued for a social archaeology, the former with an evolutionist/functionalist emphasis (e.g., Brandt and Slofstra 1983), the latter being more structuralist (e.g., Van de Velde 1979). Later, two task groups ("pioneer programs") were set up, one to work on political developments in the Iron Age, Roman, and early medieval periods as a historical anthropological exercise, the other to attempt to integrate earth sciences with anthropological notions of the Paleolithic period of northern Europe.

No matter whether there were written records or not, archaeology has probably always been understood as ancient history in the Netherlands. Views regarding the means to write that history have varied as have the understandings of how such a history should read. A kings-and-battles approach is not feasible, as was clear even to Reuvens; however, a bourgeois emphasis on "high culture" (art, literature) has hampered Dutch archaeological discussion. A more general approach has recently been gaining ground. The means to read ancient history through archaeology have also varied considerably, with emphasis swinging repeatedly from objects toward context and back, and from observation to inferences-the increasing efficiency of soil removal (in the early years by crofters, in the twentieth century by vast numbers of unemployed people and later by mechanical equipment and technicians), which resulted in an ever-larger scale of field operations, has been utilized primarily by the empirically minded.

Finally, a word or two should be said about present archaeological practice in the Netherlands. Theorizing (or general critical discussion) began when it became clear that there was no simple one-to-one correspondence between Dutch archaeological data and Dutch archaeological history-as was still assumed tacitly or openly in the major field projects of the 1970s and 1980s. Probably, it was a matter of reflexivity emerging from repression: the implications of fieldwork had been authoritatively taught to be straightforward ("This is no archaeology," a comment by an archaeologist working on david l. clarke's *Analytical Archaeology,* may be considered typical for much of Dutch archaeology until recently). In its turn, the self-perceived peripheral nature of Dutch archaeology can be invoked. Archaeology was considered either a handmaiden of ancient history, a collector of objects for art history, or a consumer of the advances in ecological research, in each of which the numbers of scholars were many times larger than all the archaeologists combined.

In other words, the referent groups, or the intellectual debates to which Dutch archaeologists used to refer to, were external to the discipline. The archaeologists were not in a position to contribute substantially to the core debates nor were they in a position to establish a general discussion of their own. Only when the number of archaeologists had crossed a quantitative threshold (Van der Leeuw 1994), could internal discussion become effective: first, through the full implementation of a complete archaeological training program in 1986; second, when in archaeological academia distinction could be obtained by the additional deployment of a perceptibly different outlook; and third, through the fierce competition for junior jobs when too many students to be employed archaeologically took their degrees in the period after 1975. The discussion has been channeled through a yearly congress on theoretical archaeology and communicated to a wider audience through a semiannual journal, *Archaeological Dialogues,* which was first issued in 1994.

Some Other Dutch Archaeological Enterprises

Apart from provincial Roman, classical, and prehistoric archaeologists, there were others interested

in other periods and other regions: Mesopotamia, Egypt, and, of course, the Dutch colonies in Southeast Asia and the Caribbean. Many of these scholars continued philological pursuits and were hardly interested in field archaeology, but several philologists have been and are active in excavation and survey programs.

In the Dutch East Indies (present-day Indonesia), an early pioneer was eugene dubois (1858- 1940), a physician and paleontologist who discovered the remains of *Homo erectus* (Pithecanthropus) on Java in 1891. Although work on these protohumans continues (by C. ter Haar, G.H.R. von Koenigswald, H.R. van Heekeren, and G.-J. Bartstra), the main interest of colonial archaeologists has been in the monumental remains of the classical Hindu period, most of them on Java (the Borobudur complex, the temples at Prambanan, etc.). These scholars came up with remarkably modern ideas on restoration as early as the 1910s and 1920s (especially N.J. Krom and Th. Van Erp; Bernet Kempers 1978). Some members of the Colonial Antiquities Service were sent to the Netherlands to be trained by Van Giffen (notably W.J.A. Willems and P.V. van Stein Callenfels), and they almost inevitably returned with prehistoric interests: for example, megaliths and the Hoabinh shell heaps. The Dutch did not set up a training program for prospective indigenous archaeologists.

After World War II and after Indonesian independence in 1949, the Archaeological Service of the Indonesian Republic was run by a Dutch planter and amateur archaeologist, H.R. van Heekeren, and he was succeeded by his Indonesian assistant and trainee, R.P. Soejono. Dutch interest in the archaeology of Indonesia has never been great. Bartstra of the University of Groningen has taken over the Paleolithic interests of Van Heekeren and has been cooperating with Soejono on the Pleistocene hominids in the archipelago since the 1970s.

In the Caribbean, the ethnologist J.P.B. de Josselin de Jong worked on Amerindian prehistory and did some small excavations on the islands of Aruba and Curaçao. Since the 1970s, was a more regular interest in the past of these Dutch colonies (including Surinam) on the part of archaeologists from Leiden University-E. Boerstra, A.H. Versteeg, C. Hofman, M. Hoogiand, each having had appropriate field training by Modderman.

Of the Dutch archaeologists who have been active in the Middle East, the best known is perhaps henri frankfort (1897-1954), an international figure who was born in Amsterdam. He worked with sir william matthew flinders petrie at the British School in Athens and with J.H. Breasted at the Chicago oriental institute, where he organized the multidisciplinary Diyala project in Iraq while simultaneously holding a professorship of Middle Eastern archaeology at the University of Amsterdam (1932-1939). Later, Frankfort went to the Warburg Institute in London to become professor of the history of preclassical antiquity at London University.

Another well-known name in Mesopotamian archaeology is M.N. van Loon, who also worked in the Chicago Oriental Institute before he was appointed professor in Amsterdam (1972-1987). Excavations at Tell Hammam in Syria are continued by D.J.W. Meijer, who presently works at Leiden. H.J. Franken, a theologian turned archaeologist, worked in Palestine at Deir Alla (where work is now carried on by G. van der Kooij). Franken also collaborated with kathleen kenyon at Jericho and Jerusalem and contributed to both the recording and the interpretation of tell stratigraphy and pottery studies by employing artisan potters in his institute. The Groningen BAI has also conducted investigations in this region (H. T. Waterbolk at Bouqras in Syria), as has the RMO (P. M.M.G. Akkermans at Tell Sabi Abyad in Syria; H. Schneider in Egypt).

Conclusions

This account has made it clear that Dutch archaeology is not primarily the development of Van Giffen's ideas but, rather, that he was part of an important phase of an ongoing tradition. From the very beginning of academic archaeology, even from the first recorded excavation in the Netherlands (Titia Brongersma and Ludolf Smids at the Borger megalith grave in 1685), auxiliary sciences have systematically been called on to aid in or back up interpretation.

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New Zealand: Historical Archaeology

Culture contact, extractive industry, and urban domesticity are themes that dominate the archaeological history of New Zealand since 1769 when European exploration brought New Zealand into the historic era. Originating in the 1920s, public and academic interest in the field of historical archaeology in New Zealand has grown dramatically since the mid-1970s.

Archaeological interest in the prehistoric Maori occupants of the country developed within a few decades of the founding of the first European settlement in 1792, but it was almost 120 years before attention turned to the postcontact period. The earliest work focused on sites from the mid-nineteenth-century wars between the Maori and the colonists, the most important being Elsdon Best's description of European redoubts, stockades, and blockhouses in the Wellington district (Best 1921) and his analysis of the manner in which Maori *pa* (earthwork fortifications) adapted to the introduction of muskets and artillery bombardment (Best 1927). These and other early works (*see* Smith 1990) concentrated on the description of surface features and reconstruction from historical sources rather than excavation. These works were also driven by the enthusiasm of individual scholars rather than by an institutionally based concern for the sites or the material culture of the historic period. Once the attention of those scholars turned elsewhere, historical archaeology in New Zealand became dormant.

The first excavation of a historic period site took place in 1959 at Orongo Bay, Gisborne, and was of a nineteenth-century Maori occupation

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New Zealand: Prehistoric Archaeology

Early Problems: 1769-1950

Natural History: 1769-1892

Initial research into the presence of the Maori in New Zealand was carried out by historians, philosophers, and scientists who studied aboriginal peoples as an aspect of natural history. In 1770, English explorer Captain James Cook and English botanist Joseph Banks noted similarities between the New Zealand Maori and the inhabitants of other South Seas Islands and concluded that both had a common origin to the west (Beaglehole 1962). By the time of his third voyage in 1777, Cook was able to discuss the distinctive features of Maori material culture (fortified villages, carved canoes, weapons, and ornaments) and the dissimilarities between Maori and eastern Polynesian cultures, such as the absence of the monumental stone *marae* (temples comprising a rectangular enclosure with a stone platform) he had seen in Tahiti (Reed and Reed 1969).

The presence of the giant ratite *Dinornithiformes*, or moa, in New Zealand was demonstrated by Richard Owen on the eve of the signing of the Treaty of Waitangi (Owen 1839), and knowledge that the extinct moa occurred in human habitation sites followed shortly after. Scientific demonstration of the association of moa and human remains came from the work of the German-trained geologist Julius von Haast (1872), though other scientists such as Walter Mantell and James Hector were also active at the same time.

Through the works of English geologist sir charles lyell (1869), Haast was influenced by John Lubbock's (1865) division of human cultural development into the Paleolithic period, characterized by crudely chipped stone artifacts and extinct mammals such as the mastodon, and the more recent Neolithic period, containing polished stone implements. Haast assumed that the moa remains from human encampments in the South Island were of Pleistocene age and that the moas had been finally exterminated by a Paleolithic race who used only chipped stone implements. He initially identified this race with the Australian Aborigines but later accepted that its members were of Polynesian origin. He denied that these moa hunters were the ancestors of the Neolithic Maori, as the latter manufactured polished stone implements and used nephrite (greenstone), indicating that they had reached a higher state of civilization.

Haast's views were challenged by Alexander McKay, whom Haast had employed to excavate Moabone Point Cave near Christchurch, New Zealand. McKay (1874) noted that moa bones and polished stone adzes occurred together and argued that this was proof that the moa hunters had a technology similar to that of the Maori. He concluded that whether or not the Maori had been responsible for the extinction of the moas depended on how old the sites were as well as on the date of first arrival of the Maori. Basing his estimate on the length of time required to produce the Maori population present in 1769, McKay suggested the Maori had probably been in New Zealand for about 1,350 years and furthermore that their first impact on the country was the extermination of the moa.

Traditional History: 1892-1950

The polynesian society was created in New Zealand in 1892, and its formation marked a split between the humanities and the natural sciences following the reorganization of science into specialized disciplines. Most of the research at the end of the nineteenth century and in the first half of the twentieth was carried out by a small number of professionals in museums or else was done on a part-time basis by interested individuals working for private firms or in public service. Although the Polynesian colonization of the Pacific archipelago was diffusionist by necessity, the study of Maori origins retained other aspects of the

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central and eastern Polynesia (Skinner 1921). Subsequently, Skinner maintained the Polynesian identity of all the prehistoric inhabitants of New Zealand. In 1924, Skinner drew attention to the presence of tanged adzes in New Zealand, the Chatham Islands, and Polynesia and also in those areas of Southeast Asia where Austronesian languages are spoken. In so doing, he substantiated his conclusions of the previous year (Skinner 1923) that the closest relationship of the Moriori culture (Chatham Islands) and the southern culture of the Maori was with eastern Polynesia.

Skinner's insights were confirmed by ethnographer Edwin G. Burrows's (1938) differentiation of Polynesia into a western cultural block (Samoa, Tonga, and neighboring islands) and eastern Polynesia, which joined the Society Islands with Hawaii, the Marquesas Islands, Easter Island, and New Zealand. Skinner employed the untrained but enthusiastic David Teviotdale as his archaeological collaborator, and Teviotdale's collections of tanged adzes, fishhooks, bone and stone ornaments, and greenstone artifacts clearly demonstrated the association of Maori artifacts with moas at sites such as Waitaki, Shag River, and Little Papanui (Teviotdale 1932).

Culture-Historical Studies: 1950-1965

The excavation of thirty-six human burials at Wairau Bar, near Blenheim on the South Island, between 1939 and 1952 represents the introduction of culture-historical archaeology to New Zealand. Accompanying the human remains were grave goods, including parts of moa skeletons, moa egg "waterbottles," tanged adzes, fishhooks, and necklaces of whale ivory "reels" and imitation whale teeth. The site also incorporated housing, areas for stone working, and cooking and midden dumping areas.

roger duff (1950) reformulated the ideas of Haast, Smith, Buck, and Skinner to argue that New Zealand's prehistory could be divided into an early, or moa hunter, period of Maori culture, and a later period of Maori culture. Duff defined Maori culture in terms of the observations of Cook and the earliest ethnographers. He was, however, unable to accurately date the Wairau Bar burials or to demonstrate the chronological and stratigraphical relationships between his two culture periods. Consequently, Duff made use of the presence of tanged adzes and the age-area concepts of centers of innovation and marginal survival to argue that Wairau Bar dated from the earliest period of Hawaiki dispersals. Second, he used Smith's chronology of the discovery of New Zealand in a.d. 950 and the arrival of the domestic plants *kumara*, taro, yams, and gourds with the great fleet in a.d. 1350 to both date and explain the development of the later Maori culture.

In 1955, Duff was able to announce a C-14 date of a.d. 1150 for Wairau Bar (Duff 1956). His predictions regarding the nature of the early period of eastern Polynesian culture were confirmed by Kenneth Emory and Yosihiko Sinoto of Hawaii's Bishop Museum, who in 1964 discovered human burials at Maupiti in the Society Islands, which were associated with whale tooth pendants, fish lure shanks, and tanged adzes, items almost identical to those recovered in New Zealand.

Ideas of adaptation to the temperate New Zealand environment continued to run alongside ideas of migrations and racial or economic replacement as explanations for the development of the distinctive Maori material culture. Cook thought that the Maori houses reflected the cool New Zealand environment while Skinner (1924) explained divergences between Maori and eastern Polynesian art and culture as a response to the move from the tropics. Buck (1949) similarly maintained that local developments were responsible for the most distinctive Maori cultural items, including warm houses, clothing, and *kumara* storage pits. The use of large canoes and carved houses was stimulated by the availability of large trees while fortified pa, warfare, and curvilinear art forms were a response to the tribal rivalry and competition that took place after the arrival of the great fleet. Finally, Duff (1947) explained the terraced pa, the tangless rounded 2B adze, and greenstone ornaments, which he used to

define his Maori period in terms of population growth and the innovative use of local materials.

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most particularly Green (1963), advocated the use of nonartifactual evidence to establish the space and time coordinates of sites and prehistoric social entities. In quick succession, flaked stone artifacts (Shawcross 1964b), storage pits (Parker 1962; Shawcross 1964a), and shell middens (Davidson 1967) were tested and found to be poor indicators of either chronological periods or regional styles.

Additional attention was given to archaeological sites where artifacts might be better preserved, in particular swamp sites-such as Ngaroto (Shawcross 1968), Kauri Point (Shawcross (1976), Mangakaware (Bellwood 1978), and Kohika (Irwin 1975)-or artificial pa constructed out of shell in low-lying areas such as Oruarangi on the Hauraki Plains (Shawcross and Terrell 1966). The artifacts from these sites have contributed to the knowledge of artifact and carving styles, and they have proved to have an antiquity that has undercut many of Groube's prescriptions for the classic phase. However, the specialized and rare nature of these sites has precluded the extension of these findings to other areas (Furey 1996).

Much attention has also been given to purifying the ethnographic and archaeological record of European influences in order to define a pristine classic Maori culture, an approach criticized by Stuart Bedford (1996). Artifact collections and observations made by the earliest visitors to New Zealand have been studied in detail (Salmond 1991; Shawcross 1970a), and some research has concentrated on archaeological sites known to have been occupied at the time of first contact such as Paeroa pa, which was mapped by Marion du Fresne in 1772 and destroyed by his men after du Fresne's death. In almost every case, either the historically documented phase could not be identified or else it had been destroyed by subsequent occupation (Groube 1965).

Studies of Process: 1965-1999

Because of the short time depth of New Zealand prehistory, culture-historical archaeology in New Zealand has always included some study of the processes of change. After 1965, the lack of success in defining culture periods culminated in an explicit shift to the study of processes.

Regional and Thematic Studies

The appointment of English archaeologist Charles Higham and other archaeological staff members at Otago University in the 1960s initiated a fruitful period of regional studies. These began with Australian archaeologist Peter Coutt's study of contact between Europeans and Maori in the Foveaux Straits region (Coutts 1969).

The Wairarapa Research Programme, initiated by Foss Leach and Helen Leach in 1969, marked a further stage in the development of a regional approach as a viable alternative to the definition of cultural periods (Leach 1976). This program, carried out at Palliser Bay in the Wairarapa, a marginal area for Maori agriculture on the northern side of Cook Strait, brought together studies of site distribution, settlement types, agriculture, house forms, shell midden content, stone artifacts, and traditional history (Leach and Leach 1979). It provided a model for similar regional studies that have been carried out for the Chatham Islands (Sutton 1982), Auckland (Davidson 1978; Irwin 1985), Northland (Sutton 1990), the Hauraki Plains (Phillips 2000), and the South Island (Anderson 1998). Such regional studies have not always escaped presenting their evidence within the culture-historical framework (see Prickett 1982), but for the most part, they have documented increases or decreases in the magnitude of human populations or changes in the complexity of regional, economic, or social organization for which the division of New Zealand prehistory into archaic or classic periods is largely irrelevant.

A number of studies, however, have continued to rely on adaptational or environmental explanations. Doug Sutton and Yvonne Marshall's (1980) use of convergent adaptation to explain similarities between

the Chatham Island Moriori, southern South Island Maori, and other southern foragers such as the Tasmanians is an example (see Anderson 1981). In a more recent study of the emergence of a northern Maori chiefdom, Sutton (1990) modified this stance by also considering sociopolitical and ideological factors. On the other hand, Atholl Anderson (1991) has returned to modeling the initial colonization of New Zealand in terms of the arrival

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of a small and highly mobile population that was stimulated by the rich environment to live more by hunting than by swidden agriculture, which involved effort in field preparation through cutting down and burning trees.

A major investigation of the various traits used by Duff, Golson, and Green to define their culture periods-e.g., material culture (including fishing gear, ornaments, adzes, and other stone artifacts), subsistence and technology, house and settlement forms, burials, warfare and pa design, and art styles-led New Zealand archaeologist Janet Davidson (1984) to conclude that changes in these traits took place at different times and in different places in response to quite different stimuli. Arguing that classic Maori culture could not have had a single point of origin, Davidson stressed that the polarization of New Zealand prehistory into the archaic and classic periods created insuperable difficulties for the explanation of the changes she had documented.

Thematic and regional projects in historical archaeology have been well documented by Ian Smith. Apart from Groube's (1965) study of proto-historic settlement patterns in the Bay of Islands, major projects have included the excavation of sites affected by the central North Island Tongariro power scheme carried out by Hoskins, a study of culture contact sites in Fiordland (Coutts 1969), Prickett's study of historic sites of the Taranaki wars (between Maori and the Crown), Neville Ritchie's explorations of the Otago goldfields affected by the Clutha dam development project, and, finally, a program on sites affected by urban development in the Auckland region led by Bulmer and others (see I. Smith 1990).

The last two projects were initiated under the Historic Places Amendment Act of 1975, a monument to the work of Green that gave the New Zealand Historic Places Trust control of the destruction of archaeological sites. Since 1975, the number of archaeologists employed by public and private agencies has matched the combined total of archaeologists in the universities and museums (about eighteen). Salvage archaeological projects have resulted in new surveys of remote or forested areas and the detailed archaeological investigation of the layout of fortified, residential, agricultural, and colonial industrial sites (Clough 1990).

Economic and Ecological Archaeology

In an innovative series of studies of North Island shell middens, Wilfred Shawcross combined grahame clark's economic approach with that of the Californian school of midden analysis (Heizer and Cook 1956). Using the interrelationships among site size, population, and the energy content of shell middens, Shawcross's work ranged from a study of the length of time a small group might have occupied a site (Shawcross 1967b) to the potential of harbor shellfish resources to support a human population (Shawcross 1967a) to the carrying capacity of both the North and South Islands based on seaboard productivity (Shawcross 1970b) and, finally, to the use of shell middens to construct a thermodynamic model that would allow a comparison of an early and late period midden in terms of work and efficiency (Shawcross 1972).

Detailed investigations of midden content and shellfish gathering practices have also been carried out by Reg Nichol (1988) and Atholl Anderson (1973). Anderson's study of prehistoric shellfish gathering behavior at Black Rocks, Palliser Bay, represents an early and probably independent use of ecological niche and optimal foraging models in New Zealand archaeology. Since 1978, Anderson has pursued the interaction of the prehistoric human population and moas in New Zealand. The results of this taphonomic and chronological study are correlated with the ecology of the moa and the distribution and contents of early archaeological sites to show the rapid extinction of the moa through hunting between 900 and 400 b.p. (Anderson 1989; Anderson, Allingham, and Smith 1996). Anderson and Smith (1996) argue that the early period of base settlements (villages), supported by localities rich in moas and seals, was a

short-lived phenomenon and an unsustainable colonizing strategy. Villages reemerged on the southern part of the South Island in the later part of its prehistory as the result of an intrusion of peoples from the North Island who were equipped with a more highly organized

exploitation strategy based upon stored foods and exchanges, including the payment of tribute to chiefs.

Chronological and Demographic Studies

In research on fortified pa, Groube (1964, 1970) plotted the regional distribution of chronological types based on their evolution from large, open-terraced pa to small pa that were heavily defended by multiple ditches, banks, and palisade posts. Initially, Groube explained this change in social terms as reflecting the breakdown of large tribal entities (and chieftainships?) into small, highly competitive descent groups. Chronology, demography, and resource stress were also included as factors. Groube argued that it would take 200 years or more for the population of a small group of colonists arriving in a.d. 1000 to reach about 25,000. After that, however, even moderate growth would take the population up to 100,000 by a.d. 1700. The thousands of fortified pa sites that dot the North Island landscape were the outcome of increasing competition for good-quality agricultural land within the zone of favorable climate. This was a form of resource stress through overpopulation that only had major effects during the final 200 years of New Zealand's prehistory.

It was many years before the information on pa distribution and chronology would allow the testing of Groube's hypotheses. Matt Schmidt (1996), using Anderson's (1991) suggestions for chronometrical reliability, derived 72 robust dates from a series of 221 radiocarbon dates from ninety-six pa. These dates suggested, first, that pa sites appeared rather suddenly at about a.d. 1500 and, second, that Groube's different classes of pa were spatially and chronologically coterminous. These conclusions repeated those of Geoffrey Irwin's (1985) study of spatial and hierarchical relationships of the pa of Kaipara Harbor and elsewhere. Irwin found that there was evidence that the settlement system (of Pouto) went through a stress threshold during the late prehistoric period that resulted in a spate of pa building. Multiple small pa and a few massive ones indicative of a higher order of organization suggested that the pa building was a response to both internal division and external threat.

Anderson (1991), in an extensive review of the time of initial settlement of New Zealand based on radiocarbon dates, found little evidence for settlement earlier than a.d. 1200. He added that the possibility of a planned immigration by some hundreds of people could not be ruled out. Sutton (1987, 1994), by contrast, used indications of fire disturbance in New Zealand pollen cores to claim that initial settlement was substantially earlier than a.d. 800. Part of Sutton's argument for an early date of colonization is based on life expectancy data and the implications of fertility and diet for population growth (Brewis, Malloy, and Sutton 1990).

Questions regarding the chronology of settlement and population growth in prehistoric New Zealand directly concern the time available for cultural processes. At present, the short chronology supports the idea of multiple settlement episodes and rapid and possibly intrusive changes in population, technology, and settlement patterns. The longer chronology supports arguments for the internal development of Pacific societies through evolutionary processes that led to the development of chiefly societies as a result of population increase, resource stress, agricultural intensification, or competition (Kirch and Green 1987).

Groube (1970) allied his model of population growth and resource stress with David Simmons's attempt (Simmons 1976) to reinstate the status of Maori canoe traditions by shifting their location to voyages around and between the islands of New Zealand (see Orbell 1985). Linking the distribution of the highly defended “ring ditch” pa with the historic movements of the “Awa” peoples enabled Groube to claim that the exile and forced migration of this group followed a standard Polynesian response to overpopulation. Computer simulations (Levison, Ward, Webb 1973), experimental voyages (Finney 1977), and increased knowledge of Pacific archaeology and Polynesian sailing techniques (Irwin 1992)

have led to a reassessment of Andrew Sharp's pessimistic views. His model has now been replaced by the possibility of planned voyages, multiple episodes of discovery and colonization,

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Nicaragua

See Costa Rica and Nicaragua

Nilsson, Sven

(1787-1883)

The son of a farmer who was taught to read and write by his father, Sven Nilsson enrolled at Lund University in sweden in 1806 with the intention of becoming a priest. He finished a degree in theology but then studied philology, natural history, and philosophy. In 1812, Nilsson was offered a position at Lund's natural history cabinet (or premuseum collection) as well as an associate professorship in natural history.

Through his work of classifying donations to the cabinet Nilsson became interested in fossil remains and research. He was elected to the Royal Swedish Academy of Sciences in 1812 and drew up plans for the academy's transformation into the Swedish Museum of Natural History, where he was eventually a curator.

While he was working in the museum, Nilsson continued to study zoology, geology, and anatomy and finished a medical degree in 1818. In 1832, he returned to the University of Lund as a professor of zoology, and the natural history museum at Lund became the center for Swedish zoology. In Nilsson's view, all natural-scientific research rested ultimately on careful comparisons, which made collecting decisive for the development of the sciences. He became a central figure in nineteenth-century Swedish zoology through his forty-year career as a university teacher and through the popularization of his scientific interests via lectures and publications. He was also one of the pioneers of the embryonic discipline of quaternary geology, linking geology, zoology, and archaeology to create a

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picture of the environment and living conditions in Sweden over long periods of time-the beginning of late-quaternary research.

Although Nilsson had collected archaeological artifacts since the 1820s and had participated in archaeological excavations as early as 1819, it was not until later in his career that he began to devote much of his time to archaeology, when he endeavored to translate a natural-science approach into a complex model of cultural development that could be measured empirically through technological change. Nilsson was the first to use comparative ethnography to elucidate cultural history-and thus he exercised great influence on the development of modern anthropology, particularly on American anthropologist lewis h. morgan and English ethnographer e. b. tylor. oscar montelius, who was critical of Nilsson in other contexts, believed that his cultural-evolutionary scheme and his comparative method had elevated antiquarian research into a science.

Nilsson began to lose prestige within the archaeological establishment mainly because his attempts to determine the origin of the Swedish Bronze Age led to chronological misjudgments. But his contributions were considerable: he provided a picture of prehistory that was more complex than any other; he clarified how flint tools were made, both through the use of experiments as well as through ethnographical and ethnological analogies; and he helped confirm and develop the three-age system. Perhaps most significant of all, however, was the fact that he showed how Stone Age societies had probably lived and demonstrated that the three-age system applied to Sweden as well as to denmark.

Johan Hegardt

See also

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Nimrud

Also known as Kalhu, Nimrud was an Assyrian city on the banks of the Tigris River quite close to nineveh. Made famous as a result of its excavation, initially by austen henry layard beginning in 1845 and later by sir max mallowan in 1954, Nimrud suffered fluctuating fortunes during its history. First established in the late second millennium b.c., the city was designated an imperial Assyrian city around 883 b.c. but shortly afterward lost that status to Khorsabad.

Phoenician bronze bowl from Nimrud

(Image Select)

But there had been time enough to produce the palaces, major sculptures (such as the winged bulls), and hundreds of cuneiform texts that were so enthusiastically excavated by Layard. The public exhibition of the results of his excavations in England after 1849 created a high level of public interest, which can in part be explained by the lure of spectacular objects. By the same token, Layard was quite aware of the powerful attraction of archaeological “proofs” of stories from the Old Testament (even though he managed to confuse Nimrud with the biblical Nineveh). In 1954, the site was systematically reexcavated

in a somewhat less bravura manner by Mallowan, who had signal successes of his own, particularly in the recovery of the famous Nimrud ivories.

Tim Murray

See also

Mesopotamia

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Nineveh

Nineveh, the great capital of the Assyrians on the river Tigris, became prominent around 700 b.c. during the reign of Sennacherib, who moved his capital there. Notwithstanding its great size and the magnificence of its architecture, Nineveh was sacked by the Medes and the Babylonians in 612 b.c.

First excavated by paul emile botta in 1842, the site is most famously associated with sir austen henry layard, who began excavating at Sennacherib's Palace in 1846. Layard was fortunate in his assistant Hormuzd Rassam, and the latter developed into an excavator of skill and vigor and took over the excavations after Layard's return to England in 1851. Between 1846 and 1851, during two major expeditions, spectacular examples of Neo-Assyrian art such as winged bulls and stone wall relief carvings were recovered and sent back to the british museum-which was the major sponsor of the work. Rassam later excavated the famous relief carvings of the royal lion hunt, which also grace that museum.

Of equal importance to the architecture and art works were the numerous cuneiform tablets that made up the Assyrian royal archives in the seventh century b.c., which have since been deciphered. Given the significance of the site, it is hardly surprising that it has attracted constant attention, including the valuable and technically excellent excavations undertaken by sir max mallowan in 1931 and 1932 and the postwar work of Iraqi archaelogists such as Manhal Jabr and the short tenure of the University of California, Berkeley, team under the direction of David Stronach (1987-1990).

Excavating a low-relief carving of the fish god, Dagon; drawing from Austen H. Layard, Discoveries in the Ruins of Nineveh and Babylon; with Travels in Arme-nia, Kurdistan, and the Desert (London, 1853)

(Ann Ronan Picture Library)

Tim Murray

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Mesopotamia

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Novgorod

Novgorod is an urban medieval site that served as the capital of northwestern russia from the twelfth to fifteenth centuries a.d. Located on the northern shore of Lake Ilmen in northwest Russia, Novgorod occupied a strategic position with access to the Volga and Dnieper Rivers and the Baltic Sea; therefore, it connected Russia, western Europe, Byzantium, and the Muslim East (Yanin et al. 1992). The territory of Novgorod, an early state, spread as far as the White Sea to the north and the Ural Mountains to the east, and the city served as the largest center of international and domestic trade in medieval Russia (Yanin 1990).

Archaeologists such as Elena Rybina and Valentin Yanin have conducted research at the site, adding to the 21,000 square meters excavated so far, which still represents less than 1 percent of the total area (Ostman 1997). The waterlogged conditions at the site contributed to the complete preservation of many

organic remains such as wood, bone, leather, and birchbark, as well as houses, streets, and medieval topography. Archaeologists have been able to analyze

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individual households, including the homes of artists, craftspeople, nobles, and slaves (Rybina 2001).

A most interesting feature of medieval Novgorod was the existence of thousands of documents scratched onto birchbark pages (*beresty*), of which almost 1,000 have been recovered. These deal with a wide range of subjects and include peasant complaints, financial records, school exercises, notes on literature, and love letters. Other preserved objects include tools, weapons, musical instruments, toys, jewelry, clothes, and craft materials.

A medieval church in Novgorod, Russia

(Image Select)

Thalia Gray

See also

Medieval Europe

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Novo Mesto

A late prehistoric settlement and complex of burial sites in Dolenjska (lower Carniola) in slovenia, Novo Mesto is characterized by a number of cemeteries dated from the whole first millennium b.c. The settlement is located on the Marof and was probably occupied from the late-Bronze Age to Roman times. The first excavations of the cemeteries began at the end of the nineteenth century (by the Naturhistorisches Museum, Vienna, and the National Museum, Ljubljana). However, more intensive research was initiated by the Dolenjski Muzej (lower Carniola museum) in Novo Mesto from 1967 onward.

The Novo Mesto cemeteries date to three main periods: late-Bronze Age (ninth-eighth centuries b.c.), early-Iron Age (eighth-fourth centuries b.c.), and the late-Iron Age to the Roman period (third century b.c.-second century a.d). From the first period, the sites of Mestne njive, Kapiteljska njiva, and Brsljin contain some 400 urned cremation graves and were part of the Ljubljana Urnfield group. Grave goods consisted mostly of dress ornaments (fibulae, bracelets, pins) and ceramic vessels. Only a few graves contained weapons (axes, spearheads), razors, necklaces, knives, or glass beads.

The early-Iron Age sites of Kapiteljske njive and Kandija are made up of some twenty earthen barrows.

The burial rite was inhumation (from few to seventy graves per barrow). Some rich princely graves of this period were recorded containing body armor, tripod, various helmet types, weapons, and decorated bronze vessels together with numerous warrior graves and graves with standard personal ornaments and ceramic vessels. In the early-Iron Age period, Novo Mesto was one of the most important centers of the Dolenjska (lower Carniola) group of the Hallstatt culture.

The late-Iron Age sites of Kapiteljske njive, Kandija, and Beletov vrt are characterized by cremation burials in flat cemeteries. Graves contain mostly middle and late la tène artifact types (swords with scabbards, shields, knives,

belt pieces, fibulae, necklaces, bracelets, and pottery) and early Roman provincial objects.

Peter Turk

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Nubia

Nubia is the name that has been given in modern times to a region that was known to ancient Egyptians and their neighbors as Kush (or Cush) and to Greeks and Romans as Aethiopia. Today, it comprises the most southerly part of Egypt and the adjoining northern part of the Republic of Sudan. Historically, however, the region has usually been both culturally and politically autonomous, neither wholly Egyptian nor wholly Sudanese. Its peoples speak languages of the African eastern Sudanic family and exhibit both racial and cultural characteristics that connect them with peoples further to the south in Africa as well as with their Egyptian neighbors. Nubia was the seat of the ancient Empire of Kush and later of medieval Christian kingdoms that successfully resisted the incursion of Islamic Egypt for a thousand years.

The northern boundary of Nubia since time immemorial has been at the First Cataract of the Nile, just upriver from the town of Aswan in Egypt. The peoples to the south of that point have always been and remain ethnically and linguistically different from the Egyptians. The southern limit of Nubia is more difficult to specify, for it has varied at different times in history. However, in the usage of archaeologists and culture historians, the term is generally synonymous with ancient Kush and Aethiopia; it designates that portion of the Nile Valley, upriver from Egypt, that was strongly affected by cultural and political currents from Egypt and the Mediterranean world. In that sense, the historic southern limit of Nubia should be placed somewhere to the south of modern Khartoum at the confluence of the Blue and White Nile Rivers.

The Nubian environment resembles that of Egypt in that the fertile Nile Valley is flanked, for most of its length, by totally lifeless deserts. Instead of a broad and continuous floodplain, however, the valley in Nubia contains only limited and disconnected patches of alluvium while elsewhere, bare granite or sandstone outcrops come right to the water's edge. In most of the region, moreover, the Nile did not annually overflow its banks, and irrigation required the use of man-made lifting devices. The agricultural potential was, as a result, very much less than that of Egypt, and the population was proportionately smaller. The prosperity of ancient and medieval Nubian civilizations did not depend on agricultural fertility, as in the case of Egypt, but on the country's position astride one of the world's oldest and richest trade routes. Before the development of trans-Saharan caravan trade in the first century a.d., the Nile Valley represented the only secure corridor across the Sahara through which gold, ivory, slaves, and other coveted goods from the African interior could reach the Mediterranean Basin.

A Resume of Cultural History

The late Palaeolithic and early Neolithic cultures of Nubia conformed to a general pattern that has been observed all over the eastern Sahara. Although pottery made its appearance surprisingly early, other

aspects of Neolithic cultural development lagged far behind contemporary developments in the Near East. As the Sahara gradually became drier and wild animal and bird life retreated to the Nile corridor, the abundance of aquatic and game resources seems to have actually retarded any heavy reliance on agriculture until near the end of the Neolithic period; similarly, the warm climate retarded the development of permanent housing. It was only during the time of “the copper age,” more or less contemporary with the beginnings of dynastic civilization in Egypt, that advanced Neolithic cultures made their appearance in Nubia.

The distinctive late Neolithic cultures of Nubia were first discovered as a result of excavations near Aswan in 1907. Because the finds corresponded to nothing previously known from Egypt, they were designated by the discoverer

belt pieces, fibulae, necklaces, bracelets, and pottery) and early Roman provincial objects.

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A Resume of Cultural History

The late Palaeolithic and early Neolithic cultures of Nubia conformed to a general pattern that has been observed all over the eastern Sahara. Although pottery made its appearance surprisingly early, other

aspects of Neolithic cultural development lagged far behind contemporary developments in the Near East. As the Sahara gradually became drier and wild animal and bird life retreated to the Nile corridor, the abundance of aquatic and game resources seems to have actually retarded any heavy reliance on agriculture until near the end of the Neolithic period; similarly, the warm climate retarded the development of permanent housing. It was only during the time of “the copper age,” more or less contemporary with the beginnings of dynastic civilization in Egypt, that advanced Neolithic cultures made their appearance in Nubia.

The distinctive late Neolithic cultures of Nubia were first discovered as a result of excavations near Aswan in 1907. Because the finds corresponded to nothing previously known from Egypt, they were designated by the discoverer

Early Archaeology in Nubia

Because of its historical connection with Egypt, Nubia has always been regarded by Egyptologists as part of "their" rightful domain. However, chaotic political conditions prevented any actual exploration in the country until the early nineteenth century when Nubia was once again annexed as an Egyptian colony. The Swiss explorer J.L. Burckhardt made the first full traverse of the country by any European in 1813, noting along the way a number of ruined Egyptian temples, including the huge rock-cut colossi of abu simbel. He was followed over the next three decades by several other explorer observers who left descriptions and sometimes woodcut illustrations of the major Nubian antiquities. Systematic and scientific investigation began, however, with the monumental work of karl richard lepsius, who between 1842 and 1845 copied all of the then-visible hieroglyphic inscriptions and reliefs on all of the ancient monuments both in Egypt and in Nubia as far south as the ruins of Meroe. His resulting five-volume *Denkmaler aus Agypten und Athiopien* (1849) remains today as the sole authoritative source for a great many monuments that have since been destroyed.

In the later nineteenth century, political conditions were again disturbed as a result of the Mahdist rebellion in the Sudan, and field investigation did not resume until after the Anglo-Egyptian reconquest in 1898. The highly publicized military campaign in the Sudan aroused a great deal of interest not only among the general public but among archaeologists, and within a decade of the reconquest, no fewer than nine expeditions took the field in the Egyptian and Sudanese portions of Nubia. In the years immediately following the reconquest, Wallis Budge of the british museum carried out a series of rather desultory excavations at several places in northern Sudan while James Breasted and a team from the University of Chicago's oriental institute made photographic records of all the major temples and inscriptions in Nubia. A little later an expedition from the Vienna Academy of Sciences began work in the area just upstream from Aswan, and two expeditions, one from Oxford University and one from the university of pennsylvania museum, worked on sites in the Egyptian-Sudanese border area. Far to the south, a Liverpool University expedition began to excavate the royal palace compound at the city of Meroe, and an expedition privately financed by Sir Henry Wellcome, a pharmaceutical manufacturer, worked at Gebel Moya south of Khartoum. The architect Somers Clarke, also with private financing, undertook to record all of the medieval Christian remains of both Egypt and Nubia.

Although all the early expeditions, except that of Wellcome, were led by Egyptologists, it is noteworthy that they did not confine themselves to only the archaeological remains of the pharaonic periods. Several of them dug at sites of the Kushite period, and the Oxford and Pennsylvania groups, as well as Somers Clarke, also made major contributions to the study of medieval Nubian remains. There thus arose very early the idea that Nubian archaeology should be a unified study, embracing the whole history of the country, rather than being strictly divided between the Egyptologist and the medievalist, as was the case in Egypt. On the other hand, all of the early expeditions, except that of the Pennsylvania Museum, paid primary attention to monumental architectural remains, mainly of the pharaonic and Kushite periods, although several also did some excavation in cemeteries. There was a conspicuous neglect of townsites, which mostly appeared to be of medieval or later date and which, in any case, were not expected to yield attractive and intact objects for display.

The single most important turning point in the development of Nubian archaeology came about through an act of destruction. The Egyptian irrigation authorities had built a small dam on the Nile just above Aswan at the turn of the century, and in 1907, it was decided to enlarge it so as to create a lake almost 100 miles long. The region to be inundated included a substantial part of Lower Nubia and a number of its important temples as well an unknown, but presumably large, number of other sites. In advance of the destruction, the Egyptian Survey Department sponsored what was, in fact, the world's first

archaeological salvage program. It was called the Archaeological Survey of Nubia, although its

monumental structures-fortresses, temples, and palaces-from the pharaonic and Kushite periods and also on the excavation of graves from all periods that would yield objects for museum display. Typically, an expedition worked at the same site for four or five seasons in succession, with a small team of European supervisory personnel and a very large native labor force. The quality of architectural recording and mapping was generally very high, since this work was done by trained specialists, but excavation controls were likely to be lax and written documentation poor. A few scholars like Somers Clarke, F. Ll. Griffith, and Monneret de Villard took a special interest in the numerous ruined churches of Nubia, but in other respects the medieval period was neglected. The numerous and well-preserved Christian Nubian townsites were considered too recent to be of interest, and cemeteries were wholly avoided once it was discovered that Christian Nubian graves contained no objects.

World War II brought an end to all archaeological work in Nubia for more than a decade, but when work by European expeditions resumed in the middle 1950s, British, French, Italian, and German expeditions all began excavating some of the pharaonic and Kushite monumental sites that had been bypassed earlier. At the same time, Sudan's Government Antiquities Service made its first entry into the field and immediately enlarged the scope of Nubian archaeology by investigating both prehistoric (Paleolithic and Neolithic) remains and medieval townsites.

The High-Dam Campaign and After

At the end of the 1950s, the Egyptian government announced plans to build a new and much higher dam at Aswan, one that would back up the Nile waters for more than 100 miles into the territory of the Sudan and complete the final destruction of what had once been Lower Nubia. The new reservoir would not be emptied in the summer, as its predecessor was, and the sixteen major temples in Egyptian and Sudanese Nubia would therefore have to be either physically removed to higher ground or surrendered permanently to the lake's waters. Both the Egyptian government and the newly independent Sudanese government (independent of Anglo-Egyptian rule since 1956) chose the former alternative, and the International Campaign to Save the Monuments of Nubia was launched, with great fanfare, in 1960. The United Nations Educational, Scientific, and Cultural Organization (UNESCO), with headquarters in Paris, agreed to provide overall coordination and to serve as a fund-collecting agency for the campaign, and throughout the next decade it generated a steady flow of publicity that served to focus world attention on the archaeology and culture history of Nubia.

Throughout the 1960s, the tremendous engineering feats of temple removal and reconstruction engaged the world's attention, particularly in the case of the great rock-cut temple of abu simbel. It and most of the other Egyptian temples were taken apart and reassembled on higher ground along the lake shore, close to their original sites. The four temples of Sudanese Nubia were removed to the national capital at Khartoum, several hundred miles to the south of the lake area.

Although much less publicized, the Campaign to Save the Monuments of Nubia had also a purely archaeological component, which was and remains the largest coordinated body of archaeological work undertaken anywhere in the world. Between 1959 and 1970, when the new lake reached its full contour, no fewer than sixty expeditions, representing twenty-three different countries, took part in the effort to excavate the sites of Lower Nubia before their final destruction. The high-dam campaign, as it came to be known, in effect broke the monopoly of Egyptologists on the study of Nubian archaeology, for the new expeditions included a large number of European and American prehistorians as well as classicists, Africanists, and many other kinds of specialists. The newcomers brought new and often more-advanced excavation methods to the Nubian field as well as a new and more global cultural perspective.

The salvage campaigns were organized somewhat differently in Egypt and in the Sudan. In Egypt, the

territory to be flooded was divided into parcels of more or less equal size, and these

Nyerup, Rasmus

(1759-1829)

During the early-nineteenth century, Copenhagen was the administrative and intellectual center of the joint kingdom of denmark and Norway, and, as in the rest of Europe, there was growing concern about the destruction of ancient monuments and archaeological sites. A royal collection of artifacts, or a Kunstkammer, was located in Christianborg, but it was unordered and overflowing with material. sweden had already passed legislation for the protection of its monuments and artifacts, and groups in Denmark and Norway became interested in similar legislation.

Professor Rasmus Nyerup researched these issues and traveled throughout Europe to find the best solutions. In 1801, he visited the Museum of French Monuments in Paris, which had been set up under the new republic, and was most impressed. In 1806, he published the results of his research and recommendations: *Survey of the National Monuments of Antiquity Such as May Be Displayed in a Future National Museum,* the last volume of which outlined his ideas as to how prehistoric material and later remains from Denmark and Norway should be exhibited in a museum similar to the one in Paris.

The defeat of the Danish by the English in 1801 and 1807 stimulated national enthusiasm for past greatness now perceived to be circumscribed by contemporary politics, and by 1806, Nyerup was beginning to receive the first contributions of archaeological material for a future national museum. In 1807, the first legislation for the protection of monuments and archaeological finds was enacted, and it provided for the setting up of a commission to advise on the foundation of a state museum. Nyerup became secretary and member of this commission.

By 1816, the job had become too big for him, and a young numismatist, with a deep interest in antiquity, the right connections, and a talent for classification, christian jurgensen thomsen, replaced him as secretary. Although it was Thomsen who gradually brought the Danish national collection into working order, which involved developing a whole new system of classification, it was Nyerup's survey that helped Thomsen formulate the system. And it was Nyerup's passion for, and knowledge of, antiquities that helped found the Danish National Museum, whose collections and scholars greatly contributed to the elucidation of prehistory, not only in Scandinavia, but also in Europe as a whole.

Tim Murray

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O

Obermaier Grad, Hugo

(1877-1946)

Hugo Obermaier Grad was born into a traditional and cultured family fond of humanist studies and collecting. Between 1886 and 1895, Obermaier's training alternated between the study of the classics (Greek and Latin) and reading the work of the archaeologist heinrich schliemann, which, combined with familiarity with Roman Bavarian antiquities, awoke his interest in archaeology. He then studied philosophy and theology and was ordained as a Catholic priest in 1900.

At the University of Vienna, Obermaier studied geology with A. Penck, anatomy and anthropology with C. Toldt, and prehistoric archaeology with M. Hörnes. In 1904, he obtained his Ph.D. Between 1904 and 1906, he completed his training in Paris where he was in contact with the great French prehistorians Lapparent, Gaudry, marcellin boule, emile cartailhac, Commont, and Capitan and studied French Paleolithic sites, museums, and private collections. It was here and at this time that he began to work with the French prehistorian and priest henri breuil. Indeed, Obermaier and Breuil shared the secretariat position in sessions of the Congrès International d'Anthropologie de Monaco in 1905.

In 1909, Obermaier visited spain for the first time, and he subsequently spent summers participating in the excavations and study of the art of important Cantabrian Paleolithic sites in the caves of Castillo (1910-1914, with Breuil and H. Alcalde del Río), at altamira (1925 on), and in La Pasiega as well as in the Pileta Cave, Málaga, among other sites.

From 1909 to 1911, Obermaier taught a course on the Primitive History of Man at the University of Vienna without giving up his cooperative work with French researchers. In 1911, he went to Paris to work with Boule and Breuil, who were directors of the Institut de Paléontologie Humaine founded by Prince Albert I of Monaco in 1910.

In view of the great importance of his research in Spain, the Real Academia de la Historia (Royal Academy of History) made Obermaier an honorary member in Munich in 1913. His connection with the Institut de Paléontologie was interrupted by the outbreak of World War I, but the Junta para la Ampliación de Estudios e Investigaciones Científicas (Board for the Expansion of Study and Scientific Research) offered him the post of assistant lecturer in the Museo de Ciencias Naturales (Museum of Natural Sciences) in Madrid while the Duke of Alba took him into his household as chaplain. From then until 1938, Obermaier worked in Spain and became a Spanish citizen in 1924. In 1922, at the request of the Philosophy and Arts Faculty of the Universidad Central (Central University) in Madrid, the chair of Primitive History of Man was created for him, and he was head of the section of the Museo Antropológico in Madrid until 1936.

In 1926, he was admitted to the Royal Academy of History, and he was made an honorary doctor by the universities of Friburg, Oporto, and Lisbon as well as the Skandinaviska Släkt Tudie Samfundet (Germanitas Genealogiae Gothica). He belonged to the Academy of Sciences of Bavaria and the Pontificia of the Nuovi Lincei of Rome. He was a member of the deutsches archäologisches institut (German

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Archaeological Institute) and a honorary member of the Prussian Academy of Sciences (both in Berlin), a honorary member of the Anthropological Society of Vienna, and a honorary fellow of the Royal Irish Academy.

In 1927, Obermaier founded, and directed until 1936, the monthly magazine *Investigación y Progreso* sponsored by the Center for Germano-Spanish Cultural Exchange, which published short papers on all fields of knowledge and research, mostly by German authors. Absent from Spain at the outbreak of the Civil War, he never resumed his academic career or residence there again. He was in Italy for a short time and then, in 1937, became a lecturer in prehistory at the Catholic University of Friburg in Germany, where he died.

Obermaier made important contributions to knowledge of Iberian prehistory in Europe, and to the development of the discipline of prehistory in Spain, through his teaching activity at the University of Madrid and through his research, which was primarily published in German and French. This research was concerned with Quaternary geology, the European Paleolithic period, Paleolithic rock art, and rock art during the postglacial period, both on the Iberian Peninsula and in Africa. He was responsible for the fundamental study of megalithic burial grounds, such as the dolmen of Matarrubilla (Seville) and the passage grave of Soto (Huelva).

Obermaier's first work of synthesis, *Der Mensch der Vorzeit* (1931), was translated into Russian a year later. The books *El hombre fósil* (1916) and *El hombre prehistórico y los orígenes de la humanidad* (1932) have been fundamental references for the study of the Paleolithic period in Spain for several decades.

In Spain, Obermaier's solid empirical training helped “to definitely overcome the distrust and prejudice which existed in academic circles with regard to Prehistory” (Peiro Martin and Pasamar Alzuria 1989-1990, 24). The introduction of Obermaier into these circles was additionally facilitated by his position as a Catholic author and by the sponsorship of the Duke of Alba. His most original contribution was his attempt to convert prehistory into paleoethnology by using ethnographic parallels. He was close to the historical-cultural school, but he did not consider it adequate for the study of the origins of human cultures (Obermaier 1926, 19). His paleoethnology was based on the community of ideas among peoples with the same degree of maturity, “how ever distant they were placed in space and in time” (Pairo Martin and Pasamar Alzuria 1989-1990, 27), and archaeological data. Some of the most important Spanish archaeologists were his pupils.

Isabel Martínez Navarrete

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Okladnikov, Aleksei Pavlovich

(1908-)

The son of a village schoolteacher, Aleksei Pavlovich Okladnikov was born in Siberia and developed an interest in the history, traditions, and folklore of that region. Okladnikov finished school in 1925 and entered the teacher-training

became first director of the Institute of History, Philology, and Philosophy in Novosibirsk. During the 1960s and 1970s, Okladnikov edited and authored the *History of Siberia,* for which he received the USSR's State Award in 1973. He returned to work in Soviet Mongolia and put forward a general scheme of the evolution of the Paleolithic period there. He also studied petroglyphs, discovering and examining thousands of them and publishing his interpretations. He supervised over forty doctoral dissertations, and his students now work in positions in archaeology across the whole of russia. He was awarded the Gold Medal of the Hero of Labor in 1978, on his seventieth birthday.

Ruslan S. Vasilevsky

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Olduvai Gorge

Located near the Serengeti Plain in northern Tanzania, Olduvai Gorge is an erosional feature connected to the Rift Valley of Africa. Discovered as a fossil locality by the Germans before World War I (notably by Wilhelm Kattwinkel [1866-1935] and Hans Reck [1886-1937]), Olduvai Gorge was taken up as a research area by louis b. leakey when Reck revisted the area with him between 1931 and 1932. Leakey and his wife, mary leakey, conducted regular fieldwork in the gorge over the next thirty years, but it was not until 1959 (with Mary Leakey's discovery of the cranium of what Louis Leakey named *Zinjanthropus boisei*) that the spectacular discoveries which are synonymous with the place were made.

The landscape of the Olduvai Gorge

(Gallo Images/Corbis)

In many ways, Olduvai Gorge is an ideal fossil locality with a geological history spanning the last 2 million years and fossil-bearing sediments sandwiched by datable volcanic tuffs that have so far yielded australopithecines and early forms of the genus *Homo* (*Homo habilis* and *Homo erectus*). Notwithstanding its importance as a fossil locality, the sediments at Olduvai also contain a vitally important cross-sequence of early hominid stone technology. It is the type site of the Oldawan industry, the oldest yet discovered,

and archaeologists have been able to trace the development of that industry through three phases (A, B, and C) on the site, and there is clear evidence of the replacement of these industries by the Acheulean around 1.4 million years ago.

Skulls discovered in Olduvai Gorge

(Gamma)

Work continued in the Olduvai Gorge after the death of Louis Leakey and the retirement of Mary Leakey from a leadership role at the site. Apart from being one of the world's most significant localities for homind fossils, it is also one of the most important training grounds for the current leaders in paleoanthropology and Pleistocene archaeology.

Tim Murray

See also

Africa, East, Prehistory; Laetoli

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Olmec Civilization

The Olmec civilization is often called the “mother culture” of mesoamerica. The first complex society of the area, the Olmecs developed and formalized many of the great hallmarks of Mesoamerican civilization.

The term *Olmec* means “people of the land of rubber.” The name was applied by the aztecs to the people living on the southern edge of the Gulf of Mexico-a low-lying, hot, and humid region where rubber trees are native. When archaeological sites with colossal heads carved in basalt were discovered in the area, archaeologists thought that they were relatively recent in date. A few scholars, however, argued for a greater antiquity. With the advent of more refined dating techniques such as radiocarbon dating, the debate was settled: the florescence of Olmec culture dated from about 1200 to 400 b.c.

Many of the most famous Olmec sites are in the steamy lowlands along the southern coast of the Gulf of Mexico, which is where the colossal heads were first found. This area has been called by many scholars the “Olmec heartland,” and sites such as San Lorenzo and la venta are two of the best-known and most excavated of all Olmec sites. Olmec San Lorenzo flourished between about 1200 and 900 b.c. The main part of the site was a huge, partly human-built earth mound some 1,200 meters long by 800 meters wide, on top of which were constructed ceremonial mounds, ritual pools, and a stone drainage system. The huge stone heads and other sculptures (carved from boulders dragged from about 60 kilometers away as the crow flies) were originally set in groups atop the large mound. Some were found to have been intentionally buried in large trenches; recently some heads have been discovered where they were apparently stored for recarving. About 900 b.c. many of the stone monuments at San Lorenzo were defaced (it was presumably at this time that some were buried in trenches), and the site was largely abandoned.

La Venta's florescence followed the decline of San Lorenzo and is dated from about 900 to 400 b.c. By that time the Olmecs had become master craftspeople in another medium, jade, which then became the most prized commodity throughout subsequent Mesoamerican cultures. La Venta suffered a fate similar to that of San Lorenzo: around 400 b.c. some of its monuments were smashed or defaced, and the site was abandoned.

The Olmec heartland was not the only place where the Olmec peoples flourished. Their presence in the highlands of central mexico is also attested at dozens of sites. Major highland Olmec sites included Chalcatzingo (ca. 1000-500 b.c.), just south of Mexico City, and another with the tongue-twister name of Teopantecuanitlan (ca. 900-600 b.c.). These

and many other Olmec sites were strategically located to control important resources and trade and communication routes. The large numbers and sheer volume of imported objects in many such sites clearly offer evidence of the Olmecs' ability to command resources from a wide area.

There are still many unanswered questions regarding the Olmecs. For example, was their widespread presence and influence based on political control, economic power, or the spread of an Olmec religion? All three possibilities have been proposed, but as yet there are no clear answers.

The Olmecs were wonderful artists and produced the first great art style of Mesoamerica. Their stone carvings great and small, their beautifully made and decorated ceramics, and their surviving paintings all are indicative of a mature and self-confident civilization. Many of their images are portraits of their gods, and major advances have been made in recent years in “deciphering” the Olmec pantheon. But other pieces are more personal, from the 20-ton portrait heads of their rulers to the smaller jade masks and other objects that have often been found in large numbers in caches.

What can be called classic Olmec civilization declined around 400 b.c., but the Olmec people survived. One of their achievements in later times was the development of a writing system. Traces indicating the first steps toward developing a script can be seen in monuments from La Venta, but evidence indicates that a full-fledged writing system was not used until near the time of Christ. This script, called epi-Olmec, has been brilliantly deciphered by two American scholars, John Justeson and Terrence Kaufman.

Peter Mathews

See also

Maya Civilization

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Olorgesailie

Although this Acheulean site south of Nairobi, in Kenya, was first discovered by louis leakey and mary leakey, it is most famously associated with the work of glyn isaac, who excavated there in the 1960s and early 1970s. The site originally aroused considerable interest because of the extensive record of hand-axe manufacture noted by Isaac and because he argued that he had identified clear evidence of butchery there. One part of the site also exhibited a large number of gelada baboon remains near a concentration of hand-axes, which gave rise to some speculation about whether these animals had been killed by hominids. Isaac's original interpretations of Olorgesaillie have been challenged on the basis that the sites are found in sandy stream channels, which at least makes it possible that the accumulations of stones and bones were not the direct result of hominid action.

Tim Murray

See also

Africa, East, Prehistory

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Oriental Institute of Chicago

Founded in 1919 by the U.S. Egyptologist James Henry Breasted, with support from John F. Rockefeller, the Oriental Institute was the expression of a strong interest at the University of Chicago in the archaeology, history, and linguistics of the ancient Near East. Rockefeller's generosity continued into the 1930s when the institute took possession of a purpose-built museum and an office and laboratory complex. But Breasted envisioned a greater role for the institute than simply being a repository of ancient artifacts; he believed it should also physically document the significant part played by Near Eastern civilizations in the evolution of western culture. Since its inception the Oriental Institute has been heavily involved in fieldwork throughout the Near East, and its staff members have been particularly active in the study of the ancient languages of the region, especially Assyrian and sumerian. In this regard, they have created dictionaries and advanced the systematic study

PREV NEXT

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Although this Acheulean site south of Nairobi, in Kenya, was first discovered by louis leakey and mary leakey, it is most famously associated with the work of glyn isaac, who excavated there in the 1960s and early 1970s. The site originally aroused considerable interest because of the extensive record of hand-axe manufacture noted by Isaac and because he argued that he had identified clear evidence of butchery there. One part of the site also exhibited a large number of gelada baboon remains near a concentration of hand-axes, which gave rise to some speculation about whether these animals had been killed by hominids. Isaac's original interpretations of Olorgesaillie have been challenged on the basis that the sites are found in sandy stream channels, which at least makes it possible that the accumulations of stones and bones were not the direct result of hominid action.

Tim Murray

See also

Africa, East, Prehistory

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Oriental Institute of Chicago

Founded in 1919 by the U.S. Egyptologist James Henry Breasted, with support from John F. Rockefeller, the Oriental Institute was the expression of a strong interest at the University of Chicago in the archaeology, history, and linguistics of the ancient Near East. Rockefeller's generosity continued into the 1930s when the institute took possession of a purpose-built museum and an office and laboratory complex. But Breasted envisioned a greater role for the institute than simply being a repository of ancient artifacts; he believed it should also physically document the significant part played by Near Eastern civilizations in the evolution of western culture. Since its inception the Oriental Institute has been heavily involved in fieldwork throughout the Near East, and its staff members have been particularly active in the study of the ancient languages of the region, especially Assyrian and sumerian. In this regard, they have created dictionaries and advanced the systematic study

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of ancient texts through epigraphy (most notably in Egypt).

Tim Murray

See also

Albright, William F.; Egypt, Dynastic; Egypt, Predynastic; Iran; Israel; Jordan; Mesopotamia; Syro-Palestinian and Biblical Archaeology

Ozette Village

The Ozette Village is a Northwest North American coastal shell midden site on the Olympic Peninsula of Washington State. It was occupied for at least 2,000 years until the early-twentieth century, and a portion of the site was preserved intact by a catastrophic mudslide in protohistoric times.

The coastal shell middens of the Olympic Peninsula were first excavated in the early-twentieth century. Radiocarbon dates place the sites within the last 3,000 years. Like many of the coastal sites, Ozette is a shell midden, located at the top of Cape Alava, the westernmost tip of the continuous United States. The village was a multiseason and winter-use food processing site. The primary food resource was whale.

Although the site, composed of several locations between the mainland and the nearby offshore islands, may have been occupied for 2,000 years, a portion was covered in a catastrophic mudslide around 1500 a.d. A mudslide capped the site with a six- to ten-foot layer of clay, rendering a unique opportunity to study the native village on the Olympic Peninsula Pacific coast. Many food-processing remains were recovered at Ozette. Ozette is unique in the preservation resulting from the mudslide. Not only did the clay mud cover occur before contact with Europeans, but it also created a water-soaked environment for the contents of the houses it covered. The wet condition preserved materials such as fiber and wood, which would normally deteriorate very rapidly.

Scientists have been fascinated with the Northwest Coast cultures because of their elaborate development of a mostly sea animal- based subsistence that included hunting whales, sea lions, seals, and sea otters. As a result of the mudslide, Ozette provides a complete material record of village daily and seasonal life. Over 85 percent of the artifacts from Ozette were made of perishable materials that have not survived at other sites such as wood, plant fiber, and structural components.

Ozette was first test-excavated in 1967 by Richard D. Daugherty. Ozette was one of the five Makah Indian tribe villages on the Peninsula, located between a low ridge and a narrow beach facing the Bodeltah Islands. The Makah call themselves “people of the seagulls and rocks.” The area is rich in bird, fish, and mammal life. The Islands protect the shore and waters for canoeing and are part of the village site. Ozette has mainly sea mammal remains, including sea lions, harbor seals, and sea otters. Whale remains are the most abundant of all; over 75 percent of recovered faunal remains are from a few species of whale. The rich variety of sea life brought whales near the shore, where they were hunted from canoes by the Makah. Other abundant food and material resources included ducks, geese, shorebirds, and shellfish.

In the winter of 1947, Daugherty surveyed Ozette as part of an archaeological survey of the entire Pacific coast of Washington. Ethnographic studies were conducted in 1948 and 1949. In 1955 Stallard and Denman conducted a small test excavation at Ozette. In the summers of 1966 and 1967 Daugherty, Roald Fryxell, and Carl Gustafson tested all areas of the site; the earliest radiocarbon dates they received were 2010 +/- 190 years ago. In 1967 Area B, a recent longhouse area, was excavated on the sea bank edge. Normally perishable materials such as fiber matting, cordage, basketry, wooden wedges,

and boxes were found in the test excavations. In 1970, storms uncovered more perishable artifacts on the bank edge. At that time, the Makah Tribal Council asked Daughtery to return and salvage the materials. From that point on, excavations were continued year-round until 1981. After initial testing, a singular excavation project was conducted for over ten years, in cooperation with with the Makah Indian Nation.

The sheer volume of well-preserved fragile artifacts from the site is overwhelming. A special processing and exhibit center was constructed just for Ozette materials. The location required

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Palenque

Palenque is a classic Maya site and kingdom in the southern state of Chiapas in mexico. Its florescence was during the late classic period, ca. a.d. 600-800, and after its decline and abandonment it became enveloped by dense forest until it was rediscovered in the late-eighteenth century. During the nineteenth century, the beauty of its architecture and art made the site famous, and during the twentieth century, excavations and mapping at the site have revealed an extensive city. The discovery in 1952 of a royal tomb beneath the Temple of the Inscriptions at Palenque was one of the greatest Maya archaeological finds.

Palenque's early history was not particularly stellar. A king list extending back to the early fifth century exists at the site, and some early remains have been found dating from Palenque's early years. Nevertheless, most of Palenque's archaeological remains excavated thus far date to the period after a.d. 600.

Shortly before and after that date, Palenque was devastated by a series of defeats in war. It appears that the capital itself was invaded, and a series of royal deaths around this time indicates that the kingdom was rocked to its foundations. The new king to emerge from this period of upheaval was a man called Hanab'-Pakal. He came to the throne in a.d. 615, at the age of twelve, and proceeded to guide his kingdom to a period of stability and power. By the time he died in 683, Palenque was one of the greatest kingdoms in the Maya area.

Hanab'-Pakal achieved that stability by consolidating the eastern frontier of his kingdom with military victories over his old enemies while a probable kinsman of his simultaneously extended the kingdom to the west. With his kingdom stabilized, Hanab'-Pakal turned his attention to his capital city and embarked on a major building program. Much of the palace at Palenque was his work, and he also began work on his most famous monument, the Temple of the Inscriptions. This temple pyramid, which contains the tomb of Hanab'-Pakal, has an interior stairway (filled in and covered in antiquity) leading to the temple above. Hanab'-Pakal was buried in a beautifully carved stone sarcophagus upon his death at the age of eighty.

Hanab'-Pakal was succeeded by his oldest son, Kan-Balam II, who extended his father's building program, building most notably the famous “Group of the Cross,” an arrangement of three temples that are widely considered to be among the most elegant of all Maya buildings.

Palenque's fortunes waxed and waned over the following decades, but by a.d. 800, the site was in decline. Late construction at Palenque consisted of such work as poorly built walls subdividing the elegant chambers of the palace-a sad conclusion to Palenque's great architectural tradition.

In addition to its beautiful architecture (which features the widest corbeled vaults in the Maya area), Palenque is famous for its elegant art. Many of the temples have beautiful scenes in modeled stucco adorning their outer facades. Stone carving at Palenque was mostly done using flat panels of finely grained limestone rather than the upright, free-standing stelae that typify other sites. These panels were carved and then set on walls in the interior of buildings, so for the most part they have been

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A pyramid in the ruins of Palenque

(Gamma)

Peter Mathews

See also

Mesoamerica

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Paleolithic Archaeology

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The Discovery of the Archaeological Record

Individuals in many societies have, throughout history, expressed an interest in the human past and its visible antiquities, but much of this was philosophical speculation removed from the study of the remains themselves. It was the European Renaissance that provided the foundations for a material study of the past. The classical writers discussed the ancestors of the northern Europeans, which led some renaissance scholars to speculate on the origin of European antiquities (Daniel 1975, 17). Some sixteenth-century scholars were able to travel to greece and italy and see classical antiquities for themselves. During this time, however, the focus was on art and architecture, on visible standing monuments rather than on buried remains.

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edges, but such investigations did not begin in earnest until the second half of the nineteenth century. Gravel terraces were formed from water-laid sediments and contained a stratigraphic record of artifacts and animal bones, but this record was not as substantial as that found in caves (Sackett 2000).

A series of investigations in the late eighteenth and early nineteenth centuries reported the association of human remains or artifacts with the remains of extinct animals, but in each case doubts were cast on the stratigraphic integrity of the finds since they derived from limestone caves known to be affected by water movement. Thus, after French archaeologist Torunal discovered human bones associated with the bones of extinct animals at Grotte de Bize (a cave in southwest France) his colleague Serres claimed that both sets of bones were in the same state of preservation, but a committee led by Cuvier that evaluated the finds dismissed the suggestion. Belgian archaeologist philippe schmerling, excavating a number of caves near Liege in Belgium, uncovered human remains as well as many artifacts associated with rhinoceros and mammoth bones, but reports of these finds were not taken seriously by contemporary scholars (Daniel 1975, 33-35; Sackett 2000).

At kent's cavern in southern England, excavated by amateur archaeologist John MacEnery between 1825 and 1829, artifacts were discovered associated with rhinoceros remains beneath a stalagmite floor. At first MacEnery concluded that the associations were real, thereby demonstrating human antiquity, but after discussions with Buckland he became convinced that they were the result of postdepositional admixture (Grayson 1983, 75-76). Buckland himself sought an explanation for human remains from Goats' Hole Cave in Paviland (England) that would enable him to associate both the human remains and the artifacts he found with the Roman-British period (Daniel 1975, 37; Grayson 1983, 67).

The Establishment of High Human Antiquity

Although the number of discoveries of artifacts associated with bones of extinct animals continued to mount, the demonstration of high human antiquity required that the stratigraphic integrity of deposits be accepted. This first occurred at two locations: in the Somme gravel terraces in northern France and at brixham cave in England. From 1837 onward, inspired by the earlier studies of French archaeologist Picard, jacques boucher de perthes collected artifacts and the bones of extinct animals from the Somme River gravels. He published his findings in *Antiquités celtiques et antédiluviennes* in 1847, describing the stratigraphic position and integrity of his discoveries (Daniel 1975, 58; Grayson 1983, 119). However, intertwined with his stratigraphic observations were a range of speculative assertions that did little to further the acceptance of his views by his contemporaries. He assigned symbolic significance to many of the artifacts he discovered and interpreted them all according to a catastrophist theory that would have been more at home in the late eighteenth century than in the 1840s (Grayson 1983, 126; Sackett 2000).

In 1858, a grant was given to amateur geologist william pengelly to excavate the newly discovered cave at Brixham in search of paleontological samples. The project was supervised by a group of eminent British geologists: joseph prestwich, Lyell, hugh falconer, Richard Owen, and R. Godwin-Austen. Excavations revealed the bones of extinct animals, but unexpectedly, thirty-six artifacts were also recovered beneath a stalagmitic layer three to eight inches thick. Their discovery sparked a variety of explanations, but these were quickly unified as the result of a visit by Falconer to the sites of Boucher de Perthes in 1858. Impressed by what he saw at the Somme excavations, Falconer encouraged Lyell, Prestwich, and Godwin-Austin, together with the antiquarian Henry Flower and sir john evans, to also visit the sites of Boucher de Perthes. As a result of these visits, Prestwich and Evans were able to photograph a hand-axe *in situ*, associated with the bones of extinct animals at st. acheul in northern France (Daniel 1975, 58; Grayson 1983, 172-176; Sackett 2000).

In 1859, Prestwich read a paper to the Royal Society recalling Frere's work at Hoxne and describing how Pengelly's work at Brixham and

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the discoveries of Boucher de Perthes in the Somme had convinced him of high human antiquity. Evans read a similar paper to the society of antiquaries of london (Daniel 1975, 58). A number of French scholars supported the British proposals. édouard lartet, for instance, almost immediately thereafter published the results of a study of cut marks on the bones of extinct animals that suggested the presence of humans in the remote past. The speed of his publication suggested that he had accepted high human antiquity sometime before the 1859 consensus (Sackett 2000).

The year 1859 also marked the publication of Charles Darwin's *Origin of Species,* but the two events were not connected. Darwin's theory of evolution to explain human ancestry was owing to Thomas Henry Huxley, who had published *Man's Place in Nature* in 1863 (Daniel 1975, 65), and Darwin's theory dealt with descent with modification, that is, successive generations of a species over time change in form, character, and behavior. The establishment of high human antiquity demonstrated that humans, like other animal species, had a long history on earth, which inevitably led to questions about the nature of human evolution.

The intellectual climate had changed considerably before 1859 as a result of debates between supporters of monogenesis and polygenesis. Those who supported a theory of monogenesis suggested that all humans belonged to a single species, and this was the prevailing view during the late eighteenth and early nineteenth centuries. However, after the 1840s, scholars who believed in multiple human species, or polygenesis, were able to use archaeological discoveries made in Egypt to argue that different human races were in existence as early as 2500 b.c. If a pre-1859 biblical chronology was accepted for the antiquity of humanity, there remained insufficient time for human racial differences to occur. Morton was able to use this evidence in support of the case of polygenesis (Grayson 1983, 158). In attempting to refute this position, monogenesists like Pickard were forced to abandon the biblical chronology to provide sufficient time for the development of racial differences. Therefore, well before 1859, many scholars were convinced that the Bible was inadequate as a source for determining human antiquity.

Early Years of the Discipline: 1860-1880

Three challenges dominated archaeological research following the acceptance of high human antiquity: establishing the validity of the three-age system; explaining progress in terms of economic, social, and political factors; and relating patterns of technological change in the archaeological record to human evolution.

French archaeologists proposed two ages of stone, the *période de la pierre taillée* (flaked-stone tools) and the *période de la pierre polie* (polished-stone tools), and these periods were adopted by Sir John Lubbock (lord avebury) in his book *Pre-historic Times* (1865*).* He applied the term Paleolithic to the period when artifacts were deposited with the remains of mammoths, cave bears, and rhinoceros, and the term Neolithic was applied to the period when polished stone artifacts were made. Such technological changes could be demonstrated through stratigraphic excavation and showed a pattern of increasing complexity through time-thus illustrating the universality of human progress.

By the 1860s, the twofold division had been increased to four based on the excavations of Lartet and henry christy in the Dordogne region of southern france (Lartet and Christy 1865-1875), where Lartet provided stratigraphic evidence for their existence based on associated animal remains. The cave period of the aurochs, or bison, was preceded by the reindeer period, the woolly mammoth and rhinoceros period, and finally the cave-bear period. To these Garrigou added earlier periods based on the presence of warm climate fauna. Finds from the Somme River gravel terraces associated with such fauna suggested that the people there lived mainly in open sites. The great bear and mammoth periods were

characterized by both rock-shelter and open-site deposits (Daniel 1975, 100).

In his use of paleontological categories as a basis for organizing archaeological materials, Lartet was well ahead of his time (Daniel 1975, 101). Indeed, the book by Lartet and Christy (1865-1875) on their Dordogne research reads

like an ambitious attempt at paleoethnology (Sackett 2000). However, it was not a direction that was followed for very long, and French archaeologist gabriel de mortillet reformulated Lartet's scheme, substituting archaeological names for the paleontological descriptions.

The hippopotamus age became the Chellean, later renamed the Abbevillian. Much of the great bear and mammoth age was classified as Mousterian, named after the site of le moustier in central France. De Mortillet identified the mammoth period with the site of Aurignac and called it Aurignacian. The reindeer age was divided into two, the earliest ultimately named the Solutrian after the site of solutré in eastern France, and the later named after la madeleine in central France (Daniel 1975, 103). However, even though site names had replaced the names of animals as labels, the scheme still owed much to paleontology. Each stage was thought of as an epoch, a vaguely defined temporal phase, rather than as an artifact complex (Sackett 1991). It was easy, therefore, to relate a unilinear succession of technological change to a unilinear theory of human evolution (Trigger 1989, 95-97).

The idea that all human groups passed through the same stages of cultural development, albeit not at the same time nor at the same rate, provided the rationale for using more-primitive living human groups to model the lifestyles of prehistoric groups with similar technologies. This analogy also provided an answer to the problem of explaining progress in terms of economic, social, and political factors. Huxley (1863) suggested that the Australian Aborigines could be used to flesh out reconstructions of the Neanderthals and their Middle Paleolithic tool kits (Trigger 1989, 113) while Lubbock (1865) applied descriptions of the Eskimo lifestyle to paint a picture of long-extinct Upper Paleolithic communities (Trigger 1989, 115).

By the 1880s, the Enlightenment ideal of universal human progress had been replaced by the idea that differences between cultural groups had deep-seated biological origins. As nationalism was encouraged, so was the search for the biological roots of those national characteristics, and racial factors replaced environmental ones as explanations for the different historical trajectories of different cultural groups (Trigger 1989, 111). Darwinian evolution seemed to equate with these ideas and helped to lay the foundations for a form of cultural evolutionism in which natural selection was invoked to explain both the differences between cultures and the biological capacity for culture. Thus, the sequence of stone artifact technologies described by Paleolithic archaeologists seemingly provided the tangible evidence needed to document the evolution of modern human societies (Sackett 1991).

Artifacts as Cultural Markers

Toward the end of the nineteenth century, a growing European nationalism fostered an interest in the history and archaeology of particular ethnic groups and focused attention on the archaeology of more recent time periods. By now, archaeologists had documented far more variation in material culture assemblages than could be accommodated comfortably within a unilinear evolutionary framework. In seeking to explain this variation, a resemblance was noted between the patterning of archaeological assemblages and differences in the material cultures of living peoples, with the diffusion of ideas contributing to the creation of distinct culture areas (Robertshaw 1990; Sackett 1981; Trigger 1989, 122).

Those observations laid the foundations for an explanatory model that was to dominate Neolithic, Bronze, and Iron Age archaeological research for much of the twentieth century. The model's development can be traced through the work of oscar montelius on typology and seriation (Trigger 1989, 158), gustaf kossinna on material remains used to track the history of ethnic groups (Trigger 1989, 163), and the late-nineteenth-century German ethnologists who established the association between material remains and ethnic groups, but it is perhaps best exemplified by the work of English archaeologist vere gordon childe (Childe 1925).

Childe sought to identify recurring sets of material remains whose spatial and temporal boundaries could be used to define the boundaries between prehistoric cultures. Those prehistoric cultures were considered analogous to

in the first half of the twentieth century, knowledge of North African prehistory was extended by the work of Sandford and Arkell (1929, 1933, 1939) in the Nile Valley, gertrude caton-thompson (1934) at Kharga Oasis in Egypt, and charles mcburney and R. W. Hey (1955) in Cyrenaica in what is now eastern Libya.

Initial work in the Near East was carried out by Godefroy Zumoffen between 1897 and 1900, and he was followed by Henry Neuville (1934, 1951) and Francis Turville-Petre (1932). However, the most significant excavations were by Neuville, Stékelis, and dorothy garrod (Garrod and Bate 1937) at Skhul, el-Wad, and et-Tabun in Israel.

In 1926, louis s. leakey began research in the Rift Valley of Africa for sites. In his *Stone Age Cultures of Kenya Colony* (1931) Leakey used European terminology to describe the African industries. Astley John Hilary Goodwin and Clarence Van Riet Lowe (1929) developed the first lasting African terminology based on their assessment of archaeological materials on the terraces of the Vaal River valley. They introduced the classic tripartite sequence of early, middle, and late Stone Age, which was applied widely in Africa during the 1930s and 1940s (Fagan 1981). However, Europe, not Africa, was seen as the source for new ideas. The Sahara acted as a significant barrier preventing movement from south to north and allowing only "higher" cultures to move north to south (Deacon 1990).

Parallel Phyla after World War II

Explanation for change according to the parallel phyla scheme was found in diffusion and migration, sometimes leading to quite dramatic explanations for supposed major changes in the artifact record. A species difference, for instance, was proposed to account for the change from the Mousterian to the initial Upper Paleolithic by both Burkitt in 1933 and Leakey in 1934 (Isaac 1972b).

After World War II, the French archaeologist françois bordes and his colleague Maurice Bourgon developed a new approach to the description, analysis, and interpretation of Lower and Middle Paleolithic artifact assemblages. This approach, which was to become enormously influential (Bordes 1950; Bordes and Bourgon 1951), separated the description of an artifact assemblage from the description of the artifacts it contained and distinguished the description of artifact forms from the description of the techniques involved in their production. The Bordes approach thus removed the circularity inherent in the work of Breuil and Peyrony, who had relied on certain diagnostic artifact types (type fossils) to simultaneously describe the content of an assemblage and assign it a position in an evolutionary scheme (Sackett 1981). Although developed initially to describe French Lower and Middle Paleolithic assemblages, Bordes's approach soon became the accepted method for characterizing assemblages from other parts of Europe as well as those from North Africa, the Middle East, and Asia.

Bordes used a common set of attributes to describe sixty-three different tool types that were recurring features of Middle Paleolithic assemblages. These attributes included the location of the retouched edges on the tool blank, the type of retouch applied to those edges, the number of retouched edges, and their shapes (Bordes 1961a, 1961b). The great majority of artifacts recovered from Lower and Middle Paleolithic sites could be classified using this typological scheme.

There are several reasons for the rapid and widespread acceptance of Bordes's methodology. First, the classificatory scheme on which it was based proved applicable to Lower and Middle Paleolithic artifact assemblages from many different contexts in many different regions. Second, artifact assemblages were not characterized solely on the basis of a few, apparently diagnostic, tool types. Third, the methodology facilitated comparisons between assemblages. Not only were they described using the same set of tool types, but Bordes introduced a simple statistical method for describing the composition of artifact

assemblages that showed how the percentage frequency of each tool type found in an assemblage altered in response to changes in the percentage frequencies. Fourth, because it provided a way of examining spatial and temporal variation in the co-occurrence of artifact

types, Bordes's method broadened the range of interpretative possibilities. Finally, the conclusion that variation in contemporaneous artifact assemblages reflected the existence of established cultural traditions brought Paleolithic archaeology closer to the explanatory frameworks being applied under the influence of Childe.

Functional Approaches

At the same time that Bordes was discussing cultural traditions, other archaeologists were exploring the possibility that recurring assemblage types might represent seasonal or functional differences in activities undertaken at different sites (e.g., Binford and Binford 1966; Clark 1959; Freeman 1966; McBurney 1950; Oakley 1952, 18). Of these, lewis binford's study became the best known because of a lively debate between Binford and Bordes (e.g., Binford 1973; Bordes 1973; Bordes and de Sonneville-Bordes 1970), a debate that arose from fundamentally different views about the type of behavioral information preserved in the archaeological record.

Bordes argued that variation in material remains reflected ethnic or cultural groupings. Binford argued that differences in the activities undertaken in different parts of the landscape, at different times of the year, were such pervasive features of hunter-gatherer societies that they must have been major influences on the composition of past material culture assemblages. At the heart of the debate lay the problem of disentangling the effects of functional and stylistic differences on the composition of artifact assemblages and of deciding which artifact attributes were stylistic or functional in origin.

Although the debate between Bordes and Binford dominated the literature for a time, there were archaeologists working on other time periods who were keen to explore the interpretative implications of new data being generated, not only by an expanding archaeological record but also by the incorporation of new techniques. For example, in a discussion of the implications of new dating techniques for the interpretation of the archaeological data, glyn isaac (1972a) noted that there are orders of magnitude of difference in the geographic and temporal distributions of Lower and Middle Paleolithic assemblages when compared with those recovered from the Upper Paleolithic record.

Isaac suggested that these differences could relate to the evolution of specific behavioral capacities and that different explanations for the existence of patterned variation in artifact assemblages might be sought for different portions of the record. For example, he postulated that while Upper Paleolithic artifacts may have served as cultural markers, this could not be considered an appropriate explanation for the similarities and differences exhibited, for example, by Acheulean artifact assemblages, simply on the basis of the spatial and temporal scale of the documented pattern of variation. This observation, coupled with the long-standing suggestion that the Upper Paleolithic record marked the establishment of modern human populations and a unique set of behavioral traits (e.g., Burkitt 1955, 143-161; McBurney 1950), was reinforced by studies of many different components of that record (e.g., Binford 1973; Mellars 1989).

From the 1960s to the Present

In the last four decades of the twentieth century, another shift occurred in the way Paleolithic archaeologists ascribed meaning to the succession of stone technologies first documented in the late nineteenth century. Even during the 1950s, a number of archaeologists working with the earliest Paleolithic record had expressed dissatisfaction with the multiple phyla concept (Isaac 1972b), opting instead for an explanation that involved relating assemblage differences to different activities between sites (e.g., Clark 1950, 1959; Howell and Clark 1963; Kleindienst 1961). Following this lead, archaeologists once again became interested in the comparative method as a means for learning about

human evolutionary history.

During the late nineteenth century, evolutionists like Darwin, Huxley, and Haeckel had begun to ask questions about the kind of ancestor that had given rise to humans. In trying to answer the question, they attempted to identify the closest living relatives to humans and drew up a list of human-versus-ape characteristics.

types, Bordes's method broadened the range of interpretative possibilities. Finally, the conclusion that variation in contemporaneous artifact assemblages reflected the existence of established cultural traditions brought Paleolithic archaeology closer to the explanatory frameworks being applied under the influence of Childe.

Functional Approaches

At the same time that Bordes was discussing cultural traditions, other archaeologists were exploring the possibility that recurring assemblage types might represent seasonal or functional differences in activities undertaken at different sites (e.g., Binford and Binford 1966; Clark 1959; Freeman 1966; McBurney 1950; Oakley 1952, 18). Of these, lewis binford's study became the best known because of a lively debate between Binford and Bordes (e.g., Binford 1973; Bordes 1973; Bordes and de Sonneville-Bordes 1970), a debate that arose from fundamentally different views about the type of behavioral information preserved in the archaeological record.

Bordes argued that variation in material remains reflected ethnic or cultural groupings. Binford argued that differences in the activities undertaken in different parts of the landscape, at different times of the year, were such pervasive features of hunter-gatherer societies that they must have been major influences on the composition of past material culture assemblages. At the heart of the debate lay the problem of disentangling the effects of functional and stylistic differences on the composition of artifact assemblages and of deciding which artifact attributes were stylistic or functional in origin.

Although the debate between Bordes and Binford dominated the literature for a time, there were archaeologists working on other time periods who were keen to explore the interpretative implications of new data being generated, not only by an expanding archaeological record but also by the incorporation of new techniques. For example, in a discussion of the implications of new dating techniques for the interpretation of the archaeological data, glyn isaac (1972a) noted that there are orders of magnitude of difference in the geographic and temporal distributions of Lower and Middle Paleolithic assemblages when compared with those recovered from the Upper Paleolithic record.

Isaac suggested that these differences could relate to the evolution of specific behavioral capacities and that different explanations for the existence of patterned variation in artifact assemblages might be sought for different portions of the record. For example, he postulated that while Upper Paleolithic artifacts may have served as cultural markers, this could not be considered an appropriate explanation for the similarities and differences exhibited, for example, by Acheulean artifact assemblages, simply on the basis of the spatial and temporal scale of the documented pattern of variation. This observation, coupled with the long-standing suggestion that the Upper Paleolithic record marked the establishment of modern human populations and a unique set of behavioral traits (e.g., Burkitt 1955, 143-161; McBurney 1950), was reinforced by studies of many different components of that record (e.g., Binford 1973; Mellars 1989).

From the 1960s to the Present

In the last four decades of the twentieth century, another shift occurred in the way Paleolithic archaeologists ascribed meaning to the succession of stone technologies first documented in the late nineteenth century. Even during the 1950s, a number of archaeologists working with the earliest Paleolithic record had expressed dissatisfaction with the multiple phyla concept (Isaac 1972b), opting instead for an explanation that involved relating assemblage differences to different activities between sites (e.g., Clark 1950, 1959; Howell and Clark 1963; Kleindienst 1961). Following this lead, archaeologists once again became interested in the comparative method as a means for learning about

human evolutionary history.

During the late nineteenth century, evolutionists like Darwin, Huxley, and Haeckel had begun to ask questions about the kind of ancestor that had given rise to humans. In trying to answer the question, they attempted to identify the closest living relatives to humans and drew up a list of human-versus-ape characteristics.

Common characteristics could then be attributed to the last common ancestor and evolutionary scenarios developed to identify the critical changes that had led to the development of modern humans. Darwin, for instance, argued that movement to the ground, bipedal locomotion, which freed the hands, and natural selection resulting from an adaptive system involving tool use, social cooperation, and warfare were all critical components leading to the development of modern humans. Paleolithic archaeologists were faced with the challenge of finding supporting evidence for such scenarios.

During the 1940s, the new evolutionary synthesis had finally done away with goal-directed change by integrating natural selection and migration with mutation and chance. Washburn (1951a, 1951b) integrated this new evolutionary theory into physical anthropology, shifting the emphasis from descriptive anatomy to the analysis of adaptation. In one of the first studies to come from the new physical anthropology, Bartholomew and Joseph B. Birdsell (1953) proposed that the loss of the estrus cycle and continuing mutual sexual attraction among humans demonstrated that the long surviving family was central to human society. These two men suggested that early hominid groups formed stable family groups providing parental care to dependent young. Following physical anthropologist raymond dart's (1949) suggestion that Australopithecines were dependent on tools for hunting and butchering animals, they proposed that sexual dimorphism was associated with competition among males for females and that aggressive hunting behavior was derived from this dimorphism (Zihlman 1997).

Studies like that of Bartholomew and Birdsell, together with work by Dart, suggested a feedback between large brains, bipedalism, and tool use. Although it is now known that Dart's interpretation of the Makapansgat faunal assemblage (literally, the animal bones that were excavated at the site) was in error (Brain 1981), his work, together with that of other scholars, set out a methodology for extracting behavioral information from the material debris left in archaeological sites. In the years since 1960, archaeologists have used evolutionary theory to generate different scenarios that can be tested against the Paleolithic record. The best-known example of this research is Isaac's food-sharing hypothesis.

Isaac noted two major differences between apes and humans: humans may feed as they forage as apes do, but apes do not regularly postpone food consumption until they have returned to their home base; also, humans actively share food as they acquire it (Isaac 1978). Based on these observations, Isaac hypothesised that the HAS and KBS sites at Koobi Fora (East Africa, Kenya) were formed by hominids carrying stones and bones to a site. These differences in turn suggested the existence of provisioning, the existence of home bases, and the sexual division of labor early in human prehistory.

Beginning in the 1940s, African archaeologists also changed the way they excavated sites. The first excavation of a “living floor” by Louis Leakey and mary leakey occurred at olorgesailie in 1943 (Fagan 1981), and it was followed by similar excavations at Isimila by F. Clark Howell (Howell, Cole, and Kleindienst 1962) and Kalambo Falls by j. desmond clark (Clark 1969, 1974).

At Isimila, Howell emphasized artifact variation within one stratigraphic horizon, thereby challenging the concept of progressive typological and morphological development through time (Gowlett 1990). Interest in defining living floors spread from Africa to Eurasia (Isaac 1972b), and a series of excavations in Europe and the Middle East were conducted at a range of sites: for example, Torralba-Ambrona (Howell 1966), Latamne (Clark 1966), Vértesszöllös (Kretzoi and Vértes 1965), 'Ubeidiya (Stekelis 1966), and Terra Amata (de Lumley 1969). In the Dordogne region in France, Hallam L. Movius (1974) selected Abri Pataud for excavation and adopted a strategy that would allow for the exposure of horizontal surfaces of contemporary occupation.

Conclusion

Among the more recent Paleolithic studies, some seek to provide a more detailed investigation of the patterns of similarity and difference which characterize each division of the record

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Beginnings: Landscape Change, Dating, and Archaeology

The first application of pollen analysis was to explore vegetation history in the 1920s, first in sweden by the geologist Lennart von Post (Erdtman 1967). The new science spread rapidly throughout northern and central Europe (including Russia) so that by 1927 more than 150 papers had been published (Erdtman 1927). In Great Britain, following Gunnar Erdtman (1924), a. j. h. godwin and M. E. Godwin (1933; H. Godwin 1940) began a long tradition of pollen analysis with archaeological connections. As pollen analysis developed in Europe (Faegri 1981), a significant development was the division of pollen diagrams into zones representing time phases with characteristic pollen records, first in denmark (Jessen 1935) and then somewhat similar schemes in other places such as Britain (Godwin 1940). These zonations provided the basis for the initial use of pollen analysis, as they provided a means of dating suitable sediments that was used for the next twenty years until the advent of radiocarbon dating. Erdtman listed the publications on palynology in the journal *Geologiska Foreningens I Stockholm Forhandlingar* each year from 1927 to 1955, thus providing thorough coverage of the early literature.

The Effects of Human Settlements on Past Landscapes

Early research worked out vegetation history, mostly that of woodlands, from the study mainly of tree and shrub pollen. This developed into study of the influences of climate and human activity on past vegetation (Bertsch 1928). Refinements in technique led to the identification of more types of pollen, particularly those of herbs, many of which (such as weeds) are important indicators of past human activity (Firbas 1934); for example, cereal pollen indicates farming (Firbas 1937). These refinements permitted the interpretation of certain features seen in pollen diagrams from natural deposits as the faint traces of the activities of the first farmers in the Neolithic period in Denmark (Iversen 1941) and in Norway (Faegri 1944).

One such feature is the elm decline, which is a noticeable and widespread reduction in elm pollen at a particular point in many pollen diagrams that is used to divide the Atlantic pollen zone from the succeeding subboreal one. There has been much discussion over the years whether the elm decline was caused by human activity, climatic change, or other factors.

Many pollen diagrams also show changes just above (after) the decline horizon, and Iversen (1941) elegantly showed that these probably represent prehistoric episodes of woodland clearance, farming, and abandonment, which he termed *Landnam.* The pattern of landscape change as a result of human activity has since been studied and dated in detail up to the present.

Recent archaeological palynology in central Europe has concentrated on particular aspects of archaeology, such as the detailed history of vegetation change as a result of human activity near a particular settlement area, such as H.-J. Beug's (1992) study in northern Germany, covering the period from the Neolithic period to the Middle Ages, in which the cereals wheat, barley, oats, rye, and millet are distinguished. Other work has concentrated upon a particular culture, such as A. J. Kalis's (1988) work on the early Neolithic *Linearbandkeramik,* also in Germany.

Another development of archaeological palynology since the 1960s has been its extension to drier regions with fewer suitable deposits, such as the lands bordering the Mediterranean. Here the effects of human occupation are expressed rather differently when compared with human occupation effects further north. Beug (1962) worked on sites in Croatia while S. Bottema and H. Woldring (1990) have summarized results from the eastern Mediterranean region, K.-E. Behre (1990) those from the Near East, and A. C. Stevenson (1985) those from the western Mediterranean. In these areas, woodland disturbance swiftly led to its replacement by evergreen woods and then by scrub. Some typical crops

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In North America, archaeological aspects of pollen analysis from natural sites have also been a minor interest compared with quaternary vegetation change as a whole. The effects of human

activity have often been slighter than in Europe, and therefore harder to detect and to separate from other factors such as climate. E. T. Burden, J. H. McAndrews, and G. Norris (1986) succeeded in showing the vegetation changes caused first by Native Americans and then by European settlers (characterized by the presence of *Plantago lanceolata,* an alien in North America), in Ontario, canada.

Other parts of the world have been less intensively studied. In Central America, D. J. Rue (1987) has conducted archaeologically oriented palynology, and others have done so elsewhere; for example, R. L. Clark (1983) in Australia, N. Fuji (1990) in japan, and Y. V. Kuzmin (1992) in eastern russia. Although there are many other pollen results from different parts of the world, only few of them have sufficient detail with regard to data and chronology to be very useful for archaeological research.

Pollen Analyses of Wet Archaeological Deposits

K. Bertsch (1926) pioneered on-site archaeological applications of pollen analysis in Germany, and H. Harri (1929) did so in switzerland on waterlogged lake shore settlements. This kind of work has been done by a few other researchers, such as W. Beijerinck (1931), who carried out on-site studies of settlement mounds *(terpen)* in the netherlands that included pollen analyses.

Many of the later developments have been made by researchers concentrating on one particular aspect of archaeological palynology in a particular region. Where archaeological deposits were wet enough for good pollen preservation, pollen analysis could be done on the occupation deposits themselves, as in the case of occupation mounds in northern Germany (Korber-Grohne 1967).

Further work has been done on lakeshore settlements around the Alps, which provide wet sediments closely linked with the occupation of the sites. At Seeberg-Burgaschisee-Sud, one pollen diagram was obtained from a sediment profile going through the archaeological occupation layer itself, and others were obtained from profiles through natural deposits at increasing distances from the settlement, thus tracing the decreasing effects of occupation at increasing distances from the site itself (Welten 1967). This site also provided rare evidence of leafy branches having been brought to the site for fodder, evidence obtained from pollen records of plants that are in flower when the leaves are fully developed such as *Tilia* (lime), *Acer* (maple), and *Hedera* (ivy).

Wet archaeological sediments have also been studied from deposits from wells (Dauber, Fietz, and Lang 1955; Firbas 1930), ditches, etc., at otherwise dry archaeological sites. Coprolites (fecal remains), mostly from dogs, have been analyzed in Europe (Paap 1976) along with a number of other archaeological materials (Greig 1982), including human feces (Knights, Dickson, Dickson, and Breeze 1983).

Waterlogged archaeological deposits in which pollen is preserved often also contain other remains such as the seeds of plants, remains of insects, and eggs of parasitic worms. The study of a range of biological remains from a particular deposit can provide complementary results on past environments, for example the research on Lindow Man, a prehistoric bog body found in Cheshire, in England (Stead, Bourke, and Brothwell 1986).

Pollen Analyses of Dry Archaeological Deposits

Certain soil conditions can preserve pollen. Acid soils, for example, inhibit the processes of decay. Some archaeological features such as burial mounds or structures built from turf sod have buried ancient soil surfaces together with the preserved pollen content. Such soil pollen has been extensively studied in Britain by G. W. Dimbleby (1962) and in the Netherlands by H. T. Waterbolk (1950) and by A. J. Havinga (1963).

Cave sediments have been studied by M. van Campo and andré leroi-gourhan (1956) as well as a number of other workers in France. Some archaeological objects may themselves contain pollen and even contribute to its preservation by the presence of metal corrosion products, for example, the remains of honey or mead in a bronze container found in southern Germany and studied by U. Korber-Grohne (1985).

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In the United States, archaeological pollen analysis has involved much work on coprolites, often preserved in dry conditions in arid environments. Some work began in the 1960s, such as that by E. O. Callen and T. W. M. Cameron (1960), P. S. Martin and F. W. Sharrock (1964), and J. Schoenwetter (1962). Human fecal material from latrine pits has also been studied (Reinhard, Mrozowski, and Orloski 1986). The results yield much information about the diets of the people concerned, both Native American and European.

Syntheses of Results

As sufficient results have accumulated in particular regions, they have been synthesized into regional accounts of landscape change including archaeological considerations, as, for example, those covering central and northern Europe (Firbas 1949-1952), the British Isles (Godwin 1956), and the Netherlands (van Zeist 1967). Further work has resulted in highly detailed regional studies, for example, in northern Germany and southern Scandinavia (Muller-Wille, Dorfler, Meier, and Kroll 1988), southern Germany (Kuster 1988), poland (Ralska-Jasiewiczowa 1977), and a summary of Europe (Behre 1988). Useful collected works have been published on subjects such as human impact in pollen results (Behre, ed. 1986), and on archaeological palynology (Dimbleby 1985; Renault-Misovsky, Bui-Thui-Mai, and Giraud 1985).

James Greig

See also

United States of America, Prehistoric Archaeology

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Panama

Before World War I Panamanian archaeology was known largely through grave goods collected by dilettantes in Panama's western isthmus. Museum studies focused on the Chiriquí culture (now known as Gran Chiriquí) (Haberland 1984). Paleolithic stone tools from a Caribbean valley (along the Río Obispo) and shard scatters in Darién forests (Cana) were soon forgotten. A 1915 exhibition of pottery from Coclé included polychrome vessels that were rare in Chiriquí tombs, and in their designs German archaeologist max uhle (1924) saw Maya influences. Soon after, freelance writer Alpheus Hyatt Verrill drove disorderly trenches through the El Caño site, mistakenly believing that a volcanic eruption had destroyed a temple there. The sculpted and unsculpted monoliths of the site in fact belonged to a ceremonial center, which has been largely overlooked by professional archaeologists. In the early 1930s Harvard University sent archaeologists Henry Roberts and Samuel K. Lothrop to Sitio Conte; they excavated 59 graves in which mostly adult males were buried with large quantities of pottery and

personal ornaments, including more than 1,000 metal objects. In 1940 J. Alden Mason excavated a further 41 graves.

Lothrop derived Panama's second archaeological culture-Coclé-from Sitio Conte's mortuary arts and believed it spanned a period of 190 years before the Spanish conquest (a.d. 1330-1520). He assumed that Sitio Conte's hinterland was the Coclé culture's epicenter, from which its influences emanated to neighboring regions. He thought that most pottery and jewelry was made locally and that a few objects were imports from colombia and ecuador. Influenced by the Spanish chronicler Fernández de Oviedo, he proposed that the richest graves belonged to hereditary chiefs and nobles and the more modest ones to commoners and slaves.

In 1927 Swedish archaeologist Sigvald Linné traveled by boat with Baron Nordenskiöld to the Pearl Islands, the Darién, and the Caribbean coast east of the Calovébora River. Although his mandate was to search for contacts with “higher” cultures and for evidence of transisthmian migrations, Linné intuitively laid the foundations

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Paphos

An area on the flat lands near the sea in the modern Cypriot city of Paphos has been designated a world heritage site because of the quality and quantity of archaeological material, primarily from the Hellenistic and Roman periods, to be found there. Large rock-cut tombs of the Hellenistic period (the so-called tombs of the kings) demonstrate architectural links with Alexandria. Nea Paphos was the administrative center of cyprus in the Roman period. Excavated public buildings of this period include an odeon with adjacent agora, a temple of Asklepios, and a theater. Villas of the period, excavated by a Polish team under A. W. Daszewski, are decorated with fine mosaics. One of these (the house of Theseus) may have been the villa of the Roman governor. Recent expansion of the modern city and hotel construction in the

area have placed severe stress on the archaeological resources, so the Department of Antiquities is constantly engaged in rescue excavations and related mitigation programs.

Palaepaphos, 15 kilometers east of Nea Paphos, was an important center in earlier periods and the center of the ancient cult of Aphrodite. This area has been extensively explored by a long series of archaeologists, including some working for the Cyprus Exploration Fund (1888), T. B. Mitford and J. H. Iliffe (1950- 1953), and David Rupp's long-running Canadian Palaepaphos Survey Project. Material from a late-Bronze Age sanctuary at the site was reused in the construction of the Roman Temple of Aphrodite and subsequently in the building of a medieval sugar mill. Excavations since 1966 by F.-G. Maier have covered a variety of sites, including the siege mound used by the Persians when they besieged and took the city in the fifth century b.c.

David Frankel

Papua New Guinea and Melanesia

Historical Background

One of the central theaters of anthropological research for a century, Melanesia has been systematically explored archaeologically only since the 1950s. Before that time, collections of Melanesian material culture were made, sometimes haphazardly, by explorers, sailors, missionaries, government officials, and anthropologists. Such collections sometimes included archaeological materials, which have subsequently taken on great scientific value. These materials have formed, with written descriptions of traditional Melanesian behavior by the same explorers and anthropologists, a rich ethnographic background on which some of the central themes of Melanesian archaeology have been predicated.

The University of Auckland in New Zealand was influential in opening up archaeology in the eastern Melanesian islands in the 1950s, and there is a similar connection between the 1960s development in Australian universities of formal archaeology courses and research into Australian archaeology and the development of archaeological research in western Melanesia. Fundamental to these developments was the appointment of jack golson to the Australian National University in the early 1960s. Within a couple of years of arriving in Australia, Golson, already experienced in Pacific archaeology from a previous appointment at the University of Auckland, had graduate students working in the New Guinea Highlands, the Bismarck Archipelago, and further afield in New Caledonia and Tonga.

In the Melanesian islands a compelling theme for investigation already existed, comprising some disparate and dated threads of evidence that had recently come together: decorated potsherds collected in the early 1900s by a German missionary on Watom Island, off the coast of New Britain, and deposited in the Musée de l'Homme in Paris; a 1920s expedition to Tongatapu in western polynesia where similar pottery excavated by American archaeologist W.C. McKern from midden sites went unrecognized; and the recovery of more of this pottery in the 1940s on the Île des Pins off New Caledonia by J. Avias, who recognized the similarity of the designs on his material and those on the Watom shards.

Not long afterward, E.W. Gifford, from the University of California, led archaeological expeditions to Fiji and then to New Caledonia where he excavated more decorated pottery from a site called Lapita, first reported in 1917 by Frenchman M. Piroutet. Charcoal from the site was submitted for dating by the new radiocarbon technique and produced surprisingly old dates of 2500-3000 b.p. Gifford recognized that a distinctive, highly decorated, and almost identical form of pottery, now called Lapita after Gifford's New Caledonian site, occurred in sites stretching from the Bismarck Archipelago to Tonga.

It was a small and inevitable step to link evidence from Lapita sites to long-standing questions concerning Polynesian origins first posed by English explorer Captain James Cook. Golson, himself involved in Lapita research in the second half of the 1950s from his Auckland base, proposed in 1961 that a “community of cultures,” stretching the length of Melanesia and

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recognized by the commonality of Lapita pottery in the sites, could be identified as the ancestors of the historic western Polynesian cultures. Accordingly, to further substantiate this view, Golson, now at the Australian National University, dispatched graduate students to Watom, the Île des Pins, and Tonga to carry out more detailed excavations.

A second thread of Melanesian archaeology was simultaneously evolving in Papua New Guinea. In 1959, the anthropologist Ralph Bulmer worked in the New Guinea Highlands with his archaeologist wife, Sue Bulmer, and it was she who conducted the first professional excavations in that country. The combination of an archaeologist and an anthropologist interested in biology and ecology as well as prehistory resulted in their seminal joint article, "The Prehistory of the Australian New Guinea Highlands," in a special issue of *American Anthropologist* in 1964. Meanwhile, the first Pleistocene date for human occupation in Australia had been announced. New Guinea, part of the same landmass during lowered Pleistocene sea levels, was one potential route of human entry onto this huge continent. Researchers set out to develop spatial and chronological frameworks for humans in the highlands, a direct counterpart to similar exploratory archaeology being initiated in northern Australia at that time.

In 1968, Ralph Bulmer became Foundation Professor of Anthropology at the newly formed University of Papua New Guinea, and he appointed Jim Allen to a lectureship in prehistory the following year. Sue Bulmer and Allen began projects delineating the prehistory of Port Moresby, which helped facilitate a further series of Australian National University graduate projects along the south Papuan coast. By the end of the 1970s, this area was, archaeologically, the best known region in Papua New Guinea.

From the beginning, systematic archaeology in Melanesia separated along colonialist lines, with Australian scholars taking the lead in Papua New Guinea, the French in New Caledonia and Vanuatu (then the New Hebrides), and the New Zealanders in the Solomon Islands and Fiji. Of course, such a generalized division of interests always has exceptions, and a smattering of American and other scholars also contributed. Today, the territorial prerogatives have fragmented as indigenous archaeologists have taken over the responsibility for their histories through a strong system of museums and cultural centers in each of the Melanesian nations. Outside archaeologists interact with them and each other on the basis of specialized research interests facilitated by regular specialized conferences within the region. Several large-scale projects, such as the Southeast Solomons Culture History Project of the early 1970s and the Lapita Homeland Project of the mid-1980s, have shown the value of multipersonnel approaches to this geographically disparate region, and a number of current projects are now using the same team-based and interdisciplinary strategy.

Such a developmental process of research has not yet produced a coherent regional prehistory for Melanesia. Lapita, an exception, is a recognizable archaeological horizon that makes archaeological sense and comprehensible narrative history, factors that explain the time and effort put into Lapita research and the emphasis put on it in syntheses of Pacific prehistory. Post-Lapita archaeology, on the other hand, too often consists only of lists of poorly described ceramic types and other artifacts from sites that frequently depend heavily on local ethnographies for coherence. If there are behavioral themes linking the later archaeologies of the separate island groups, they are yet to be convincingly articulated. At the same time, a number of researchers have sought to come to terms with the particular constraints of their oceanic world by developing theoretical perspectives, whether culture-historical, sociopolitical, economic, or ecological, that are quite advanced for the relative infancy of their subject.

Pre-Lapita

Modern humans crossed from island southeast asia into the Australasian region some time before 40,000 b.p. *Homo erectus* had reached Java a million years earlier but had failed to cross the water

barriers further east. The biogeographical boundary called the Wallace line separated the primates, carnivores, elephants, and ungulates of Asia and the terrestrial marsupial fauna of

from New Guinea or New Ireland, required that 60 to 90 kilometers be traversed totally out of the sight of any land. This is apparently the earliest known example of true seafaring anywhere in the world.

By 20,000 b.p., the change to moving resources to people is reflected in the appearance of obsidian from a New Britain source 350 kilometers away in two New Ireland sites. An introduced animal, the cuscus (*Phalanger orientalis*), also occurred in both sites at this time. This marsupial, which became an established species on New Ireland and an important food source, is the earliest of a series of animal translocations in the region and raises the possibility that useful plants and nut-bearing trees were also moved about well before the end of the Pleistocene period.

The sporadic use of caves in New Ireland in the early-Holocene period raises the contentious question of whether people were more dependent on cultivated plants and were settling down there around 8,000-10,000 years ago, as in the New Guinea Highlands. Lacking the complex evidence of later Lapita sites, some researchers continue to dismiss the various strands of supporting evidence that have emerged. These include further residues of taro and yam on various stone tools, including elaborate stemmed and hafted obsidian and chert items; the presence of domesticated *Canarium* nut shells in various island sites where wild forms were not endemic; several sites where up to twelve nut species indicate the presence of arboriculture; increasingly extensive distributions of obsidian from its several sources both east in the Bismarck Archipelago and west along the north coast of New Guinea; the appearance of stone and edge-ground axes, earth ovens in several sites, and pig remains in two lowland sites; and changing settlement patterns involving beachside, coastal, and inland open sites as well as caves and rock shelters on smaller offshore islands and atolls. It is thought that the model of gradual economic intensification reflected in these developments requires more substantial food productive systems than those provided solely by hunting and gathering.

Lapita

Beginning about 3500 b.p., an influx of Austronesian language speakers bringing exotic items of material culture from Southeast Asia transformed the history of the Melanesian peoples. The distinctions between the Lapita and what preceded it are so great that early researchers saw this migration of Polynesians-to-be as having little interaction with existing Melanesians other than bringing them agriculture, sailing technology, pottery, complex shell technologies, obsidian trading, prestige exchange, the pig, the chicken, and other benefits of their more complex society. Some researchers still hold such a view, but others now propose more interactive and integrative models that suggest the success and spread of Lapita depended on a greater economic and organizational parity between the indigenous groups and the new arrivals than previously thought. However, the new material culture, so dominant archaeologically, has acted to mask the prior levels of indigenous development. The island populations were ready for and receptive to the changes brought by Lapita. The mainland culture of New Guinea seems to have been bypassed or was more resistant since no Lapita-type sites occur there.

Lapita people almost immediately breached the previous barrier to Pacific expansion at the end of the main Solomons chain to occupy outlying islands in the southeastern Solomons, settle Vanuatu and New Caledonia, and reach Fiji, Tonga, and Samoa. The implication that a new sailing technology existed, specifically the double-hulled canoe, is strong. In any case, new spheres of influence beyond the Bismarck Archipelago added new dimensions of oceanic distance to Melanesian relationships, distances that provided the basis for the diversity that would develop in Melanesian societies.

An increased number of sites from this period may reflect higher populations, more-sedentary settlements in coastal and inland sites, a higher visibility of sites with pottery, or combinations of all three possibilities. The introduced technology of pottery-making looms large in all assessments of Lapita.

Apart from a single claim for earlier Melanesian pottery from

the Sepik area of New Guinea, Lapita pottery is the first introduction of this technology to Melanesia. However, while characteristics of Lapita pottery can be found in Southeast Asia, such similarities are at present more generic than specific, not clearly antecedent in time, or both. Any clear Lapita pottery trail into the Pacific begins in the Bismarck Archipelago. Plain and decorated pots occur, with decoration being so elaborate that its presence in sites separated by thousands of miles must reflect a historically related and almost certainly socially interactive group, especially when much of the pottery seems to have been produced on a local or island level. If the pots themselves did not move far, the trading of obsidian was more extensive (although perhaps no more intensive) than in earlier times and appears to reflect a local continuity in both production and exchange.

Dentate-stamped shard of Lapita pottery from Babase Island, New Ireland Province, late second millennium B.C.

(G. Summerhayes)

Despite claims for Pleistocene house sites in the New Guinea Highlands, Lapita sites provide us with the first clear archaeological indications of villages. No Lapita open sites have earlier preceramic deposits, and several have revealed evidence of stilt houses built over lagoons. Typically, Lapita sites contain extensive and diverse types of shell tools and ornaments, including adzes, fishhooks, vegetable peelers, armshells, and beads. Some sites have yielded diverse plant remains, and pig, dog, and fish and shellfish are typically present. Although the Lapita people were fishing agriculturists, they did not transfer rice cultivation from Southeast Asia, remaining instead dependent on root crops and fruit and nut trees.

Very little is known of Lapita social organization, and the few Lapita burials known are without grave goods. Arguments have been made for Lapita shell ornaments representing items of prestige exchange, and linguistic reconstructions suggest that some form of hierarchical structure existed. Strong and lasting social frameworks able to function at a distance seem fundamental to the transformation represented by Lapita.

Post-Lapita

Conventionally, the Lapita tradition is thought to have ended by about 2000 b.p., although various researchers have argued for both earlier and later terminal dates because the Lapita period was not static. Its stamped pottery is most elaborate in both decoration and vessel form in the earliest centuries in western Melanesia, subsequently simplifying through time and across space. The range of pot shapes diminishes, dentate

secondary burials, which suggests that deceased clansmen were re-interred with their chief.

Whether the lack of rigid hierarchical social structures over large parts of Melanesia prevented the dense populations of agriculturists, like those in the New Guinea Highlands, or complex maritime traders, like those in island Melanesia, from achieving the transformation to city-states as elsewhere in the world remains a matter of debate. In neither case did any particular group control both a stable agricultural base and access to wealth accumulation through trade, which some people believe are requisites for such transformations. Especially in the case of island Melanesia, the emergence of maritime societies followed a gradual and logical adaptation to an oceanic world that had more limited terrestrial resources than homelands to the west. This evolution was clearly aided and added to by movements of people and technologies into the region from further west, coupled with increasing local complexity and specialization if not long-term stability.

Jim Allen

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Parrot, André

(1901-1980)

André Parrot first studied theology and then, as a result of art history lessons at the École du louvre, became interested in the ancient Near East. He spent a year at the École Biblique et Archéologique in Jerusalem and then excavated at Nerab in northern Syria in 1926. In 1927, he excavated at Balbeck in Lebanon, and in 1931, he worked at the Sumerian site of Telloh, where he was director of excavations from 1931 to 1933.

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Parrot's association with the Louvre continued throughout his career. He was appointed conservator, then chief conservator, of the Department of Near Eastern Antiquities, and during his time there, he completely reorganized the Near Eastern galleries. He was appointed director of the museum in 1965. He published on the history of art and biblical history, demonstrating links between the biblical world and other Near Eastern civilizations.

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Peabody Museum of Archaeology and Ethnology

The Peabody Museum, a part of Harvard University in Cambridge, Massachusetts, has been an active sponsor of field archaeology since its founding in 1866. It has undertaken significant field research in the Maya area, lower Central America, the southwestern and southeastern sections of the United States, and the early prehistory of Europe and Asia. The first academic department to grant a Ph.D. in archaeology in North America, the Peabody Museum has provided an institutional base for the development of culture-historical archaeology and the direct historical approach.

The Peabody Museum helped shape the discipline of archaeology in North America. Its initial constitution called for special attention to "the early races of the American Continent," an orientation reflected in its original name, the Peabody Museum of American Archaeology and Ethnology. Forty years were to pass before the museum undertook serious archaeological exploration outside the Americas, and during that time, the museum underwent significant changes in organization that were of fundamental importance both to its changing orientation and to its impact on training in archaeology in the United States.

secondary burials, which suggests that deceased clansmen were re-interred with their chief.

Whether the lack of rigid hierarchical social structures over large parts of Melanesia prevented the dense populations of agriculturists, like those in the New Guinea Highlands, or complex maritime traders, like those in island Melanesia, from achieving the transformation to city-states as elsewhere in the world remains a matter of debate. In neither case did any particular group control both a stable agricultural base and access to wealth accumulation through trade, which some people believe are requisites for such transformations. Especially in the case of island Melanesia, the emergence of maritime societies followed a gradual and logical adaptation to an oceanic world that had more limited terrestrial resources than homelands to the west. This evolution was clearly aided and added to by movements of people and technologies into the region from further west, coupled with increasing local complexity and specialization if not long-term stability.

Jim Allen

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Peake, Harold John Edward

(1867-1946)

The son of a church minister, Harold John Edward Peake was trained in estate management and developed an interest in changes in the history of land tenure and land use. He spent some time on a ranch in British Columbia, canada, where he studied prehistoric pastoralism, and he then studied art and ceramics in japan and china.

Peake returned to England in 1899 and became curator of the Newbury Museum, which became well known for its prehistory exhibits of implements, pots, potsherds, and maps. Peake's catalog of 17,000 prehistoric British bronze implements was deposited in the British Library in recognition of its significance. Peake was interested in the evidence of the human past in relation to the environment of the time and its impact on people. His book *The Bronze Age and the Celtic World* (1922) attempted to link archaeology and linguistics while *The English Village,* published in the same year, was a study of social evolution. He regularly contributed to the Royal Anthropological Institute's journal.

Peake became well known for his literary collaborations with Professor herbert j. fleure, such as the ten-volume *Corridors of Time,* written between 1927 and 1936, which provided economic interpretations of the archaeological record. In these volumes, Peake contributed specifically to the debate about the beginning of cereal cultivation in northern mesopotamia during the Neolithic period and to questions on the origins of metallurgy.

Peake was a member of the council of the Royal Anthropological Institute and president of the institute between 1926 and 1928. He received the Huxley Medal in 1940.

Tim Murray

Pei Wenzhong

(1904-1982)

Pei Wenzhong was born in Hebei Province in northern china, the son of a primary schoolteacher who was involved in local anti-illiteracy campaigns. As a young man, Pei became politically active in the areas of better education and wholesale reform of China's traditional social institutions.

In 1921, Pei was admitted to Beijing University to study geology, and in 1927 he graduated with a major in paleogeology. The following year he went to work in Hebei Province at the site of Pleistocene fossiliferous fissures at Zhoukoudian, where an international team of scientists had been endeavoring since 1921 to uncover evidence of some of China's earliest human occupants. Beginning in 1929, Pei became field supervisor of the Zhoukoudian excavations, and at the end of the year made the most important discovery of his long career-the first skull of *Homo erectus* found on Chinese soil. This specimen, later known popularly as Peking man, formed the basis for a thorough reinterpretation of human evolution in eastern Asia.

At Zhoukoudian, Pei was influenced by such scholars as the Canadian anatomist Davidson Black, the U.S. anthropologist Franz Weidenreich, the French Jesuit archaeologist henri breuil and geologist and vertebrate paleontologist Pierre Teilhard de Chardin, and the Swedish archaeologist j. gunnar andersson. The Zhoukoudian excavations from 1921 to 1937 became, in fact, a model not only of multidisciplinary science but also of multinational collegiality.

Pei's discovery of the *Homo erectus* cranium at Zhoukoudian catalyzed his lifelong interest in China's Pleistocene prehistory, and from 1929 to 1935, under his guidance, many important localities at Zhoukoudian were discovered and excavated. These included the earliest archaeological material at the site (500,000 years old), the first unequivocal stone artifacts in association with fossil humans in China, and evidence of the use of fire dating back more than 300,000 years. In 1935, Pei enrolled at the University of Paris to study for his doctorate under Breuil's direction. Pei completed his degree, returned to Beijing in 1937, and took charge of the Cenozoic research laboratory there. In 1938, he joined the Communist Party.

From 1949 until 1953, Pei was head of the museums division of the Bureau of Social and Cultural Affairs under the Ministry of Culture in the new People's Republic of China. In 1957, he transferred to the Chinese Academy of Sciences and assumed the title of reseacher in the academy's Institute of Vertebrate Paleontology

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Born in Cornwall, England, the son of a sea captain, William Pengelly was the product of a village school and self-education. He began teaching, opened his own school, and was involved with the politics of improving education and ensuring universal access to it. He helped to found the Mechanics Institute (1837) and the Natural History Society (1844), both in his home town of Torquay, and the Devonshire Association for the Advancement of Literature, Science, and Art (1862). He became a private tutor of mathematics and geology and a popular public lecturer on those subjects.

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In 1858, he explored and excavated brixham cave with the paleontologist hugh falconer under the auspices of the Royal and Geological Societies of London. They unearthed the bones of several extinct fossil animals and flint knives and thus provided convincing proof of high human antiquity. Pengelly became a fellow of the Geological Society in 1850 and received its Lyell Medal in 1886. In 1863, he was elected to the Royal Society.

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Persepolis

Situated 58 kilometers from Shiraz in southwestern iran, Persepolis was developed mainly by the Persian king Darius I around 500 b.c. and destroyed by Alexander the Great in 330 b.c. Long visited by travelers and explorers, Persepolis was first systematically excavated by Ernst Herzfeld from 1931 to 1939 and later studied by E. F. Schmidt for the oriental institute of chicago. Subsequent work has been undertaken by the Iranian Archaeological Service, directed by Andre Godard initially and then by Ali

Sami. The site is an architectural masterpiece made up of a series of terraces, gateways, palaces, and staircases, the most famous of which contains exquisite carvings of people (from all parts of the Persian Empire) bearing tribute to the “Great King”-Darius I. At the head of this staircase is the Gate of All Nations built by Xerxes I, but the most magnificent structure is the Apadana (or Hall of Audience) built by Darius I and Xerxes I. Excavations and restoration work continue at the site today.

Detail of carvings on the palace of the Persian king Xerxes I

(Image Select)

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Detail of carvings on the palace of the Persian king Xerxes I

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Persia

See Iran

Peru

Investigation into Peru's pre-inca past began during the early colonial period in the sixteenth century. The writings of Pedro Cieza de León record his visit around 1550 to the Guamanga Valley, now called Ayacucho, where he observed and described the ruins of Huari. The Indian residents of the area ascribed the ruins to an ancient race of people who had lived in the area long before the Inca conquest. Cieza, a very observant chronicler, noted that the walls of the ruins were deteriorating and showed signs of great age. Additionally, he noted that the plans of the buildings were distinctly different from those of the Inca constructions. Later, when he visited the ruins of Tiahuanaco at the south end of Lake Titicaca, Cieza drew similar conclusions about the antiquity of that now-famous site and proposed that Huari and Tiahuanaco were part of a culture that existed in the Andes before the Incas. In linking these two sites, Cieza anticipated what is commonly accepted among Andean scholars today, but his thinking was not recognized for another 400 years.

It was not until the middle of the nineteenth century that scholars again took more than a fleeting interest in Peru's prehistory. Tschudi, visiting Peru from Switzerland between 1848 and 1852, became interested in the many ruins to be found everywhere in the valleys of the Peruvian coastal desert. He was particularly attracted to the massive adobe-walled structures of chan chan, the capital of the Chimu empire, and one of those structures now bears his name in honor of his pioneering work at the site.

In 1850, Antonio Raimondi, a famous figure in Peruvian history, arrived in Peru from Italy. During the many years that Raimondi spent in Peru, he traveled widely and explored nearly every part of Peru's very diverse geography. He wrote copiously about what he observed, and much of what he wrote was published in 1874 in his book *El Peru.* In the course of his travels he encountered many archaeological sites, the most noteworthy of which was the now-famous site of Chavín de Huantar, and one of that site's most important monuments is called the Raimondi Stone.

Persia

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Moche-Chan Chan project directed by Michael Moseley and the Ayacucho botanical project under the direction of Richard MacNeish. Looting of the rich, accessible coastal sites continues, despite international efforts to stop it, and like the drug trade, it will almost certainly continue as long as there is a market in North America and Europe for Peruvian antiquities.

J. Scott Raymond

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Petrie, Sir William Matthew Flinders

(1853-1942)

William Matthew Flinders Petrie's father, William Petrie, was a civil engineer, and his mother was the daughter of the explorer Matthew Flinders. Delicate as a child, Petrie was educated at home in England and showed early precocity in science and mathematics. As a boy he collected Greek and Roman coins, and in his teens and early twenties made triangulation surveys of earthworks and hill forts and, with his father's help, measured Stonehenge. His first visit to Egypt was in 1880. Living in a rock tomb and undertaking, almost single-handedly, a survey of the entire pyramid field, Petrie's meticulous measurement of the interior of the Great Pyramid disproved a current theory that it had been built under divine inspiration.

In 1884, Petrie was employed by the recently formed egypt exploration society (then the Egypt Exploration Fund; EEF) to dig for that group. For his excavations of Tanis (1884) and Naucratis and Daphnae (1885-1886) he adopted an entirely new approach to Egyptian archaeology. Excavators had hitherto employed forced-labor gangs, driven by overseers, and had been concerned only with recovering monumental pieces, inscribed blocks, and museum exhibits-everything else was discarded. Petrie chose and supervised his own workforce, rewarding workers for their finds-which otherwise might have gone to dealers.

Maintaining that pottery was a key to the age of a deposit, and that much could be learned from hitherto discarded objects even if broken, he began to assemble his own collection, the nucleus of what was to become a teaching museum. From 1888 to 1890 he dug in the Fayyum in Lower Egypt, penetrating the pyramids of Illahun and Hawara. Among his finds were many mummy portraits of the Roman period and a workmen's village with a wealth of domestic objects. In June 1890 he excavated Tel el Hesy for the Palestine Exploration Fund, and for the first time he dated strata of occupation by the pottery, some of which he was familiar with from Egypt. Back in Egypt, important finds at Meydum (1891) and Tell el amarna (1892) brought him his first honorary doctorate.

As a result of the will of Amelia Edwards, founder of the EEF and a novelist who had been his friend and supporter, Petrie became the occupant of the first Chair of Egyptology in Great Britain, at University

College, London, in 1892. He was expected to excavate in Egypt every winter, training students in archaeological method. With his first student, James Quibell, he found archaic statuary of a hitherto unknown type at Coptos in 1893. The next year they dug the first predynastic cemetery in Egypt (later Petrie was to devise a chronological sequence for the graves by a remarkable statistical method of his own). After three years in abydos (1900-1904), where he excavated the royal tombs of the earliest dynasties, and a winter in the copper-mining area of Sinai, he left the EEF's employment for the second time and founded the British School of Archaeology in Egypt. His wife, Hilda, whom he married in 1896, was his constant companion and right hand in the field, and she labored at home to raise funds and find new subscribers for their work; their camps, run on a shoestring, were a byword for spartan living.

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During the 1914-1918 war, Petrie remained in London arranging and partly cataloging his museum. This large collection, augmented every year by objects found or bought in Egypt, had been bought by University College in 1913. As the Petrie Museum, it is today a teaching collection without rival. In 1920, Petrie returned to Egypt to dig for a few years more; in 1926, he moved his work to Palestine, where he excavated between 1926 and 1934 three large tells near the Egyptian frontier. In 1934, at the age of eighty-one, he retired from the chair at University College and two years later went to live in Jerusalem, where he died. He had dug over 50 sites and written over 100 books and over l,000 articles and reviews. He held five honorary doctorates, was made a fellow of both the Royal Society (1902) and the British Academy (1904), and was knighted in 1923.

sir william matthew flinders petrie

(Image Select)

Margaret S. Drower

See also

Egypt: Dynastic; Egypt: Predynastic

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Peyrony, Denis

(1869-1954)

Originally a school teacher, Denis Peyrony became the excavator of major French Paleolithic sites such as la Ferrasie, laugerie haute, and le moustier. Peyrony used a version of the type-fossil approach to lithic classification to establish relative chronologies in French stone tool technology, which did not always accord with the linear evolutionary sequences proposed by édouard lartet and gabriel de mortillet. Indeed, Peyrony's argument that the Aurignacian and the Perigordian lithic traditions were contemporaneous was a major step toward identifying the existence of geographical (if not “cultural”) variability in Paleolithic technologies.

Tim Murray

See also

France; Lithic Analysis

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Philippines

The Philippines, lying at the eastern margin of mainland Asia (see Map 1), has been a crossroad for the movements of peoples and ideas from the mainland to the Pacific islands since prehistoric times. Manila likewise has been the key entrepôt of maritime trade and commerce, notably during the almost 250 years (from 1564 to 1815) when the Manila galleons sailed the Pacific Ocean between Manila and Mexico.

Philippine archaeological resources, both on land and under water, are abundant and phenomenal. Archaeological sites range from the earliest indirect evidence for the presence of man in Cagayan Valley, northern Luzon, during the Middle Pleistocene to sixteenth-century dugout wooden coffin burials in northeastern Mindanao. Recent archaeological finds in the country also indicate the existence of complex societies in the northern, central, and southern Philippines, the latter dating as early as the ninth century a.d.

Important archaeological discoveries also include a flotilla of plank-built and edge-pegged wooden boats found in a waterlogged environment that range in date from the fourth to the thirteenth centuries a.d. Throughout Southeast Asia and, indeed, the world at this time, only in the Philippines are such prehistoric boats known to exist.

The history of archaeology in the Philippines elucidates the rich and varied archaeological wealth of the country, as well as the pivotal roles that pioneering individuals played in the evolution, history, and growth of archaeology in the country. For convenience, this updated history is presented in periods that parallel the political administrations of the archipelago from the sixteenth century to the present: the Spanish Period (1521-1898); the American Period (1898-1946); the post-World War II era and the 1950s; the l960s; the 1970s; the 1980s; and the 1990s to the present. Space limitations allow the inclusion of only the most important archaeological discoveries since the 1960s.

The Spanish Period (1521-1898)

Although Ferdinand Magellan reached the Philippines on March 16, 1521, Spanish colonization of the archipelago did not begin in earnest until 1565. The Spanish explorers and colonizers noted the variety of Philippine cultures and languages. The early Spanish chroniclers of Philippine society and culture were generally members of religious orders; they primarily wrote ethnographic reports intended for Spain's ruling monarch or their own religious superiors.

The early Spanish writings were mostly descriptive in character, depicting, in varying details, the physical appearances and lifeways of the Filipinos as observed by the writers. At a later time a great deal of linguistic studies were conducted and subsequently published together with the ethnographic reports. Several chroniclers reported on archaeological discoveries, including Antonio de Morga, the vice-governor general of the Philippines in the seventeenth century who, in his *Sucesos de las Islas Filipinas,* noted ancient artifacts found by farmers in Luzon.

The only recorded important archaeological reconnaisance undertaken in the archipelago during the Spanish period was conducted in 1881 by Alfred Marche, a French archaeologist who systematically explored the central Philippines and discovered numerous sites. He collected varied archaeological specimens, mainly porcelains and stonewares recovered primarily from burial caves. The majority of his collections are now kept at the Musée de l'Homme in Paris. Marche's exploration activities at Marinduque Island (see Map 2) became “the most successful Philippine archaeological expedition recorded from Spanish times” (Beyer 1947, 260).

An Austrian, professor Ferdinand Blumentritt, also published a series of articles about the Philippines and its people around this time. Cursory exploration of caves and open archaeological sites were undertaken in several areas in the Philippines between 1860 and 1881, including those by the German traveler Feodor Jagor in 1860 and J. Montano and Paul Rey between 1879 and 1881.

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Philippines

The Philippines, lying at the eastern margin of mainland Asia (see Map 1), has been a crossroad for the movements of peoples and ideas from the mainland to the Pacific islands since prehistoric times. Manila likewise has been the key entrepôt of maritime trade and commerce, notably during the almost 250 years (from 1564 to 1815) when the Manila galleons sailed the Pacific Ocean between Manila and Mexico.

Philippine archaeological resources, both on land and under water, are abundant and phenomenal. Archaeological sites range from the earliest indirect evidence for the presence of man in Cagayan Valley, northern Luzon, during the Middle Pleistocene to sixteenth-century dugout wooden coffin burials in northeastern Mindanao. Recent archaeological finds in the country also indicate the existence of complex societies in the northern, central, and southern Philippines, the latter dating as early as the ninth century a.d.

Important archaeological discoveries also include a flotilla of plank-built and edge-pegged wooden boats found in a waterlogged environment that range in date from the fourth to the thirteenth centuries a.d. Throughout Southeast Asia and, indeed, the world at this time, only in the Philippines are such prehistoric boats known to exist.

The history of archaeology in the Philippines elucidates the rich and varied archaeological wealth of the country, as well as the pivotal roles that pioneering individuals played in the evolution, history, and growth of archaeology in the country. For convenience, this updated history is presented in periods that parallel the political administrations of the archipelago from the sixteenth century to the present: the Spanish Period (1521-1898); the American Period (1898-1946); the post-World War II era and the 1950s; the l960s; the 1970s; the 1980s; and the 1990s to the present. Space limitations allow the inclusion of only the most important archaeological discoveries since the 1960s.

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Map 2. Land archaeological sites in the Philippines

The American Period (1898-1946)

The Philippines were occupied by the United States in 1898, and the U.S. administration of the archipelago began a year later. President William McKinley created the Taft Commission in 1900 in an attempt to craft proper legislation for the Philippines. The commission, in turn, established the Bureau of Non-Christian Tribes.

This bureau, which changed names through the years, was placed under different institutions and was eventually abolished.

In 1901 the first government museum was created, designated as the Insular Museum of Ethnology, Natural History, and Commerce, and was placed under the Bureau of Non-Christian Tribes. In the course of its existence the museum went through various changes, but it was never abolished. Today, it is a government bureau within the Department of Education, Culture, and Sports and is now officially called the National Museum.

Considered the founder of Philippine archaeology, henry otley beyer (1883-1966), an American from Iowa, arrived in Manila in 1905 to join the civil service. His pioneering works resulted in much of what was known about Philippine prehistory. Three years with the Philippine Bureau of Education found him among the Ifugao of northern Luzon, serving as a schoolteacher and documenting their lifeways. In 1914 he founded the Department of Anthropology at the University of the Philippines, and his first writing on Philippine archaeology came out in 1921. As head of the anthropology department, Beyer studied the racial and cultural history of the country.

From 1922 to 1925 Carl Guthe from the University of Michigan led an archaeological expedition to the central Philippines. Guthe was the first trained archaeologist to work in the archipelago, and his exploration activities focused on the collection of ceramics in the hope that these materials would shed light on the early maritime trade between the Philippines and mainland Southeast Asia. He identified 542 archaeological sites and collected more than 30 cubic tons of archaeological specimens, which are now are kept at the University Museum of the University of Michigan.

Early 1926 saw Beyer's first involvement in field archaeology, via the accidental discovery of major prehistoric sites at Novaliches during the construction of a dam for the water supply of Manila. Beyer's ensuing investigation was to be the start of the Rizal-Bulacan Archaeological Survey. By the middle of 1930 excavation activities had also reached Bulacan Province, and in five years of work a total of 120 sites had been identified, with the collection of almost half a million specimens.

Personnel of the National Museum conducted surveys and excavations during the 1930s. In 1934 Ricardo E. Galang, the first Filipino-trained archaeologist, spent two months excavating fourteenth- to fifteenth-century sites at Calatagan, Batangas. In 1938 he investigated a jar burial at San Narciso, Quezon. He recorded a total of six jar burial and midden sites in the area and recovered associated materials of shell bracelets, beads, and ceramics.

In 1938 Generoso Maceda, another staff member of the National Museum, identified a jar burial site in Pilar, Sorsogon Province, in southern Luzon. Twenty-four jars containing artifacts were excavated in three sites (Evangelista 1962, 21). In 1940 Olov Janse, a Swedish-American archaeologist with support from Harvard University, conducted archaeological excavations in the Calatagan sites. Working in three sites, he excavated a total of sixty-six graves, the results of which were published in the annual report of the smithsonian institution (Janse 1946).

There was a complete cessation of archaeological activities during the Japanese occupation of the archipelago (1941-1945). Beyer, who was under conditional internment, was assisted by Tadao Kano, a Japanese civilian assigned to protect museums in the Philippines. The Japanese allowed Beyer to continue working at the museum of the University of the Philippines and at the Institute of Ethnology and Archaeology, which enabled him to pursue his research writing and complete the final sections of his major postwar publications (Evangelista 1962; Jocano 1975; Solheim 1981).

Post-World War II and the 1950s

An increased interest in the beginnings of Philippine society and culture developed in the years after World War II, and archaeology as a course was included in the curriculum at the University of the Philippines. Beyer's research writings during the war years resulted in two important publications, his "Outline Review of Philippine Archaeology by Islands and Provinces" and his *Philippine and East Asian Archaeology, and Its Relation*

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to the Origin of the Pacific Islands Population (Beyer 1947, 1948). These major works are invaluable as references for archaeologists working in the Philippines to this date.

Archaeological exploration and excavation activities resumed in the l950s, led by two Americans, Wilhelm G. Solheim II and Robert B. Fox. Both were pivotal in arousing the interest of a number of Filipinos to pursue careers in archaeology. With an M.A. in anthropology from the University of California, Solheim published his first work on Philippine prehistory and archaeology in 1951. He conducted archaeological excavations from 1951 to 1953 in Masbate Island with two Filipino students, Alfredo E. Evangelista and E. Arsenio Manuel. Archaeological data generated from the excavations there were collated with the archaeological materials from the Guthe collection recovered in the 1920s from the central Philippines, resulting in *The Archaeology of the Central Philippines: A Study Chiefly of the Iron Age and Its Relationships* (Solheim 1964).

Fox (1918-1985) wrote avidly and extensively about Philippine ethnology, archaeology, and natural history from the late 1940s until 1973. He stayed in the Philippines after his service with the U.S. Navy during the war. With B.A. and M.A. degrees in anthropology, Fox was active in Philippine ethnography before focusing his attention on the archipelago's prehistory.

Major fieldwork in the 1950s was undertaken through the National Museum under the direction of Fox, working with Evangelista and several other members of the museum staff. In 1956 Fox and Evangelista excavated the Sorsogon Province of southern Luzon. A jar burial/stone-tool assemblage was encountered; the sites range in date from 2900 to 2000 b.p.

The most extensive archaeological project in the middle of the 1950s was the Calatagan, Batangas, Archaeological Project south of Manila led by Fox. Over 500 pre-Spanish graves were excavated in a number of burial sites, resulting in the recovery of thousands of trade ceramics-Chinese and Siamese porcelains and stonewares of the late-fourteenth to early-sixteenth centuries a.d. Extended primary burials were revealed as well as secondary burials in jars, with some graves exhibiting evidence of teeth filing and ornamentations. It is unfortunate that the 1950s excavations at Calatagan would witness the start of widespread pothunting activities, which continue to this day.

The 1960s

Fox led major archaeological activities for the National Museum from 1962 to 1966 in a number of caves along the west coast of Palawan, known collectively as the tabon caves. Work in this area resulted in the discovery of late-Pleistocene human fossil remains and associated stone implements. Going back to over 30,000 years ago, six successive periods of prehistoric occupation were found. The C-14 dates available for the Tabon Caves range from 30,500±1100 b.p. and 9250±250 b.p. At nearby Manunggul Cave an earthenware burial jar was found with incised and hematite-painted designs about the shoulder and cover (the latter having a ship-of-the-dead motif dating from 890 to 710 b.c.); it is now one of the country's National Cultural Treasures.

The preliminary results of the archaeological work at the Tabon Caves were published by Fox in 1970. This work included information on human bone fragments that, although recovered from a disturbed area of the caves, have been dated from 22,000 to 24,000 years ago-still the earliest evidence for *Homo sapiens* in the Philippines.

In 1966 significant archaeological sites were discovered right in the city of Manila. Known as the Santa Ana Sites, they exhibited both habitations and burials that “date more than 400 years before the arrival of the Spaniards in Manila” (Fox and Legaspi 1977, 1). The main burial site excavated was originally an archaeological mound on which the present Santa Ana Church was built, and the associated tradeware

ceramics recovered from the burials date from the late eleventh to the fourteenth centuries a.d.

In 1967 cursory underwater archaeological activities were undertaken by the National Museum and the Times-Mirror-Taliba, a now-defunct newspaper outfit, in Albay, 500 kilometers south of Manila (see Map 3). Believed to be a Spanish galleon, the ship was found 40 to 65 meters below the surface. In addition to two large

designs. C-14 dating of shells recovered from this site resulted in dates ranging from 8000 to 6500 b.p. Shell adzes were also noted from Duyong Cave, Palawan, in the Ryukus Islands, and on other Pacific islands.

The 1970s

The 1970s saw a profusion of archaeological research undertaken by both Filipino and foreign archaeologists. The elephant fossil sites in Cagayan Valley, northern Luzon, which had previously been reported, were explored and excavated in the 1970s by the National Museum. Led by Fox, the research uncovered hundreds of fossilized remains of mammals such as elephas, stegodon, rhinoceros, crocodile, giant tortoise, pig, and deer, as well as flaked and cobblestone tools (Fox and Peralta 1972). The first three large mammals in this group are now extinct in the Philippines.

Encumbered by geological problems in the open sites of Cagayan Valley, Richard Shutler Jr., then with the University of Iowa, was crucial in sending to the country a succession of geologists and geomorphologists from Iowa State University. Led by Carl Vondra in 1977, these researchers defined the Plio-Pleistocene terrestrial sequence in the Cagayan Valley basin, demonstrating the in situ association of artifacts and Pleistocene fauna, the age of artifacts, and the Plio-Pleistocene environments in the valley. Geological research has since solved the majority of the problems of the Pleistocene geology of the area, but the debate over the age of the artifacts still continues.

In 1972 Solheim and A. M. Legaspi led an archaeological survey of coastal southeastern Mindanao, a joint project of the National Museum and the University of Hawaii (Solheim, Legaspi, and Neri 1979). The Talikod rock-shelter sites, where flaked shell and stone tools were recovered, are the earliest sites recorded from the survey, with dates ranging from 7620 ±120 b.p. and 3950±90 b.p.

Two ethno-archaeology studies were undertaken in the 1970s. The first was conducted by Bion and Agnes Griffin among the Agta Negritos in the Sierra Madre range of northeastern Luzon from 1974 to 1976. With the goal of providing models for adjustments to hunting and gathering in wet and seasonal environments, the researchers hoped that the results of the study might be utilized for an archaeological understanding of hunters in tropical settings.

William Longacre of the University of Arizona directed an ethno-archaeological study in pottery-making villages in Kalinga Apayao, northern Luzon. Designed to provide data directly relevant to archaeological methods for inferring patterns of behavior and organization of peoples who lived in the past, the project, now in its third decade, has revealed significant insights into the manufacture, distribution, uses, breakages, and discarding of ceramics and how these and other material culture relate to human behavior.

From 1977 to 1978 archaeological surveys and limited excavations were undertaken in Iloilo Province, Panay, in the central Philippines. Australian archaeologists from the Victoria Archaeological Survey, led by Peter Coutts, focused their research on the establishment of a regional sequence, on the study of tradeware ceramics on Panay Island, on the recording of local pottery-making traditions and their trading networks, and on the collection of osteological materials for comparative studies.

While the geologists were working out the problems at the open sites at Cagayan Valley, the National Museum archaeologists concentrated their research activities in Penablanca, about 15 kilometers east of the Pleistocene open sites. Led by Wilfred Ronquillo and R. A. Santiago, exploration activities in the limestone area resulted in the recording of over 100 caves and rock shelters, eight of which have since been excavated. Basically aimed at elucidating the structure and distribution of the stone-tool industries in the area, the technological and functional analyses of the lithic flaked tools and debitage recovered

from the excavations of Rabel Cave (ranging from 4900 to 3000 b.p.) indicated the generalized functions of the flake tools, which made them ideal for use as maintenance tools; the manufacture of the stone flaked tools involved a percussion method without core preparation.

In 1977 Barbara Thiel, then a graduate student at the University of Illinois, excavated two caves at Penablanca, Cagayan Province-Arku

by the recovery of cordage of palm fibers. Their presence indicates that an older ship-building method was used. The Butuan archaeological assemblage points to a complex society in this area, indicated by craft specialization (such as wood, bone, and shell working, pottery manufacture, bead reworking, and metallurgy-specifically gold working) and the capability to participate in long-distance trade.

In 1979 an archaeological program led by Karl Hutterer of the University of Michigan started an interdisciplinary project focused on the prehistoric social and cultural development of a small geographical area in Negros Oriental. Known as the Bais Anthropological Project, the research, participated in by graduate students from Michigan, generated archaeological, ethnographic, biological, and geological data used to provide an overall understanding of prehistoric and present-day societies in Negros.

The 1980s

Archaeologists from the National Museum were busy during the 1980s. Although limited in manpower, the museum is the only institution that undertakes full-time archaeological research activities in the country. One of its priority activities is rescue archaeology, which involves the investigation of caves prior to the mining of bat droppings for use as fertilizer.

In 1981 archaeological exploration activities started at the limestone formation of Anda, in the island province of Bohol in the central Philippines. Designed to explicate the island adaptation of prehistoric man, this project, led by Santiago, resulted in the discovery of over 130 caves and rock shelters, the majority of which are archaeological sites. A number of caves exhibit wooden coffin burials as well as rich prehistoric habitation and burial sites.

Museum archaeologists were active in various areas in the country, such as Laurel, Batangas; Ma-ug, Prosperidad, Agusan del Norte; and Polillo Island, Quezon Province. Important archaeological data were generated from the continuation of the excavations at the Butuan sites in northeastern Mindanao, where primary extended burials indicate teeth filing and blackening.

Laura Junker, Hutterer's former student and now a professor of anthropology at Vanderbilt University, did research in Tanjay, Negros Oriental, in the central Philippines. Concentrating on the operation of control over the distribution of prestige goods, tradewares, and earthenware ceramics, Junker used archaeological and ethnohistoric data to test the hypothesis that early Philippine chiefdoms' participation in Southeast Asian luxury goods trade during the tenth to the sixteenth centuries a.d. was strongly linked to centralized control of a complex intraregional system of production, exchange, and resource mobilization.

In the 1980s numerous underwater archaeolgical sites were worked by the National Museum. The various shipwrecks found in Philippine territorial waters include Spanish, English, American, and Asian craft, usually with portions of the cargo still intact. The tradeware ceramics help date the ships and cargo. The associated archaeological materials have added new insights into the history of the trade from the ninth to the eighteenth centuries, as well as the nature of the trade and the societies that produced, bartered, and used the goods.

In the majority of cases the sites explored and excavated were worked as joint ventures with private entities. The shipwrecks studied include: one believed to be a merchant boat, found in 1982 on the southeast coast of Marinduque Island, about 150 kilometers south of Manila; a probable local watercraft found in 1983 at Puerto Galera, Mindoro Island; and a sixteenth-century wreck found in 1985 at the Royal Captain Shoal, a coral reef west of Palawan Island. The archaeological materials recovered from this site include porcelain plates, saucers, bowls, cups; boxes and box covers;

blue-and-white, pear-shaped, terra-cotta bottles; jarlets; jars; over 200 beads; 33 identical gongs; and bronze, iron, and copper objects. The tradewares recovered from the wreck point to the Wan Li period (1573-1620).

It was also in 1985 when the *Griffin,* an East India Company vessel, was excavated northwest of Basilan Island in the southern Philippines. Along with numerous Chinese tradeware ceramics, the few metal objects found include

iron ingots used as ballast, iron tools in the form of adzes, cannonballs, lead sheets used to line the wooden tea crates, lead musketballs, teapots, a Chinese coin of copper alloy, shoes and belt buckles of copper alloy and gilt bronze, and other objects used for daily life on board the ship.

In 1986 the exploration for the sunken galleon *San José* was started off the waters of Lubang Island, Mindoro Province. Only portions of the ship's planks, numerous shards of blue-and-white chocolate cups, and fragments of bronze, iron, and copper materials were recovered.

The 1990s to the Present

Important archaeological discoveries were made in the 1990s. In 1991 earthenware potteries with covers exhibiting anthropomorphic motifs were excavated at Ayub Cave, Pinol, Maitum, Sarangani Province. Led by E. Z. Dizon, the analysis of the potteries, designed and formed like human figures with varied and distinct facial expressions, indicates that they were used as covers for multiple secondary burial jars. Typologically the jars and the associated materials found date to the Metal Age period in the Philippines, around 500 b.c. to 500 a.d.

The year 1991 also marked the start of an archaeological survey for the Spanish warship *San Diego,* which sank off Fortune Island on December 14, 1600. A joint project of the National Museum and World Wide First, Inc., the excavation found the wreck at a depth of about 50 meters below the sea's surface. Two seasons of underwater archaeological excavation were undertaken, resulting in the recovery of over 34,000 archaeological items, including tradeware porcelains and stonewares, earthenware vessels, metal artifacts, and various organic materials.

The archaeological materials recovered from the *San Diego* site include more than 500 blue-and-white Chinese ceramics in the form of plates, dishes, bottles, kendis (spouted water containers), and boxes that may be ascribed to the Ming dynasty, specifically to the Wan Li period; more than 750 Chinese, Thai, Burmese, and Spanish or Mexican stoneware jars; over seventy Philippine-made earthenware potteries influenced by European stylistic forms and types; parts of Japanese samurai swords; 14 bronze cannons of different types and sizes; parts of European muskets; stone and lead cannonballs; metal navigational instruments and implements; silver coins; 2 iron anchors; animal bones and the teeth of pigs and chickens; and seed and shell remains of prunes, chestnuts, and coconut.

Noteworthy among the metal finds are a navigational compass and a maritime astrolabe. Also retrieved from the site is a block of hardened resin that was noted in historical accounts to have been used for caulking and for making fire in stoves. A summary of the excavations and finds is presented in C. Valdes's *Saga of the* San Diego, published in 1993.

In the northernmost islands of the Philippines, the Ijangs (megalithic structures situated in elevated hills, indicating evidence of fortification) were confirmed through archaeological explorations and limited excavations. Led by Dizon and Santiago, the cursory archaeological activities indicate that the structures closely resemble the castles reported from Okinawa and date to the twelfth century a.d. These recent finds may prove crucial in the understanding of the formation of sociopolitical complexities in the Philippines.

This concise history of archaeology in the Philippines records the fascinating story of the search for the prehistoric beginnings of the archipelago, which is inextricably linked with mainland Southeast Asia and the Pacific islands. Although it may seem that archaeological activities in the country are adequate, there are still countless archaeological sites in the country that need proper assessment, excavation, and management. Unfortunately, these important and nonrenewable components of the country's cultural resources are also subject to plunder, nearsighted exploitation, and vandalism. Properly managed and

protected, these archaeological resources have educational, recreational, and tourism potential. Without doubt, they are worth protecting for the enrichment and enjoyment of succeeding generations.

Wilfredo P. Ronquillo

See also

Island Southeast Asia

at Penablanca, Cagayan Province." Manila: Ms. National Museum.

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David Frankel

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One of the most influential French Paleolithic archaelogists of the nineteenth century, Edouard Piette gained fame as the excavator of the major cave site of le mas d'azil in the French Pyrenées, where a single sequence linking the Upper Paleolithic and the Mesolithic was identified for the first time. He named the linking assemblage Azilian (after the site). A keen student of Paleolithic art, Piette acquired a great collection of portable art (i.e., art that was moveable as opposed to Paleolithic art on cave walls), particularly the bones of animals that had been incised. He gave this collection (as well as his collection of ancient stone tools) to the French Museum of Antiquities at Saint Germain-en-Laye, where it is displayed as a unity.

Tim Murray

See also

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Piggott's initial area of interest was the Neolithic period of Great Britain, and between 1930 and 1950 he defined the principal monument and artifact types, the chronological sequence, and the regional characteristics of the period. This work culminated in his definitive account of the period, *Neolithic Cultures of the British Isles* (1954). His approach in this work was distinctive and was characterized by detailed description, accompanied by very fine illustration, and a minimalist approach to social interpretation. It was an attempt at objectivity designed to extract accurate information for a scientific understanding of prehistoric societies. Piggott acknowledged the influence of o. g. s. crawford and Alexander Keiller in his early development, and the scientific rigor of both of those methodical Scotsmen clearly influenced Piggott's approach.

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Pieridou, Angeliki

(1918-1973)

Angeliki Pieridou studied archaeology at the University of Athens and worked for many years in the Cyprus Museum. She was involved in a variety of archaeological projects in cyprus, especially of later antiquity. She was especially important in pioneering research on Cypriot folk arts and crafts.

David Frankel

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Piette, Edouard

(1827-1906)

One of the most influential French Paleolithic archaelogists of the nineteenth century, Edouard Piette gained fame as the excavator of the major cave site of le mas d'azil in the French Pyrenées, where a single sequence linking the Upper Paleolithic and the Mesolithic was identified for the first time. He named the linking assemblage Azilian (after the site). A keen student of Paleolithic art, Piette acquired a great collection of portable art (i.e., art that was moveable as opposed to Paleolithic art on cave walls), particularly the bones of animals that had been incised. He gave this collection (as well as his collection of ancient stone tools) to the French Museum of Antiquities at Saint Germain-en-Laye, where it is displayed as a unity.

Tim Murray

See also

Lithic Analysis

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Piggott, Stuart

(1910-1996)

stuart piggott is one of a small group of extremely influential archaeologists who began their careers between the First and Second World Wars and who went on to dominate British and European archaeology in the decades after 1945. The breadth of his interests are exceptional, and although his views have been the subject of considerable criticism in recent years, his work is still valued today.

Piggott's initial area of interest was the Neolithic period of Great Britain, and between 1930 and 1950 he defined the principal monument and artifact types, the chronological sequence, and the regional characteristics of the period. This work culminated in his definitive account of the period, *Neolithic Cultures of the British Isles* (1954). His approach in this work was distinctive and was characterized by detailed description, accompanied by very fine illustration, and a minimalist approach to social interpretation. It was an attempt at objectivity designed to extract accurate information for a scientific understanding of prehistoric societies. Piggott acknowledged the influence of o. g. s. crawford and Alexander Keiller in his early development, and the scientific rigor of both of those methodical Scotsmen clearly influenced Piggott's approach.

World War II was a turning point in Piggott's career. It marked an end to his employment as Keiller's research assistant at avebury and a broadening of his archaeological interests. During the war he was sent to India, and when not

working on aerial photographic interpretation he was able to do a considerable amount of research on the early prehistory of the subcontinent, which resulted in the publication of several books and papers.

On returning to Britain, he became the new Abercromby Professor in Edinburgh, a post that brought with it a commitment to fieldwork in Scotland and an incentive to research the broader field of European archaeology. The former resulted in the excavation of several important Neolithic sites. The latter led to the publication of a synthetic study of ancient Europe, which examined themes covering prehistory from the introduction of agriculture.

Ultimately, these two imperatives changed the direction of Piggott's interests. He became more interested in later prehistory and, in particular, the development of wheeled transport and the significance of Celtic art and religion. Interest in wagons, chariots, and horses was a theme that brought together many of his European interests, charting the movement of peoples and the rise and fall of political elites.

Piggott continued as the Abercromby Professor in Edinburgh until his retirement in 1978. After that time, he carried on writing, and a large number of books and papers appeared on many subjects, not just those discussed above. He also developed his interest in the history of British archaeology. In this area, he originally focused on the figure of william stukeley, an individual with an important role in the understanding of the Neolithic period at Avebury, but he later expanded his work to cover the antiquarian imagination of the sixteenth, seventeenth, and eighteenth centuries.

As his career progressed, Piggott became more and more aware of the limits of archaeological inference. He realized that much of his earlier speculation on the Neolithic period was inaccurate, which was emphasized by the radiocarbon revolution that undermined the typological chronology he had striven so hard to construct. He therefore narrowed the range of his interests in the later part of his career to emphasize the history of archaeology and the technological development of transportation.

Niall Sharples

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For references, see *Encyclopedia of Archaeology: The Great Archaeologists, Vol. 2*, ed. Tim Murray (Santa Barbara, CA: ABC-CLIO, 1999), pp. 630-633.

Piltdown Forgery

The Piltdown man, one of the most famous forgeries in the history of paleoanthropology, was a composite of a skull and associated skeletal remains discovered in a gravel pit in East Sussex, England. The skull (named after Piltdown Common where it was found) was first unveiled at a meeting of the Geological Society of London in 1912 by Charles Dawson, the discoverer, and Arthur Smith Woodward of the British Museum of Natural History, the professional paleontologist who backed its legitimacy and importance. Based on excavations made at the site by Dawson, Smith, Woodward, and others, crude stone tools (or *eoliths*) were thought to have been found in association with the remains of an animal that had a large brain but an apelike jaw with “modern” teeth. Coming at a time when skeletal evidence of the physical evolution of human beings was extremely rare, especially from really remote antiquity, the Piltdown discovery gained great notoriety.

Model of the Piltdown “skull,” in fact a re-creation from parts of two animals

(Ann Ronan Picture Library)

As Frank Spencer (1990) has noted, however, from the very first the Piltdown remains were regarded as problematic by some people, but a clear understanding of just how problematic they really were was only gradually revealed. As

time passed, and other discoveries of fossil hominids were made in Asia and Africa that were dramatically different from Piltdown, the English remains came to be seen as being anomalous rather than of very great interest. It was not until 1953 that the Oxford physical anthropologist J. S. Weiner reanalyzed the remains and concluded that the braincase and jaw were from separate animals-a suspicion confirmed by fluorine testing. Further analysis demonstrated that the jaw was that of an ape and that the teeth had been deliberately altered and stained to match the color of the braincase fragments. By 1955, the entire Piltdown collection was rejected as fraudulent.

Of course, the revelation of fraud requires the identification of the forger, and this topic has become one of the most enduring detective stories in the history of physical anthropology. The list of suspects ranges from the obvious (such as Dawson) to the truly surprising (eminent physical anthropologist Sir Arthur Keith) and has included most of the people who were in any way associated with the forgery. In the absence of a signed confession by the forger, we are left with a range of probabilities. Although these may not be enough to obtain a conviction in a court of law, there is every reason to believe that there was a greater purpose to the forgery than to simply hoax the scientific community.

Tim Murray

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Pincevent

The site of Pincevent in france lies near the village of Montereau in the southeastern part of the Paris basin. It is situated on the River Seine, between its confluence with the river Yonne and its confluence with the river Loing, in a landscape of high plateaus and wide valley systems. Its immediate surroundings were quarried for gravel from 1926 onward, but its archaeological potential was recognized only thirty years later when occasional finds began drawing the attention of local collectors.

Between 1956 and 1964, volunteers made several attempts at recording and salvaging some of the abundant remains from both prehistoric and historic times. In 1963, several Magdalenian hearths were unearthed, provoking the local suspension of gravel extraction through the intervention of the Association Française pour L'étude du Quaternaire and the Société Préhistorique Française in 1964. The site was acquired by the Ministère des Affaires Culturelles, which enabled a team from the Centre de Recherches Préhistoriques of the University of Paris to initiate a comprehensive archaeological investigation, which was partly subsidized by the Centre National de la Recherche Scientifique. The excavations at Pincevent have become famous for their detailed and rigorous execution, setting a precedent for archaeological fieldwork that is still valid today. They were directed by andré leroi-gourhan until 1985 and continued by his team, including, among others, Pierre Bodu and Claudine Karlin.

Although finds suggest that the locale of Pincevent was the setting for human activities during at least parts of the late Pleistocene and the Holocene periods, research has focused on the Magdalenian remains. These assemblages owe their excellent preservation to a gentle incorporation into a two-meter-thick sequence of clays and silts deposited through the occasional flooding of the river Seine. They consist of scattered lithics, bone fragments, and clasts (archaeological debris) punctuated by hearths and are generally interpreted as representing a number of activity sites created by Magdalenian people in the context of (possibly seasonal) reindeer hunting. Two assemblages, those of habitation number one and section thirty-six, are the focus of two major publications.

The archaeological phenomenon of Pincevent is very much a product of the history of the discipline of

French archaeology and of the persons involved in the excavations and subsequent research. Leroi-Gourhan's background in ethnography and anthropology, and his belief that material culture is as meaningful a cultural manifestation as linguistic expressions, led him to adopt an ethnographic approach to the Magdalenian

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remains at Pincevent. The excavations, consisting of extensive horizontal exposures, were designed to obtain information on site structure, which was treated as representing a number of settlement floors. Casts were made by Michel Brézillon of entire excavation surfaces, replicating the spatial arrangements of the archaeological remains. Ethnographic case studies were employed to illuminate butchery patterns, and the lithics were subjected to technological analysis and refitting studies to gain insight into the *chaînes opératoires* ("operational sequences"). These were taken to be forms of expression of mind and language and were therefore of vital importance for the study of cognitive evolution.

In the last decades, many researchers have been involved in analyzing and (re)interpreting aspects of the Magdalenian remains from Pincevent. Refitting and technological studies have been claimed to yield information on the age, gender, and social contexts of the Magdalenian people that visited Pincevent. Several spatial analyses have been conducted; most notably, the hut structures that were tentatively reconstructed by the excavator are now rejected by many archaeologists. Raw material analyses have provided insight into the movement of material, placing Pincevent within a wider regional framework.

Since excavation commenced at the site of Pincevent, it has increasingly acquired a model status, the influence of which reaches far beyond the boundaries of both French and paleolithic archaeology. The meticulous excavation through extensive horizontal exposures and the detailed recording practices have become models for archaeological fieldwork, and the interpretations of the structure of the site have become models for the interpretation of site structure elsewhere. Above all, however, the site of Pincevent has become the archetypal archaeological site. It has provided archaeologists with a template of what an ideal archaeological site looks like and has been used to judge the interpretative potential of other sites. Particular importance is assigned to archaeological configurations stemming from limited time spans of activity owing to rapid burial and to minimal postdepositional disturbance as a result of gentle burial in fine-grained sediments. This template betrays an enduring preoccupation with the ethnographic analysis of archaeological sites. However, discrepancies between the ethnographic approaches applied to it and the structure of the site, despite its excellent preservation and excavation, make Pincevent an important locus for a critique of current frameworks for archaeological interpretation.

Josara de Lange

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Pitt Rivers, Augustus

(1827-1900)

Augustus Pitt Rivers was born Henry Lane Fox, and it was when he succeeded to the large estate of his cousin that he took the Pitt Rivers name. He began his career in the army in 1845 and thus traveled to Malta and Scutari in the Crimea during the 1850s, to Canada during the American Civil War in 1861, and to Ireland from 1862 to 1866, where he was assistant quartermaster-general in Cork.

Pitt Rivers's interest in archaeology, and in ethnography and collecting ethnographic material, was initially stimulated by the Great Exhibition of 1851 in London and his own collection became his life's passion. He was part of an upper-class, well-educated group of people who interacted socially with, or were

related to, the scientists and social scientists of the day, such as Herbert Spencer and John Stuart Mill. Pitt Rivers was an an early convert to Darwinism and through membership in the Ethnological Society of London became friends with the antiquarian and politician Sir John Lubbock (lord avebury), later his son-in-law, and the philosopher and politician Thomas Henry Huxley.

While stationed in Ireland, Pitt Rivers explored and surveyed the local historic circular forts or raths, promontory forts, ogham stones

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(stones with Celtic inscriptions), and some medieval antiquities, and in 1864 he was elected fellow of the society of antiquaries of london. On his return from Ireland three years later, he began his archaeological fieldwork in earnest, and for the next thirteen years he surveyed and excavated in Yorkshire and at the hill forts and in the flint mines of Sussex Downs. He field-walked in Oxfordshire and Wiltshire, he discovered Paleolithic implements and animal bones in the drift gravels of the Thames Valley, and he excavated barrows at Guildford and Brighton in southern England. He also traveled abroad and undertook archaeological fieldwork in france and denmark.

Pitt Rivers joined the Anthropological Society of London in 1865 and in 1868 was general secretary of the International Archaeological Congress that met at Norwich and London. In 1871, he helped to form the Anthropological Institute-he was later to serve as its president-and he became a fellow of the Royal Society in 1876. By 1874, his collection of ethnographic material had grown to 14,000 pieces, which he loaned to the British Museum of Natural History to educate the public. In 1884, this collection was given to Oxford University and became the basis of the Pitt Rivers Museum. In 1880, on his inheritance of Lord Rivers's estates, he visited Egypt, where he met sir william matthew flinders petrie and discovered Paleolithic remains in the drift gravels of the Valley of the Kings.

In 1882, General Pitt Rivers retired from the army. For the remaining years of his life, his archaeological work was divided between a notable series of excavations at Cranborne Chase, mostly on his own property, and his official duties as the first inspector of ancient monuments. Lubbock's Ancient Monuments Protection Act of 1882 provided for an inspector to effect the legislation, and Pitt Rivers undertook seven journeys of inspection between 1883 and 1889, primarily in highland Britain, surveying and sketching monuments.

At Cranborne Chase, Pitt Rivers supervised the excavations of a Neolithic barrow, several round barrows, and Bronze Age enclosures; the hill fort of Winkelbury; the Romano-British settlements of Woodcutts and Rotherley; the linear ditches Bokerley Dyke and in Wiltshire, Wansdyke; and the medieval King John's house, Tollard Royal. Several exercises in experimental archaeology were also carried out, accounts of the excavations were published, and a public museum was established at Cranborne Chase detailing the excavations and finds.

Pitt Rivers's fame has rested at different times on his abilities as an excavator, a builder of typologies, and a theorist. He was one of the finest excavators of his generation, and his care in recording information in plan and section drawings rivals modern practice, but he could be inconsistent in its use. In the evidence that he chose to record, Pitt Rivers was far in advance of his contemporaries. He kept most of the potsherds and animal bones that others usually discarded, arguing for their importance for dating a site. He was not a good field archaeologist and not adept at seeing relationships between earthworks, but Pitt Rivers probably did more than anyone in his generation to promote the establishment of a sound chronology for British archaeology through his work behind the scenes in the royal archaeological institute and more particularly by the creation of typologies for field monuments as well as portable artifacts. He should perhaps also be assessed as an administrator, as one who bridged the gap between anthropology and archaeology believing that they were inseparable elements in the system of cultural evolution, and as an educator who had strong views on museum design and display and accessibility to the public. He was also present at, and instrumental in, the first faltering steps of the heritage preservation movement in England.

Mark Bowden

See also

Britain, Prehistoric Archaeology

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Plymouth, Massachusetts

Plymouth, Massachusetts, was a seventeenth-century colony settled by English religious dissenters,

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Poland

The interest in antiquity in Poland dates back to the thirteenth century, as evidenced in the records of mounds called "giants tombs." In the fourteenth century Jan Długosz, in his *Historia Polonica*, mentioned clay vessels rooted into the ground, which he considered to be the work of nature. The author who correctly identified those clay vessels as cinerary urns was John Jonston (1605-1675), a doctor and naturalist of Scottish origin from Szamotuły (in the Wielkopolska region). At the same time, Jacob Mellen provided the first detailed description of excavation works in the graveyard of the Lusatian culture in Śmigiel (also in the Wielkopolska region). The sixteenth and seventeenth centuries brought dis coveries of the first archaeological artifacts, such as box graves, urns, and coins. Of special note in the eighteenth century were the activities and initiatives of the last Polish king, Stanislaus Augustus Poniatowski, a great lover of antiquity. The first private collections of archaeological materials were founded in that period. At the end of eighteenth century Count Jan Potocki (1761-1815) drew public attention to archaeological artifacts as sources of knowledge about the history of the Slavs. Considered the pioneer of historical and archaeological studies on the Slavs and their culture, he was the first to formulate a hypothesis about the autochthony of Slavs and authored such important works as *Recherches sur la Sarmatie* and *Histoire primitive des peuples de la Russie.*

The year 1795 was a tragic one for Poland, for it was the year in which the country lost its political independence and was divided between russia, Prussia, and austria. For 123 years, therefore, until Poland regained its independence in 1918, the Polish interest in antiquity and then in prehistory developed independently in each of the occupied areas. The first institution to take on archaeological studies was the Warsaw Royal Society of Friends of Sciences, founded in 1800. One of its initiatives was to organize lectures, mainly on history, religion, art, or the beginnings of writing among the Slavs. The society also emphasized the importance of collecting archaeological materials, thus contributing to the formation of the nucleus of the collection of the future Museum of Prehistory. At the same time, state and private collections expanded, for example, those of the Włyńskie Lyceum in Krzemieniec, the Museum of the Czartoryskis in Lvov, the Płock Scientific Society, and the Dukes Czartoryski in Puławy.

The true turning point in the studies of prehistory was a work by Adam Czarnocki (1784- 1825) (whose

pen name was Zorian Dołega Chodakowski) entitled *On the Slavonic Lands before Christianity* (1818). Written in the romantic spirit, Czarnocki's work comprised ethnographic, archaeological, and linguistic elements; it described a program for a systematic study of prehistoric monuments and argued for comprehensive research on Slavdom. It also recognized the unique function and importance of archaeology in the study of the past, with particular emphasis on the prehistory of the Slavs. This interest in the past of Slavdom was inspired by patriotism, which for Poles was closely linked with the loss of statehood. During the whole period of romantic archaeology, that is, until the 1870s, the attention of archaeologists was almost entirely focused on the history of Slavs. In 1848 a four-faced statue of Światowid (a Slavic deity)-made of sandstone and 2.7 meters

Polynesia

Polynesia Defined

The term *Polynesia* was an invention of the European Enlightenment, a direct consequence of the great voyages of Pacific exploration associated with such famous navigators as Louis de Bougainville, James Cook, George Vancouver, and La Pérouse. The first use of the term (derived from the Greek words for "many" and "island") is generally attributed to De Brosses in his 1756 *Histoire des navigations aux terres Australes,* where it applied to all of the islands of the "Great South Sea." The modern definition of *Polynesia,* as the islands found within the vast triangle subtended by Hawai'i in the north Pacific, New Zealand in the southwest, and easter island (Rapa Nui) in the far southeast, dates to the French explorer Sebastien Dumont d'Urville (1790-1842). In his 1832 *Notice sur les Iles du grand océan,* he set Polynesia apart from Melanesia, the islands of the southwestern Pacific from New Guinea to Fiji, and from Micronesia, the islands north of the equator ranging from the Marianas and Palau in the west to the Marshall Islands in the east. This tripartite segmentation of Oceania continues to have geographic salience, even though its value for historical understanding has been greatly diminished.

Culture historians such as roger c. green (1991) have recently recognized that a more meaningful way to partition Oceania is between *Near Oceania* (comprising New Guinea, the Bismarck Archipelago, and the Solomon Islands) and *Remote Oceania* (comprising all of Micronesia, the Melanesian archipelagoes of Vanuatu, the Loyalty Islands, New Caledonia, Fiji, and all of Polynesia). This distinction recognizes the deep history of the Pleistocene human occupation of Near Oceania (beginning at least 40,000 years ago) and the relatively late expansion of Austronesian-speaking peoples into Remote Oceania (after about 2000 b.c.). Nonetheless, the term *Polynesia* retains considerable salience, for the island cultures found within this vast triangle (along with a few Polynesian "outliers" scattered to the west of the triangle proper) do cohere as a single cultural region.

The high degree of relatedness among the peoples of Polynesia was first recognized, on the basis of language similarities, by Enlightenment voyagers such as J. R. Forster, the naturalist of Captain Cook's second voyage, who published a comparative table of Polynesian words in 1778. Modern historical linguistic studies confirm that the thirty-six documented Polynesian languages form a single branch of the great Austronesian language family. They can all be traced back to a proto-Polynesian language, for which more than 4,000 words have now been reconstructed (Kirch and Green in press). As biological populations the Polynesian islanders also exhibit considerable phenotypic homogeneity and common genetic markers. Recent studies in molecular biology suggest that the Polynesian ancestors passed through a "genetic bottleneck" at some point in their early history, quite probably associated with the initial colonization the Fiji-Tonga-Samoa region.

Ethnographically Polynesia is generally subdivided into two major sectors: *Western Polynesia,* which includes Tonga, Samoa, Futuna, 'Uvea, and a few smaller islands in this region, and *Eastern Polynesia,* including both the central-eastern archipelagoes of the Cooks, Australs, Societies, and Marquesas and the more isolated islands of Hawai'i, Easter, and New Zealand. The formal distinction between Western and Eastern Polynesia was first defined on comparative ethnographic evidence by Edwin G. Burrows in 1939. Archaeological research has subsequently demonstrated that Western Polynesia was settled first, around 1000-900 b.c., and was the geographic homeland of the ancestral Polynesians (the speakers of proto-Polynesian language; see Kirch and Green in press). Subsequent dispersals out of this homeland region, to the east, north, and southwest, led to the settlement of Eastern Polynesia. Dating the settlement of Eastern Polynesia remains a controversial matter, but scholars would agree the process began sometime after 500 b.c. and was completed by a.d. 800-1000.

Nineteenth-Century Scholarship

As already noted, the late-eighteenth-century voyagers recognized the coherence of Polynesia (Captain Cook wrote of the “Polynesian Nation”), and they began to advance theories of Polynesian origins, generally suggesting that the Polynesians were related to similar peoples found in the Malay Archipelago (modern indonesia). Again, linguistic similarities provided key evidence.

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Culture historians such as roger c. green (1991) have recently recognized that a more meaningful way to partition Oceania is between *Near Oceania* (comprising New Guinea, the Bismarck Archipelago, and the Solomon Islands) and *Remote Oceania* (comprising all of Micronesia, the Melanesian archipelagoes of Vanuatu, the Loyalty Islands, New Caledonia, Fiji, and all of Polynesia). This distinction recognizes the deep history of the Pleistocene human occupation of Near Oceania (beginning at least 40,000 years ago) and the relatively late expansion of Austronesian-speaking peoples into Remote Oceania (after about 2000 b.c.). Nonetheless, the term *Polynesia* retains considerable salience, for the island cultures found within this vast triangle (along with a few Polynesian "outliers" scattered to the west of the triangle proper) do cohere as a single cultural region.

The high degree of relatedness among the peoples of Polynesia was first recognized, on the basis of language similarities, by Enlightenment voyagers such as J. R. Forster, the naturalist of Captain Cook's second voyage, who published a comparative table of Polynesian words in 1778. Modern historical linguistic studies confirm that the thirty-six documented Polynesian languages form a single branch of the great Austronesian language family. They can all be traced back to a proto-Polynesian language, for which more than 4,000 words have now been reconstructed (Kirch and Green in press). As biological populations the Polynesian islanders also exhibit considerable phenotypic homogeneity and common genetic markers. Recent studies in molecular biology suggest that the Polynesian ancestors passed through a "genetic bottleneck" at some point in their early history, quite probably associated with the initial colonization the Fiji-Tonga-Samoa region.

Ethnographically Polynesia is generally subdivided into two major sectors: *Western Polynesia,* which includes Tonga, Samoa, Futuna, 'Uvea, and a few smaller islands in this region, and *Eastern Polynesia,* including both the central-eastern archipelagoes of the Cooks, Australs, Societies, and Marquesas and the more isolated islands of Hawai'i, Easter, and New Zealand. The formal distinction between Western and Eastern Polynesia was first defined on comparative ethnographic evidence by Edwin G. Burrows in 1939. Archaeological research has subsequently demonstrated that Western Polynesia was settled first, around 1000-900 b.c., and was the geographic homeland of the ancestral Polynesians (the speakers of proto-Polynesian language; see Kirch and Green in press). Subsequent dispersals out of this homeland region, to the east, north, and southwest, led to the settlement of Eastern Polynesia. Dating the settlement of Eastern Polynesia remains a controversial matter, but scholars would agree the process began sometime after 500 b.c. and was completed by a.d. 800-1000.

Nineteenth-Century Scholarship

As already noted, the late-eighteenth-century voyagers recognized the coherence of Polynesia (Captain Cook wrote of the “Polynesian Nation”), and they began to advance theories of Polynesian origins, generally suggesting that the Polynesians were related to similar peoples found in the Malay Archipelago (modern indonesia). Again, linguistic similarities provided key evidence.

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By the early decades of the nineteenth century the islands of Polynesia were becoming the targets of increasing European interest, first by itinerant traders, followed by various missionary sects and, by mid-century, imperial efforts at colonization. The French annexed Tahiti and surrounding archipelagoes, and the British took political control of Aotearoa (New Zealand) from the indigenous Maori (but not without a protracted war of resistance). Somewhat later Samoa fell to German and then U.S. and British interests, and the legitimate Hawaiian government was overthrown by a cabal of U.S. expatriates in 1893. As was typical in other parts of the colonized world, scholarly interests in the newly subjugated populations followed missionary and imperialist expansion. The origins of modern anthropology and prehistoric archaeology, as many have argued, are closely intertwined with global European expansion.

Many missionaries and colonial officials who found themselves in Polynesia conducted pioneering ethnographic and linguistic research and used the data to construct theories of Polynesian origins and history. Although a few archaeological ruins were studied (such as the Hawaiian temple, or *heiau,* sites recorded by Thomas Thrum in Hawai'i), archaeology per se figured little in these nineteenth-century endeavors. Rather, great emphasis was placed on indigenous Polynesian oral traditions and narratives, by such scholars as Sir George Grey, Abraham Fornander, and S. Percy Smith. Their particular accounts varied, but these authors generally traced Polynesian origins back to Asia, with protracted migrations through the western Pacific into the Polynesian triangle. Fornander's *Account of the Polynesian Race* (1878) remains a classic of this genre, tracing the Polynesians back to “the Vedic family of the Arian race” that was eventually “driven out of India” and gradually spread into Indonesia and beyond.

In New Zealand, however, direct archaeological evidence in the form of prehistoric stone implements (flake tools and ground-stone adzes) came to the fore when they were found in association with the bones of several species of giant, extinct, ostrichlike birds known as moa. As early as 1872 Julius Von Haast was excavating “moa-hunter” sites in the South Island of New Zealand and using such evidence to argue for a race of Paleolithic hunter-gatherers who had preceded the classic Polynesian Maori in these southern islands.

By the fin-de-siècle, such ad hoc scholarship was giving way to more formal academic enterprises, associated with the founding of museums, universities, and other institutional bases from which ethnological and archaeological research would henceforth be sponsored. The polynesian society was established in New Zealand in 1892 to promote such research, and the *Journal of the Polynesian Society* remains a prominent publication today. The Otago Museum and Dominion Museum in New Zealand and the Bernice P. Bishop Museum in Hawai'i became leading centers for archaeological and ethnographic research. The Bishop Museum, in particular, would come to play the dominant role in Pacific archaeological research throughout the first half of the twentieth century.

The Problem of Polynesian Origins

In the first decades of the twentieth century archaeology began to come into its own in Polynesia. Katherine Scoresby Routledge, a remarkable woman and scholar, led a three-year private expedition to Easter Island to investigate its enigmatic, giant stone statues. Routledge combined archaeological survey and mapping of the ruins with ethnographic inquiries among the surviving Rapa Nui people to arrive at the conclusion that the statues and the temples upon which they stood were “the work of the ancestors” of the Polynesian-speaking Rapa Nui themselves, not the vestiges of some vanished race (Routledge 1919, 291). In Hawai'i, John F.G. Stokes carefully surveyed the remains of stone temple sites on Hawai'i and Moloka'i Islands to determine whether a sequence of temple forms could be inferred and possibly correlated with Hawaiian oral traditions of religious change. Stokes also conducted stratigraphic excavations on the island of Kaho'olawe and found a succession of fishhook types in the Kamohio rock

shelter, although the significance of his results would remain unappreciated for nearly fifty years.

The greatest impetus to Polynesian archaeology, however, occurred in 1920 when geologist Herbert E. Gregory acceded to the directorship of the Bishop Museum in Honolulu, convened the first international Pan-Pacific Science Conference, and proclaimed that the study of Polynesian archaeology and anthropology should be a major research priority (Kirch 2000, 20-24). Gregory, who continued to hold a professorship at Yale University, had important connections with the East Coast establishment in the United States and was able to secure major funding for a series of research expeditions to several Polynesian archipelagoes. The Bayard Dominick Expeditions of the Bishop Museum, from 1920 to 1922, were designed to implement the emerging Americanist vision of a holistic anthropology, combining multiple lines of evidence from ethnography, archaeology, ethnobotany, and physical anthropology (somatology). Research teams combining these disciplines were dispatched to Tonga, the Austral Islands, the Marquesas, and Hawai'i to carry out parallel investigations designed to address the overarching problem of Polynesian origins.

In retrospect, however, archaeology played a subordinate role in the Bayard Dominick Expeditions, leaving the field to be dominated by the comparative ethnologists. In the Tongan expedition, for example, archaeologist William C. McKern (later to become famous for his work on North American ceramic taxonomy) focused most of his efforts on the mapping of large stone monument sites, making only limited excavations in a few caves and kitchen middens (McKern 1929). McKern did recover an elaborately decorated form of pottery in these excavations, but lacking any method for direct dating, he interpreted this as a late-prehistoric variant of Fijian trade ceramics. Only decades later would his shards be properly recognized as part of the Lapita cultural complex, dating to the early part of the first millennium b.c. and associated with the first human settlement of Polynesia.

In the Marquesas Islands Ralph Linton (best known for his later ethnographic work in Africa) directed the archaeology but completely failed to recognize the potential for stratigraphic excavations. Without even bothering to test excavate, Linton simply concluded that “no opportunity was afforded for the gradual accumulation of stratified deposits” and that “no kitchen midden or shell heaps exist in the islands” (1925, 3). Thus he focused entirely on the mapping of late-prehistoric and early-postcontact monumental structures, interpreting these strictly within the context of a static, ethnographic reconstruction of “traditional” Marquesan culture. Even the possibility of cultural change or time depth (long periods of time) was thereby eliminated.

Consequently, despite a renewed emphasis on modern, scientific methods of archaeological survey (and sometimes excavation), the interpretation of Polynesian prehistory from the 1920s until World War II was largely dominated by comparative ethnology. The failure of archaeology to take hold partially resulted from the absence of any evident method for direct (or even relative) dating. Radiocarbon dating was still a thing of the future, and the methods of seriation being developed in North America and elsewhere for generating relative chronologies were seen as not applicable in Polynesia, given the general absence of pottery. Thus the stone structures and stone tools mapped and recorded by archaeologists in Polynesia were fitted into a largely static, ethnographic reconstruction and subsumed under the rubric of “material culture.” To be sure, a great deal of fundamental survey work was carried out during these years, such as that done by Kenneth P. Emory in the Society Islands (Emory 1933) and elsewhere or that of Wendell C. Bennett (1931) on Kaua'i Island (Bennett would later make his mark in Andean archaeology). This was archaeology, but it was not prehistory.

Migration Theories of the Early Twentieth Century

With the failure of archaeology to provide a real temporal framework for culture change and culture-history in Polynesia, the interpretive field was left to the comparative ethnologists, who adduced the new archaeological survey data only rarely. Dominant among this group of scholars was Edward S.

Craighill Handy, who had led the Marquesas party of the Bayard Dominick

Expeditions in 1920. Handy's theoretical perspective was closely allied to that of the European Kulturkreise (culture-circle) school (see, e.g., fritz graebner 1905), in which the origins of a particular people or culture were sought through a comparison of trait lists with neighboring or even far-flung cultures. Thus Handy developed an elaborate theory of Polynesian origins and migrations in which Polynesian cultural traits were correlated with "Brahmanical" and "Buddhistic" cultures ranging from India to china (Handy 1930). Rather than seeing variations among the Polynesian cultures as deriving from a lengthy process of cultural change in situ, he interpreted all variation as the outcome of successive "waves" of migration.

A more influential theory of Polynesian origins was promulgated by the Maori scholar Te Rangi Hiroa (also known as Sir Peter Buck), who had succeeded Gregory as director of the Bishop Museum in 1936. Hiroa was a seasoned ethnographer, with experience throughout much of Polynesia. He had, however, little use for archaeology, finding it a "dry subject." Hiroa relied more upon the salvage ethnographic work of Bishop Museum scientists to develop a migration theory that traced the route of Polynesian voyages into the Pacific not via the large archipelagoes of Melanesia but through the small coral atolls of Micronesia. In his widely read book, *Vikings of the Sunrise,* Hiroa argued that "the master mariners of the Pacific [the Polynesians] must be Europoid for they are not characterized by the woolly hair, black skins, and thin lower legs of the Negroids nor by the flat face, short stature, and drooping inner eyefold of the Mongoloids" (1938, 16). Hiroa's racially charged theory can be understood in retrospect in light of the severe racial prejudice he himself suffered at the hands of the dominant white academic society and in terms of the racial pigeonholing that characterized much of anthropology in the early twentieth century (Kirch 2000, 24-27). His theory was, however, a highly forced contrivance, and archaeology later in the twentieth century lent no support whatsoever to the concept of a Micronesian migration into Polynesia.

Within the genre of migrationist theories of Polynesian culture-history, mention must also be made of the highly influential writings of Thor Heyerdahl, a Norwegian zoologist and adventurer who captured the world's attention in 1947 with his daring *Kon Tiki* raft voyage from South America to the Tuamotu Islands. World War II had already focused much attention on the Pacific islands, and Heyerdahl now claimed to have a theory that explained the Polynesians as deriving from successive migrations not from Asia but from the Americas. The full theory was published in a massive volume a few years after the *Kon Tiki* voyage (Heyerdahl 1952), and Heyerdahl funded his own archaeological expedition to Easter Island and other Eastern Polynesian islands in 1955 and 1956 in an effort to prove his origins theory. His hypothesis has not survived the test of modern archaeological research, but Heyerdahl must be credited with helping to spur a reinvigoration of Polynesian archaeology in the period immediately following World War II.

Stratigraphic Archaeology and Culture-History

After several decades of being relegated to a minor supporting role in Polynesian studies, archaeology suddenly emerged in the aftermath of World War II as the primary source of data on Polynesian culture-history. This intellectual transformation can be traced to several developments. One was the heightened scientific interest in the Pacific islands generated in the wake of the war itself (a number of influential U.S. anthropologists and scientists had worked closely with military intelligence in the Pacific theater). Thus, in the later 1940s, renewed archaeological studies in the Pacific were initiated by such scholars as Edward W. Gifford of Berkeley in the Fiji archipelago and Alexander Spoehr of the Field Museum in the Marianas Islands (Gifford 1951; Spoehr 1957). Rather than continuing with surface surveys of monumental architecture, which had dominated prewar field research, these new efforts emphasized a return to stratigraphic excavations. Significantly, both Gifford and Spoehr, working outside

of Polynesia proper in island groups where pottery had been manufactured and used by the indigenous

inhabitants, were able to demonstrate sequences of material cultural change, primarily in ceramic styles. As a result materially documented time depth and culture change were finally shown to exist in Oceanic archaeology. Within Polynesia proper Kenneth Emory of the Bishop Museum also began a program of excavations in Hawaiian archaeological sites, beginning about 1950. The prehistoric Hawaiians had never used pottery, but Emory and his colleagues Yosihiko Sinoto and William Bonk realized that they could apply the methods of seriation to changing styles in bone and shell fishhooks, thus outlining a culture-historical sequence for the Hawaiian Islands (Emory, Bonk, and Sinoto 1959).

Equally important to the reapplication of stratigraphic methods were the discovery and implementation of radiocarbon dating by willard libby, beginning in the late 1940s. Emory, Gifford, Spoehr, and others were quick to take advantage of Libby's offer to date samples from various parts of the world, and by the early 1950s a number of radiocarbon dates had been published for sites ranging from Hawai'i to New Caledonia and the Marianas. The significance of this technological development cannot be underplayed, for it provided an independent means of assessing chronology, and the dates themselves left no doubt that the time depth of Polynesian prehistory could now be counted in thousands-not hundreds-of years. As Emory put it, radiocarbon dating "opened up undreamed of possibilities for reconstructing the prehistory of [Polynesia]" (Emory, Bonk, and Sinoto 1959, ix).

By the mid-1950s there was a veritable resurgence of field archaeology throughout Polynesia. In New Zealand the pioneering excavations of roger duff (1950) at Wairau Bar were followed by a series of careful excavations conducted by jack golson, a young Cambridge-trained archaeologist who had been appointed to a faculty post at the University of Auckland (Golson 1959). As mentioned earlier, Thor Heyerdahl privately financed and led his own Norwegian Archaeological Expedition to Easter Island and other Eastern Polynesian locales in 1955 and 1956, with excavations conducted by four professional archaeologists (Heyerdahl and Ferdon 1961, 1965). Their work also put the statue cult of Easter Island within a radiocarbon framework. At the same time, Robert Suggs of the American Museum of Natural History took up where Ralph Linton had left off in the Marquesas Islands, quickly demonstrating that the latter's assumptions about a dearth of stratified sites had no empirical justification. Suggs found a wealth of artifact-rich deposits, and his monograph outlined one of the first well-defined culture sequences for a Polynesian archipelago (Suggs 1961).

Coming less than two decades after Hiroa's migrationist theory had been at the fore, the new outpouring of archaeological results inspired a radical rethinking of Polynesian culture-history. Suggs (1960) wrote the classic synthesis of this period, *The Island Civilizations of Polynesia*, not only debunking the older ethnographic theories of Handy, Hiroa, and their peers but also attacking the rival Heyerdahl theory of American origins. Suggs's synthesis privileged the material evidence of "dirt archaeology," but it also drew widely upon newly emerging linguistic and human-biological research. Polynesian origins were now traced back to a Southeast Asian homeland, with a dispersal route through the Melanesian archipelagoes (not Micronesia, as Hiroa had advocated), this latter evidenced by a ceramic style that would shortly come to be named Lapita. The Western Polynesian archipelagoes of Tonga and Samoa were now argued to be the immediate Polynesian homeland, with subsequent voyages of colonization to the Marquesas and Society Islands and thence to the farthest islands of Eastern Polynesia.

Settlement Archaeology in Polynesia

The rejuvenation of stratigraphic archaeology in Polynesia and its expansion beyond Polynesia into the western Pacific was initially driven by a strong culture-historical orientation, encouraged by rapid success in defining considerable time depth and sequences of material culture change (whether in ceramic styles or in fishhooks and stone adzes). Under this culture-history paradigm, the emphasis in fieldwork was

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dynamism of island ecosystems. Although the human role in the extinction of New Zealand's giant moa birds had long been documented (Anderson 1989), it became increasingly clear that there had been major episodes of human-induced avian extinctions throughout tropical island of Polynesia (Steadman 1995). Combined with evidence for deforestation, erosion and valley alluviation, and the widespread conversion of natural communities to highly anthropogenic landscapes, our view of island ecosystems and the role of indigenous peoples in shaping their landscape histories has been entirely transformed (Kirch and Hunt 1997).

A further outgrowth of the settlement-pattern reorientation in Polynesia throughout the 1960s, 1970s, and 1980s was a concern with wider theoretical issues in processual archaeology. The Polynesian societies had been taken as a virtual "type" instance for the concept of the chiefdom, which was regarded by many processual archaeologists as a key intermediary stage in the evolution of human societies from simpler band and tribal levels of sociopolitical organization to fully state-level polities. This made the study of variation and cultural change within Polynesian chiefdoms a topic of some theoretical import. T. Earle (1978, 1997), for example, drew upon his research on Kaua'i, Hawai'i, both to test Wittfogel's "hydraulic hypothesis" regarding the role of irrigation in the rise of complex societies and more generally to test notions of "how chiefs come to power." Kirch (1984) integrated ethnohistorical and archaeological approaches to construct a broad model of the evolution of Polynesia chiefdoms, arguing that the trend toward increased hierarchy and social control in certain Polynesian societies was substantially constrained by a constellation of demographic, ecological, and economic parameters. In a later study Kirch (1994) argued that a fundamental dichotomy between "wet" and "dry" agricultural landscapes strongly constrained the evolution of hierarchy and power.

New Views on Polynesian Origins and Dispersals

Perhaps because the question of how a "Neolithic" people managed to discover and colonize the most isolated islands on earth remains such an intrinsically compelling issue, the matter of Polynesian origins and dispersals did not disappear with the paradigm shift from culture-historical to processual archaeology. Rather, this question has received renewed scrutiny and been the subject of invigorated debate since the 1970s, as a result of several developments. One impetus was the expansion of modern archaeological work into Melanesia, a region that had been almost entirely neglected prior to World War II. In particular, the realization that a widespread early-ceramic horizon-the Lapita cultural complex-linked the initial stages of human settlement in both Polynesia and eastern Melanesia provoked a fundamental rethinking of Polynesia origins (Green 1979). The earliest Polynesian cultures are now seen to be a direct development out of an early eastern Lapita culture, itself the eastward extension of a process of Lapita expansion that had commenced in the Bismarck Archipelago around 1500 b.c. (Kirch 1997).

Equally important has been a rethinking of the process of dispersal and colonization of islands within the Polynesian triangle itself, where the longest voyages of discovery involved distances of as much as 3,000 kilometers against generally prevailing winds and currents. Computer simulations of the probabilities of accidental drift voyaging first led to a new realization of the high degree of intentionality in early Polynesian voyaging (Irwin 1992). But it is the dramatic experimental voyages of the replicated voyaging canoe *Hokule'a* that have particularly forced a new model of Polynesian colonization (Finney 1994). These voyages, conceived as a kind of "experimental archaeology," have taken the double-hulled, 19-meter *Hokule'a* on journeys between many Polynesian archipelagoes without the aid of instrument navigation, the most dramatic being a voyage from Mangareva to remote Easter Island in 1999.

The investigation of voyaging and interaction between Polynesian islands and archipelagoes has also been spurred by the application of new archaeometric techniques, especially X-ray fluorescence

sourcing of basalt artifacts such as adzes. M. I. Weisler and Kirch (1996) demonstrated the transport of stone adzes between

Samoa and the Cook Islands, a distance of some 1,600 kilometers, and more recently Weisler (1998) has tracked the movement of adzes from the Marquesas to the Society Islands. Equally innovative has been the work of E. Matisoo-Smith and colleagues (1998) using studies of mitochondrial DNA variation in Pacific rats (*Rattus exulans*) to show patterns of interisland contact.

Contemporary Archaeology in Polynesia

Polynesian archaeology continues to change and evolve. The very practice of archaeology has been significantly affected by changing institutional and sociopolitical contexts. Throughout the first six decades of the twentieth century, archaeology fell almost exclusively within the institutional purview of a few museums and universities. This situation began to change dramatically in the 1970s with the rise of "public archaeology" or, as it has come to be labeled in Americanist contexts, "cultural resource management" (CRM) archaeology. In Hawai'i, for example, most contemporary archaeological work is carried out not by research institutions but by private (for-profit) archaeological contractors. Thus the very definition of field projects has shifted from areas selected strictly on the basis of their research potential to specific locations subject to impact from highway construction, resort development, and the like (Graves and Erkelens 1991; Kirch 1999). Similarly, in French Polynesia much archaeological work is now undertaken to mitigate the adverse effects of "development," such as in the large-scale Papeno'o Valley project where the construction of hydroelectric dams was the main consideration. Although it has generated significant new funding sources for fieldwork, this shift to CRM archaeology also led to the production of a very large "gray literature" of archaeological reports not published in the usual academic journals and monographs-a serious problem for the long-term archiving and preservation of archaeological evidence.

The sociopolitical context of Polynesian archaeology is also rapidly evolving. Once almost exclusively the purview of white, expatriate scholars (Te Rangi Hiroa was a major exception), archaeology in the islands has begun to incorporate significant numbers of indigenous practitioners. As Polynesians themselves are trained in the theory and methods of archaeology and begin to take up professional posts in museums, universities, historical preservation agencies, and CRM firms, they bring new questions and concerns to the field. There is, for example, a renewed interest in the potential integration of indigenous oral traditions and narratives with archaeological evidence (Cachola-Abad 1993). Heightened cultural sensitivity toward the archaeological record has also changed the nature of archaeological practice. This is evidenced, for instance, in the complete reburial of several thousand human skeletal remains that had been excavated from Hawaiian archaeological sites, a direct outcome of the Native American Graves Protection and Repatriation Act in the United States.

These and other influences will continue to modify the ways in which archaeology is practiced in Polynesia and elsewhere in the Pacific islands. Certainly, however, there is no sign that interest in Polynesian archaeology is abating. The long-term history of the islands and their indigenous peoples has engaged scholars for more than two centuries, yet new questions continually emerge even as older issues receive renewed scrutiny from fresh approaches and methods.

Patrick V. Kirch

See also

Papua New Guinea and Melanesia

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Polynesian Society

Formed in Wellington, New Zealand, on 8 January 1892, the Polynesian Society has been publishing a quarterly journal ever since. The *Journal of the Polynesian Society* (*JPS*) is one of the oldest continuously published anthropological journals in the world and has always been the preeminent journal of its kind in the Pacific region. The journal and the society's other publications, including fifty memoirs, are the primary record of the society's activities. A bibliography of the journal was compiled by Dorothy Brown (Brown 1993), and a centennial history by M. P. K. Sorrenson (Sorrenson 1992) was published by the society. Most of the society's papers are held at the Alexander Turnbull Library in Wellington, and the remainder are in the society's office in the Maori Studies Department of the University of Auckland.

Ethnographic recording of the culture of the

Ngata was a leading Maori scholar in his own right, a longtime member of the society and later its president, and a frequent contributor to *JPS.* The board subsidized the society's publications and other activities.

Although Maori scholarship remained the main focus of the society's work and publications, the wider Pacific was not ignored. An important figure in this regard was Ngata's friend and former political colleague, Te Rangihiroa (Peter Buck), who first became a research fellow at the Bishop Museum in Hawaii in 1927. He subsequently became its director. Buck remained in frequent contact with Ngata, as can be seen by their extensive correspondence, published as *Na To Hoa Aroha* (Sorrenson, ed. 1986-1988). He was also in touch with Andersen, sometimes contributed to the *JPS,* and solicited copy from his Bishop Museum colleagues, including E. C. S. Handy and Kenneth Emory. Nevertheless, the bulk of the material for the *JPS* still came from enthusiastic amateurs.

The professional takeover of the journal and eventually the society did not occur until after World War II and the establishment of an Anthropology Department at the University of Auckland in 1950, when Bill Geddes, jack golson (the first archaeologist to be appointed to a New Zealand university), Murray Groves, and Bruce Biggs took turns as editor of *JPS.* They also infiltrated the Wellington-based council of the society. The editorship of the *JPS* has remained with the Auckland Anthropology Department, and the Auckland editors have given the journal a thoroughly professional appearance and content, drawing most of their material from academic colleagues at New Zealand universities and from abroad.

Most of the articles have been on social anthropology, linguistics, and archaeology, and the balance between New Zealand and Pacific material has gradually tilted in favor of the latter as the Pacific peoples, several of them in the process of gaining independence, became the focus of intense academic interest. A notable case was papua new guinea, the anthropologists' last frontier. But old perennials, like the quest for Polynesian origins, have continued to tease scholars and fill the pages of the society's publications. That subject got a new lease of life when the society published Andrew Sharp's controversial *Ancient Voyagers in the Pacific* in 1956, and there have been numerous subsequent contributions published in *JPS* or as separate memoirs. The subject is far from exhausted, even today.

With the later establishment of Maori studies departments in most New Zealand universities, there was a greater involvement of Maori scholars in the journal and the society. In 1979, Bruce Biggs, the first professor of Maori studies at Auckland, became president of the society, and in the following year, the society's office was shifted from Wellington to Auckland, where it remains. In 1999, Biggs surrendered the presidency to his successor in the Maori studies chair, Sir Hugh Kawharu.

The society ended its first century as it had begun: a small band of dedicated scholars, now mainly university academics, who in their “spare” time continue to put together a journal that remains preeminent in its field.

M. P. K. Sorrenson

See also

Polynesia; New Zealand: Historical Archaeology

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Pompeii

No archaeological site has captured the popular imagination like Pompeii, a prosperous Roman town on the Bay of Naples, some 200 kilometers south of Rome. It was effectively discovered in 1748; inscriptions and other finds made during the construction of an aqueduct between 1594 and 1600 had failed to raise interest. Destroyed by the eruption of Vesuvius in a.d. 79, ancient Pompeii covered 66 hectares within the city walls, with villas, cemeteries, and other

now regarded rather less like a time capsule than it was in the past.

In the twentieth century Vittorio Spinazzola (working from 1910 to 1923) and Amadeo Maiuri (from 1923 to 1961) cleared an enormous area of Pompeii, especially along one of the main streets of the town, the so-called Via dell'Abbondanza. Publication lagged badly behind, and Pompeii's structures suffered disastrously (especially from 1940 onward) from pollution, theft, tourism, earthquakes, bombardment during World War II, and, most particularly, neglect. Since 1980 the pace of excavation has slowed considerably, and a large-scale restoration program has been undertaken using mainly traditional materials, rather than the inappropriate modern materials used in the past. The most recent projects have concentrated on previously excavated structures, documenting what remains of the buildings and decorations in an attempt to recover the finds and their contexts; to better understand the building history of the structures and the urban development of Pompeii, digging often extends below the a.d. 79 level.

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Popenoe, Dorothy Hughes

(1899-1932)

Trained as a botanist and a pioneer in the determination of cultural chronology in Honduran prehistory, Dorothy Hughes Popenoe conducted independent fieldwork in Honduras and sought the advice and sponsorship of A. M. Tozzer of the peabody museum at Harvard University. Her major works, published posthumously, dealt with the sites of Playa de los Muertos and Tenampúa in Honduras.

A brief memoir by Thomas Barbour, issued as an introduction to her posthumously published study of Antigua, guatemala, and an obituary by Alfred M. Tozzer in *Maya Research* provide sketchy details of Popenoe's early life. She was born in Great Britain, and following World War I she worked as a technical illustrator at Kew Gardens in London. She developed enough expertise to establish new species of grasses in the scientific literature. Her relocation to Washington, D.C., in 1923 as an employee of the U.S. National Herbarium led to her marriage to Wilson Popenoe. Accompanying him to Honduras in 1925, after he accepted a position with the United Fruit Company, she began a brief but highly active career that was ended prematurely by her accidental death.

Popenoe's earliest work, published with her husband in 1931, was the report of a site uncovered during construction of a botanical station at Lancetilla, near Tela on the Caribbean coast of northern Honduras in 1925. The report mixes a scientific format, a description of each category of data, with a speculative vignette about life at the site on the eve of Spanish conquest. Since both Wilson and Dorothy Popenoe were accomplished botanists, it is no surprise that they attempted to present the archaeological data

according to the standards of the time, including the use of general taxonomies of material culture, especially of lithics, that implied time depth. But the site could not be placed in any real context because of a paucity of available literature on Honduran archaeology.

Dorothy Popenoe's interest in archaeology was apparently engaged by this chance discovery. According to Barbour, she was determined not to be idle after her transfer to Honduras and had begun historical and ethnographic investigations. Following the Lancetilla excavations, she took a major step forward in archaeology by initiating excavations at Tenampúa in the Comayagua Valley in 1927, a fortified hilltop site that had been reported over fifty years earlier by American archaeologist E. G. Squier. Popenoe's Spanish-language report (1928), reissued in English after her death by the smithsonian institution (1936), is most notable for drawing on sixteenth-century ethnohistoric documents in an attempt to identify the site.

Portugal

The first Portuguese contacts with the Stone Age came through the navigators who reached the coasts of Africa, South America, and Asia in the fifteenth and sixteenth centuries. By a.d. 1500 these contacts had already resulted in the production of the first reports on such peoples as the Guanche of the Canary Islands, the San (Bushmen) of Southern Africa, and the Indians of brazil, including accurate descriptions of polished stone axes and other tools. However, these descriptions failed to produce any impact on sixteenth- and seventeenth-century humanists and scholars who studied Roman and pre-Roman antiquities.

By the end of the eighteenth century archaeology had become an established discipline. The first scientific excavations in Portugal were undertaken at the time by Friar Manuel do Cenáculo, in the Iron Age settlement of Cola (Alentejo). Several descriptions and inventories were published of dolmens, which were correctly interpreted as pre-Roman monuments but generally thought to be altars, not burial chambers. And, as elsewhere in Europe, it was not until the mid-1800s that the concept of the remote antiquity of humanity was finally accepted, mainly as a result of developments in the geological sciences.

Beginning in 1848 several organizations were created to survey the geology of the country, and prominent members of their staffs, such as Carlos Ribeiro and Joaquim Filipe Nery Delgado, became interested in the problem of human origins. Ribeiro's work on the eolith problem and the possible existence of people in Europe in the Tertiary era is well known. It led scholars of the time to agree to convene the 1880 session of the Congrès International d'Anthropologie et d'Archéologie Préhistoriques in Lisbon in order to be able to inspect his sites and finds.

Delgado's work is not as well known but is of greater general methodological relevance. He was appointed to the Geological Survey in August 1857 at the age of twenty-two, but his first independent work was the geological mapping of the Peniche area. This project eventually led him to the excavation of the Casa da Moura cave site, which he began on January 19, 1865. The results obtained after initial testing led to the almost immediate publication of an extensive bilingual (Portuguese and French) monograph whose title, *The Existence of Man on Our Soil in Very Remote Times Proved by the Study of Caves,* leaves no doubt as to the research design that drove him in this early stage of his scientific career.

At that time the evidence from caves was regarded as untrustworthy. It was the fluvial deposits of the Somme Valley that played a key role in the establishment of the remote antiquity of humans. They, in turn, were used to validate some of the associations between artifacts and extinct fauna found in various caves of Germany, England, france, and belgium. Several objections had been raised against such evidence. Some argued that deposits of very different ages could easily be intermixed during the flooding to which caves are often submitted; others contended that the use of caves by people to bury their dead may have caused the occurrence of human bone in apparent association with extinct faunas; and still others suggested that although the deposits might have been originally undisturbed, mixing could arise from careless investigation.

Since his work was wholly based on the exploration of caves, Delgado had to deal with these objections, which probably explains the most remarkable characteristic of his monograph: the fact that it represents an integrated geo-archaeological approach to site-formation processes. Moreover, the great detail with which he recorded stratigraphic observations (the correctness and precision of which have since been demonstrated by reexcavation of the residual deposits at Casa da Moura) was intended to avoid any objections that his conclusions were based on careless excavation.

His most important find was a carefully described and measured human skull and mandible, which were enveloped in a matrix of concreted red sands just like the ones that composed the in situ lower deposit of the site. This cranial material was clearly of Pleistocene age and should therefore be counted, alongside better-known fossils such as the Engis adult skull and the Red Lady of Paviland, as one of those early findings of Upper Paleolithic human fossil remains that took place before the 1868 discovery of the Cro-Magnon burials. However, unlike the material at Paviland and Engis, the Casa da Moura material's age was correctly recognized and established by the discoverer.

Later revision of the Paleolithic artifacts from the cave identified Gravettian and Solutrean components. At that time, however, investigations

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Potocka Zijalka

Potocka Zijalka is an alpine Paleolithic cave site in slovenia, approximately 1700 meters above sea level, on the southern edge of the Karavanke mountain ridge on the Slovenian-Austrian border. The site was discovered by srecko brodar in 1928 and was systematically excavated until 1935.

The archaeological record comprises numerous cultural layers all belonging to the Wurm I-II phase of the Aurignacian period, around 34,000 years ago. Brodar's excavation revealed numerous finds, the most outstanding among them being 133 bone points of the Mladec, or elongated oval-shaped, type (also Lautscher type), the largest known collection of points of this type found in one site. Some of them have traces of the earliest known ornamentation of parallel incisions while others seem to be the prototype of a needle and a simple flute with three holes made from the cave bear's mandible. The total artifact assemblage consists of more than 100 tool types.

The vast majority (99 percent) of the faunal remains belong to the cave bear (*Ursus speleaus*) with the more poorly represented other species being musk ox (*Ovibus moscatus*), wolf (*Canis lupus*), and smaller mammals (*Micromammalia*). Several hearths containing charcoal of tree species *picea* and *pinus* were detected some 20 meters from the entrance to the cave. Owing to the extreme altitude and the artifact richness of the site, Brodar proposed that Olschevien (called after Olseva, the location of the Potocka Zijalka) was a distinctive cultural phase of the alpine Aurignacian hunters and gatherers. However, his proposal has not been accepted.

Drasko Josipovic

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Poverty Point

Brought to public attention in 1873 by Samuel Lockett, Poverty Point is one of the most significant sites in North America, located near the Mississippi River in northern Louisiana. It is most closely linked to the work of James A. Ford, who began research there in 1953. Constructed between 1730 b.c. and 1350 b.c. by a preagricultural people, the site features complex earthworks undertaken on a massive scale. The central construction is composed of six rows of concentric ridges, which are thought to have been 1.3 meters high originally. The five aisles and six sections of ridges created by this construction take the form of a wheel; the diameter of the outermost ridges measures three-quarters of a mile. Scholars believe that these ridges served as foundations for dwellings, although little evidence of structures has been found. However, features and midden deposits uncovered during excavations offer some support for this theory. Large earth mounds were also constructed on the site; among them are Poverty Point Mound, which measures about 210 by 195 meters at its base and is 21 meters high, and Mound "B," which is conical in shape.

We know quite a bit about the people who lived at Poverty Point. For example, they imported stone for projectile points from as far away as the Ouachita and Ozark Mountains. Indeed, the evidence indicates that Poverty Point was part of a major trading network that spanned the eastern United States.

Tim Murray

See also

United States of America, Prehistoric Archaeology

References

Gibson, J. L. 1996. *Poverty Point: A Terminal Archaic Culture of the Lower Mississippi Valley*. Louisiana Archaeological Survey and Antiquities Commission.

Powell, John Wesley

(1834-1902)

John Wesley Powell grew up in the midwestern portion of the United States, fought in the American Civil War, and later became an explorer of the Colorado River canyons. He began fieldwork among the Soshone, Ute, and Paiute Native American Indian peoples of the Great Basin and Grand Canyon regions. He founded the smithsonian institution's Bureau of American Ethnology (BAE), which he directed from 1879 until 1902.

As an early anthropologist, geologist, and member of the Anthropological Society of Washington, D.C., Powell was an evolutionist. Greatly influenced by Charles Darwin, Herbert Spencer, and lewis henry morgan, he envisaged a rigid framework for human development. As director of the BAE, he supported the Cyrus Thomas Survey of North American Indian mounds and sponsored the fieldwork of archaeologists frank cushing and william henry holmes, among others. He also supported the preparation of the 1891 linguistic map of North American native peoples and the collection of Native American Indian vocabularies.

Powell argued for applied government anthropology to improve reservation conditions; for federal government support of linguistic, archaeological, and ethnographic fieldwork; and for the preservation of antiquities such as Great Serpent Mound in Ohio and casa grande in Arizona. The publication of his own

fieldwork was not realized until a century after his death; however Powell contributed many essays to the BAE's annual reports as its director.

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Zernel, J. J. 1983. *John Wesley Powell: Science and Reform in a Positive Context.* Ann Arbor: University Microfilms.

Prescott, William Hickling

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Born in Salem, Massachusetts, and educated at Harvard University, the partially sighted William Hickling Prescott became a prolific writer with a particular interest in Spanish history. *A Chronicle of the Conquest of Granada* (1829) and *History of the Reign of Ferdinand and Isabella the Catholic* (1838) were followed by *History of the Conquest of Mexico* (1843) and *History of the Conquest of Peru* (1847). The last two multivolumed

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works portrayed the aztec and inca as civilized peoples and remain the standard authorities on the Spanish conquistadores in the New World. Both works brought Prescott widespread recognition in Europe.

Tim Murray

See also

Mexico; Peru

Prestwich, Sir Joseph

(1812-1896)

Born in London and educated at University College, London, Joseph Prestwich abandoned a career in chemistry to work in his father's wine merchant business. He took up geology and became particularly interested in stratigraphical analysis. His papers on the Tertiary geology of southeastern England and on Quaternary geology published in the mid-1840s and 1850s established his reputation and his place among the elite of British science. In 1874, Prestwich finally retired from business and took up the chair of geology at Oxford University.

In 1858, Prestwich was a member of the committee of the Geological Society of London that presided over the excavation of brixham cave by william pengelly, but Prestwich agreed with Richard Owen and geologist sir charles lyell that the evidence was not enough to establish greater human antiquity. In 1859, hugh falconer insisted that Prestwich visit French archaeologist jacques boucher de perthes in France and examine the evidence of human antiquity that he had found in the Somme River gravels. Prestwich was persuaded of the validity of this evidence, and from then on he supported the notion of a high human antiquity and the value of the discoveries at Brixham Cave.

Prestwich was elected fellow of the Royal Geological Society in 1833 and fellow of the Royal Society in 1853. He was knighted in 1896.

Tim Murray

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Prinsep, James

(1799-1840)

If any person in addition to alexander cunningham can be called a founding father of Indian archaeology, the honor should go to James Prinsep. He was the assay master of the East India Company mints and was posted first to Varanasi and then to Calcutta. Prinsep initiated the tradition of field investigations by members of the company and other European officials in various parts of the country where they traveled in their private capacities. Prinsep became the secretary of the Asiatic Society of Bengal in the 1830s and began the new and regular publication of the society, which continues even today: the *Journal of the Asiatic Society of Bengal* first appeared under his editorship in 1832. His stimulation and encouragement of the antiquarian interests of his European contemporaries in India has been well expressed by Abu Imam (1966, 21-22): “A new breed of officers arose who interested themselves in the mysterious remains of the country's past, although preoccupied with their official duties.… On their

various rounds in the four corners of India, these officers began to shower on Prinsep coins, inscriptions and rubbings in profuse numbers.… Soon both the collectors and the interpreters were acting in a spirit of friendly competition."

Prinsep's own special fields of study lay in coins and inscriptions. He studied and cataloged a large series of north Indian coins, beginning with Roman coins in "upper India" (Prinsep 1832). His study of Greek coins in the possession of the Asiatic Society (Prinsep 1833) was the first study of the Indo-Greek phase of history in the northwestern part of the subcontinent. He was also astute enough to realize the significance of the nameless early historic coins of northern India, and in the Indian area he was certainly the first to appreciate the dating value of coins in archaeological contexts (Prinsep 1834).

It is, however, principally for his decipherment of the ancient Brahmi script of the Asokan inscriptions of the third century b.c. and of the similarly dated Kharoshti script (confined principally to the northwest) that Prinsep is most famous. The study of the late form of Brahmi script began in the late eighteenth century on the basis of its resemblance with the script form

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of late medieval Bengali and related manuscripts in eastern India. The task of decipherment then proceeded from the known to the unknown and culminated in Prinsep's reading of the Asokan inscriptions around 1837 (Prinsep 1837). He achieved this task between 1834 and 1838. The main source of study of the Kharoshti script for Prinsep was a series of Indo-Greek coins bearing royal names both in Greek and Kharoshti, which made the task of decipherment comparatively easier.

Pinsep's spirit comes through when, writing about the framework of archaeological researches in India, he advocates “the need of an independent pursuer of the object for its own sake; or for his own amusement and instruction” (Prinsep 1835, 623).

Dilip Chakrabarti

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Proskouriakoff, Tatiana

(1910-1985)

Tatiana Proskouriakoff was one of the greatest scholars of the maya civilization. She made major contributions in the areas of Maya art and architecture as well as in the decipherment of Maya hieroglyphics.

Proskouriakoff was born in Russia in 1910 and emigrated to the United States with her family while still a child. She graduated from university with a degree in architecture just as the Great Depression set in. She was a wonderful artist, and her talents were spotted by Linton Satterthwaite, who at the time was excavating the classic Maya site of Piedras Negras, guatemala, as part of a University of Pennsylvania project. He hired her as staff artist for the project, and her superb reconstruction drawings of ancient Maya sites and temples caught the attention of scholars working for the Carnegie Institution of Washington, D.C., at the time the largest and best-funded institution working in the Maya area. Proskouriakoff was hired by the Carnegie Institution in 1940 and spent the rest of her career as one of its staff archaeologists, working at sites such as Copan, Uaxactun, and Mayapan in Central America.

In 1946, Proskouriakoff published *An Album of Maya Architecture,* which is a compendium of her reconstruction drawings of classic Maya buildings. In 1950, she published *A Study of Maya Art,* a brilliant analysis of the motifs and details contained in Maya sculptural art that contained as a major

component a technique for “style dating” monuments that had no legible dates. These two books immediately became “classics” in Maya studies.

But Proskouriakoff did not stop there and focused her attention on Maya hieroglyphs. In 1960 she published an article that is perhaps the most important in all of Maya studies. Cogently, and in great detail, she deciphered the dynastic sequence of Piedras Negras, identifying a 200-year succession of kings and their birth and accession dates at the site. Such work might not seem particularly earthshaking, but the article must be seen in the context of the then-current views on ancient Maya society. Increasingly over the previous thirty years or so, Mayanist scholars had come to the conclusion that classic Maya society was not ruled by secular kings but was made up of a peaceful rural peasantry overseen by a priestly class that lived almost as ascetics in otherwise unoccupied “ceremonial centers.” Proskouriakoff's article changed this view overnight, and since the 1960s there has been a tremendous advance in the understanding of classic Maya society and politics. Scholars can now decipher Maya hieroglyphic inscriptions almost completely, and the intricacies of Maya politics within and between kingdoms are increasingly understood.

Proskouriakoff continued leading that aspect of Maya research until the Carnegie Institution withdrew from the field of Maya studies in the 1960s. By this time she was living in Cambridge, Massachusetts, and was affiliated with the peabody museum at Harvard University. Even in retirement, Proskouriakoff continued to make major contributions to the field: for instance, in 1974 she published a major study of the thousands of jade objects thrown into the sacred well at chichén itzá, Yucatán, once one of the principal centers of the Maya.

Peter Mathews

See also

Maya Epigraphy; Mesoamerica

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Pueblo Bonito

Pueblo Bonito is the largest Anasazi site of chaco canyon in northwestern New Mexico. It is located on the north side of Chaco Canyon, between Chaco Wash and the canyon wall. Built in the Pueblo III style during the early tenth century, Pueblo Bonito has 800 rooms in a D-shaped complex over three acres, with evidence of earlier settlements underneath the remaining structure. Approximately 1,000 residents were accommodated by this site. Pueblo Bonito is characteristic of the southwestern Anasazi sites of the Pueblo III period, with Black-on-red pottery; rectangular pit houses; multistory, multiroom pueblos; and well-developed kivas.

Among the many sites of Chaco Canyon, Pueblo Bonito is remarkable for offering scientists a chance to accurately date the structures. Besides being the largest and most outstanding site of the time, Pueblo Bonito contains many wooden support beams. The wood was well preserved in the southwestern climate of dry heat and affords a uniquely precise insight into the timeline of the building. Dendrochronology, a dating technique developed using tree rings to measure time, was used very successfully to pinpoint the age of the building. Pueblo Bonito has been accurately dated to between a.d. 919 and a.d. 1130 through tree-ring dating of the large number of wooden beams.

The structure itself is the most impressive site in the entire Southwest at this time for several reasons. It is the largest masonry structure; and judging by its sameness throughout was most likely planned as a unit. It contains many kivas (large meeting or ceremonial rooms), and is similar to pueblos nearby, but the scale of Pueblo Bonito is very large in many aspects. The walls are very thick and the rooms much larger than other pueblos. The walls are rubble-filled, with a shaped sandstone exterior that encloses an inner court. Pueblo Bonito is three to four stories high at the back, with one great kiva and several smaller kivas.

The site has advanced architecture and similarly complex cultural traits. This conclusion is reached, according to Lister and Lister, because of the social organization needed to create such a large and planned village. The site shows evidence of population increase, localization of the population, and craft specialization. All these factors represent a complex, stable social organization. Most likely the Pueblo Bonito site was influenced by the casas grande sites in Mexico.

In an 1877 visit to Chaco Canyon William H. Jackson drew a map of the Pueblo Bonito site and a reconstruction. Pueblo Bonito was first photographed by Victor Mindeleff in 1888. From 1897 to 1899,

George H. Pepper and Richard Wetherill cleared 189 rooms and several kivas, published in their field notes. Neil M. Judd completed excavation of the rest of Pueblo Bonito between 1921 and 1927. The more significant reports were published by *National Geographic Magazine.* Gordon Vivian of the National Park Service worked on stabilizing and opening more rooms in the 1930s. Judd and andrew e. douglass collected tree-ring specimens for dating, as did Deric O'Bryan at Gila Pueblo. Tree-ring dates range from a.d. 828 to 1130. Construction and minor reconstruction continued between two main building periods, first in the early tenth century, after a.d. 919, and the second in the second half of the eleventh century.

Many of the Pueblo Bonito rooms contained burials and funerary items, but do not contain remains of the entire population. Many rooms excavated were previously undisturbed, and had intact floors and ceilings which preserved artifacts

that would normally deteriorate, such as wood, basketry, cordage, and shell. Pueblo Bonito is the most studied of sixteen great towns built in the Pueblo III era.

Danielle Greene

See also

United States of America, Prehistoric Archaeology

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Thomas, David Hurst. 1989. *Archaeology.* Fort Worth: Holt, Rinehart and Winston.

Pumpelly, Raphael

(1837-1923)

Raphael Pumpelly was born in canada, lived in the United States, and studied to be a mining engineer in Freiberg, Germany. In 1859 he returned to the United States to mine silver in Arizona, and in 1861 he went to San Francisco where he was appointed geologist for the Japanese government. When this job finished in japan in 1863, Pumpelly traveled to china and then, in 1865, made his way overland to Europe via central Asia and Siberia.

Pumpelly returned to the United States in 1869 and began to explore the copper and iron deposits of Michigan; in 1871, he became that state's state geologist. Ill-health caused him to resign, and he returned to the eastern states. In 1884, he began working for the New England Division of the U.S. Geological Survey under john wesley powell. In 1903, the Carnegie Institution of Washington, D.C., hired him to organize and conduct expeditions to central Asia to look for prehistoric sites and evidence of climatic changes. His excavation of the site of Anau in Russian Turkistan led Pumpelly to propose an “oasis theory” for the origins of food production during the Neolithic period. This theory was based on the fact that as the Near East became drier after the last Ice Age, its hunter-gatherers were forced to group around water sources and domesticate wild animals and crops in order to survive. sir grafton elliot smith, harold john edward peake, and herbert j. fleure popularized this theory during the two decades after Pumpelly's death, and vere gordon childe was especially influenced by it.

Tim Murray

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United States of America, Prehistoric Archaeology

Putnam, Frederic Ward

(1839-1915)

After early training under Henry Wheatland at the Essex Institute in Salem, Massachusetts, Frederic Ward Putnam studied with Louis Agassiz and Asa Gray at Harvard University. After the revolt of Agassiz's students in 1863, Putnam returned to Salem, where he had been born, and founded and published *The American Naturalist,* directed the new (1868) Peabody Academy of Science, and pursued a career in ichthyology and herpetology.

Upon the death of Jeffries Wyman in 1874, Putnam returned to Cambridge, Massachusetts, as director and curator of the peabody museum of American Archaeology and Ethnology at Harvard. He became Peabody Professor of Anthropology as well in 1887, and he held all three positions until retirement in 1909. He served as permanent secretary of the American Association for the Advancement of Science (AAAS) from 1873 to 1898 and president of AAAS from 1898 to 1899. He was a founding member of the archaeological institute of america in 1879 and was largely responsible for its early work in the Western Hemisphere. From 1891 to 1894, he served as chief of the Department of Ethnology of the World's Columbian Exposition in Chicago, directing the work of anthropologists Franz Boas, Alice C. Fletcher, Zelia Nuttall, Marshall Saville, George Byron Gordon, George A. Dorsey, Warren K. Moorehead, and many others. From 1894 to 1903, he served as curator of anthropology at the American Museum of Natural History in New York. He and Boas supervised the Jesup North Pacific Expedition and the Hyde expeditions to the American Southwest in the late nineteenth century. In

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Jean Louis Armand de Quatrefages studied medicine at the University of Strasbourg and practiced as a doctor in the southwestern French city of Toulouse until 1840 when he moved to Paris to become a scientific writer and illustrator. De Quatrefages was a talented draftsman and began to work for the National Museum of Natural History in Paris while publishing extensively on invertebrate biology and classification.

In 1850, he was appointed to a university chair of natural history, but in 1855 he returned to the museum to take up the chair of anthropology (formerly anatomy and human natural history) and his research and publications became focused on anthropological issues. He was strongly opposed to Darwinian evolutionary theory and to the theories of English scientist Thomas Henry Huxley, and he remained firmly convinced that mankind had not evolved from apes but was a separate entity in the rest of the animal world. He was also against polygenism and an opponent of the French anthropologist Paul Broca.

Although a conservative, de Quatrefages was an early believer in the idea of human antiquity, which, allied with his anti-evolutionist views, explains why he was such an ardent supporter of the authenticity of the moulin-quignon Jaw. De Quatrefages's major publication, *Crania ethnica* (1882), produced jointly with colleague Theodore Hamy, followed the rejection of his arguments concerning the validity of the Moulin-Quignon fossil. The book stands as his most significant contribution to the debate about the nature of human physical evolution in Europe.

Tim Murray

See also

Falconer, Hugh; French Archaeology in the Classical World

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Quebec

In Quebec, it is said that everything began in 1960 with the outburst of what has been called the Quiet Revolution. This was the time when the people of Quebec decided to change their country, to cast aside fear and silence, to shake the traditional basis of social power, and to share in urbanized North America's every positive move toward success and efficiency. The gradual results of this changed perspective had quite an impact on archaeology.

In 1960, the 1,540,680 square kilometers of Quebec was perhaps the largest archaeological *terra incognita* in the whole western world. There were no university training programs, no governmental sponsorship of archaeological studies, and no professional archaeologists. The word *archaeology* itself

had almost no meaning. It was culturally irrelevant.

Certainly several artifacts had been found since the establishment of Europeans in the area. For instance, Samuel de Champlain dug through a prehistoric Amerindian site in 1608 when he set the foundations of his trading post

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"Race" and Ethnicity, Archaeological Approaches to

Concepts of race and ethnicity have played an important role in the production of archaeological knowledge throughout the history of the discipline. One of the first questions that antiquarians and archaeologists have asked of the physical remains that they deal with is, Who was responsible for these creations? The answers have almost always been sought in terms of named groups of people, and embedded in these attributions are theories about the nature of the groups concerned. Here, the concepts of race and ethnicity have taken center stage, alongside the related concepts of culture, nation, and tribe. Yet despite their apparently straightforward role in the initial naming and classification of archaeological remains, race and ethnicity have a checkered history within the discipline. Their complex and overlapping meanings and uses have changed dramatically over time, as have the different theories surrounding them. They have also been implicated in some of the major epistemological shifts within the discipline. Finally, archaeological interpretations of race and ethnicity have been intricately bound up with the construction of modern ethnic, national, and racial identities, adding greater weight and urgency to the development of critical approaches to these concepts within the discipline.

Race, Culture, and Language

During the nineteenth century the study of archaeological remains became intertwined with the task of defining the "races" of humanity. A complex range of theories and definitions developed over this time, but a number of general trends can be observed. Race was thought to be *the* primary basis of human differentiation. Other concepts that later became associated with very different forms of group identity-concepts such as nation, ethnic group, and tribe-were often used interchangeably, but they were all heavily racialized. Races were regarded as discrete, objective entities, each possessing its own unique character. Scholars attempted to identify and describe the different races of humanity on the basis of empirical criteria. Physical and anatomical features were given a primary role in the definition of races, but language, psychology, and cultural and intellectual ability were also seen as important. Indeed, racial theories posited a direct relationship between biological and cultural capabilities, and it was argued that physical features such as cranial shape and size determined cultural and intellectual ability. Research was also devoted to explaining the origins of different races, which entailed the study of the historical and evolutionary relationships between them. Many different disciplines were involved in the study of race, including anthropology, archaeology, philology (historical linguistics), biology, psychology, and anatomy, and the individual scholars often moved between two or more disciplines. Recent historiographical studies of nineteenth-century theories of race include George Stocking's *Culture and Evolution* (1968), Michael Banton's *The Idea of Race* (1977), and I. Hannaford's *Race: The History of an Idea in the West* (1996).

Archaeological research played an important role in the development of racial typologies and in historical and evolutionary theories of race.

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During the nineteenth century the study of archaeological remains became intertwined with the task of defining the "races" of humanity. A complex range of theories and definitions developed over this time, but a number of general trends can be observed. Race was thought to be *the* primary basis of human differentiation. Other concepts that later became associated with very different forms of group identity-concepts such as nation, ethnic group, and tribe-were often used interchangeably, but they were all heavily racialized. Races were regarded as discrete, objective entities, each possessing its own unique character. Scholars attempted to identify and describe the different races of humanity on the basis of empirical criteria. Physical and anatomical features were given a primary role in the definition of races, but language, psychology, and cultural and intellectual ability were also seen as important. Indeed, racial theories posited a direct relationship between biological and cultural capabilities, and it was argued that physical features such as cranial shape and size determined cultural and intellectual ability. Research was also devoted to explaining the origins of different races, which entailed the study of the historical and evolutionary relationships between them. Many different disciplines were involved in the study of race, including anthropology, archaeology, philology (historical linguistics), biology, psychology, and anatomy, and the individual scholars often moved between two or more disciplines. Recent historiographical studies of nineteenth-century theories of race include George Stocking's *Culture and Evolution* (1968), Michael Banton's *The Idea of Race* (1977), and I. Hannaford's *Race: The History of an Idea in the West* (1996).

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closely interrelated and coeval with one another. On the basis of this methodology he claimed that it was possible to identify major prehistoric racial groups, such as the Aryans and the Slavs, and trace their relationships through time. The work of others, such as the early archaeology of vere gordon childe, although of a very different political persuasion, was embedded in similar concepts and methodology, as exemplified in Childe's book *The Aryans* (1926). The conflation of race, language, and culture in the study of archaeological remains can be confirmed by a glance though the volumes of any early archaeological journals. For more recent historiographical overviews see Colin Renfrew's *Archaeology and Language* (1987), K. Sklenár's *Archaeology in Central Europe* (1983), and Siân Jones's *Archaeology of Ethnicity* (1997).

The Politics of Race

Racial typologies and classifications remained all-pervasive throughout the nineteenth century and the first few decades of the twentieth century, penetrating many aspects of social life and informing ideological and political debates. The idea that the physiological characteristics of particular races determined cultural and intellectual ability, allied with evolutionary theories, provided a convenient way to justify relationships of power in the context of slavery and colonialism. For instance, applied to colonial America or Africa, such approaches placed the indigenous inhabitants lower down on the evolutionary ladder and members of European "civilization" at the top. Archaeologists maintained this idealized evolutionary racial hierarchy by going to great lengths to attribute "sophisticated" sites and assemblages to migrating races of European or Near Eastern origin (despite evidence to the contrary) rather than to the supposedly backward non-European races. For classic examples see Peter Garlake's *Great Zimbabwe* (1973) and R. Silverberg's *Mound Builders of Ancient America* (1968). Recent historiographical studies highlighting the politics of racial theory and the role of archaeology more generally include Bruce Trigger's *A History of Archaeological Thought* (1989) and "Archaeology and the Image of the American Indian" (*American Antiquity* 45, 1980), Martin Bernal's *Black Athena* (1980), and K. Sklenár's *Archaeology in Central Europe* (1983); further case studies are provided by contributions to a number of books in the One World Archaeology Series (Routledge), in particular *Archaeological Approaches to Cultural Identity* (S.J. Shennan, ed. [1989]) and *Social Construction of the Past: Representation as Power* (G. C. Bond and A. Gilliam, eds. [1994]).

The concept of race played an equally important role in European politics of the nineteenth and early twentieth centuries. Nations were conceived of in racial terms, and states justified their actions toward one another and their own populations on the basis of racial theory. Once again archaeology's role in legitimizing and informing contemporary political thought concerned historical relations between races, in particular the evolution of European civilization. Archaeological evidence was employed in the competition between nation states as to whose racial pedigree was superior and which nations had played a decisive role in the development of European civilization. The most notorious case in this regard is the way in which the Nazi regime used the work of archaeologists, including Kossinna, to support its misplaced claims about the superiority of the Germanic race, contributing to the ideological apparatus that supported the destruction of millions of Jews in the Holocaust. Other European nations also employed archaeological evidence in support of racial theories that would be used to legitimate their relationships with others. The English, for instance, used archaeological evidence to emphasize their Roman and Anglo-Saxon heritage and to justify their superiority over the Welsh, the Scottish, and particularly the Irish, all of whom were considered to be racially inferior. For an overview of the German case see Bettina Arnold's "The Past as Propaganda: Totalitarian Archaeology in Nazi Germany" (*Antiquity* 64, 1990); for an analysis of the English case see Richard Hingley's *Roman Officers and English Gentlemen* (2000).

Culture-History and Typology

The political importance of race in contemporary society goes some way toward explaining

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why the concept was so all-pervasive and persistent until the 1920s and 1930s. However, race politics also contributed to the demise of race within the social sciences because those in contemporary institutions abhorred the notion of race and the practices associated with it. By the 1930s a critique of the concept of race was emerging in archaeology, just as it was in social and cultural anthropology, as expressed in J.S. Huxley and A.C. Haddon's *We Europeans: A Survey of Racial Problems* (1935). This critique consisted less of an attack on the concept of race per se than of a dismantling of the correlation of cultural and physical groupings and a questioning of the appropriateness of the concept of race for archaeological analysis. For instance, in "Races, Peoples and Cultures in Prehistoric Europe" (*History* 18, 1933), Childe argued that any confusion between cultural-linguistic and physiological similarity should be studiously avoided, as culture is a "social heritage" that has no direct link to the physical traits acquired through heredity. Writing in the early 1930s, Childe was concerned with the political implications of archaeological research, most notably the political use of Kossinna's claims about the superiority and the purity of the Nordic Aryan race. This concern to distinguish race from cultural forms of differentiation was heightened following World War II and the ensuing outrage over the political appropriation of the past under the Third Reich. Racial-ethnic labels, such as the "Germani," the "Aryans," and the "Indo-Europeans," were avoided by many due to their political associations. Following the rejection of the grand evolutionary schemes of the late nineteenth century, the empiricist trend that emerged was consolidated, at least in Europe. However, the emphasis now was on the description of empirical evidence in terms of artifact "types" and "archaeological cultures," rather than on past peoples.

By the mid-twentieth century the definition of culture areas had become the principal means by which prehistory was delineated in space and time, producing a mosaic of discrete peoples and cultures. But despite the uncoupling of race and culture, the culture concept carried over many associated ideas about the nature of human groups, in particular their holistic, bounded, and homogeneous character. The normative theories of culture that were employed were based on the idea that within a given group, cultural practices and beliefs tended to conform to prescriptive ideational norms or rules of behavior. Further, these norms were said to be maintained by regular interaction within the group and the transmission of shared cultural norms to subsequent generations through the process of socialization. A culture was therefore regarded as the product of a particular society or ethnic group, and at the same time it was assumed to provide the distinguishing characteristics of that group. Within an archaeological framework such ideas led to the assumption of a fixed and one-to-one relationship between material types and particular past peoples, even if they were no longer referred to as races. Thus, as Ulrich Veit argued in "Ethnic Concepts in German Prehistory" (in *Archaeological Approaches to Cultural Identity,* S.J. Shennan, ed. [1989]), the term *archaeological culture* became merely a quasi-ideology-free substitute for the terms *race* and *ethnic group.* Peoples of the past still lurked behind the apparently neutral archaeological cultures. Useful summaries of the place of culture-history in the archaeological traditions of various European countries can be found in contributions to *Archaeological Theory in Europe* (I. Hodder, ed. [1991]). For a discussion of developments in other regions of the world see the contributions to *Theory in Archaeology: A World Perspective* (P. J. Ucko, ed. [1995]).

Recent Approaches and Debates

During the 1960s and 1970s a concerted shift occurred in archaeological theory and method with the emergence of the "New Archaeology" (later more widely referred to as "processual archaeology"). The normative concept of culture that had dominated traditional archaeology was overturned within New Archaeology. It was argued that culture constitutes an integrated system, made up of differently functioning subsystems such as subsistence, exchange, politics, ideology, and religion. Consequently, it

was argued, archaeological remains must be regarded as the product of a variety of past processes,

the communication of similarity and difference, which ethnicity inevitably entails. Thus, from an archaeological perspective, it cannot be assumed that there is any fixed relationship between particular material types and particular identities. And furthermore, rather than consisting of neat, coherent cultural entities, the resulting pattern is more likely to be a complex web of overlapping styles of material culture relating to the repeated realization and transformation of ethnicity in different social contexts. Examples of such an approach to ethnicity are provided by Stephen Shennan in his introduction to *Archaeological Approaches to Cultural Identity* (S. J. Shennan, ed. [1989]) and by Siân Jones in *Archaeology of Ethnicity* (1997). Peter Wells's analysis entitled "Identity and Material Culture in the Later Prehistory of Europe" (*Journal of Archaeological Research* 6, 3, 1998) provides a convincing application of such an approach. Other general studies of cultural identity that reach similar conclusions include Julian Thomas's *Time, Culture and Identity* (1996) and Andrew Jones's "Where Eagle's Dare" (*Journal of Material Culture* 3, 3, 1998). Studies focusing on the discourses involved in the construction of identity, particularly the role of myth and tradition, are also becoming common; for instance, see Jonathan Hall's *Ethnic Identity in Greek Antiquity* (1997).

Conclusions: The Present Past

Recent research focusing on ethnicity in archaeology has overturned many traditional assumptions about the discrete, bounded, and homogeneous nature of cultures and the straightforward link between culture and identity that is central to culture-historical archaeology. But studies focusing on ethnicity still tend to be sporadic. The relationship between cultures and ethnic groups remains a problematic area of archaeological analysis. There is, therefore, a pressing need for further research, at the very least because of the role of archaeological knowledge in the construction of modern ethnic and national identities. Of all the recent developments concerning identity in archaeology, perhaps the most significant in terms of its impact on the discipline as a whole is the concern with the role of archaeology in the construction and legitimation of national identities. The 1980s and 1990s witnessed an increasing body of conferences, symposia, and publications devoted to this topic. (Examples include the contributions to *Nationalism and Archaeology in Europe,* M. Diaz-Andreu and T.C. Champion, eds. [1996]; *Nationalism, Politics and the Practice of Archaeology,* P.L. Kohl and C. Fawcett, eds. [1995]; *Nationalism and Archaeology,* J. Atkinson et al., eds. [1996]; and Philip Kohl's overview entitled "Nationalism and Archaeology" in *Annual Review of Anthropology* 27, 1998.) Clearly, traditional approaches to race and ethnicity have enabled history, place, and people to be tied together in an exclusive and monolithic fashion, reinforcing essentialist representations of ethnic and national identity in the present. The challenge for archaeologists is twofold. First, they must recognize the relationship between present constructions of group identity and our interpretations of the past. And second, rather than abandon the study of ethnicity and identity altogether, they must pursue more sophisticated analytical and interpretive approaches in order to ensure that essentialist perspectives are not merely imposed on the past.

Siân Jones

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Ratzel, Friedrich

(1844-1904)

Born in germany and educated at Munich University, Friedrich Ratzel originally studied zoology. After graduating in 1869 he spent six years traveling before returning to Munich to study for a doctorate in geography. He is one of the most important figures in the development of nineteenth-century geography, and he contributed to the development of ethnology as a separate discipline in the German-speaking world.

Friedrich Ratzel

(Science Photo)

Ratzel's work focused on the influence of the environment on human life and on political geography. He also supported German colonialism, inventing the word *lebensraum* ("living space"), used later by the Nazis as a means of justifying territorial expansion in the 1920s, 1930s, and 1940s. Ratzel also coined the term "anthropogeography," which was used during the nineteenth century to distinguish the discipline now known as human geography.

With colleagues fritz graebner, Leo Frobenius, and Wilhelm Schmidt, Ratzel founded the cultural-historical school of anthropology. His concept of a culture area (*Kulturkreis*) was widely used within both German and American anthropology and in describing cultural regions such as Melanesia and Mesoamerica, becoming one of the common concepts within the discipline. Ratzel taught for most of his life at the University of Leipzig and wrote about diffusion and diffusion routes, another fundamental interest of the cultural-historical school.

Tim Murray

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Heine-Geldein, R. 1964. "One Hundred Years of Ethnological Theory in the German-Speaking Countries: Some Milestones." *Current Anthropology* 5: 407-418.

Ravdonicas, Vladislav I. (1894-1976)

A member of the Communist Party and a theoretician, Vladislav I. Ravdonicas led the movement to create a new Marxist archaeology in the Soviet Union during the 1920s and 1930s. In a paper, "For a

Soviet History of Material Culture," Ravdonicas criticized the theoretical positions of such prominent Russian archaeologists as Aleksandr Miller and vasiliy gorodcov, which in some cases led to their being dismissed and exiled. The State Academy for the History of Material Culture, led by the Stalinist Nicolay Marr, ensured that Ravdonikas's protégés occupied leading positions within the discipline.

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Although this approach to archaeology had dire consequences and many limitations, it also resulted in some interesting interpretations and directions within the discipline. Because Russian archaeologists had to concentrate on how ordinary people lived, they undertook large-scale excavations of settlements, camps, and work sites and therefore collected important data in the areas of Paleolithic and Neolithic houses and settlements in particular.

Tim Murray

See also

Russia

Rawlinson, Sir Henry Creswicke

(1810-1895)

Henry Creswicke Rawlinson was born in England the son of wealthy middle-class parents. He took up a military cadetship in the East India Company in 1827 and while serving in that capacity met the governor of India, Sir John Malcolm, a diplomat and oriental scholar who inspired and encouraged the young Rawlinson's prodigious interest in languages. In 1839, he was sent to Persia (now iran) to help reorganize the Persian army by raising regiments from frontier tribes in order to prevent the spread of Russian influence toward India. Also in 1839, he helped with the crisis in Afghanistan, becoming a British political agent in Kandahar where he raised Persian cavalry that fought in subsequent battles with the Afghanis.

Henry Creswicke Rawlinson

(Hulton Getty)

Rawlinson continued to study throughout his military career, and his language and leadership abilities were so exceptional that he was appointed to explore unknown areas of the subcontinent, central Asia, and the Middle East. These included Susiana (now southwestern Iran) in 1836, and in 1838 he explored Persian Kurdistan for the Royal Geographic Society, for which he was awarded the society's gold medal. It was during this trip that he first became interested in cuneiform inscriptions. In 1843, Rawlinson became a political agent for the East India Company in Turkish Arabia, as well as becoming a British consul in Baghdad, and combined his new interests in epigraphy and archaeology with his diplomatic career.

He began to locate and copy, decipher, and translate Persian cuneiform inscriptions and to publish them in the *Journal of the Royal Asiatic Society.* At the same time that he was working in Iraq and Iran, several other scholars of philology in England and Ireland were endeavoring to decipher cuneiform from the direction of its vowel systems. All of the independent translators, including Rawlinson, were given an undeciphered inscription to test their ability. The results so closely resembled each other that cuneiform was officially recognized as deciphered-an epigraphic triumph similar to that by the great French philologist jean-françois champollion in the field of Egyptian hieroglyphics. But it was Rawlinson's translations of inscriptions “in the field” that were the most important contribution-and earned him the title of the first successful decipherer of cuneiform.

Rawlinson returned to England in 1849 and was commissioned by the british museum to excavate in

Babylonia for the benefit of that institution's collections. In 1851, Rawlinson was asked by the British Museum to revise the second

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half of the early cuneiform texts brought back by sir austen henry layard from nimrud. From this work he published *Inscriptions of Assyria and Babylonia* (1850) and *Outline of the History of Assyria as Collected from the Inscriptions by A.H. Layard* (1852). He remained involved with Layard's collection and oversaw the publication of six volumes of inscriptions between 1861 and 1880.

In 1856, Rawlinson resigned his diplomatic position and returned to England for good to become a member of Parliament. He became a trustee of the British Museum in 1876 and remained one until his death. He continued to be involved in the Royal Asiatic Society and was its president from 1878 to 1881, and he was president of the Royal Geographic Society 1871- 1872 and 1874-1875. Rawlinson helped with the state visits of the shah of Persia in 1873 and 1889 and was a royal commissioner for the Paris Exposition of 1878 and the India and Colonial Exhibition of 1886. He was made a baronet in 1891.

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See also

Mesopotamia

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A German pre- and proto-historian and chief curator at the museum in Munich, Paul Reinecke contributed to European archaeology for over fifty years while remaining independent of the influential archaeologist gustaf kossinna and the German cultural-historical school under friedrich ratzel and fritz graebner.

Reinecke's interests ranged from the Neolithic to Roman provincial archaeology, but he is best known for his studies of and interest in categories of objects, such as metal helmets and fibulae from the late Bronze and early Iron Ages. It was Reinecke who named the later Bronze/early Iron Age period "Halstatt" after the cemetery and mining site excavated in austria on Lake Halstatt. The later Iron Age was named "la tène" after a site in switzerland. Detailed typological analyses of these objects and of funeral rites and rituals of this period enabled him to differentiate between northwestern German and Scandinavian developments and to propose his own southern German Iron Age regional variations.

Tim Murray

See also

Celts; Germany

Reisner, George Andrew

(1867-1942)

George Andrew Reisner was an eminent Egyptologist, a pioneer in the archaeology of nubia and the

Sudan, and the organizer of the world's first archaeological salvage project. He was born in 1867 into a German-American family in Indianapolis, Indiana. A youthful interest in the ancient Near East led him to study Assyriology and Semitic languages at Harvard, where he graduated in 1889 and took a Ph.D. in 1893. He then went abroad for further study in germany, at that time the world center for Near Eastern research. While in Berlin, however, he fell under the spell of the great Egyptologists Adolf Erman and Ludwig Borchardt, who diverted the young American's interests from the Near East to Egypt. In 1897, he accompanied Borchardt to Egypt and assisted him for two years in the enormous task of cataloging the collections in the Egyptian Museum of Antiquities.

Reisner began fieldwork in 1899 when he led a University of California expedition excavating at Naqa el-Derr in Middle Egypt. In 1903, the expedition transferred its activities to the enormous necropolis of Giza, in the shadow of the Great Pyramids, the area that was the major focus of Reisner's activities for the rest of his life. When funding from the University of California was discontinued in 1905, Reisner organized the Harvard-Boston Expedition, a joint enterprise of Harvard University and the Boston Museum of Fine Arts, and remained its director for nearly forty years.

The Harvard-Boston Expedition was originally designed to work only in Egypt, but a development in 1907 resulted in a major enlargement of its focus. The first Aswan Dam (now often called the Low Dam) was then under construction

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The Harvard-Boston Expedition was originally designed to work only in Egypt, but a development in 1907 resulted in a major enlargement of its focus. The first Aswan Dam (now often called the Low Dam) was then under construction

he investigated, Reisner also developed formal typologies of pottery and other artifacts. Finally, his introduction of the use of standard grave-recording forms has already been mentioned. He was fond of saying that a well-conducted excavation should be recorded in such a way that future scholars could reconstruct every detail of the conditions found by the original diggers. His British colleague, Herbert Winlock, asserted that Reisner was the greatest excavator of Egyptian antiquities then alive, while walter b. emery went so far as to assert that he was the greatest archaeologist America had ever produced.

Although from 1910 onward Reisner held appointments both as professor of Egyptology at Harvard and as curator of Egyptian Art at the Boston Museum, he was quintessentially a field man. He spent nearly the whole of every year in the Nile Valley, digging in Egypt in the summer and in the Sudan in the winter, and returned only intermittently to give courses at Harvard and to attend to his curatorial duties at the museum. His later years were plagued by poor health and failing eyesight, which eventually forced him to give up his university appointment, but he remained active as director of the Harvard-Boston excavations until the end of his life. He died in his field camp on the Giza Plateau on 6 June 1942.

Because of his almost single-minded dedication to fieldwork, Reisner published final reports on only a few of his excavations. After his death, final reports on most of his Sudan excavations were published by his longtime assistant and colleague, Dows Dunham, and William Kelly Simpson published individual reports on many of the Giza tombs.

William Y. Adams

See also

Africa, Sudanic Kingdoms; Egypt: Dynastic; Egypt: Predynastic

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Remote Sensing

Remote sensing has been defined as the science and art of obtaining information about an object, area, or phenomenon through the analysis of data procured by indirect means. In other words, information is obtained by the use of a device that is not in direct contact with the subject under investigation. In the broadest sense, different techniques can be considered as remote sensing. These range from subsurface sensing methods, such as ground-penetrating radar, seismometer, and soil resistivity, to the analysis and interpretation of the electromagnetic energy radiated from the surface of the earth, recorded on air- and spaceborne platforms in the form of aerial photography, and satellite and radar imagery. This article deals only with the latter forms.

Basic Principles of Electromagnetic Energy

In simple terms, electromagnetic energy is the energy that is emitted or reflected from all objects. The emission of this energy is picked up by special airborne or spaceborne sensors and is processed in photographic or digital form. In reality, only the sun emits strong enough electromagnetic energy to be picked up by the sensors; the remaining objects on the earth's surface will reflect the energy they receive from the sun. Visible light is the most common form of electromagnetic energy, but other familiar forms of electromagnetic energy are heat, ultraviolet rays, radio waves, microwaves, and X-rays.

Electromagnetic energy radiates in waves that travel in harmonic sinusoidal movements. The length of the waves varies, and in the process gives place to a range of wavelength variation known as the electromagnetic spectrum. The part of this spectrum that we are more familiar with is the optical wavelength, which is divided into several bands for remote sensing purposes. The visible light that can be perceived by the human eye forms a fraction of the optical wavelengths. It comprises the blue, green, and red bands with a wavelength range that goes from about 0.4 to 0.5 m, 0.5 to 0.6 m, and 0.6 to 0.7 m, respectively. Outside the visible range adjoining the blue band is the ultraviolet band (UV), which has a wavelength

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ranging from 0.3 to 0.4 m. On the other end, following the red band, are three different categories of infrared (IR) waves: near-IR (.07-1.3 m), mid-IR (1.3-3 m), and thermal-IR (less than 3 m).

The still-enigmatic Nazca geoglyphs in Peru were not discovered until the 1920s, when planes began to fly over the desert; the glyphs, often over 100 meters in diameter, are visible only from the air.

(Marilyn Bridges/Corbis)

Length of wave is of prime importance in remote sensing because it will determine the type of interaction that electromagnetic energy will have with the objects sensed from the earth's surface. For example, the blue band is able to penetrate water bodies; thus it is particularly useful in coastal mapping. The red band is useful for sensing chlorophyll absorption and, hence, in differentiating vegetation cover from nonvegetation, including cultural features, while the near-IR has proved useful for determining vegetation types.

On the other side of the spectrum, we have the microwave radiation of electromagnetic energy, which consists of radio waves that range from 1 millimeter to 1 meter in length, and it cannot be recorded by standard optical means but it can be recorded by special radar. Radar is the acronym for *radio detection and ranging,* and as its name suggests, it uses radio waves to detect the presence of objects and determine their position. Radar imagery, then, is rather different from aerial photography or satellite imagery. The latter are passive sensors that depend on the sun as the source of electromagnetic energy and can therefore use only the visible and infrared wavelengths of the spectrum to create images. Radar is an active sensor that emits its own electromagnetic energy in the form of radio waves to create images.

Aerial Photography

Remote sensing in the form of aerial photographs has been used in archaeology since at least the early 1900s. J. Capper is credited with having taken the first photographs of an archaeological site, Stonehenge, from a hot air balloon in 1906. These photographs, however, were more a novelty than a conscious archaeological venture. The first conscious use of aerial photography for archaeological purposes was in 1913 when Sir Henry Wellcome took photographs of his excavations in the Sudan using a

box kite. And between 1919 and 1921, there occurred the first systematic application of aerial photography by European and American archaeologists, working in mesopotamia and the Cahokia Mounds, Illinois, respectively.

Since many archaeological sites leave no traces detectable at ground level but can produce distinctive soil patterns that are easily discernible from the air, archaeologists saw the clear advantages that aerial photography offered and readily embraced this new tool. The decade of the 1920s witnessed a boom in the use of aerial photography in archaeology. In 1925, Poidebard traced ancient caravan routes that led to Roman fortifications in Syria, and alfred kidder and Charles Lindbergh photographed a series of archaeological sites while flying over the Yucatán Peninsula and the American Southwest.

The onset of World War II in Europe not only did not stop the use of aerial photography, it virtually furthered its development. For obvious reasons, aerial photography was perfected during this period, both by technological innovations in aircraft and cameras and by further developments in its interpretative principles. In this process archaeologists played a leading role; some, such as glyn daniel, were even recruited by the military as photo interpreters.

The success of these early ventures and the developments in the technique that followed World War II secured a place for aerial photography in archaeology. However, the differences between the European and North American academic traditions, along with differences in the nature of the archaeological sites per se, resulted in very distinct approaches in the use of this new method of archaeological survey. European archaeologists were more concerned with a classical-historical approach and centered their efforts on site detection. North American archaeologists, on the other hand, who by this time had been greatly influenced by julian steward's cultural-environmental approach, put the emphasis on more regional approaches.

These theoretical orientations had an important effect on the preferred method of aerial photography that was adopted. In Europe, where the main interest was the architectural characteristics of spectacular sites, oblique photography was favored because of the better perspective that it produced. This method assisted European archaeologists in the discovery of thousands of sites throughout the countryside. In the Americas, where archaeologists put greater emphasis on anthropological issues such as subsistence activities, vertical photography was the preferred method because it facilitated regional mapping in which the location of archaeological sites was considered in relation to resource areas. Examples of this type of project are Ralph Solecki's 1952 Missouri River survey and gordon willey's 1953 seminal settlement pattern study of the virú valley in peru.

But interpreting aerial photography to locate sites and/or resource areas is just the initial stage in archaeological research. Regardless of the method applied-oblique or vertical photography-the archaeologists' final intent is to map the features that are of relevance to their research. The application of reliable methods to measure the observed features with the intent of producing a map is a subject covered by photogrammetry. Through the application of the principles of photogrammetry, the photo interpreter can quantify-in terms of location and extent-the interpreted features on the surface of the earth. Thus, the quantification process complements the information obtained by the initial interpretation and is geared toward identifying what features are present in the photograph, where they are on the ground, and over what areal extent.

With the advent of more sophisticated methods of remote sensing, such as satellite and radar imagery, the new developments in aerial photography technology have centered more on photogrammetry computer applications, image enhancing, and digital photography. Nevertheless, because of its lower cost, greater scale, and extensive coverage, the traditional black-and-white aerial photography still

remains a favored methodological tool in archaeological research.

Satellite and Radar Imagery

Remote sensing from space has its origins with the development of the first meteorological satellites, which in 1960 transmitted back to earth the first coarse images of the earth's surface

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dust, smoke, and even tree canopy and soil and thus provide images for targets that cannot be seen with the other platforms.

These characteristics have proved to be of great value not only for the detection of archaeological features situated underneath a tree canopy or other covering but also for the detection of subsurface archaeological features. One SIR-A radar image made over the Sahara revealed a prehistoric river system located between one and four meters beneath the sand. Subsequent excavation yielded human artifacts dating back to the Paleolithic period and other archaeological data that indicated a moister environment.

The complex nature of the archaeological data, comprising cultural and environmental elements, requires archaeologists to take advantage of all the available methodological tools. With the changing emphasis in archaeological research, which has shifted from site-oriented problems to more-regional approaches, the adoption of remote sensing along with other new technologies such as geographic information systems makes perfect sense. Although still in its early stages, remote sensing provides an excellent means of gathering data that describe the biophysical context where human groups developed. The growing access to affordable computer power along with the increasing availability of satellite and radar images will soon consolidate the position of remote sensing as an essential component of the archaeologist's tool kit.

Armando Anaya Hernández

See also

Crawford, O. G. S.; United States of America, Prehistoric Archaeology

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Rock Art

The study of rock art in all its various forms has no specific point of origin. Indeed, rock art was never really “discovered” at all with the obvious exceptions of caves blocked since the Ice Age, sites buried by deposits (which had to be excavated), and areas no longer frequented by humans (deep jungle, remote desert). Local people always knew the rock art was there, often believing it to be the work of devils, evil spirits, sorcerers, or fairies, and would sometimes point it out to visiting explorers or scholars. Most early “scholarly discoveries” of rock art came about accidentally as traveling missionaries or explorers reported on anything of interest that they encountered.

It was not until the late ninteenth or early twentieth century that systematic searches for rock art began. Naturally, early reports had no concept of the art's age (even today, most rock art remains undated) since archaeology had not yet become an established discipline and there was as yet no idea of the antiquity of humankind or of the very concept of prehistory.

It seems that it was the Chinese who were the pioneers, since the earliest known written reports of rock art are to be found in *Han Fei Zi,* a book written 2,300 years ago by the philosopher Han Fei (280-233 b.c.). In the fifth century a.d., Li Daoyuan, a geographer of the northern Wei dynasty (a.d. 386-534), wrote a famous geography book called *Shui jing zhu* (Notes on the Systems of Rivers), which consists mostly of his personal experiences and describes places he had seen. He mentions a score of places with rock art in about half of china's provinces and states that he had also heard of rock art in India and Pakistan. The book also describes techniques (painting and engraving) and subjects (tigers, horses, goats, and chickens as well as divinities and masks, footprints, and hoofprints).

The earliest known reference to rock art in Europe occurred 1,000 years after Li Daoyuan's book when, in 1458, Calixtus III, one of the Borgia popes from Valencia, forbade the Spanish to carry out cult ceremonies in a cave with horse pictures-presumably a decorated cave of Ice Age date-showing the persistence of beliefs

attached to prehistoric images. Only two years later, one traveler, Pierre de Montfort, wrote a letter to his wife that mentioned the Vallée des Merveilles in the Alps as "an infernal place with figures of devils and a thousand demons carved everywhere on rocks." In the sixteenth century, Onorato Lorenzo, a priest from the same region wrote a large unpublished manuscript called "Accademio dei Giordani di Belvedere" that contained information obtained from shepherds, and this manuscript mentions the "Meraviglie" and provides a long list of rock-art motifs and subjects.

The earliest known documentation of rock carvings in Europe occurred in sweden when some seventeenth-century drawings of petroglyphs at Backa Brastad near tanum, Bohuslän (at that time part of Norway, itself linked to denmark) were made by Peder Alfssön, a schoolmaster from Kristiania (Oslo), and sent to one ole worm, the king of Denmark's doctor. Worm, a renowned polymath and founder of museums, had sent out questionnaires to educated people in the provinces, mainly priests, asking them to notice the location, setting, and dimensions of ancient monuments and, if possible, to make drawings, investigate how the monuments were constructed, and ascertain what the local people said or believed about them. Alfssön produced freehand wash drawings and accompanying text, which, amazingly, still survive in Copenhagen, having escaped several wars and great fires (they remained forgotten until published as small copperplate engravings by P.F. Suhm in 1784). It is not known exactly when the drawings were made, but they were made a part of the Copenhagen archives in 1627, which makes them the oldest known drawings of rock art in the world.

Alas, Worm made no mention of rock art in his 1643 book on ancient Denmark, and Alfssön, of course, had no inkling of the art's antiquity. The latter believed that the carvings-including a large human figure subsequently nicknamed *Skomakeren* ("the shoemaker")-were medieval graffiti by apprentice stonemasons working on the construction of a church in the vicinity. It was only in the eighteenth century that scholars came to realize that such carvings were very old, though at first it was believed they depicted historical events such as battles between Viking ships.

In the Alps, a French historian, Abbé Pietro Gioffredo, wrote *Storia delle Alpi Marittime* (ca. 1650) and based his somewhat fanciful account of the Vallée des Merveilles on Onorato Lorenzo: "Various stones of all colours, flat and smooth, decorated with engravings of a thousand imaginary subjects, representing quadrupeds, birds, fish, agricultural or military mechanical instruments dating from several centuries, and… the authors of such merry jokes were shepherds trying to avoid boredom."

In russia, petroglyphs (*pissanye kamni,* or "written stones") were mentioned in the notes made by travelers, ambassadors, and merchants during the seventeenth and eighteenth centuries. For example, a Moldavian prince, Nikolai Milesku Spafarii, an ambassador for Czar Alexei Romanov, traveled through Siberia to China in 1675 and mentioned petroglyphs in the Yenisey Valley in his travel notes. Tomskaya Pisanitsa in Siberia was described in a Russian chronicle of the seventeenth century as a big stone with the images of animals, birds and people, and in 1692, the Dutch traveler and scientist Nicolaas Witsen, a friend of Peter the Great, published a book *Nord und Ost Tartaray* (North and East Tartary) in Amsterdam (2d ed., 1705). In effect, that work was the first Siberian encyclopedia, and it contained descriptions of "ancient paintings," including rock pictures on the River Irbit in the Ural Mountains.

Developments in the New World

The major development of the sixteenth century occurred in the New World where "inscriptions" of various kinds were spotted, and sometimes described and illustrated, by conquering Europeans exploring the interior of Brazil. During the first centuries of the conquest, members of various religious orders also penetrated the interior of Amazonia. The earliest known information on rock art in this area is attributed to Ambrósio Fernandes Brandão, who, in 1598, recorded the existence of rock engravings

in the present state of Paraíba on the Araçai River. In 1618, Brandão published drawings of motifs in

soon followed: on the east bank of the Taunton River in Massachusetts, the first drawing of Native American petroglyphs on Dighton Rock (a large rock covered with deeply incised abstract designs and highly stylized human figures) were made by colonists in 1680-although the markings have been attributed by some people on the fringe of archaeology to Norsemen, Phoenicians, Scythians, and Portuguese explorers. The pictograph site of La Roche-à-l'Oiseau on the Outaouais River in quebec was mentioned in 1686 in connection with Indians throwing down offerings of tobacco when they passed close to the rock.

The Age of Enlightenment

In the eighteenth century, a time when so many fields of inquiry began to be transformed into serious topics of study, a more profound and sustained interest began, and rock art was reported on two more continents. As yet, however, serious study developed very sporadically and slowly.

For instance, in Ireland, Newgrange and the other decorated tombs were frequently described and illustrated in the eighteenth and nineteenth centuries, and “rude carvings” at Killin, County Louth, were reported by Wright in 1758. Regarding Scandinavian rock art, a letter from a superintendent of the Swedish-Norwegian border written in 1751 mentions carvings in Bohuslän: “In the parish of Tanum, not far from the sea, I have also visited a sloping rock, where a man with spear in his hand is cut, and about whom is said that a Scottish commander had been killed in his flight during a military campaign and that the position of his dead body was reproduced in the rock.” The letter's plea for an inventory to be started in the parish fell on deaf ears.

Also in the mid-eighteenth century, the great cairn of Kivik in Skane, southern Sweden, was discovered, and the carved figures on the stone slabs of its central cist were drawn in very professional fashion by Carl Gustaf Hilfeling, an antiquarian who specialized in depiction and description. The much-traveled Hilfeling also visited Bohuslän, and his travel books published after 1792 include several drawings of monuments and rock carvings in that region. He produced measured drawings done to scale, not freehand sketches, and his pictures are full of comments on size, distance, and location. Unfortunately, he had a tendency to see nonexistent runic inscriptions on some rocks.

In 1719, Czar Peter the Great sent a young doctor and naturalist, Daniel-Gotlieb Messerschmidt, to lead a scientific expedition to study the nature and population of Siberia. In Tobolsk, Messerschmidt met Philip Johann Tabbert von Strahlenberg, a Swedish officer who was a prisoner in Siberian exile, and together they carried out the first scientific excavations in the region. In 1722, Messerschmidt made a drawing of a rock with symbols, images of animals, and a man. He also discovered runic inscriptions on rocks that were determined to be old Turkic in 1893; earlier, they conjured up romantic ideas about Vikings and Germans and led Messerschmidt to investigate ancient rock images more closely and make copies of them.

In his diary entry for 23 February 1722, he reported that by the Yenisey River, not far from the village of Birjusa, near Krasnoyarsk, there were all kinds of “characters” and figures, written in red, to which the locals ascribed all kinds of meanings because the motifs were quite high above the river on smooth, steep rocks so the locals could not understand how people could have made them there. He also noted that the locals called them *pisannyj kamen.* On 18 August of the same year, Messerschmidt saw numerous Scythian graves bearing stones covered with figures, some of which he published as drawings. His diary entry for 26 September mentions that at the Gordovaja stena he once again saw characters and figures about eight and a half meters above the river level that were made with a crimson and indelible color.

In 1730, liberated and back home in Sweden, von Strahlenberg published a book (*Das Nord- und Östliche Theil von Europa und Asia*), the first scientific publication about the archaeological monuments of the Yenisey region (Siberia), including petroglyphs. Other expeditions to Siberia followed, and these also examined the archaeology and rock art of the region. For example, the historian Gerhard-Friedrich Mueller

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produced a book in 1750 in Russian (*Opisanie Sibirskogo carstva*) in which he refuted the supposition that these ancient rock drawings could be taken as a special form of writing. In this work, which was later also published in German, he published sketches of some figures.

Further Work in the New World

Discoveries of rock art continued to be made in the Americas. In 1711, Father Eusebio Kino described and mapped "the painted rocks"-actually engravings-near Gila Bend, Arizona. In Quebec, the Nisula site on Lac de la Cassette was mentioned on Father Pierre-Michel Laure's maps, drawn between 1731 and 1733 during the French regime in Canada and showing the so-called Domaine du Roy in Nouvelle france, where it says "Pepéchapissinagan [the stone thing on which there are paintings] naturally painted figures can be seen on the rock." Heads, or faces, carved at the foot of the great falls on the Connecticut River in the village of Bellows, Vermont, have been commented on by travelers and researchers since 1789, the petroglyphs being described variously as Indian chiefs, families, symbols of male authority, memorials of noteworthy events, idle artwork, and the work of shamans recording vision experiences.

In the eighteenth century, a Jesuit missionary called Schabel visited Pedrazza, Venezuela, and thought the petroglyphs there to be engraved by "angelic hands." Alexander von Humboldt himself saw many petroglyphs during his travels through South America at the end of the century, and he put forward some interpretations of petroglyphs in the Orinoco region. Father Pedor Lozano, in about 1730 to 1760, interpreted the abundant engravings and paintings of colombia, brazil, Paraguay, and peru as tracing the itinerary of St. Thomas, with all footprints being attributed to the saint as usual (conversely, red handprints were often attributed to the devil in Latin America). But Filippo Salvadore Gilii, another Jesuit missionary in Venezuela, reported in 1781 that, according to the Tamanaco Indians, rock inscriptions there had been made by the creator-god Amalivaca.

There was a great deal of activity in Mexico in the eighteenth century. For example, a 1792 compilation commissioned by the Spanish viceroy of New Spain, Conde Revilla Gigedo, contained a natural history of Baja California that was attributed tentatively to the Jesuit Juan Bautista Mugazábal, who died in 1761. If correct, the compilation would be the oldest known reference to rock art on the peninsula, and it describes a clear attempt to obtain relevant ethnographic information:

In all of civilized California, from south to north, and particularly in the caves and smooth cliffs, rustic paintings can be seen. Notwithstanding their disproportion and lack of art, there can be easily distinguished the likenesses of men, fish, bows and arrows, and diversely assembled lines in the fashion of written characters. The colours of these paintings are four: yellow, red, green and black. The majority of the images are painted in very high places, and from this, some infer that there is truth in the constant tradition of giants among the ancient Californians.… It has been impossible to ascertain what these figures, lines and characters mean, despite extensive questioning of the California Indians. The only thing which has been determined from what they say, is that they are from their ancestors, and that they have absolutely no knowledge of their significance.

An eighteenth-century Jesuit missionary, the Spaniard Miguel del Barco, wrote hundreds of pages about California that were not published until 1972 by Miguel Leon-Portilla in *Historia natural y crónica de la Antigua California*. This account contains an extended reference to the great murals of Baja California, and it quotes Joseph Mariano Rothea, a missionary at San Ignacio from 1759 until 1768:

I happened to investigate several painted caves.… one would be about 30 to 35 feet long, about 16 feet wide.… From top to bottom it was all painted with various figures of men, women, and animals.… The colours were the same that are found in the volcanoes of the Tres Virgenes: green, black, yellow and

flesh-coloured. The durability of these colours seemed notable to me; being there on the exposed rock in the inclemencies of sun and water where they are no doubt struck by rain, strong

wind or water that filters through these same rocks from the hill above, with all this, after much time, they remain highly visible.… Without scaffolds or other implements suitable for the purpose, only giant men would have been able to paint at so much height.

Hence, the Cochimí, the local people, had legends disassociating them and their ancestors from the painters, and the missionaries thought the paintings impressively old. Del Barco also wrote:

The people of this land say that the giants were so large that, when they painted the ceiling of a cave, they lay on their backs on the ground and that even thus they were able to paint the highest part. An enormous fable that, for its verification, would necessitate those men to have a height of at least thirty feet, unless we imagine extremely long paint brushes in their hands!… It is simpler to persuade oneself that, for this work, they found and conveyed to the cave, or caves, some wood with which to form a scaffold.

Africa and Australia

The eighteenth century also saw the first discoveries of rock art in africa. The earliest reference is from 1721, when an ecclesiastic in the Portuguese colony of Mozambique mentioned paintings of animals on rocks in a report to the Royal Academy of History in Lisbon. In 1752, explorer Domingo van de Walle de Cervellón reported engravings in the cave of Belmaco on Las Palmas in the Canary Islands. These meandering pecked motifs were considered to be mere doodles, produced by chance or the imagination of the ancient barbarians. That same year, explorers led by Ensign August Frederick Beutler, who were more than 200 miles from their Capetown base, noticed rock paintings in the valley of the Great Fish River in the Eastern Cape, which they recognized to be the work of “the little Chinese” (bushmen).

The first known copies of rock art in the region were made in 1777-1778 by an expedition to the Sneeuwbergen (“snowy mountains”) of the Eastern Cape led by Governor Joachim van Plettenberg. The copies were made by Colonel Robert Jacob Gordon and his draftsman servant Johannes Schumacher-the latter had already copied probable petroglyphs or rock paintings (he called them *teekeningen*) in 1776 on an expedition to the western area area of the Cape that had been led by H. Swellenberg. In 1790-1791, on an expedition led by Grosvenor, Jacob van Reenen noted in his diary that “on a rocky cliff the Bushmen had made a great many paintings or representations of wildebeeste, very natural, and also of a soldier with a grenadier's cap.”

The French traveler Le Vaillant published a book on South Africa at this time in which he dismissed the bushman paintings as “caricatures” and said of pictures in a cave in the Eastern Cape, “the Dutchmen believe them to be a century or two old and allege that the Bushmen worship them, but though it is quite possible, there is no evidence to show it.”

One of the first people who made an attempt to understand the rock art of southern Africa was Sir John Barrow, who was excited to see rock paintings on his journeys through Cape Colony and beyond in 1797 and 1798. He was filled with wonder that they could have been produced by people described by one writer in 1731 as “troops of abandon'd Wretches” lacking laws, fixed abodes, and religion: “In the course of travelling, I had frequently heard the peasantry mention the drawings in the mountains behind the Sneuwberg made by the Boujesmans; but I took it for granted they were caricatures only, similar to those on the doors and walls of uninhabited buildings, the works of idle boys; and it was no disagreeable disappointment to find them very much the reverse.”

The art's beauty made him think that the San (bushmen) had been rendered “more savage” by the conduct of the European settlers. He was especially interested in the aesthetic aspects of the art, which he assumed was indeed “art” in the European sense. On inquiring about their age, he was told that some

paintings were known to be new while others had been present since the first settlement of this part of the colony.

The other new continent whose rock art was “discovered” in this period was australia. There had been a report in 1678 by J. Keyts, a Dutch trader, of rock paintings on a cliff face in Speelmans Bay, western New Guinea (Irian Jaya), but

it was ignored at the time. European discoveries in Australia began during the first months of colonization in 1788 and continued sporadically over the next century as explorers and pioneers pushed further into the country. At first, very few sites were discovered or documented, and the colonizers made little effort to inquire about the meaning of motifs and designs. The art was considered to be childish attempts by primitive people to produce paintings and radically inferior to the European art of the period.

A San (bushman) in South Africa standing by an example of ancient rock art

(South African Tourist Board)

The first known European discovery of Australian rock art was made in Bantry Bay, near Sydney, by Governor Arthur Phillip, the commander of the First Fleet and of the first settlement at Port Jackson, in 1788, when he led short expeditions into the surrounding area. The expedition surgeon's journal describes how, on 16 April 1788, “We saw… some proofs of their ingenuity in various figures cut on the smooth surfaces of some large stones. They consisted chiefly of representations of themselves in different attitudes, of their canoes, of several sorts of fish and animals; and considering the rudeness of the instruments with which the figures must have been executed, they seemed to exhibit tolerably strong likenesses.”

In his first dispatch of 15 May 1788 to Lord Sydney, Phillip wrote: “In Botany Bay, Port Jackson and Broken Bay we frequently saw the figures of men, shields, and fish roughly cut on the rocks; and on the top of a mountain I saw the figure of a man in the attitude they put themselves in when they are going to dance, which was much better done than I had seen before, and the figure of a large lizard was sufficiently well executed to satisfy every one what animal was meant.”

The Nineteenth Century

By the end of the eighteenth century, therefore, prehistoric rock art was being noticed and even copied with increasing frequency, though no great accuracy. In the next century, a turning point was to be reached, not only in numbers of discoveries but also in the realization that some of the art was of great antiquity. Just as archaeology became established by the mid-nineteenth century, when the great antiquity of humankind

careful and true observations create better conditions for interpretation.

The earth on the carvings was taken away, the mosses were scratched off by an iron scraper, the water was led another way and the bedrock was cleaned and washed somewhere. If the figures were small and unclear, I had to-in order to be sure-visit the place at that hour of the day when the sun was shining so that a separation of the figures was possible by light and shadow. It is possible to have the same effect after the sun set by the help of a lantern. If the observation was difficult I had to revisit the place. On these occasions chalk was brought to make contours. It was also rewarding to use the finger tips to know if a line was natural or artificial.

To produce his drawings, Brunius laid a grid system over the rock surface and copied the figures onto a corresponding grid paper, all within a controlled scale. Figures that were hard to identify were visited several times in different conditions-as mentioned in the above quotation, in oblique sunlight, by night lantern, or after a rain. The figures were marked on the rock with chalk and drawn onto paper with pencil in such a way that a darker line denoted a deeper carving. Finally, he also discussed the location, age, and significance of the figures; noted differences in their condition, from intact to almost totally disappeared; and looked at the sites' environs, their setting in the landscape, and the presence of monuments nearby.

Since Brunius was such a pioneer, he had very little comparative material to help him with interpretation. He also had a moral problem in his documentation-should the impressive sexual organs of the male figures be depicted or not? He therefore referred to other tribes such as the Lapps or the Huns as the creators of the rude customs shown on the rocks and claimed that the original Nordic people were above this cultural level.

The bombshell of Paleolithic (Ice Age) art came after decades of sporadic and misunderstood finds. Its existence was first established and accepted through the discovery, in the early 1860s, of engraved and carved bones and stones in a number of caves and rock shelters in southwestern France, particularly by édouard lartet and his English associate henry christy. These objects were found with Paleolithic stone and bone tools and the bones of Ice Age animals, which proved their great age-in particular, the famous engraving from la madeleine of a mammoth on a piece of mammoth tusk. There followed a kind of “gold rush,” with people plundering likely sites for ancient art treasures.

Some French scholars had noticed art on cave walls in the 1860s and 1870s but had not realized its age or significance. The pioneer who did make the crucial mental leap was a Spanish landowner, Marcelino Sanz de Sautuola, who noticed in 1879 that the bison figures painted on the ceiling of the cave of altamira , near the north coast of Cantabria, were closely similar in style to the figures in Paleolithic portable art. Unfortunately, most of the archaeological establishment refused to take his published views seriously, dismissing him as naive or a fraud. One prehistorian who did accept Altamira, however, was edouard piette, who, in the late 1880s, was to find the famous painted pebbles in the cave of le mas d'azil in the French Pyrenees, a discovery the establishment found equally hard to swallow. One of the doubts raised about Altamira was that the cave was too humid and the rock too friable to have preserved painting for so long, but the stratigraphic position of the Azilian pebbles finally proved that ocher could adhere to rock for millennia.

It was in southwestern France once again that the final breakthrough occurred when engravings were found, in 1895, in a gallery of the cave of La Mouthe in the Dordogne region. Since the gallery was blocked by Paleolithic deposits, it was obvious that the engravings must be of the same age. Other discoveries soon followed in other caves in southern France, culminating in those of Les Combarelles and Font de Gaume in 1901, which served to at last establish the authenticity of Paleolithic cave art.

The Twentieth Century: A Splintering of Approaches

In the twentieth century, the discoveries made involved not just individual sites but whole classes of art and brought more countries onto

vociferously to having their ancestors or sacred objects excavated and stored in museums without their knowledge or permission, so rock-art researchers in several parts of the world (especially Australia) have had to modify their procedures and outlook after aboriginal groups campaigned for control of their own culture and provided input into (and demanded feedback from) research into their art. It is safe to say that, today, nobody in Australia would dream of beginning a study of rock art without consulting the aboriginal custodians of the region in question.

On the technical side, photography was adopted quite early-the first photograph of an African rock painting was taken in 1885-but the procedure became commonplace within a decade. Much later, color photography began to be used, at first by pioneers such as Alex Willcox in South Africa beginning in 1951, and technology such as digital cameras, video, and computer enhancement is now coming into its own. In the last few years of the twentieth century, new techniques of direct dating began to revolutionize (in some cases) or at least fine-tune (in others) the traditional chronologies built up over decades, and newly dated rock art at last joined the already well-dated portable art in being embraced by mainstream archaeologists as data worthy of attention. It remains to be seen in what new directions the latest technology and the impending discoveries of the twenty-first century will take rock-art studies, especially as the field is one of ever-increasing popularity in many parts of the world.

Paul G. Bahn

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Romania

Romania is rich in archaeological discoveries because of its geographical location in southeastern Europe, through which important roads used since ancient times have passed, and because of its temperate climate (*Istoria României* 1 1960; *Istoria României* 2 1962). Its diverse landscape includes thick forests and mountainous areas that afforded natural protection from invaders, and broad plains where native populations could live during peaceful times, allowing them to survive for millennia on Romania's plentiful natural resources.

In the early nineteenth century, amateur archaeologists began to collect artifacts from ancient settlements, which led to the founding of the first museums: in Sibiu in 1817, the National Museum in Bucharest in 1834, the Historico-Natural Museum in Iaşi also in 1834, and another in Cluj in 1859. In the late nineteenth century, these amateurs began to unearth and study some Neolithic and Geto-Dacian settlements. In 1880 Grigore Tocilescu published a paper entitled “Dacia before the Romans,” and in 1912 Ion Andrieşescu published the “Contribution to Dacia before Romans.” These publications encouraged Vasile Pârvan, with the aid of Ion Andrieşescu, to train some young scholars to specialize in archaeology, and Romanian archaeological research blossomed. Young researchers started their fieldwork with university scholars such as Ion Nestor in Bucharest, Constantin Daicoviciu in Cluj, and Mircea Petrescu-Dâmboviţa in Iaşi; all over the country, archaeologists began prospecting and excavating and publishing the results in the journal *Dacia,* which was translated into several languages. Other museums based on small collections were founded in counties, towns, and villages (mostly small

collections). Between 1926 and 1948, sites representing all historical periods were systematically excavated (Nestor 1933). Since 1950, the Institute of Archaeology in Bucharest has published *Studies and Research of Ancient History and Archaeology* (in Romanian) in addition to the internationally translated *Dacia* and numerous monographs. In the last few decades of the twentieth century, dozens of specialized periodicals were being published (almost

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Rouse, Irving Benjamin

(1913-)

Born in Rochester, New York, Irving Benjamin Rouse went to Yale University in 1930 with the intention of studying botany, but some cataloging work at the Peabody Museum began his interest in archaeology. He went on to study for his doctorate in archaeology and received it in 1939.

Rouse spent the whole of his career at Yale University: at the Peabody Museum as an assistant curator of anthropology from 1938 to 1947, associate curator of anthropology from 1947 to 1954, research associate and affiliate from 1954 to 1962 and 1975 to 1977, curator of anthropology from 1977 to 1984, and curator emeritus. His fieldwork during this long period added substantially to the Peabody's research collections in the Caribbean area, giving it one of the premier Caribbean archaeological collections in the world. At the same time, Rouse worked in the Department of Anthropology from 1939 to 1943 as instructor, from 1943 to 1948 as associate professor, and from 1954 to 1970 as professor. He was appointed Charles J. McCurdy Professor of Anthropology in 1970, a post he held until his retirement in 1984. He played a significant role in the education of a number of students who have gone on to prominence of their own in archaeology, including Robert C. Dunnell, Patrick V. Kirch, and Bruce G. Trigger.

Rouse's primary area of interest has been the Caribbean. He has excavated in Puerto Rico, Cuba, Florida, Venezuela, Trinidad, Antigua, Guadeloupe, the Bahamas, the Dominican Republic, the Virgin Islands, and Jamaica. This tremendous breadth of first-hand experience, coupled with the fact that Rouse constructed the chronologies of many key areas in the region and his proclivity for synthetic writing, guaranteed Rouse a central position in Caribbean archaeology, a position he still holds. Many of Rouse's publications synthesize Caribbean culture-history, or aspects of it, and he has often been called upon to summarize Venezuela and/ or the Caribbean area in large syntheses, such as the *Handbook of South American Indians* (1948), and in several synopses of current work in the *Handbook of Latin American Studies.* He has contributed chapters to many of the significant books about settlement

patterns, chronologies, and biogeography in archaeology, and some of his more influential pieces were journal articles: masterful areal syntheses such as “Prehistory of the West Indies,” published in *Science* in 1964, and “Pattern and Process in West Indian Archaeology,” in *World Archaeology* in 1977.

His interest in early human culture developed initially as a result of his Caribbean research but then expanded well beyond it, and his most recent research has focused on contact-era and postcontact inhabitants of the region. He has continued his culture-historical research as well, which culminated in the publication of *Migrations in Prehistory* in 1986.

Rouse's level of activity and methodological contributions have garnered an impressive array of awards and honorific positions. He served as editor of *american antiquity* from 1946 to 1950, and he served on the executive board of the American Anthropological Association from 1950 to 1953 and was that assocation's president

in 1967-1968. His honors and awards include the Viking Fund Medal in Anthropology (1960), election to the National Academy of Science (1962), and the Distinguished Service Award from the American Anthropological Association.

Robert C. Dunnell

See also

Caribbean; Florida and the Caribbean Basin, Historical Archaeology in

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Royal Archaeological Institute

The Royal Archaeological Institute (RAI) is one of the older archaeological societies in Great Britain and has a tradition based on the broadest study of the past, a study that encompasses aspects of the art and architectural history of Britain and adjacent areas as well as the full temporal range from the Paleolithic to the early modern periods.

In December 1843, a group of people with a passionate interest in the past came together to form a new national organization to promote their antiquarian interests, which were becoming increasingly popular at the time. They acted out of disillusionment with the only existing national body, the society of antiquaries of london, which was by then effectively moribund. The new group was drawn from a wider social spectrum than the members of the Society of Antiquaries, but it remained largely drawn from the London establishment.

The organization was founded as the British Archaeological Association and organized the first national archaeological congress, which was held in Canterbury, England, in 1844. The meeting was a major success, but there was a serious dispute over the rights to the publication of the congress, which led to a split in the membership. The result was the birth of two separate organizations: one kept the name British Archaeological Association; the other styled itself the Archaeological Institute of Great Britain and Ireland but retained ownership of the journal that had been established-the *Archaeological Journal* has been published annually ever since). The latter organization became the Royal Archaeological Institute of Great Britain and Ireland in 1866, and in 1962, it received a royal charter and dropped the reference to Great Britain and Ireland from its title.

Through the nineteenth century, the RAI became firmly established as the center of archaeology and antiquarian studies in Britain. Its members were eclectically drawn from the British establishment and, at times, included influential politicians and thinkers. The pattern of meetings established in the early years continues today. Through the winter, there are monthly meetings in London, at which lectures and reports on research in archaeology and architectural history are presented. In the summer, there is a residential meeting, lasting a week, for which participants travel to a locale, visit key buildings and monuments, and listen to talks about them. In more recent years, these activities have been supplemented by day-long excursions at other times of the year. The institute also has a long tradition of sponsoring fieldwork and research. Most notably, it engaged in a broad-based project to study the origins of the medieval castle during the 1960s. Some of the most distinguished of British archaeologists (e.g., Sir Alfred Clapham, Dame Joan Evans, christopher hawkes, Sir John Lubbock [lord avebury], and sir mortimer wheeler) have served as officers of the organization over the years.

One of the enduring legacies of the institute is its publications. The *Archaeological Journal* has appeared annually since the 1840s, and a series of other volumes have appeared as well. The proceedings of the summer meetings, sometimes printed in the *Journal*, otherwise as separate volumes, represent a key source for understanding the topography, archaeology, and buildings of the British Isles. Equally, the articles in the earlier volumes of the *Journal* represent a prime source for understanding the emergence of the discipline, its concepts, and its methods of study. During the twentieth century, the *Journal* published a variety of key articles for understanding the archaeology of Britain. For many years until 1978 the *Journal* attempted to provide an annual review of research progress

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across the full range of British archaeology. In more recent years, as archaeology has become more compartmentalized, the journal has developed a reputation as one of the few places where multiperiod sites can sensibly be published.

As the twenty-first century begins, the RAI remains one of the few archaeological societies in the United Kingdom that has a mixed membership of both interested members of the public and professional archaeologists. It also retains a broadly based organization catering to people who have a truly catholic interest in Britain's past.

Martin Millet

See also

Britain, Prehistoric Archaeology

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Russia

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The rest of the literature may be divided into two parts. One part comprises books describing prerevolutionary times, and the other part books dealing with Soviet times. The first accounts (Ravdonikas 1932; Khudyakov 1933), issuing from Marxist dogmatists, are too nihilistic in their evaluations of the prerevolutionary past, and few are objective (Formozov 1961). The most complete historiographic work (Lebedev 1992) is subjective and disordered.

Books describing Soviet times are often very critical (Miller 1956). Although written in freedom and abroad, Miller's book was not particularly competent because he was a provincial archaeologist, and the essence of great scholarly debates eluded him. In contrast, the apologetic book by A.L. Mongait (1956) was written inside the country, and it is not so much a history of the discipline as a survey of its state during Soviet times. Two later books are also apologetic: V.F. Gening's book (Gening 1961) was written in the framework of militant dogmatism, but A.D. Pryakhin's work (Pryakhin 1986) is more moderate and factual. Pryakhin tried to present a more objective and frank exposition, as much as that was possible, first abroad in some articles in English (in 1977 and 1982) and then in a book published in

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Russian Society and the Knowledge of Antiquities

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the development of Russia and kept it separate from the rest of Europe. In Russia, there was no Renaissance, no Reformation, and certainly no Crusades or Inquisition. Hence, until Russia was "Europeanized" by Peter the Great, there was no antiquarian tradition as in the rest of Europe.

Some kinds of antiquities were revered not because of curiosity about or sympathy for ancient culture but because of sacred and religious reasons. There was a special reverence for Greek Christian culture rather than for Greek pagan culture, which was revered in Western Europe. For Russia, Greek Byzantine civilization was the source of the Russian Orthodox religion, and some antiquities were esteemed as insignia of power or attributes of rulers and heroes. So "Monomach's cap," the Russian crown, was revered as a Byzantine article even though, in reality, it had been made during the time of the Golden Horde. In Pskov, "the sword of Litvanian Count Dovmont," the defender of the city, was saved and respected. It was to save such treasures that the czars created a state armory in the Kremlin in Moscow. First mentioned in documents in 1504, the armory still exists as a museum today.

The attitude toward other antiquities was utilitarian and not always good for the monuments. People extracted saltpeter from ancient earthworks, and barrows were simply robbed. In Siberia, special bands of barrow robbers, called *bugrovshchiki* (from *bugor* or "hillock," the local term for "barrow"), made their living pillaging ancient monuments, and hundreds of the monuments disappeared. Observing the robbery of ancient graves and the melting down of treasures from them, the Dutchman Vitsen, who visited Russia during the time of Peter the Great, wrote that the Russians did not like antiquities. The collecting of classical antiquities had begun in Italy the late fifteenth century, in England in the sixteenth century, and in France in the seventeenth century, but it did not occur in Russia before the early eighteenth century.

Czarist Antiquarianism: The First Forms of Scholarly Attitude to Antiquities, 1696-1762

The development of antiquarianism in Russia was a result of the enlightened absolutism of Peter the Great. In the last years of the seventeenth century he traveled incognito throughout Europe, and on his return in 1698, he began to reform the whole of Russia based on European standards. These reforms involved changed attitudes to antiquities as well. Peter demanded that ancient numisma (coin collections) and other finds, as well as all kinds of curiosities and rarities, be sent to him from all over Russia. Between 1715 and 1716, a Uralian factory owner, Demidov, and Count Gagarin sent him collections of golden antiquities that had been taken away from the *bugrovshchiki*. In 1718, Peter created the Kunstkammer Museum in the newly founded capital of Saint Petersburg and issued a special edict ordering that everything that was very old and unusual was to be sent there. In 1721, he ordered that the curious things that were being found in Siberia were to be sent to him, and so the well-known Siberian collection of Scythian and Sarmatian gold, which is now in the Hermitage Museum, was established.

Under Peter the Great, scientific expeditions to Siberia began. In the 1720s, the German naturalist Messerschmidt was sent there for seven years to study Siberian natural resources and folk art and to buy and collect antiquities. The Russian Academy of Sciences, created by Peter and consisting in part of foreigners, took over the organization of the primary expeditions to Siberia only after Peter's death. The great Siberian expedition of 1733-1743, led by Justus Bering, opened the strait between Asia and North America, and the archaeological survey of this expedition was conducted by the Germans Gerhard Miller and I. Gmelin.

Sentimental Opening of Classical Heritage, 1762-1812

After 1762, the German-born queen Catherine II ruled Russia. She was educated in the spirit of the French Enlightenment and corresponded with the French encyclopedists and the French writer

François-Marie Voltaire. The cult of the civil ideals that grew out of the Enlightenment was connected with an interest in classical antiquity and with fashionable sentimentality, and the purchase of classical antiquities from elsewhere became common. In 1768, just a year after

the development of Russia and kept it separate from the rest of Europe. In Russia, there was no Renaissance, no Reformation, and certainly no Crusades or Inquisition. Hence, until Russia was "Europeanized" by Peter the Great, there was no antiquarian tradition as in the rest of Europe.

Some kinds of antiquities were revered not because of curiosity about or sympathy for ancient culture but because of sacred and religious reasons. There was a special reverence for Greek Christian culture rather than for Greek pagan culture, which was revered in Western Europe. For Russia, Greek Byzantine civilization was the source of the Russian Orthodox religion, and some antiquities were esteemed as insignia of power or attributes of rulers and heroes. So "Monomach's cap," the Russian crown, was revered as a Byzantine article even though, in reality, it had been made during the time of the Golden Horde. In Pskov, "the sword of Litvanian Count Dovmont," the defender of the city, was saved and respected. It was to save such treasures that the czars created a state armory in the Kremlin in Moscow. First mentioned in documents in 1504, the armory still exists as a museum today.

The attitude toward other antiquities was utilitarian and not always good for the monuments. People extracted saltpeter from ancient earthworks, and barrows were simply robbed. In Siberia, special bands of barrow robbers, called *bugrovshchiki* (from *bugor* or "hillock," the local term for "barrow"), made their living pillaging ancient monuments, and hundreds of the monuments disappeared. Observing the robbery of ancient graves and the melting down of treasures from them, the Dutchman Vitsen, who visited Russia during the time of Peter the Great, wrote that the Russians did not like antiquities. The collecting of classical antiquities had begun in Italy the late fifteenth century, in England in the sixteenth century, and in France in the seventeenth century, but it did not occur in Russia before the early eighteenth century.

Czarist Antiquarianism: The First Forms of Scholarly Attitude to Antiquities, 1696-1762

The development of antiquarianism in Russia was a result of the enlightened absolutism of Peter the Great. In the last years of the seventeenth century he traveled incognito throughout Europe, and on his return in 1698, he began to reform the whole of Russia based on European standards. These reforms involved changed attitudes to antiquities as well. Peter demanded that ancient numisma (coin collections) and other finds, as well as all kinds of curiosities and rarities, be sent to him from all over Russia. Between 1715 and 1716, a Uralian factory owner, Demidov, and Count Gagarin sent him collections of golden antiquities that had been taken away from the *bugrovshchiki*. In 1718, Peter created the Kunstkammer Museum in the newly founded capital of Saint Petersburg and issued a special edict ordering that everything that was very old and unusual was to be sent there. In 1721, he ordered that the curious things that were being found in Siberia were to be sent to him, and so the well-known Siberian collection of Scythian and Sarmatian gold, which is now in the Hermitage Museum, was established.

Under Peter the Great, scientific expeditions to Siberia began. In the 1720s, the German naturalist Messerschmidt was sent there for seven years to study Siberian natural resources and folk art and to buy and collect antiquities. The Russian Academy of Sciences, created by Peter and consisting in part of foreigners, took over the organization of the primary expeditions to Siberia only after Peter's death. The great Siberian expedition of 1733-1743, led by Justus Bering, opened the strait between Asia and North America, and the archaeological survey of this expedition was conducted by the Germans Gerhard Miller and I. Gmelin.

Sentimental Opening of Classical Heritage, 1762-1812

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the death of the great art historian johann joachim winckelmann, the new Hermitage Museum opened in Saint Petersburg. Built near the Winter Palace of Russian czars, it was established especially for the royal collections of classical art and Renaissance European paintings.

Shards of pottery from a Siberian barrow

(Image Select)

The treaty that concluded the war between Russia and Turkey from 1768 to 1774 gave Russia the northern shores of the Black Sea and part of the Crimea, which included sites of ancient Greek colonies. Russia finally had its own piece of classical antiquity, and the main focus of scientific and collecting expeditions shifted from the extreme north to the extreme south of the country. In the early nineteenth century, two books of travelers' tales about expeditions to Taurida (the ancient name of the Crimea) were published, and both authors-Pavel Sumarokov and Ivan Muraviev-Apostol-had been charmed by the monuments of classical antiquity. Antiquities other than those of classical times were neglected and damaged. “For all the Russian antiquities I wouldn't give even a Grosh [the smallest piece of money]” wrote the well-known Russian poet Batyushkov in a private letter. “Quite another thing Greece, quite another Italy!”

Romantic and Patriotic Insights into Russia's Past

As in many other European countries, Napoleon's invasion, national humiliation by the French, and the ensuing patriotic war of 1812 produced a burst of nationalist sentiment in Russia and awakened interest in the ancient past of the Russian people. This impulse was part of a broader romanticism based on political and social discontent, and the regard for antiquities manifested itself in two different ways.

First, the passion for classical antiquities did not cease and became even more popular, but its character changed. Sentimentality and enlightenment for their own sake disappeared, and antiquities now endowed their owners with prestige and profits. Museums needed collections to help educate society and to help artists depict the ancient world, and the latter was the aim of a prominent archaeologist of the time, Olenin, the president of the Academy of Arts. The archaeological study of Scythian monuments

Crystallization of Archaeology during the Epoch of the Great Reforms, 1855-1881

In 1855, Czar Nicholas I, unable to bear Russia's defeat in the Crimean War, died. The defeat was partly the consequence of a delay in the reformation of the country's archaic social order, a point the new czar, Alexander II, understood. He began the necessary all-embracing reforms, such as the abolition of the serfdom and changes to laws, and one of his first reforms concerned archaeology. In February 1859, the Archaeological Commission (AC) was created by the Ministry of the Court as the central state office to control archaeological excavations, the collection of data on antiquities, the stimulation of their studies, and expert knowledge of them. All archaeological finds from state and municipal land, i.e., not in private ownership, came under the authority of the AC. The Hermitage was also under the Ministry of Court, so the AC was closely connected to it and the most valuable finds went to the Hermitage. The AC published annual reports of its studies and activities, which listed all archaeological finds and their fates.

In 1864, in addition to the archaeological institutions in Saint Petersburg, two were created in Moscow-the Moscow Archaeological Society (MAO) and the Society of Amateurs of Natural Science, Anthropology, and Ethnography (OLEAE). The founder of MAO was Count Alexey Uvarov, now thirty-seven years old and an archaeologist. Beginning in 1869, MAO organized the all-Russian archaeological congresses, held every three (later four) years, each in a different town. Ivan Zabelin, a venerable Moscow archaeologist, was for many years invited to work in Saint Petersburg in the AC. Zabelin had no university education, in fact no education at all, and he obtained his great knowledge from practice. He was the real head of the Historical Museum founded by Uvarov in Moscow.

Uvarov's and Zabelin's methodological articles reveal their interest in Slavic archaeology, mainly with the ethnic identification of monuments and the widely understood *byt* (everyday life and equipment) of ancient peoples, i.e., their cultures. The two men did not separate archaeological sources of information into a special branch, instead considering it side by side with ethnographic evidence from the field, museum observations, and written sources. They included all of these sources of information into the study of archaeology. They separated the discipline of archaeology not by specific sources but according to two criteria: practically, as a period not enlightened, or poorly enlightened, by chronicles, and theoretically, not by events but *byt* (culture). Archaeology for them, from the beginning, was something like paleoethnography.

In 1874, when the participants in the Third (Kievan) Archaeological Congress went to see the Sophian Cathedral, its dean, according to the historian Kostomarov, asked them, “Haven't you come in order to search for arguments in favor of the origin of man from the ape?” Count Uvarov, leading the archaeologists, reassured the archpriest, “We do not march into such a distance.”

However, some Paleolithic discoveries were made in Russia, especially in the late 1870s and early 1880s. These included the excavations of kostenki near Voronezh on the Don River by Polyakov, the exploration of Crimean caves by Merezhkovsky, and even the discovery of a Paleolithic site in Karacharovo, on Uvarov's own land. The main explorers of these sites were naturalists, not humanists. In Uvarov's book *Archaeology: The Stone Age* (1881), there is no long chronology, and Darwin is not mentioned. Uvarov really did not march “into such a distance.”

Separation of Archaeology into a Special Discipline, 1881-1917

Liberalization ended when Czar Alexander II was assassinated by a terrorist in 1881. The majority of the archaeologists were on the side of the counterrevolution, and there were many aristocrats and priests in archaeology. Countess Praskovia Uvarova, who replaced her husband as the head of MAO after his

death, once said that archaeology is knowledge for the rich.

In 1889, as part of a general centralization, the AC received the monopoly on issuing permits for excavations. Count Bobrinsky, a well-known Saint Petersburg archaeologist and the head of the AC, began to issue permits with great fervor. Uvarova and her colleagues at MAO protested, initiating a long quarrel between Saint Petersburg and Moscow archaeologists.

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The split mirrored the competencies of the two main schools and centers for archaeology in Russia, each with its own tradition. The Saint Petersburg school, with the Hermitage and state support, stood for a more professional approach, preferring the detailed study of material and strong methodology. The Moscow school was more open to amateurs, and its members had broader interests and more often made generalizations and historical inferences.

At the end of the nineteenth century, two very great and influential archaeologists were growing up-aleksander spitsyn in Saint Petersburg and vasiliy gorodcov in Moscow. Their eventual profession was not their only similarity. Both came from the provinces, both were of middle-class origin (Spitsyn was a teacher's son; Gorodcov, the son of a deacon). Neither attended a school of archaeology, and both contributed greatly to the development and systematization of Russia's archaeology.

Classical archaeology continued along traditional lines with a preference for the analysis of the art of antiquity. The most prominent representative of this school was nikodim kondakov, a Muscovite originally, who created his own school of archaeology in Odessa and then moved with it to St. Petersburg, together with his pupils Farmakovsky and Rostovcev.

Catastrophe and Change of Structures, 1917-1924

At first, the 1917 Revolution had no impact on the content of archaeological studies, but it did cause a sharp decrease in excavations and the complete breakup of all the old institutions of archaeology. The AC and the Hermitage were subsumed into the Ministry of the Court, but both the ministry and the court suddenly disappeared. The majority of the members of the MAO, mainly from the nobility and clergy, were suppressed and lost their influence and possessions. Archaeology had developed in Russia as "knowledge for the rich," and there were now no rich in the country. Private collections were partially robbed and annihilated, and what was left was nationalized and put into the large museums.

At the same time, the new government tried to give a civilized form to its power. In November 1917, the new Peoples Commissariat (ministry) of Enlightenment asked the people to save their cultural monuments. On 19 September 1918, a decree concerning the state registration of monuments was issued, and on 10 October 1918, the exporting and selling abroad of any artifacts of Russian art and history was forbidden.

A new central institution, the Academy for History of Material Culture in St. Petersburg, was created to replace the AC. The academy was a more powerful, centralized, and all-embracing institution that studied history, linguistics, ethnography, and the arts and later concentrated on archaeology. There was only a section of this academy in Moscow. The head of the academy was Nikolay Marr, half-Georgian, half-Scot and a linguist by profession. He was a talented man but emotionally unbalanced and not self-critical. Although his education was very narrow, his pretensions were enormous. He applied his revolutionary ideas to linguistics, declaring, for instance, that Caucasian languages (Japhetic in his terminology) were previous stages of Indo-European languages not only in structure but also in substance. For him, the main process was not the splitting of languages but their fusion. Linguists closed their ears to his wild ideas, hoping that he would adopt cultural studies and archaeology, while archaeologists excused his evident ignorance of archaeology and regarded him as a great linguist. In 1923, Marr finished formulating his "new learning on language" (or Japhetic theory), which, as yet, had no influence on archaeology.

There was another important institutional novelty, the teaching of archaeology at universities where faculties of social sciences were opened. However, these new structures were unstable, the revolutionary impulse was not exhausted, and they were constantly reconstructed and reorganized.

Before the Revolution there were as many as 150 museums in Russia, and this number increased five times after 1917, mainly owing to the founding of small local museums. The development of archaeology was considerably damaged by the emigration of many of its great scholars, such as Kondakov, Rostovcev, Shtern, Bobrinsky, and Uvarova.

Revolution in Archaeology:Muscovian Control, 1924-1929

Even before Lenin died, in 1924, Joseph Stalin took over the reigns of political power, and after Lenin's death, Stalin soon got rid of any opposition and “the Lenin guard” to become the sole ruler of Russia. This change meant a very different style of government, the end of any private-sector economic freedoms, and an increasing ideological monopoly, with Moscow-based organizations dominant.

In 1926, the Russian Academy based in Moscow (RAIMK) modified its title to encompass all of the USSR and was renamed the State Academy (GAIMK). From 1924 on, to centralize control, all the scholarly institutions of archaeology were united into the Russian Association of Research Institutes of Social Sciences (RANIION). This framework facilitated the reeducation of scholarly cadres in the ways of the new communist spirit.

In Moscow the well-known Bolshevik sociologist and art critic Friche surrounded himself with a group of Gorodcov's students, who, under his influence, became very keen on Marxism and on building a Marxist archaeology. These students were Arcikhovsky, Bryusov, Kiselev, and Smirnov, and all of them later became well-known Soviet archaeologists. They fought against another group of young Moscow archaeologists from Zhukov's paleoethnological school. Zhukov was Anuchin's pupil, and he was interested in the impact of the natural environment on cultures and ethnic development. His pupils were Bader, Tolstov, and Voevodsky-they, too, became well-known Soviet archaeologists. Eventually, Zhukov was arrested and the paleoethnological school dispersed. However, Archikhovsky's “Marxist archaeology” did reign supreme in Russia before it was demolished by colleagues from Leningrad (formerly St. Petersburg).

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Revolution in Archaeology: Leningrad Campaign, 1930-1934

In 1930, Stalin had finished with any opposition to his power and was ostensibly the dictator of Russia. Lenin's new economic policy (NEP) was rejected, and the revolutionary ideas of freedom, internationalism, and annihilation of state apparatus were anathema to the tyrant. His slogan, "dictatorship of the proletariat," aimed at building socialism in the country by increasing the power of the state and exacerbating the class struggle. Resistance was ruthlessly suppressed. The collectivization of agriculture was accompanied by the mass deportation of well-to-do peasants to Siberia, and the church, the peasants' main spiritual support, was suppressed as well. Local archaeological and folklore studies were forbidden, and organizations were disbanded if they were sympathetic to and protective of old customs and church buildings.

The old archaeological cadres were badgered and accused of "creeping empiricism," of "naked artifactology," and of controlling archaeology with formal typological studies. If their work reflected idealism, nationalism, or other -isms, they were even worse off and forced to make public renunciations and repentances.

Bolsheviks from the Communist Academy (not to be confused with Academy of Sciences) came to help Marr at GAIMK, and their careers provide a study in the politics of the times. Sergey Bykovsky was a mathematician prior to the Revolution, a commissar during the civil war, a member of the Red Army's secret political security service, and then a historian in the Communist Academy. Fedor Kiparisov was a philologist and had earlier worked as a trade-union organizer. sergey semenov was a young secret political security investigator when he began his postgraduate study of stone tools using modern criminological techniques at GAIMK. Marr became a member of the Communist Party, and his courses became obligatory.

In 1930, in Leningrad, Spitsyn's pupil vladislav ravdonikas developed a work program according to orders from the Bolshevik rulers of GAIMK even though he himself was not a member of the Communist Party. Called "the Marxist history of material culture," not of archaeology, it contained sharp criticism of many contemporary archaeologists for their unwillingness to work in the new way. The use of the new term *material culture* instead of archaeology was significant. Bykovsky and other Marxists favored a model that divided material culture in general, not by its sources or its methods of manufacture, but by epochs and their socioeconomic

formation. This division was later rejected.

RANIION, because of its own reconstruction, had not caught up with all the new ideas and was dismissed. Some Moscow archaeologists joined GAIMK and built a little Muscovite department. Inspired by Marr, Leningrad archaeologists Ravdonikas and Krichevsky transferred ideas from the "new learning on language" to archaeology and built the theory of stadial (i.e., stages of history) development. This theory ignored the national specifics of cultures and their migrations and emphasized their fusions and sharp changes from epoch to epoch. It supported the current Soviet policy with regard to the maintenance of power in the multinational state inherited from the Russian Empire.

In the GAIMK periodicals of the time, theoretical articles and reviews (usually crushing) composed 47 percent of the contents, particular research themes 35 percent, and field reports 17.5 percent. However the enthusiasm for theory did not last long.

Soviet Archaeology: In the Service of Stalin's State, 1934-1956

On 1 December 1934, Sergei Kirov, the ruler of Leningrad, the second-ranking person in the Communist Party and state hierarchy, and Stalin's competitor, was killed. His murder was probably organized by Stalin, and in any case, Stalin used it as a pretext for a campaign of mass terror across the country. Stalin introduced Draconian laws, and all members of "Lenin's guard" were annihilated along with hundreds of the participants in the Sixteenth Party Congress and nearly all of the army's general officers. Terror was used initially against the top members of the Party, but it spread to involve ordinary people simply to bring the whole population under control. The cult of Stalin was introduced.

The repressions affected many archaeologists. Some, like Zhukov, had been eliminated even earlier; some, like Miller and Borovka, perished in detention; others, like Rykov and Teploukhov, committed suicide; and still others, including Rudenko, Latynin, Gryaznov, Bonch-Osmolovsky, and Sychev, languished in prisons and prison camps or were deported. It became very dangerous to have any scholarly position, and theoretical studies ceased immediately. Sociology was abolished, and sociological interests, described as "sociologization," were regarded as harmful. Marr's successors, Bykovsky and Kiparisov, were both shot.

There was a section of archaeology at the Institute of Ethnography at the Academy of Sciences in Moscow, which included the archaeologists Ravdonikas, aleksei p. okladnikov, Zamyatnin, and Bibikov. The section was allowed to issue the serial *Sovetskaya Arkheologiya* (later a journal) and then fused with GAIMK to form the Institute for the History of Material Culture (IHMK) within the framework of the Academy of Sciences. The mighty GAIMK became a demoted institution.

Archaeologists were advised to stick to the empirical facts, to stay close to the "real" history written by Soviet historians, and to use the same methods as the historians, which were based on historical materialism. With this in mind, Muscovite archaeologists, former builders of the "Marxist archaeology," reoriented their archaeology from sociology toward history, aiming their studies at historical reconstructions on the basis of known archaeological facts and written sources. Arcikhovsky described archaeology as "history armed with the spade." There were about 300 archaeological expeditions under way at this time. Knowledge about the former provinces of the Russian Empire greatly increased, and the monuments of Urartu, the barrows of Pazyryk and Trialeti, and the ancient center of Parthia Nissa were discovered in Russian Central Asia.

World War II (1941-1945) delivered yet another blow to the development of archaeology in Russia. Expedition activity ceased, and many archaeologists perished in the fighting. The German invasion annihilated many museum collections while others were taken to Germany and destroyed there. As a

result of the siege of Leningrad, IHMK archaeologists Zhebelev, Podgaecky, Zograf, Rydzevskaya, Degen-Kovalevsky, and Golmsten starved to death, and others were evacuated in an emaciated state. After the war, the institute established a department in Leningrad, but its headquarters were transferred to Moscow. By this time, Stalin's

long-term suspicion that the people of Leningrad secretly longed for their city to be the capital again meant that he did the opposite and centralized most government institutions in Moscow. He also dismissed and then executed some of what was left of the Leningrad elite.

The inglorious Soviet-Finnish War (1939- 1940) and the defeats in the first year of the Patriotic War (1941-1945) revealed the weakness of Stalin's brand of socialism, which was in reality equal to the old feudal order with elements of slave ownership. Stalin was forced to resort to the patriotic feeling of the people of the USSR, and more particularly to the patriotic feeling of the Russian people, because Russian soldiers were the basis and the majority of the Soviet army. Soviet archaeologists glorified the national character of the Russian people and some other peoples of the Soviet Union, tracing their noble ancestors and their ethnic peculiarities back in antiquity and searching for their ethnic territories and broadening their boundaries during the remote past in order to justify any new “historic claims” on territory.

Marr's position was no longer fashionable, and his theories were dismissed personally by Stalin in a public discussion in 1950 in the party newspaper *Pravda*. Stalin declared that Marr was not a Marxist, and Indo-European linguistic studies were restored. The theory of staged development was rejected as well, and another detachment of scholars was forced to publicly repent. Although the repression this time was not as dramatic as earlier, it still existed, and “cosmopolites” (mainly Jews) became “antipatriotic critics” and “slanderers” and were expelled from scholarly organizations.

Soviet Archaeology: From Thaw to Moderate Frosts to Stagnation, 1956-1991

Nikita Khrushchev's speech during the Twentieth Party Congress exposed Stalin as a despot and took power from his nearest associates. It was a kind of liberalization, and the writer Ilya Erenburg coined the word “thaw” for it. The dictatorship of the proletariat was repudiated, and normalization of relations with the West began.

All of this change led to some shifts in archaeology. Gradually, the concern for “historic rights” on maps disappeared, the details of local origins were no longer so important, and archaeologists were able to argue for migration in their explanations of cultural change. Slavic archaeology began to be as well regarded as other branches of the discipline, and ethnogenesis lost its priority. However, the new ruler of Russia neither understood humanist intellectuals nor had any special sympathy for them.

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In the middle of the 1960s, Khrushchev, whose political experiments were considered dangerous for the regime, was demoted by a palace revolution. To justify this change in policy, it became necessary to introduce objective and reliable methods in all disciplines. Archaeologists seized this opportunity to develop theoretical studies, their relationships with western non-Marxist scholars became more positive and respectful, and debates took place. However, the new scholarly freedom that led to the invasion of Prague by Russian troops in the spring of 1968 badly frightened the Brezhnev oligarchy, and debate and discussion, even critiques of Stalin, ceased.

Archaeological activity continued to grow enormously. In 1985 there were some 700 expeditions; more recently, it has been estimated that every two years 8,000 archaeological books and articles are published in the USSR, i.e., as much as was published between 1918 and 1940. Using state donations, planned economy, and centralized organization, Rybakov managed to initiate the twenty-volume edition *The Archaeology of the USSR*, and although only a small number of the volumes have been published,

hundreds of other volumes entitled *Corpus of Archaeological Sources* have appeared.

Russian Archaeology in the Struggle for Survival since 1991

In 1985, Mikhail Gorbachev's rise to power initially caused considerable liberalization and the

long-term suspicion that the people of Leningrad secretly longed for their city to be the capital again meant that he did the opposite and centralized most government institutions in Moscow. He also dismissed and then executed some of what was left of the Leningrad elite.

The inglorious Soviet-Finnish War (1939- 1940) and the defeats in the first year of the Patriotic War (1941-1945) revealed the weakness of Stalin's brand of socialism, which was in reality equal to the old feudal order with elements of slave ownership. Stalin was forced to resort to the patriotic feeling of the people of the USSR, and more particularly to the patriotic feeling of the Russian people, because Russian soldiers were the basis and the majority of the Soviet army. Soviet archaeologists glorified the national character of the Russian people and some other peoples of the Soviet Union, tracing their noble ancestors and their ethnic peculiarities back in antiquity and searching for their ethnic territories and broadening their boundaries during the remote past in order to justify any new “historic claims” on territory.

Marr's position was no longer fashionable, and his theories were dismissed personally by Stalin in a public discussion in 1950 in the party newspaper *Pravda*. Stalin declared that Marr was not a Marxist, and Indo-European linguistic studies were restored. The theory of staged development was rejected as well, and another detachment of scholars was forced to publicly repent. Although the repression this time was not as dramatic as earlier, it still existed, and “cosmopolites” (mainly Jews) became “antipatriotic critics” and “slanderers” and were expelled from scholarly organizations.

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In 1985, Mikhail Gorbachev's rise to power initially caused considerable liberalization and the

introduction of moderate freedoms. But in archaeology nothing changed during the period of "*perestroika*" (reconstruction), except for the destruction of the socialist camp and then the fall of all the socialist regimes in Europe. Glasnost (quite considerable freedom of the press) and intensive contacts with the West increased the amount of information available to the Soviet people, and their preference for capitalism became evident.

Real transformations began in 1991 when Boris Yeltsin was elected president and the Soviet Union fell to pieces as a result of an attempt to overthrow the government in August. Communist power broke down completely, and the new government began radical economic reforms. The disintegration of the old economic system without a new system to take its place, and the disruption of old economic connections among national republics, were the very painful consequences of democratization and growing capitalism. They were also very destructive with respect to archaeology.

Independent national archaeological programs emerged in the Ukraine, Belorussia, Moldavia, all the Transcaucasia, central Asia, and the Baltic areas. The monuments that had been studied for a long time by many Russian scholars were now located in countries other than Russia. Archaeology was decentralized, and the role of local centers increased. The Institute of Archaeology was split into two independent institutes in Moscow and St. Petersburg (formerly Leningrad, now St. Petersburg once again), and in the latter, the name Institute for the History of Material Culture (IHMK) was restored.

Another consequence for archaeology has been a sharp decrease in state allocations of funding for academic disciplines, including money for archaeology. The lack of state ideology has also deprived archaeologists of any material support. They have been forced to search for new sources of funding from western foundations, local sponsors, or their own earnings. The amount of foreign literature in specialist libraries decreased as the availability of foreign currency decreased.

On the positive side, communications with foreign colleagues have intensified, and the choice of methodology and direction in archaeology appears to be completely free now. The main journal has changed its name to *Archaeology of Russia,* but attempts to rebuild professional archaeological societies have not met with much success. The milieu that gave the societies their members and made them strong and influential has disappeared, and new sources of support for archaeology have not been formed as yet. Russian archaeology is at another turning point in its history.

The Development of Archaeological Thought

Antiquarianism

Peter the Great's enthusiasm for antiquities as rarities was undoubtedly antiquarian in character. Although an interest in antiquarianism came to Russia two a half centuries later than it had come to Italy, two centuries later than to England, and a century later than to France, it took the same forms. Antiquities were sampled and connected at random with ancient peoples known from written chronicles. Scholarly activity proceeded in newly annexed or explored territories on the periphery-Siberia, the Urals, northwestern Russia-and the study of antiquities was seen as a part of geography and as part of broad encyclopedic interests, as they were in other countries. However Russian antiquarianism was different in two respects.

First, Russian antiquarian interest was originally directed toward local antiquities-at colonial antiquities-rather than toward classical Greek or Roman antiquities. This difference was connected with ethnographic interests. Classical antiquities attracted attention later, when Russia received part of the lands around the Black Sea where there were ancient Greek colonies, and Russian-Slavic antiquities received attention later still.

The second distinction existed because the motivating force in Russian antiquarianism was the czar and the state. In other European countries, collecting antiquities was initially a bourgeois intellectual hobby that was later taken up by the aristocracy. Antiquarianism in Russia spread, from the very beginning, from above as one of the important aspects adopted by the Russian state from the western European way of life.

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Under the influence of the German art historian Winckelmann, classical antiquities were considered everywhere, including in Russia, as the greatest monuments of art and as an ideal. This sentimental attitude was an important part of antiquarianism, and it was alive and well in Russia until the beginning of the Soviet era, for example, in Zhebelev's *Introduction to Archaeology,* published in 1923. The final demise of these values was recognized in Marr's statement: "Down with Venus of Milos, long live the hoe!"

Romantic Ethnography

The romantic movement gave birth to a widespread interest in local medieval monuments all over Europe, and Russian romanticism was especially patriotic because it developed as a result of the war against Napoleon's invasion in 1812. In the early nineteenth century, this interest was best expressed by Chodakovsky's program of scholarly travels. He was as carried away by hill forts, as was william stukeley by megaliths in England-and like Stukeley, Chodakovsky suspected that his hill forts were sacred places. Passek had the same passion for barrows, but both men were interested in the ethnography of these monuments.

Passek's investigations of barrows occurred during the middle of the nineteenth century and were inspired by the grand excavations of barrows by Uvarov and Savelyev. Uvarov published the results of these excavations in 1871 and described the barrows as belonging to the Merya (a Finnish people), although later it became clear that they were, in fact, ancient Slavic monuments. This episode shows that leading Russian archaeologists still did not have means to properly identify ancient peoples with the peoples of today and thus identified them ethnically. It also shows that at least some Russian scholars had no nationalist subplot they were trying to justify via archaeology and that they did not try to widen the ancient territories of the Russian people to this end. Their national self-esteem was not dependent on the past.

Archaeology was considered to be the simple expansion of ethnography into the distant past. The same scholars undertook both the archaeological and the ethnographic exploration of a region. The principle that every people had distinct peculiarities of culture and distinct material or types of things seemed quite natural and was the view that the German archaeologist rudolf virchow and other German scholars of his circle took.

The best example of this point of view can be found in an 1899 article by Spitsyn, "The Distribution of Ancient Russian Tribes According to Archaeological Data," in which he established that the territory of Russian "tribes" (as they were called in the chronicles Polyane, Drevlyane, and Vyatichi) reflected the area of their temple ring types, i.e., each "tribe" had its own type of ring. Spitsyn's work resembles that of the twentieth-century German archaeologist gustav kossinna in his article "On the Decorated Iron Lanceheads as Attribute of Ancient Germans" (1905). However free Spitsyn was of Kossinna's nationalist and racist overtones, he could still get carried away by the possibilities of migrations. The notion of archaeological culture also originated in Russia at this time and has been used widely since 1901.

Migrations were only one part of Kossinna's overall concerns and not really central to them. For central Europe, where the Germans lived, Kossinna preferred to argue for local and continuous development so that, in fact, the central part of his argument was autochthonism. This concept was more widely held in Russia than migrationism. Within the framework of the "*byt*-descriptive" (everyday-life-descriptive) approach developed by Zabelin and Samokvasov, there was also an argument for a very long and continuous development of the Russian state and culture from the same territories as Kievan Rus, which must have originated from the Scythians ("the noble ancestors"). Despite the cold reception this

hypothesis received and numerous critiques, it remained tenacious and was revitalized again and again. In the middle of the twentieth century (from the 1930s to the 1970s), Boris Grekov and Boris Rybakov built a scheme for Russian state development that was still longer than that of Zabelin and Samokvasov, as they included not only Scythians but also Tripolye agriculturists, from the Eneolithic period. There are many weak points in this concept,

and its political and nationalist motivations help to explain its popularity during the Soviet period. Paradoxically, it now receives new support-from Ukrainian ideologists.

Progressivism

The three-age system made its way into Russia, as in the rest of Europe, from Scandinavia. For its establishment, it was necessary to elaborate on the Enlightenment idea of progress that declared that the contemporary was a higher cultural state than the ancient classic ideal. This idea was in harmony with the reforms of Czar Peter the Great, whose ideals were contemporary Europe and European civilization. Thus, as distinct from Germany, in Russia there was fertile soil for the idea of progress. In the middle of the nineteenth century, a series of translations (including the writing of Danish archaeologist jens jacob worsaae) acquainted Russian archaeologists with the achievements of Scandinavian progressivists. In 1881, the leader of Russian archaeologists, Count Uvarov, based his book *Archaeology: The Stone Age* on the three-age system. Thus, the basis for archaeological periodization was introduced.

The corresponding ethnographic periodization in three steps (savagery, barbarism, civilization) was merely elaborated by American anthropologist lewis henry morgan in the evolutionary spirit. However, it had been advanced earlier by Vedel-Simonsen, and in his version it was properly a progressivist scheme and was adapted by Fredrich Engels into the basics of Marxist revolutionary ideology.

Evolutionism

Created in England, France, and Sweden, archaeological evolutionism became known in Russia comparably early-through reviews, surveys, expositions, and, later, translations of Lubbock and gabriel de mortillet's work. It had an impact on Russian ethnography but little impact on Russian archaeology. Russian archaeologists were more conservative than Russian ethnographers (some of whom were deported as revolutionaries), and archaeologists were confused by the connection of archaeological evolutionism with the ideas of Charles Darwin.

The revolutionist periodization of de Mortillet was transferred to Russia by Fedor Volkov, who studied in France, and by his pupil Petr Efimenko, whose fundamental work on the Paleolithic was published in 1934. In that work's exposition of data, the periodization of the Stone Age was elaborated in the spirit of de Mortillet's evolutionism at a time when, in France, much of de Mortillet's approach was being revised by henri breuil and others. Russian archaeologists first learned about the methodological elaborations of Swedish archaeologist oscar montelius in the first volume of Ravdonikas's *History of Primordial Society* (1939).

In the first half of 1930s, the theory of stadial development rejected the primacy of the *Ursprache* (“ancestor language”) as well as the importance of ethnic boundaries and insisted on the mixing, crossing, and fusion of peoples. Nevertheless, it retained the autochthonistic principle of a gradual, slow sojourn of peoples in places. To substantiate the theory, Kruglov and Podgaecky, in their book *The Clan Society of East-European Steppes* (1935), introduced a correction into the concept of a revolutionary replacement of stages (the break of continuity) by using the concept of “stadial transitions,” i.e., connecting chains or intermediate types, in what was an evident retreat from revolutionary phraseology to evolutionism. Gradual evolutionism began to mark the Irkutsk school of Soviet archaeologists, especially Teploukhov and his pupil Gryaznov. For them, development occurred independently at each place, and an archaeological culture was considered identical to its period.

Anthropogeographism (Paleoethnological Trend)

Anthropogeographism, named after friedrich ratzel's school of Anthropogeography, rejected the evolutionary aspects of ancient cultures and moved the center of consideration to territorial

aspects-development in the space and distribution of culture complexes, which were considered as very steady and unchanging. A large role was given to the interaction of the sciences of man with geography and, in general, with the sciences of the natural environment.

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This trend in Russia was strangely unlucky, but there was a logic to its bad luck. During the time of the czars, in the 1880s, the Department of Anthropology at Moscow University was closed and what survived was transferred as the Department of Ethnography from the historical-philological faculty to the natural sciences faculty in order to hinder the intrusion of naturalist scientific ideas into humanist studies. During Soviet times, it was dangerous for social scientists to look for explanations in natural factors instead of socioeconomic ones or (in the early period) to have an interest in ethnic problems. The attitude of paleoethnologists, whether consciously or not, was opposed to the historicizing and politizing of archaeology and to its Marxist directions. Thus, the heads of both schools of paleoethnology-Moscow and Leningrad-were arrested and annihilated, and some members of the schools also "visited" prisons and camps. Paleoethnology remained disorganized and broken.

After interests in ethnogenesis were allowed, and even encouraged, again in the USSR, the pupils of paleoethnologists who had survived started to research ethnogenetic questions. The leading figures in this respect were Artamonov, the pupil of Miller; Tretyakov, the pupil of Efimenko; and Tolstov, the pupil of Zhukov.

Diffusionism

An interest in cultural influences first appeared in Russia in the late nineteenth century in a paper by Anuchin entitled "On Cultural Influences on the Prehistoric Soil of Russia" (1880). Yet the proper bearer of the diffusionist concept in Russia became, partly as a result of the influence of Anuchin, Vasiliy Gorodcov. His generalizing works were built on the idea of *ex Oriente lux* (out of the East comes light). He sought the origins of any novelty in a given culture-as an invasion or borrowing. He attentively observed the activity of the prominent European diffusionist sophus müller, especially his remarkable excavations of Jutland barrows, and in 1901-1903 exactly copied those excavations in the Izyum and Bakhmut districts of the Ukraine, discovering the pit-grave, catacomb-grave, and framework-grave cultures. Gorodcov's "typological method" was opposed to that of Montelius, mainly because Müller was an opponent of Montelius.

The controversy between Gorodcov and the head of the Moscow paleoethnological school, Zhukov, is characteristic of these different points of view. Zhukov built the periodization isophenomenologically, that is, he divided material into periods exclusively according to typological similarities and distinctions regardless of time. Gorodcov did so isochronologically, that is, he divided the periods into chronological sections regardless of material types. If some leading regions entered the Bronze Age, all others were considered as being in the Bronze Age; contacts were held to be more important than the level of development.

Some particular manifestations of Gorodcov's approach existed after World War II (Foss in 1949 stuck to such a periodization, as did Bryusov in part), but all in all, diffusionism did not continue in Russia, even though Gorodcov had many well-known pupils, Arcikhovsky, Bryusov, Smirnov, and Kraynov among them. They continued his interests in classification but not his diffusionism.

Combinationism

The designation of the term *combinationism* is not well known and belongs only to the historiographer,

the author of this article, who formed a special school for it (Klejn 1977). All the main schools of archaeology tried to answer the question of why there were breaks of continuity in the development of culture, because there had to be continuity in terms of process between past and present for the present to be understandable. The question of why or how cultures change requires us to limit the two notions of

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Diffusionism

An interest in cultural influences first appeared in Russia in the late nineteenth century in a paper by Anuchin entitled "On Cultural Influences on the Prehistoric Soil of Russia" (1880). Yet the proper bearer of the diffusionist concept in Russia became, partly as a result of the influence of Anuchin, Vasiliy Gorodcov. His generalizing works were built on the idea of *ex Oriente lux* (out of the East comes light). He sought the origins of any novelty in a given culture-as an invasion or borrowing. He attentively observed the activity of the prominent European diffusionist sophus müller, especially his remarkable excavations of Jutland barrows, and in 1901-1903 exactly copied those excavations in the Izyum and Bakhmut districts of the Ukraine, discovering the pit-grave, catacomb-grave, and framework-grave cultures. Gorodcov's "typological method" was opposed to that of Montelius, mainly because Müller was an opponent of Montelius.

The controversy between Gorodcov and the head of the Moscow paleoethnological school, Zhukov, is characteristic of these different points of view. Zhukov built the periodization isophenomenologically, that is, he divided material into periods exclusively according to typological similarities and distinctions regardless of time. Gorodcov did so isochronologically, that is, he divided the periods into chronological sections regardless of material types. If some leading regions entered the Bronze Age, all others were considered as being in the Bronze Age; contacts were held to be more important than the level of development.

Some particular manifestations of Gorodcov's approach existed after World War II (Foss in 1949 stuck to such a periodization, as did Bryusov in part), but all in all, diffusionism did not continue in Russia, even though Gorodcov had many well-known pupils, Arcikhovsky, Bryusov, Smirnov, and Kraynov among them. They continued his interests in classification but not his diffusionism.

Combinationism

The designation of the term *combinationism* is not well known and belongs only to the historiographer,

the author of this article, who formed a special school for it (Klejn 1977). All the main schools of archaeology tried to answer the question of why there were breaks of continuity in the development of culture, because there had to be continuity in terms of process between past and present for the present to be understandable. The question of why or how cultures change requires us to limit the two notions of

heredity and continuity with innovations. Some western scholars in the late nineteenth and early twentieth centuries stated ideas about the importance of joining various traditions together. The French historian Tarde defined invention as “logical copulation.” The German ethnologist Leo Frobenius described cultural creation as the “coupling of cultures.” In the second and third decades of the twentieth century, the English anthropologist augustus pitt rivers clearly believed that new cultural elements emerged as a result of the fusion and crossing of the old elements of culture.

In Russian archaeology at the turn of the century, Kondakov, who moved from the University of New Russia in Odessa to St. Petersburg and studied ancient art on the basis of archaeological records, advanced the idea that anything new in art emerged out of the crossing of old forms. For instance, he stated that ancient Russian art was the result of a fusion of Byzantine, nomad, and local elements. In the first decades of the twentieth century, his methodological ideas were further developed by his pupils-Rostovcev on the example of the Bosporus and Scythia and Farmakovsky on the materials of the archaic culture of the Caucasus. In the first case, the Iranian ethnic element crossed with the Greek one; in the second, the Ionian crossed with the Oriental. After the Russian Revolution, Kondakov and Rostovcev emigrated. Another pupil of Kondakov, Zhebelev, remained in Soviet Russia and managed to publish Rovtovcev's *Scythia and Bosporus,* in Leningrad in 1932. Rostovcev became a widely known specialist in the economic history of Hellenistic culture.

The ideas of the Russian combinationists influenced the development of stadialism. The idea of cultures crossing was adapted by Soviet archaeologists from the linguistics school of Marr (see below). The impact of this approach in archaeology was first made by Kondakov and Rostovcev. It was based on combinationism and a broad trend of Euro-Asianism that became very popular among Russian emigrants abroad. They believed that the Russian people were the result of a crossing of European and Asian cultures. However this trend was even more popular in history than in archaeology.

Stadialism

In the first decades of the Soviet period, the director of RAIMK/GAIMK, the main archaeological institution of the country, was Academician Nikolay Marr, a linguist and orientalist. In the middle of the 1920s he formulated his “new learning on language” (Japhetic theory), which completely rejected the concept of an Indo-European *Ursprache* (“ancestor language”), a concept that had been well elaborated by many generations of linguists, and explained the close similarity of languages, not by affiliation (common origin), but by their mixing and crossing. This theory depicted the history of speech as a series of language revolutions within the melting pot of one language family that are instantly transformed into languages with quite another structure and substance without any alien intrusion. There was no serious substantiation of these assumptions, but the revolutionary phraseology and defaming of Indo-European studies as “bourgeois” gained Marr the support of Communist Party ideologists.

This linguistic theory was picked up by some young archaeologists, especially those of the Leningrad school (such as Ravdonikas, Krichevsky, and Okladnikov), and transformed into an archaeological theory-that of stadial development. Ethnic cultures were placed under languages, and the whole of their history was depicted as a series of leaps from one stage to another-leaps in which the ethnic nature of the culture was instantly transformed. The theory resolved some of the most difficult problems of ethnogenesis as it became possible to derive any culture from any other. Such a large role was assigned to the interaction of cultures that the question of roots, of ancestors, simply no longer arose. All peoples appeared mixed, the ancestors of all of them being similar and, to some extent, common. All had behind them the various and finely crumbled mixture out of which modern peoples were formed by gradual junctions or crossings and mainly by sudden stadial transformations.

The first observable realization of this theory was Ravdonikas's work “The Cave Towns of Crimea and the Goths Problem in Connection with Stadial Development of the Northern

Black Sea Region" (1932). In it, Ravdonikas suggested that the reader believe that Cimmerians who had populated the region earlier were Japhetides, i.e., they were related in language to the Caucasians of today, that they turned as the result of revolutionary transformations into Iranian-speaking Scythians, that they in their turn became German-speaking Goths, and that the Goths became Slavs. Nobody came from the outside into Crimea; everything evolved within it. Language and culture changed sharply and abruptly. Why? Because the sharp transformations are the dialectical law of being and because language and culture are connected with social structures, which, of course, went through revolutions.

In 1934 and 1935, Efimenko attempted to represent the development of the Paleolithic through stages and in 1935 Kruglov and Podgaecky postulated a series of stages in the Bronze Age of the steppes. In their work, however, the ethnic aspect was completely absent. They timed the stages according to technical shifts, to steps in the development of production, and while showing the revolutionary character of these shifts they tried to allot all of the phenomena of culture, including "superstructional" (projective) ones, to these steps. This work looked more realistic than the fantastic transformations of languages and peoples, but the more realistic it looked, the less it retained of the theory of stadial development. Because the essence of that theory was miraculous transformations, it resisted explanations that were logical and that proposed any continuity of development. However, stadial development depends on logic and on intermediate chains-"stadial transitions" as they were called by Kruglov and Podgaecky.

During the Patriotic War (World War II in Russia), considerable mass opposition against Stalin began, which forced the state to reconsider the patriotic feelings and nationalist temper of the peoples of the Soviet Union, especially the Russian people. Ethnic groups within the USSR were encouraged to take pride in their independent origins and to search carefully for their roots. Marr's Japhetic theory contradicted this activity. In 1951, there was a multiweek linguistic discussion in the central Communist Party newspaper *Pravda* in which Stalin personally took part. He argued against Marr's works, and both the Japhetic theory and the theory of stadial development were rejected.

It was now possible to criticize Marr. He was described as a bad linguist and really not an archaeologist at all-not even knowing that there was no metal in the Paleolithic period. Despite the lack of arguments, the theory of stadial development did bring some fresh ideas into the explanation of the most difficult problems of archaeology. It insisted that archaeologists begin to consider the sources of transformations in each society, i.e., to the importance of socioeconomic shifts for the transformation of culture, to leaps that are really inherent in every development. Later, such ideas began to be discussed seriously in many archaeological schools of the West, especially those interested in "the new archaeology."

Marxist Sociohistoricism

After the victory of the Bolsheviks in Russia, Marxist doctrine and its values were imposed on the entire scholarly world, and young archaeologists began to search for methodological ideas that could distinguish their activity from "bourgeois" archaeology. One of the first to be proposed, "the complex method" (Nikolskiy 1927) was a dim conglomerate of ideas, and it was understood variously as a demand to consider things as being associated in assemblages, which was not a new idea in Europe at all. It also argued for the involvement of many source-studying disciplines in complete historic reconstruction and for the organization of "complex," that is, multidisciplinary, expeditions.

In the middle of the 1920s, a group of young archaeologists in Moscow, disciples of Gorodcov, proceeded to engage in reeducation under the guidance of the Marxist sociologist Friche. They tried to superimpose Marxist concepts and principles onto archaeological material-to study the development of implements and to show how this development conditioned the whole appearance of economy and culture-and they tried to search for a connection between dwelling forms and the economy and

socioeconomic structure of society. For a Marxist

reconstruction of the past on the basis of material remains they invented “the method of ascending.” Supposing that Marxism gives absolutely reliable schemes for a one-to-one correlation of implement types with the socioeconomic structures of society, these archaeologists believed it possible to “ascend” in reconstruction from implements of labor as a fundamental aspect of social building to economic structures (in Marxism, the basis of society) and even further to social as well as ideational relations (in Marxism, superstructures). As this process of “ascending” came to be regarded as completely plausible, there appeared to be no need to address oneself to neighboring disciplines-such as ethnography and linguistics-or even to written sources. Archaeology itself appeared as history, a history that was more trustworthy than the written one, for material records were considered as more objective evidences of the past, free from subjective distortions and admixtures.

True, history supposes an interest in personalities and particular events that is mostly inaccessible to archaeologists. Yet in the Marxist view, another notion about history dominated in which “collectives” (societies, masses) and processes acted instead of personalities and personalities figured only as “products” and “markers” of social relations. This type of history could be “built” by archaeologists.

Later on, the theoretical basis of “the method of ascending” was not further developed by its creators (Arcikhovsky, Kiselev, Smirnov, and Bryusov), who became prominent and authoritative Soviet archaeologists. However, those same students and their pupils used the method in their work and considered the whole of archaeology as another history-a “history armed with the spade” (Arcikhovsky). That idea became the initial premise of this approach. Arcikhovsky became the head of the Department of Archaeology at Moscow University and the editor of the main archaeological journal, and his younger associate and disciple Rybakov acted for three decades in the post-Stalin era as the head of the leading archaeological institution of the country and all of Russian archaeology. Given the problematics of ethnogenesis, these students preferred local development (in Russia, this preference is called “autochthonism”), and in that respect they did not diverge from Marr's ideas. After those ideas had been discredited, they restored the argument of the old Russian autochthonists Zabelin and Samokvasov and combined it with Marxist discourses on the inner sources of the state origins in each society.

This trend corresponded more than the others to Soviet ideology and was skillfully adjusted to it. It appeared to be very tenacious. In the last decades of the Soviet regime, Vadim Masson in Leningrad advanced methodological elaborations in the spirit of sociological historicism (1976, 1990), and Vladimir F. Gening in Kiev put forward a detailed methodological substantiation of “sociological archaeology” as he understood it-quite in the spirit of the 1930s. Masson's recommendations do not go beyond searching for stereotyped correlations to social structures in archaeological materials, and the expansive works of Gening are distinguished by dogmatism and scholastics. Thus, one can say the trend has been exhausted. However, analogous interests have started to appear in the West (the “sociological archaeology” of Colin Renfrew among others), so it appears that Russian archaeologists initiated a worldwide movement.

Sequention of Cultures

The views and interests of Efimenko and Artamonov were formed in the Leningrad paleoethnological school. Efimenko first studied Slavic-Russian barrows and then the Paleolithic period before moving from Leningrad to Kiev to become the head of the Institute of Archaeology there. Artamonov dealt with many branches of prehistoric archaeology-from the Bronze Age to Scythian and Slavic-Russian antiquities-as well as heading the Leningrad University Department of Archaeology and serving as the director of the Hermitage. After World War II, when the dogmatic settings of the stadialist theory were first weakened and then dismissed entirely, Efimenko and Artamonov, their pupils, and the pupils of their pupils began to reconstruct migrations in any direction, including invasions into the territory of the country

of the researcher. This was not migrationism, for they

did not seek explanations for any novelties in the migrations. Simply, the fact was recognized that peoples moved in the past and the ethnic frontiers changed. Elsewhere, these searches have been called "submigrationist" (Klejn 1994).

The interests of these students were mainly in the problems of ethnogenesis. They opposed the autochthonism of the stadialists and the ultrapatriotic autochthonism of the state glorifiers; nor did they believe in the necessity of "archaeological right"-of the deep antiquity of habitation that was necessary to substantiate the right of a people to live where they did. Their reconstructed migrations, therefore, were a kind of challenge to the then-dominate doctrine-and to official politics.

However, their position did have some scholarly basis. In order to study culture-historical processes correctly, one needs first to establish the channel by which the development proceeded, and such a channel does not necessarily occur only in the cultures of one country. Cultural traditions are transferred, not through the earth, but through human contacts. From time to time, the human masses begin to move themselves, sometimes by jerks and sometimes for great distances.

Scientism

The scientific and technical revolution in archaeology did not occur in Russia until the post-Stalin period, later than in the West. Chemical, metallographic, and petrographic analyses, and the techniques of scientific dating, began to be used more intensively in archaeological research, and many archaeologists started to look to these methods for clues to the solutions to the main problems of archaeology. It was believed that it was possible to separate archaeological cultures and epochs by material attributes that could be more easily discovered with scientific methods and technological analyses and to search for evolution and hereditary continuity in this way.

However, the founder of the functionalist-traceological method (the investigation of implement traces with a binocular microscope) in the 1930s to 1950s, Semenov, proposed his method of typology (i.e., the determination of the function of an implement by its form) as the proper scientific method. Later on, the baton of this method passed to the archaeologists who utilized mathematical methods in the service of archaeology-especially statistics and combinatorial mathematics-Yakov Sher, Boris Marshak, Vera Kovalevskaya, the German Fedorov-Davydov, and Igor Kameneckiy. In the main, they developed methods that had already been developed in the West, but the first attempts of this kind emerged in Russian archaeology in the work of Efimenko and Gryaznov in the 1930s, even earlier than in the West.

Computers began to be used by Russian archaeologists much later than they began to be used in the West, but some decades earlier Russian archaeologists, observing computerization in the West and trying to keep up with it with the help of perforated cards, had grasped that computerization demands a theoretical restructuring of all of archaeology. More measuring, more exactness in descriptions, a strictness of determinations, and an elaboration of algorithms is needed. *Descriptive archaeology* became the phrase used by Kameneckiy, Marshak, and Sher and the Gening school in Kiev.

Relativist Subjectivism

After Marxism was discredited, and with it objectivist optimism in general, the dizzying successes of science and the superb perfectness of computer programs led archaeologists to believe that research implements were all important and that research results were completely dependent on those who possessed those implements. The crisis of positivist and postpositivist methodology pushed researchers to the opposite extreme-to the absolute freedom of the researcher's intelligence in the interpretation of sources and to an exaggeration of the role of the subjective factor in the reconstruction of the past. In addition, the recent cases of Soviet and Nazi scholarship have shown how dependent the inferences of

archaeologists and historians are on social conditions and the position of the scholar is on his subjective bias. By contrast, the Marxist type of sociological analysis, which became very influential in archaeology in the West ("the critical theory"), provided the basis of the

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Salamis

Salamis, an Iron Age and classical site on the east coast of cyprus, has a long history of archaeological work. The Cesnola family worked on the site in the mid-nineteenth century, but fortunately they found too little to encourage further depredations on their part. Toward the end of the nineteenth century, M. Ohnefalsch-Richter and others excavated on behalf of various British institutions.

In the 1920s and 1930s, small-scale work was carried out by the Department of Antiquities, Cyprus. After World War II, work was resumed under the direction of vassos karageorghis, who excavated at Salamis between 1953 and 1974. During that time, the Department of Antiquities cleared and restored large areas of the classical city, including the gymnasium and the theater. French archaeologists, including J. Pouilloux and M. Yon, worked at several sites together with the Department of Antiquities between 1964 and 1974. Further work has been precluded by the Turkish occupation of northern Cyprus. In a nearby Iron Age necropolis, tumuli cover the built tombs of the eighth century, some of which have horse-and-chariot burials and luxury grave goods (such as a bronze cauldron and ivory furniture fittings).

David Frankel

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(1908-1989)

For many years Hasmukh D. Sankalia was a professor of archaeology at the Deccan College, Pune (Poona) in India, and he was also director of the college for some time before his retirement. Initially, he undertook surveys in Gujarat, his home state, and published, among other things, an analysis of the ancient historical geography of the region. Subsequently, he excavated Langhnaj, a Mesolithic to early-historical site in northern Gujarat.

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K. Paddayya

See also

South Asia

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Saqqara

Saqqara is one section of the great necropolis of Memphis, the capital of the Old Kingdom in Egypt. Most of the kings of the First and Second Dynasties were buried there. Though it is best known for the Step Pyramid built by Imhotep for King Djoser of the Third Dynasty, the site is also famous for mastaba tombs (low, rectangular, flat-roofed tombs with a shaft to the burial chamber), the Serapeum, and the numerous private tombs that date between the Old Kingdom and Greco-Roman times. Saqqara has been under virtually continuous excavation since the nineteenth century and is particularly associated with French archaeology in Egypt, especially the work of auguste mariette, who founded the Egyptian Antiquities Service and excavated the Serapeum. The Serapeum was a funeral complex where the mummified sacred Apis bulls were entombed. It was a place of pilgrimage.

Step pyramid at Saqqara

(Image Select)

Tim Murray

See also

French Archaeology in Egypt and the Middle East; Egypt: Predynastic

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(1924-1988)

A Slovenian archaeologist, epigrapher, and specialist in ancient history, Jaroslav Šašel studied at Ljubljana University, received his Ph.D. in 1969, and specialized at Graz University, the French School

in Athens, and the Institute of Advanced Study at Princeton in the United States. Between 1951 and 1961, Šašel was an assistant in the Department of Archaeology, University of Ljubljana, and from 1961 to 1988, he was a research fellow at the Institute of Archaeology of the Slovenian Academy of Arts and Sciences. He was a member of many academies and learned societies: for example, a member of the deutsches archäologisches institut (German Archaeological Institute), visiting member of

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Saqqara

Saqqara is one section of the great necropolis of Memphis, the capital of the Old Kingdom in Egypt. Most of the kings of the First and Second Dynasties were buried there. Though it is best known for the Step Pyramid built by Imhotep for King Djoser of the Third Dynasty, the site is also famous for mastaba tombs (low, rectangular, flat-roofed tombs with a shaft to the burial chamber), the Serapeum, and the numerous private tombs that date between the Old Kingdom and Greco-Roman times. Saqqara has been under virtually continuous excavation since the nineteenth century and is particularly associated with French archaeology in Egypt, especially the work of auguste mariette, who founded the Egyptian Antiquities Service and excavated the Serapeum. The Serapeum was a funeral complex where the mummified sacred Apis bulls were entombed. It was a place of pilgrimage.

Step pyramid at Saqqara

(Image Select)

Tim Murray

See also

French Archaeology in Egypt and the Middle East; Egypt: Predynastic

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Lauer, J.P. 1976. *Saqqara: The Royal Cemetery of Memphis: Excavations and Discoveries since 1850.* London: Thames and Hudson.

Šašel, Jaroslav

(1924-1988)

A Slovenian archaeologist, epigrapher, and specialist in ancient history, Jaroslav Šašel studied at Ljubljana University, received his Ph.D. in 1969, and specialized at Graz University, the French School

in Athens, and the Institute of Advanced Study at Princeton in the United States. Between 1951 and 1961, Šašel was an assistant in the Department of Archaeology, University of Ljubljana, and from 1961 to 1988, he was a research fellow at the Institute of Archaeology of the Slovenian Academy of Arts and Sciences. He was a member of many academies and learned societies: for example, a member of the deutsches archäologisches institut (German Archaeological Institute), visiting member of

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the Austrian Archaeological Institute, honorary member of the Society of Antiquaries, and correspondent member of the Slovenian Academy of Arts and Sciences.

At first, Šašel's research focused on the archaeology of major Roman towns in slovenia (Ljubljana, Ptuj, and Celje), but later he was more interested in Roman epigraphy. His numerous works include studies in epigraphy (writing/inscriptions), prosopography, ancient history, Roman military history, the ancient economy, and the historical topography of northeastern italy and the Roman provinces in the Balkans (Pannonia, Noricum, Dalmatia, Moesia). Together with his wife, Ana Šašel, he published the supplement to the *Corpus inscriptionum Latinarum* in three volumes (1963, 1978, and 1986). In his onomastic studies, he analyzed the structure and distribution of some Roman family names, and together with colleague P. Petru, he initiated research on the late Roman limes on the northeastern border of Italy.

Šašel also contributed to the *Tabula Imperii Romani* (1976), *Pauli-Wissowa Real Encyklopadie der klassischen Altertums-Wissenschaft, Princeton Encyclopedia of Classical Sites* (1976), *Der drosse Plotz* (1980), and the archaeological map of Slovenia *(Arheoloska najdisca Slovenije),* in which he published a synthesis on Roman roads. He was also the editor of numerous Slovenian and Yugoslav archaeological journals and publications.

Milan Lovenjak

References

Šašel J. 1989. “Opera selecta.” Situla (Ljubljana) 30. Reprint of his most important studies.

Saudi Arabia

See Arabian Peninsula

Schele, Linda

(1942-1998)

One of the greatest Mayanist scholars of the late twentieth century, Linda Schele began her academic career as a studio art teacher. A tourist trip to Yucatán with her husband, David, changed her life. She was fascinated by the amazing ruins that she saw and the beauty of Maya art, and she resolved to learn more about them.

In the early 1970s Schele began to study Mayan hieroglyphic writing. By this time the basic structure and some of the content of Maya inscriptions were understood, but more precise details were still unclear. Over the following quarter century that situation was to change, and Schele was at the forefront of efforts aimed at “breaking the Maya code,” as one scholar has put it.

In 1973 Schele attended the first round table conference at palenque in mexico. At this, her initial professional conference, she and colleague Peter Mathews presented a proposed king-list (chronology of rulers deciphered from Maya inscriptions) of Palenque. Over the following fifteen years she worked not only on the inscriptions of Palenque but also on those of other classic Maya sites. In the studies she conducted during these years, she was indefatigable in her attempts to evaluate the archaeological sequence in conjunction with the epigraphic history of individual sites-an approach that has paid huge dividends. At Copán, Honduras, she worked with a number of other epigraphers and archaeologists conducting excavations in and around that site, and the result was a detailed synthesis of the archaeology, architectural sequence, and history of Copán, which is now one of the best understood of

all classic Maya centers.

By the early 1980s Schele was a recognized leader in the field of Maya studies. She and a colleague from Yale University, Mary Miller, were asked to prepare a major exhibition of Maya art and to write the descriptive catalog to accompany it. The exhibition, called “The Blood of Kings,” was a tour de force. For the first time masterpieces of Maya art from collections in both Europe and North America were exhibited together. The accompanying catalog was much more than a series of descriptive paragraphs about individual objects, preceded by a brief introduction: in addition to describing the exhibition pieces in detail, the book also contained essays by Schele and Miller on several great themes in Maya art, ranging from kingship to warfare to bloodletting. These essays were major statements on various aspects of elite life among the classic Maya, and *The Blood of Kings*

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represented an important step in Maya studies, in which art, hieroglyphs, and archaeology were brought together to arrive at an exciting new interpretation of classic Maya society.

Schele's next book, written with David Freidel, continued in this same vein. Entitled *A Forest of Kings*, it was an ambitious look at Maya history, combining the archaeological sequence with history gleaned from the glyphs. It did so in such a detailed way that the classic Maya elites almost leaped off the page: for the first time the "mysterious" Maya were becoming more accessible to twentieth-century readers.

Schele was a great popularizer of the ancient Maya. One of her lasting contributions to the field of Maya studies was the development of public workshops on how to read Maya hieroglyphs. Over the years she presented many such workshops, most notably the "Texas Workshops" held in Austin, where she was based. The audience regularly included many of the major scholars in the field of Maya studies, as well as several hundred members of the general public, all of whom were as captivated by Schele's infectious enthusiasm as they were by new discoveries about the ancient Maya. With another colleague, Nikolai Grube, Schele also conducted workshops for the Maya themselves in guatemala and mexico. This was her proudest achievement: as she put it, she was giving back to the Maya people their own history, which had been taken from them in the years and centuries following the Spanish conquest.

In all her work Schele displayed rare analytic and synthetic skills in making groundbreaking discoveries herself and leading her field to still others. She was not afraid to try new approaches, and with her brilliant insights her efforts were more often than not rewarded. By fostering the same attitudes among her many students, she ensured that her intellectual heritage would survive her untimely death from cancer in 1998.

Peter Mathews

See also

Maya Civilization; Maya Epigraphy; Mesoamerica

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Schele, L., and D. Freidel. 1990. *A Forest of Kings: The Untold Story of the Ancient Maya.* New York: Morrow.

Schliemann, Heinrich

(1822-1890)

Heinrich Schliemann was born in northern Germany and became a sailor, shopkeeper, and merchant; he taught himself fluent French, Dutch, Greek, Russian, and English. A short visit to California in the gold rush days and a longer period trading in russia consolidated his personal fortune, and he began to travel extensively and to write about his experiences. He also became interested in history and archaeology, learned Latin and Greek, and was inspired by the successful careers and the great fame of famous archaeologists sir austen h. layard, sir henry rawlinson, and auguste mariette.

Heinrich Schliemann

(Ann Ronan Picture Library)

In 1866, Schliemann began to study at the Sorbonne in Paris and became interested in the debates about the veracity of Homer's legends. In 1868, he visited the places in greece and turkey mentioned by Homer, taking the same route as Odysseus to Turkey, and published a popular account of his travels. In 1869, he divorced his Russian wife and married a young Greek woman who was as passionate about Homer as he was and well connected within Athenian society.

In 1870 Schliemann began to excavate at Hissarlik,

enormous. First and foremost, he discovered the Trojan and Mycenaean civilizations at Ilios, Mycenae, Orchomenos, and Tiryns. Scholars had doubted their existence, and the unearthing of that world was one of the great moments of archaeology, and because of it, Homer's epic poetry and mythology became sources of historical information. Schliemann enriched Greek history by bringing 2,000 years into the historic record, and his findings linked classical, oriental, and prehistoric archaeology in a new way. Finally, Schliemann brought public attention to archaeology and raised the profile of the discipline through his discoveries, his publications, and his extraordinary success.

Leo Klejn

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For references, see *Encyclopedia of Archaeology: The Great Archaeologists, Vol. 1*. Ed. Tim Murray (Santa Barbara, CA: ABC-CLIO, 1999), pp. 124-125.

Schmerling, Philippe Charles

(1790-1836)

Born in Delft in the netherlands, Philippe Charles Schmerling served as a medical officer in the Dutch army from 1813 to 1816. In 1825, he completed a degree in medicine at the University of Liège, but during his four years of study Schmerling became interested in paleontology and geology after being given presents of fossils collected by workers in a nearby quarry. Beginning in 1829, he systematically explored over forty caves in and around the Liège region of belgium and became professor of geology at the University of Liège in 1835.

Schmerling's published finds (especially in his *Recherches sur les ossemens fossiles* [1833- 1834]) included more than sixty extinct fossil animal species, but it is for his discoveries of human remains that he has gained lasting fame. Schmerling excavated at the caves of Engis and Engihoul, Chokier and Fond-de-Foret, and under a layer of brecchia he found human remains in association with the bones of extinct fossil animals and with what he described as stone and bone tools. He also found an infant skull that, in 1935, was proved to be that of a Neanderthal child. Although Schmerling's work attracted the cautious interest of the English geologist sir charles lyell, the latter was unable to accept the possibility of high human antiquity until hugh falconer and others had conclusively demonstrated the case at brixham cave and had argued for the validity of French archaeologist jacques boucher de perthes's discoveries in the gravels of the Somme Valley in 1859.

Tim Murray

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Semenov, Sergei Aristarkhovich

(1898-1978)

Sergei Semenov was a Soviet archaeologist and author of *Prehistoric Technology* (1957), in which he determined the uses of prehistoric stone and bone tools by identifying the processes that caused the use-wear patterns found on them. His approach followed the USSR's Marxist interest in production methods and a historical view of the past. The translation of his book had a large impact on the

profession of archaeology in the West. Semenov's techniques became the basis of modern use-wear studies (particularly on stone tools from the Paleolithic), which have unlocked much new information about the use of ancient technology.

Tim Murray

See also

Russia

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Semenov, S.A. 1957. *Prehistoric Technology: An Experimental Study of the Oldest Tools and Artifacts for Traces of Manufacture and Wear.* Translated by M.W. Thompson. London: Cory, Adams, and Mackay.

Shanidar

Shanidar is a major cave site in the foothills of the Zagros Mountains, in northeastern Iraq, excavated by Ralph Solecki from 1957 to 1961. The site is considered to be particularly significant due to the excavation of the remains of

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nine Neanderthal adults and children, but there is a strong sequence exemplifying technological evolution from the Mousterian (between 60,000 and 40,000 years ago) through to Upper Paleolithic industries dating to about 25,000 years ago. Most attention has been focused on the Neanderthal skeletons, one of which shows evidence of a disabling disease from which the individual must have suffered for a considerable time before death. The prolonged care this individual received has been taken as evidence of the social bonds existing among Neanderthals. Some researchers have also claimed that flowers were placed in one of the burials-an indication, according to some interpretations, of sentiment among these people. Although the claim has been disputed, novelists have nonetheless readily incorporated this notion in their imaginative reconstructions of everyday life among the Neanderthals.

Tim Murray

See also

Mesopotamia

Reference

Trinkaus, E. 1983. *The Shanidar Neandertals.* New York: Academic Press.

Sharma, Govardhan Rai

(1919-1986)

Govardhan Rai Sharma was one of the most effective university teachers of archaeology in postindependence India. He built up a strong tradition of field research in the Department of Ancient History and Archaeology at Allahabad University, where he served throughout his working life. His early years were spent excavating the historic city site of Kausambi, in northern India, on which he published two major excavation reports (Sharma 1960, 1969).

However, his work in the fields of prehistory and proto-history in the neighboring Vindhyan Hills brought him more prominence in Indian archaeology. The easternmost section of the Vindhyas touches the Gangetic Plain near Allahabad, and although the prehistoric potential of the region had been known since the nineteenth century, it was Sharma who rigorously built up a section profile from the Acheulean to the Mesolithic Periods and excavated a number of what he called “advanced Mesolithic” sites both there and in the Pratapgarh area of the adjacent plain. At the site of Koldihawa in the same area, he found evidence of cultivated rice in the context of sixth-fifth millennia b.c. (Sharma et al. 1980). Between Varanasi and Allahabad, especially in the Mirzapur section of that stretch, he found a large number of Megalithic burials and painted rock shelters in association with microliths. Finally, in collaboration with j. desmond clark of Berkeley, Sharma extended his prehistoric sequence up to the Son Valley in Madhya Pradesh (Sharma and Clark 1983).

Sharma had a strong personality, which did not make him popular with his colleagues (some of whom disputed his claims after his death), but the field team he built up in Allahabad is unquestionably among the best in India.

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See also

South Asia

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Shaw, Charles Thurstan

(1914-)

One of the pioneers of West African archaeology, Charles Thurstan Shaw, or Thurstan Shaw as he has always preferred to be known, was born on 27 June 1914 in Plymouth, England. Shaw was educated at Blundell's School in Tiverton, England, and Sydney Sussex College, Cambridge, where his main archaeological teachers were Miles Burkitt and grahame clark. In 1937, Shaw joined the staff of Achimota College in the Gold Coast (now Ghana), then one of the nearest things to a university in sub-Saharan Africa. There, in addition to his teaching duties, he was in charge of the Anthropology Museum at the college and found time to conduct archaeological

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research in the south of the country, the most notable being his excavations at Bosumpra rock shelter and at a midden mound at Dawu. Shaw left the Gold Coast in 1945, but his work subsequently led, during the 1950s, to both the creation of the Ghana National Museum and the establishment of a Department of Archaeology in the University of Ghana, which grew out of Achimota College.

From 1945 to 1963, Shaw held educational posts at Cambridge University and continued to publish on African archaeology. In 1959-1960, he was invited by the Nigerian Federal Department of Antiquities to excavate at Igbo-Ukwu in eastern Nigeria, and there he uncovered important evidence for the emergence of social complexity, the development of sophisticated metallurgical skills, and the growth of long-distance trade by the late first millennium a.d. This work, together with his previous publications, led to his being appointed in 1963 to a research professorship in archaeology at the University of Ibadan in Nigeria, which he held until his retirement in 1974.

During his time at Ibadan he did further work at Igbo-Ukwu as well as excavating a rock shelter at Iwo Eleru in the Nigerian rain forest. From the latter site he recovered evidence of late-Stone Age occupation from about 10,000 b.c. to about 1500 b.c., including a human skeleton from the earliest deposits that was proto-negroid in character and the earliest such evidence in West Africa. At Ibadan, he built up a successful research team that supported not only his own work but also that of fellow archaeologists Graham Connah, Steve Daniels, and Adebisi Sowunmi. Shaw not only researched and published widely but founded and edited the *West African Archaeological Newsletter* and the *West African Journal of Archaeology,* which subsequently replaced it. His most important contribution to the future of African archaeology, however, was his creation in 1970 of a teaching Department of Archaeology in the University of Ibadan that could train some of the future generation of African archaeologists.

Following retirement, Shaw did further excavation in the Kaduna Valley of northern Nigeria and also continued to publish extensively. He lives quietly near Cambridge, England, having donated his library and papers to the Institute of Archaeology in the University of London.

There can be no doubt that Shaw's contribution to West African archaeology, and indeed to African archaeology as a whole, was an important one. His career straddled the change from colonial to independent rule in black Africa, and his vision and hard work, in his search for West Africa's past, contributed significantly to Africa's rediscovery of itself.

Graham Connah

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Shell Midden Analysis

After stone artifact scatters, archaeological deposits dominated by shell are the most commonly encountered evidence of the past, yet the infrequency of published accounts of midden analyses in the current archaeological literature suggests that archaeological deposits of shell contribute little to our understanding of human history. In this brief history of midden analyses, I locate the source of this contradiction in shifting explanatory paradigms in archaeology in general.

A shell midden is any archaeological site with a visible quantity of mollusks, which indicates the human consumption of shellfish. Shell is durable, and the preservation of shell middens is high when compared

to other faunal material. That fact, combined with the generally large number of shells in a midden site, makes them highly visible in the landscape and easily recognized. Shell deposits also provide a matrix in which other kinds of cultural material, both artifacts and bone, are preserved. In this article, the focus is on shell middens that come under the rubric of “hunter-gatherer sites,” that is, sites that reflect behavior associated with nonagricultural peoples for whom marine resources probably constituted a seasonal or year-round food source.

The modern analysis of midden sites owes much to the earliest systematic midden excavation

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Silcott, Washington

Located on the lower Snake River, eight miles downstream from Lewiston, Idaho, Silcott was a bustling little farming and ranching hamlet in the early twentieth century. White settlement began in 1861, and in 1888, Alpowa City was platted, but it eventually became known as Silcott. By 1930, the town was extinct, largely because of automobiles and better roads, which allowed people to travel and shop in nearby towns.

In 1972, three field seasons were conducted in Alpowa under the direction of Frank C. Leonhardy of Washington State University. David R. Brauner directed the excavation of Alpowa's prehistoric and historic Nez Percé sites, and Timothy B. Riordan investigated the migrant-worker sites. William H. Adams directed the excavations of Silcott, including Bill Wilson's General Store, Cliff Wilson's General Store, Trapper Wilson's House, the Ireland Place, the Ferry Tender's House, and the Weiss Ranch Dumps. These sites dated from 1890 to 1930, and their excavation marks the first time that archaeologists intentionally excavated twentieth-century sites.

The project used a multifaceted ethnoarchaeological approach involving in-depth informant interviews, documentary research, and excavations combined synergistically into an historical ethnography of the community. Using oral history to cross-verify documentary and archaeological data was innovative and provided a model for future work. The study pioneered the use of a broader context-the community-instead of focusing on individual sites. The study also represented a shift in historical archaeology away from sites associated with famous people and events and toward a broader understanding of American culture.

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Sipán

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other elaborate jewelry, make this the most spectacular tomb discovered in Peru and excavated by archaeologists. The tomb was built by the Moche, who ruled the northern coast of Peru between the first and sixth centuries a.d. These people are justly famous for their pottery, and the tomb of the lord of Sipán clearly demonstrates the quality of Moche metalwork in gold, copper, and silver.

Tim Murray

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Valley (Este and Bologna), in the alpine foothills and Alto Adige, and in central slovenia. In addition to *situlae,* objects such as helmets, belt plates, vessel lids, and shields were also decorated in the same style. Situla art represents the most refined and elaborate art pieces of the eastern early Iron Age Hallstatt cultures. All known objects of situla art have been found in rich male graves (often princely graves), and are considered among the most precious grave goods, which demonstrates the high status of the dead. All objects are normally made of hammered sheet bronze and decorated in the repoussé technique. The design was initially drawn on the interior and then hammered with punches. Some details were later also engraved. *Situlae* and other more-complex objects were bent and riveted together.

The first component (geometrization) in situla art is primarily rooted in the art and craftsmanship of the native Urnfield tradition. The second component (the orientalizing Etruscan, Greek, and Levantine elements) can be found in iconography and many other decorative elements foreign to the Hallstatt cultures (sphinxes, palmettos, lions, etc.).

The development of situla art in Slovenia can be divided into three main phases. In the earliest phase (seventh-sixth century b.c.) only a few objects (helmets, vessel lids) and almost none of the *situlae* were decorated, and the motifs were usually simple (isolated figures, animals, and floral ornaments). The classical phase of situla art belongs to the fifth century b.c., and the most frequent objects are the *situlae* with very developed and complex composition and iconography. Classic examples have normally tripartite zonal division of the scenes, and the motifs are not isolated figures any more but represent the feasts of the Hallstatt aristocracy-horse riding, symposia, boxing for a trophy, drinking precious potions, dancing, etc. The decline of situla art occurred in the fourth century b.c. Feasting and collective scenes and figural representations of men gradually disappeared, and the most frequent motifs were once again animals and floral ornaments.

The sites with the richest examples of situla art in Slovenia are the barrow cemeteries of the princely hill forts: stična, Vace, magdalenska gora, novo mesto, etc. The most classical and famous object from Slovenia is a bronze bucket from Vace, which is 23.8 centimeters high and dates to the sixth century b.c.

Predrag Novakovic

See also

Celts

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Skara Brae

Skara Brae is one of the most notable Neolithic village sites in the British Isles. Located in a sand dune on one of the Orkney Islands off the north coast of Scotland, the site was inhabited between 3200 b.c. and 2200 b.c. and comprises eight houses with stone “furniture” of beds and storage areas. The houses are connected by covered passageways. Archaeological evidence testifies to the inhabitants keeping sheep and cattle, fishing and growing cereal crops. The site was exposed during a violent storm in 1850 and was excavated by vere gordon childe between 1928 and 1930.

Tim Murray

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Škocjan

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Archaeological evidence from the late Upper Paleolithic to the Bronze Age was documented in the cave sites of Roska Spilja, Tominceva Jama, and Pecina v Sapendolu. The most important late prehistoric settlement is the hill fort of Škocjan, occupied from the late Bronze Age to the Roman period. There are four recorded cemeteries from this period, the largest (containing some 325 graves) being the flat cremation cemetery at Brezec dated to the late Bronze Age (twelfth-eighth centuries b.c.) Some very rich burials from the tenth-eighth centuries b.c., comprising sword graves, the earliest presence of iron from the tenth century, have been discovered in this cemetery.

The large ritual hoard found at the bottom of the vertical cave Musja Jama belongs to the late Bronze Age. Among other things, the hoard contained 244 bronze and 10 iron spearheads, 1iron and 19 bronze swords, and many fragments of bronze helmets and vessels. The objects and ritual offerings were mostly fragmented and destroyed by fire. According to typological analysis, this ritual center functioned between the twelfth and eighth centuries b.c. Analogies for the metal finds can be found in the Pannonian Plain in central italy and on the Balkan peninsula.

The hoard and the Brezec cemetery are evidence of a well-stratified society intensively incorporated in long-distance exchange systems at the time of transition from the late Bronze Age to the early Iron Age. Iron Age graves found in three smaller cemeteries demonstrate a certain decline in comparison with the previous period, but two major exceptions should be mentioned: another ritual hoard (Tesoretto di San Canciano), found in the Škocjan hill fort, and a rich burial with a situla with an inscription in the Venetic language found in Skeletna Jama. Both examples are dated in the fifth century b.c.

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Slovenia

The term *Slovenian archaeology* in the sense of a national institutional framework can only be fully applied for the period after 1918. In that year parts of the former Austrian provinces of Carniola, Styria, and Carinthia and the region of Prekmurje were united and joined the newly established Kingdom of Serbs, Croats, and Slovenes (renamed the Kingdom of Yugoslavia in 1929). Prior to that period, archaeology in Slovenian lands (i.e., Austrian provinces) was part of the Austrian institutional framework organized on the provincial level and governed by central institutions and scholarly societies in Vienna.

Antiquarian Background

The beginnings of studies on ancient history and antiquities in Slovenian lands can be traced to the

fifteenth and sixteenth centuries a.d. The first such attempts developed in the coastal towns of northern Istria (Koper/Capodistria, Izola/Isola, and Piran/Pirano-Slovenian/Italian names respectively), which were under Venetian rule and predominantly settled by a population that spoke a Romance language. The first known text on local ancient history is *De situ urbis Iustinopolitanae* [About Ancient Aegida/Koper] by Pier Paolo Vergerio the Elder (1370-1444). Another important early work is a topographic essay entitled *Del sito de Listria* (*The Ships of Listria*), published in Venice 1540 and written by the famous cartographer and geographer Pietro Coppo (1469/ 1470-1555/1556).

The establishment of the bishop's court in Ljubljana in the late fifteenth century gave a strong boost to the development of the Austrian province of Carniola (the central Slovene province) and to Ljubljana, the provincial capital. The central figure in this regard was August Prygl (also known as Tyffernus) (1470-1535), a

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sciences and arts in Carniola. The idea for the excavations came from Ettiene Marie Siauve (?-1813), a French archaeologist who was a member of the Académie Celtique as well as the French military commissioner in the Illyrian Provinces. Vodnik recorded these activities in his *Itineraria* (1809). Siauve himself published a book on the ancient history and antiquities of the Slovene lands, entitled *De Antiquis Norici viis, urbibus et finibus epistola* (Verona 1811).

Beginnings of the Scientific Discipline of Archaeology

A decisive step forward was the establishment of the museums and heritage protection service in the Austrian Empire in the first half of the nineteenth century. Provincial museums, which covered the territory of Slovenia, were located in Graz in 1811 around Styria, in Ljubljana in 1821 around Carniola, and in Klagenfurt in 1844 around Carinthia. Local museums were established later in Celje (1893), Ptuj (1893), Maribor (1909), and Koper (1911). The Littoral Province was left without a provincial museum, but the role was filled by the Trieste municipal museum (1875).

The Provincial Museum at Ljubljana played a decisive role in the development of the archaeological discipline in Slovenia. Although the museum was established in 1821, its archaeological activities did not start until the mid-1870s with the excavations of the prehistoric pile-dwellings in the ljubljansko barje (Iron Age sites in Carniola). Challenged by the discoveries of pile-dwellings on Swiss lakes and encouraged by the Anthropological Society from Vienna, dragotin dezman (1821-1889), the curator of the museum, directed the first large excavation in the history of Slovene archaeology, from 1875 to 1877.

Dezman's close collaboration with the Anthropological and Prehistoric Societies in Vienna proved to be decisive for further developments of this discipline in Slovenia, and in less than fifteen years (from 1875 to 1889) he succeeded in providing a firm basis for its disciplinary framework. Dezman, being a zoologist, botanist, and geologist, developed an anthropological and evolutionary concept of prehistoric archaeology; contrary to the long tradition of antiquarian and historical research in Slovenia. In this short period he excavated a series of sites (Ljubljansko Barje) and published the first synthesis on the prehistory of Carniola ("Prähistorische Ansiedlungen und Begrabnisstätten," in Krain I. Bericht, *Denkschriften der k.k. Akademie der Wissenschaften, Matematisch-naturwissenschaftliche Classe* 42, 1-54 [Vienna 1880]; "Zur Vorgeschichte Krains," in *Die österreichisch-ungarisch Monarchie in Wort und Bild, Kärnten und Krain,* 305-324 [Vienna 1891]). He tried to apply the most recent developments and standards in prehistoric science in his work. For example, he defined the la tène period in Slovenia only a few years after O. Tischler had proposed the division of the Iron Age. His research results were highly esteemed by his colleagues in austria. The Austrian Anthropological Society was very interested in his work and held its annual meeting in Ljubljana in 1879. At the end of his career Dezman succeeded in lobbying for a new museum palace (opened in 1888), whose archaeological collections and museum guide (*Führer durch das Krainische Landes-Museum Rudolfinum in Laibach* [Ljubljana 1888]) became the pride of the scientific community in Carniola.

Alfons Müllner (1840-1918) succeeded Dezman in the museum in 1889. Müllner had already published some important archaeological and historical works in the period prior to his transfer to the museum. These included *Archaologische Excurse durch Steiermark und Krain* (1878, 1880), the first topographic work in Slovenian archaeology, and a monograph on the Roman site of emona (1879). Despite the fact that he was also a naturalist, Müllner applied a different concept of archaeology in the museum-that of typological and chronological principles of artifact analysis-and he rearranged prehistoric collections accordingly. He published *Typische formen aus der Sammmlungen des krainischen Landesmuseums "Rudolphinum" in Laibach* (1900), a catalog of key forms of artifacts for prehistoric Carniola. However, in rearranging the collections, Müllner did not keep records on contexts, and a great deal of contextual data was irreparably lost.

Walter Schmid (1875-1951), who studied in

in 1830, and the museum was established there in 1893. Large excavations of the Roman cemeteries in the area took place in the first decade of the twentieth century.

In Search of a National Framework of Archaeology (1918-1945)

In 1918, after the collapse of the Austrian Empire, the regions of Upper and Inner Carniola, Lower Styria, southern Carinthia, and Prekmurje were united in Slovenia in the Kingdom of Serbs, Croats, and Slovenes. The Littoral, Istria, and the western parts of Carniola were annexed by italy, and central and northern Carinthia remained in Austria. Such a radical change left archaeology in Slovenia almost without any institutional framework; of the provincial museums, only the one in Ljubljana lay in the territory of Slovenia. A new framework had to be constituted almost from scratch, but in the newly formed state, with different traditions and priorities, this was not an easy task.

Nevertheless, the new state provided a political context for some decisive steps toward the national emancipation of the Slovenes. For the first time national institutions were established, and among those important for archaeology were the University of Ljubljana (1919), the national museum of slovenia (1921, formerly the Provincial Museum of Carniola), and the Slovene Academy of Arts and Sciences (1938).

Generally, the period from 1918 to 1945 was marked by a decline in archaeological research as compared to the "Austrian" period, and the National Museum was left without a professional archaeologist for the first ten years. The only notable exception in this regard during these years was Mihovil Abramić (1884-1962), the former director of the Archaeological Museum of Aquilea (from 1913 to 1919) who researched Poetovio in the 1920s and published the results in *Poetovio: Führer durch die Denkmäler der römischen Stadt* (Vienna 1925).

Archaeology was introduced into the university curriculum in 1924, and Vojeslav Mole (1886-1973) was appointed the professor of classical archaeology in Ljubljana. However, his role in archaeology was minor, and two years after his appointment he moved to Krakow University in poland.

The contributions of Balduin Saria (1893- 1974), a historian and epigrapher, the curator of the National Museum of Belgrade, and a professor at Belgrade University (1922-1926), were much more important. From 1926 to 1942 Saria was a professor of ancient history at Ljubljana University, and he published major works on Roman epigraphy and Roman military history: *Antike Inschriften aus Jugoslawien, Noricum und Pannonia Superior* (Zagreb 1938), and "Doneski k vojaški zgodovini naših krajev v rimski dobi" [Contributions to the Military History of Slovenia in the Roman period], *Glasnik Muzejskega društva za Slovenijo* 20, 115-151 (Ljubljana 1939). He was also very active in the organization of the Archaeological Map of Yugoslavia project, for which he designed criteria and standards. In 1936 he published a model map for the region of Ptuj (*Archäologische Karte von Jugoslawien: Blatt Ptuj* [Belgrade-Zagreb 1936]) and, together with josip klemenc, the map for the region of Rogatec (*Blatt Rogatec* [Belgrade-Zagreb 1938]).

In 1929 rajko lozar (1904-1985)) became the first archaeologist employed in the National Museum, twenty years after Schmid. Since he was the only professional archaeologist in Slovenia, he had to cover a vast array of activities, and it was only from the late 1930s that he succeeded in publishing some important works. Lozar, who was also an art historian, was the first to try to provide a conceptual framework for the history of archaeology as a national science in Slovenia, including the earlier (provincial) traditions within it, with an essay on history and conceptual issues in Slovene archaeology ("Razvoj in problemi slovenske arheološke vede," *Zbornik za Umetnostno Zgodovino* 17: 107-148 [1941]). His study on Slavic and medieval pottery production (*Staroslovansko in srednjeveško lo*

nčarstvo v Sloveniji, Glasnik Muzejskega društva za Slovenijo 20: 180-225 [1938]), also attempted to push forward this branch of archaeological research, which he considered the primary task of archaeology in Slovenia.

Although somewhat apart from major developments in central institutions in Ljubljana,

srecko brodar (1893-1987), a naturalist and schoolteacher in Celje, was able to lay foundations for Paleolithic archaeology. In 1928 he excavated the potočka zijalka Cave, and the results proved to be crucial for the interpretation of the glaciation in the Alps (see J. Bayer and S. Brodar, "Die Potočka Höhle, eine Hochstation der Aurignacschwankung in die Ostalpen," in *Prähistorica*, vol. 1 [Vienna 1928]). In the 1930s he extended his research to other sites in Slovenia and Yugoslavia (see S. Brodar, "Das Paläo lithikum in Jugoslawien (The Palaeolithic in Yugoslavia)," *Quartar* 1: 140-172[1938]).

Reconstruction of Archaeology and Definite Establishment of the National Disciplinary Framework (1945-)

Political and Social Conditions and New Beginnings

After 1945, when the king's rule in Yugoslavia was abolished, the Yugoslav Communist Party took over the government and started the process of "rebuilding the society" on a new, Marxist-Leninist basis. Another important political change was the annexation of the Littoral and Istria back from Italy to the Yugoslav Republics of Slovenia and Croatia.

These political and ideological changes had important consequences for archaeology. Lozar was a political opponent of the Communist-controlled Liberation Front during World War II, and he left the country in 1945. Mole, who had returned from Poland in 1942 and accepted a professorship at the Italian-controlled University of Ljubljana, also left in 1945. And Saria, an ethnic German who has been openly sympathetic to the German greater national cause, went to Graz, in Austria, immediately after the Italian occupation of Ljubljana in 1941. There were also experiences entailing Italian and German abuses of archaeology in Slovenia in the prewar and war years. The Italian annexation of the Littoral and Istria (from 1918 to 1943) and subsequent occupation of western Slovenia (from 1941 to 1943) were "justified" with claims about the allegedly historical borders of Roman Italy, and many individuals in Italian institutional archaeology in these regions were involved in providing "scientific" evidence for such claims. And during World War II Germans conducted several excavations in northern Slovenia in order to prove the existence of early medieval Germans south of the Alps and to provide a supposedly scientific basis for Adolf Hitler's project of ethnic cleansing and the annexation of Styria to the Third Reich.

The almost complete absence of professional archaeologists and the lack of an infrastructural framework demanded an urgent and complete reform of archaeological science in Slovenia. The leading scholars from the Faculty of Arts at the University of Ljubljana and from the Slovene Academy of Arts and Sciences played a prominent role in renewing the institutional framework. Two new institutions were established-the Department of Archaeology in the Faculty of Arts at the University of Ljubljana, begun in 1946, and the Archaeological Commission of the Slovene Academy of Arts and Sciences, which was founded in 1947 and later known as the Institute of Archaeology. The first two professors of archaeology were appointed in 1946 and 1947: Klemenc for classical and Roman archaeology and Korošec for prehistoric and Slavic archaeology. paleolithic archaeology also entered the curriculum with the 1946 appointment of Brodar as professor for Quaternary studies in the Faculty of Mathematics and Natural History, all at the University of Ljubljana. Klemenc and josip korošec were also among the founders of the Archaeological Commission, together with Milko Kos, a historian and chancellor of the University of Ljubljana, and France Stele, an art historian and conservator. A new generation of scholars also took leading positions in the National Museum. jože kastelic, a classical philologist, became the director of the museum in 1945, and stane gabrovec, an archaeologist and classical philologist, started to work in the Archaeological Department there in 1948.

The problem of repairing and maintaining monuments was even more urgent, particularly because of the war damage. In August 1945 an Office for the Protection and Scientific Research of Cultural and

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and a series of government bills secured the protection and management of monuments from 1946 to 1948. This was the first integrated solution in the field since the abolition of Austrian legislation in 1918. Another important move was the establishment of the *Arheološki Vestnik* in 1949, designed to be the central archaeological journal; it was published by the Slovene Academy of Arts and Sciences.

It is interesting that the Communist authorities did not intervene to any great extent in the conceptual issues of archaeological research in the postwar period. Of course, all the scholars who were appointed to the leading positions had studied in the prewar period and were politically acceptable to the new regime, since they either supported the Liberation Front or were not compromised by collaboration with Germans or Italians. The official program of the Yugoslav (and Slovene) Communist Party encouraged the further emancipation of the Yugoslav nations (on a Marxist-Leninist basis, of course), and the development of a national cultural, scientific, and educational framework was part of this program. Had the new leaders in the field of archaeology been too rigidly selected on an ideological basis, the country would have lacked the cadre of intellectuals needed for the reconstruction.

The new ideology *was* expressed in various resolutions, manifests, and similar protocol documents presented at conferences, in new publications, and so on, but this had no operable effect on conceptual issues. Marxism could not anchor in archaeology as it could in historiography, philosophy, economics, and similar disciplines because the Yugoslav and Slovene Marxist ideologists were not capable of providing an applicable apparatus. Consequently, the positivist and culture-history paradigm in archaeology not only persisted but also further developed.

The late 1940s and 1950s were formative years that were decisive for the establishment of a stable archaeological institutional and conceptual framework. The formative process concluded in the mid-1970s when two networks were established: a network of regional Offices for Protection of Natural and Cultural Heritage and a network of regional museums. After that point the institutional framework remained largely unchanged. Today, there are three national archaeological institutions (the National Museum; the Institute of Archaeology of the Slovene Academy of Arts and Sciences, Department of Archaeology, University of Ljubljana; and the Agency for Protection of Cultural Heritage, with seven regional offices) and ten regional museums. The stability of the institutional and conceptual framework can be seen in the developments after 1991. Although Slovenia underwent another radical political change and became an independent, democratic state, the functioning of archaeological institutional and the conceptual frameworks were not affected. In fact, the only notable change was the development of contract archaeology on a much larger scale.

Conceptual Issues

The 1950s and 1960s witnessed the first clear division of specialization in archaeological periods among Slovene archaeologists. Their field was organized in five subdivisions: Paleolithic and Mesolithic archaeology (traditionally the domain of the naturalist scholars); Neolithic and Eneolithic archaeology; Bronze and Iron Age archaeology; Roman archaeology (classical and provincial); and early Medieval and Slavonic archaeology. This structure is largely intact today.

The field's major effort in this period was the Archaeological Map of Slovenia project,coordinated by the Institute of Archaeology. In 1966, after almost fifteen years of intensive work, the data were collected, but it took another ten years to revise the data and publish *Arheološka najdišča Slovenije* (Ljubljana 1975). This gazetteer of sites and monuments contained more than 3,000 entries from the Paleolithic to the early Medieval period (nearly ten times more than any previous archaeological map). Particularly important was the series of syntheses on settlement history for each archaeological period, the first studies of this kind based on highly detailed information.

The archaeologies of the individual periods in Slovenia also needed new conceptual tools. Indeed, the only branch that was developed in the prewar period to a level comparable with

at U.S. and British universities, and joint projects in Slovenia and elsewhere. These developments have also provided something of a counterpart and a challenge to the mainstream culture-history approach.

At the same time, the scholars who came from Gabrovec's school of prehistoric archaeology-Biba Teržan, Mitja Guštin (from the University of Ljubljana), and Janez Dular (from the Institute of Archaeology)-decisively contributed to the further development of a distinctive school of prehistoric research that is well respected on an international level.

In the 1980s and 1990s other fields of archaeological research also gained recognition on the international level. In numismatics, for example, A. Globočnik and P. Kos, after less than four decades of systematic work, were able to present rich collections on an exemplary level. Šašel's work became a reference for the epigraphy and ancient history of Roman Pannonia, Noricum, Dalmatia, and Venetia et Histria, and the very high standards he set are continued in the work of M. Šašel Kos.

Slavonic archaeology was established in a proper sense only after 1945, and in its first years it was beset by political problems arising from World War II, as well as conceptual disputes with historians about its interpretative potentials. Yet, despite all these constraints, it has matured admirably in recent decades and become a respected discipline with a developed critical apparatus.

Predrag Novakovic

See also

Most na Soči

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Smith, Sir Grafton Elliot

(1871-1937)

Born in Grafton, New South Wales, Australia, Smith graduated with a degree in medicine from the University of Sydney in 1895. He won a scholarship and traveled to Cambridge to further his anatomical research. In 1900 he became professor of anatomy in Cairo, Egypt, and returned to England in 1909 as anatomy professor at Manchester University. In 1919 he became professor of anatomy at University College London. He received a Fellowship of the Royal Society in 1907, a Royal Medal in 1912, and a knighthood in 1934.

During his time in Cairo, Smith was a major participant in the planning and completion of the

Archaeological Survey of nubia. The creation of the Aswan Dam in 1902 had caused widespread flooding, which had destroyed many monuments and sites. When the Egyptian government decided the water level of the dam had to be raised another 7 meters, it was decided that this time they would record all threatened antiquities and examine and photograph all burials that would be destroyed by the new water levels-hence the survey. More than 10,000 burials were recovered and studied, the largest sample of burials ever excavated from an archaeological site. This was also the largest skeletal population ever studied and it revealed the prevalence of many interesting diseases and provided a detailed picture of everyday life and death in Egypt. The methods Elliot Smith and his colleagues developed during these studies changed the nature and significance of paleopathology forever.

Smith also contributed to the ongoing debate about primate evolution, believing that it was characterized by an increase in neurological sensory development in the areas of sight and hearing. He examined the Piltdown skull and declared it “the most primitive and most simian of human brains so far recorded,” lending some credibility to this scientific hoax at the time of its perpetration.

Elliot Smith's interests in and thoughts about ethnology and paleopathology, the results of his participation in the Archaeological Survey of Nubia, later led him to theorize that all cultural development-especially agriculture, pottery, clothing, monumental architecture, and kingship-had originated uniquely in Egypt, "the cradle of civilization," and then Egyptian merchants had carried Egyptian innovations and culture and spread them to the rest of the world. His books *The Migrations of Early Culture* (1915) and *The Ancient Egyptians and the Origin of Civilizations* (1923) elaborate these "hyper-diffusionist" ideas and were popular at the time of their publication.

Sir Grafton Elliot Smith

(Image Select)

Tim Murray

See also

Piltdown Forgery; Reisner, George Andrew

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Smithsonian Institution

Although the Smithsonian Institution (SI) became operational in 1846, its foundation actually stemmed from an 1835 bequest by James Smithson, an Englishman who had never visited the United States. Smithson's gift of over half a million dollars created one of the most significant institutions in the history of U.S. archaeology as part of one of the world's leading museum organizations.

Under its first secretary, John Henry, the Smithsonian made a vital contribution to the archaeology of North America when it published Ephraim G. Squier and edwin h. davis's *Ancient Monuments of the Mississippi Valley in 1848.* Its influence continued with the publication of Samuel Haven's *The Archaeology of the United States, or Sketches Historical and Biographical, of the Progress of Information and Opinion Respecting Vestiges of Antiquity in the United States* (1856). Both works had a significant impact on the history of prehistoric archaeology in North America.

The Smithsonian soon became an important element in the U.S. government's network of information sources, and its prominence in this arena remains undiminished. Not only would it become a storehouse of national knowledge, it would also use that knowledge in the service of government. In this sense the Smithsonian responded to a thirst for knowledge about the United States and through its work increased the desire for knowledge. This was especially true in the case of ethnology and archaeology. In 1861 the SI published "Instructions for Research Relative to the Ethnology and Philology of America" by George Gibbs, which mirrored the scope and purpose of the famous "Notes and Queries" produced by the British Association for the Advancement of Science. Gibbs's questionnaire, included in the instructions, was used by many of those undertaking primary ethnological and archaeological research, as well as others, such as missionaries and government agents, who sought a more direct understanding of indigenous Americans. In 1864, the SI sought to gather information about collections of artifacts derived from earthworked archaeological sites known as "mounds" and also about the "moundbuilders" who

built them in order to

divide), the Smithsonian has been responsive to the interests and concerns surrounding the Native American Graves Protection and Repatriation Act (NAGPRA) legislation.

Tim Murray

See also

Atwater, Caleb; Jefferson, Thomas; Moundville

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Society for American Archaeology

The Society for American Archaeology, founded in 1934, is an organization of professional and avocational archaeologists devoted to the study and preservation of the archaeology of North and South America. The 1930s were a period of tremendous growth in American archaeology-many state archaeological societies were founded, and new regional conferences provided forums for local archaeological communication. The Great Depression actually led to a vast increase in archaeological fieldwork as a way to relieve unemployment, and the increased work led to new organizations, new journals, and a perceived need for greater communication among archaeologists on the national level.

Concurrent with the increased scientific archaeological activity was increased looting and vandalism of sites. A number of archaeologists felt the need for better communication and cooperation between amateurs and professionals as well as for more effective communication within the archaeological community. Since 1920, the Committee on State Archaeological Surveys (COSAS) of the National Research Council had served as a clearinghouse for U.S. archaeology-promoting the formation of state archaeological surveys, publishing guides to archaeological fieldwork and site recording, and organizing regional conferences. The American Anthropological Association (AAA) also served as a focus of

archaeological communication through meetings and publications. *American Anthropologist* was the journal of choice for professional archaeological articles of national interest, and until 1932, it published an annual compilation of archaeological fieldwork in the United States. COSAS was quite successful in its endeavors, but its last chairman (1927-1937), Carl E. Guthe, realized that the committee's private funding would not be continued indefinitely. This fact, along with the unwillingness of the editor of *American Anthropologist* to continue publishing the annual archaeological fieldwork summary, created the need for a national organization.

In 1933, COSAS members approved the idea of a national archaeological organization, and in 1934, Guthe sent a prospectus to 192 interested individuals for comment. Response was positive enough that COSAS formed a subcommittee to write a constitution and bylaws, and an organizational meeting held in Pittsburgh, attended by 31 people, created the Society for American Archaeology on 28 December 1934 (Griffin 1985; Guthe 1967).

The society's activities originally were governed by an elected executive council consisting of a president, vice-president, secretary-treasurer, editor, and eight other members. As the years passed, the composition of the council (later called the executive committee and finally the executive board) changed with the needs of the society. A nominating committee has always

guidelines for archaeological reports, communication, archaeology and Native Americans, and certification (McGimsey and Davis 1977).

The problem of site looting and vandalism was one of the factors that influenced the original founding of the society, and official activities of the society on this issue have usually been in the form of editorials in *American Antiquity*. Activities on the international level have included authorizing the use of society funds to assist in prosecuting an illegal antiquities case (1972) and a long-term effort leading to implementation of the UNESCO Convention on Cultural Property in 1983. On the national level, the society began a major antilooting project, Save the Past for the Future, in 1988.

During its more than sixty years, the SAA has evolved from a national learned society concerned principally with communication among scholars through meetings and publication to an international professional society concerned with influencing governmental activities and defining professional standards as well as including the interests of non-U.S. Americanist scholars. The archives of the society are located in the National Anthropological Archives of the National Museum of Natural History, Smithsonian Institution.

Andrew L. Christenson

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Society for Historical Archaeology

In early January 1967, an ad hoc Committee of Fifteen, made up of most of the leading historical archaeologists in the Americas, met in conjunction with an International Conference on historical archaeology in Dallas, Texas, and over a three-day period organized the Society for Historical Archaeology (SHA). The new society's origins can be traced back over three decades before the meeting in Dallas. Special symposia at both the society for american archaeology (SAA) and the American Anthropological Association and the 1960 creation of the more-regional Conference on Historic Site Archaeology by Stanley South served as precedents. By the middle of the 1960s, the growing community of historical archaeologists realized that the SAA, which was dominated by New World prehistorians, could not represent their developing interests and that their numbers were now adequate to support an autonomous association.

Independence and formal organization led to visible success and rapid growth, with the SHA

becoming the central social, and to some degree intellectual, base for the emerging discipline. By the 1990s, its annual meetings, held in January, had more than 1,000 attendees, and its quarterly journal, *Historical Archaeology,* and substantial *Newsletter* had gained international standing and distribution. Although fundamentally a scholarly association, the SHA has also served as an effective lobbying base, as is seen by its primary role in the passage of the 1987 Abandoned Shipwreck Act by the U.S. Congress.

Phenomenal growth has resulted in a 2,000 individual membership, which makes the SHA the second-largest association of anthropological archaeologists in the world. Nevertheless, these numbers have not created an economy of scale. Across its three-decade history, a small number of dedicated volunteers have preserved and nurtured the society. The terms of office of the journal editor, Ronald L. Michael (1978- 2001), the recent book review editor, Roderick Sprague (1977-1997), secretary-treasurer, Stephanie H. Rodeffer (1978-2001), and newsletter editor, Norman Barka (1982-2001) highlight this unusual situation for a mature and national-international organization.

Even though the core of its membership is in North America, the SHA has always been international in its orientation. In 1967, scholars from canada and mexico joined their colleagues from the United States at the Dallas meeting, and during the 1960s and 1970s, the society built early linkages to both the Society for Post-Medieval Archaeology in Europe and the Australasian Society for Historical Archaeology in Oceania. The SHA is the only truly global organization in the field; it is also one of the few of these collateral associations to self-reflexively recognize its own disciplinary history. In 1981, it created the j. c. harrington medal in historical archaeology and followed that in 1989 with the Carol V. Ruppé Distinguished Service Award and in 1998 with the John L. Cotter Award. It also established the flexible and successful category of SHA awards of merit.

The Society for Historical Archaeology, and parallel organizations in North America (including the Advisory Council on Underwater Archaeology, long associated with the SHA; the Society for Industrial Archaeology; the Council for Northeastern Historical Archaeology; and the former [1960-1982] Conference on Historic Site Archaeology) and similar scholarly associations overseas, have been pivotal in the history and growth of the discipline.

Robert L. Schuyler

See also

Africa, South Historical; Australia, Historical; Caribbean; United States of America, Prehistoric Archaeology

Society of Antiquaries of London

The Society of Antiquaries of London, founded in 1707, is the oldest learned society in Great Britain and Ireland concerned with archaeology and history. The Elizabethan College of Antiquaries, with such scholars as william camden, Sir Robert Cotton, and John Stow, disbanded in the reign of James I (van Norden 1946). The Royal Society, founded in 1660, had an early interest in historical monuments such as avebury (Ucko et al. 1991) and published much material on archaeological finds in its *Philosophical Transactions,* but by the end of the eighteenth century, its attention was focused purely on science.

The Society of Antiquaries of London was founded by three friends-Humfrey Wanley, John Talman, and John Bagford-who met informally in various London taverns. At the time, people who were interested in the physical and documentary evidence of the past were called antiquaries. The society has a continuous history from 1717, when there were twenty-three members, and the first Articles of Association defined

the purpose of the new society as making knowledge of British antiquities more universal (Evans 1956). The Society of Antiquaries of London's early *Minutes* recorded the discoveries and exhibits of members, often with drawings, and are still of great interest. The drawings by the director, Charles Frederick, of the Arreton Downs hoard on the Isle of Wight, found in 1734, has made it possible for a group of Bronze Age metalwork items, now widely dispersed, to be reconstituted by later scholars and given their true provenance (Needham 1986).

The first secretary after 1717, william stukeley, made important discoveries at Stonehenge,

PREV NEXT

made by both the society and its fellows to archaeology over nearly 300 years have been considerable.

Bernard Nurse

See also

Britain, Prehistoric Archaeology

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society of antiquaries of scotland

The second-oldest antiquarian society in Great Britain, the society of antiquaries of scotland was founded in 1780. David Steuart Erskine, eleventh earl of Buchan, called a meeting of eminent historians and antiquaries at his home in St. Andrews Square in Edinburgh on 14 November, and the new society was formally constituted on 18 December. Its first meeting followed on 16 January 1781, and it set the pattern for years to come: an academic lecture and a display of items donated to the society's museum. In the terms of the charter granted in 1783, the aim of the society was "to investigate both antiquities and natural and civil history in general," and King George III and his successors were to be the society's patrons. The current laws of the society define its purpose as "the study of the antiquities and history of Scotland, more especially by means of archaeological research." The society was granted a coat of arms in 1827.

The publication of academic papers began in 1792 with the first volume of the *Transactions;* the name of the journal was changed with volume four in 1831 to *Archaeologia Scotica,* and its publication ceased with volume five in 1890. It was replaced by the *Proceedings of the society of antiquaries of scotland,* the first volume of which was published in 1854, and it remains the primary journal of archaeological record in Scotland (Graham 1969-1970). The society's minute books and correspondence, together with original drawings and manuscripts of antiquarian interest, are in the National Museums of Scotland Library, and other manuscripts formerly belonging to the society are in the National Monuments Record for Scotland.

Initially, the society occupied a number of different properties in Edinburgh, and at one time it shared a building with the Royal Society of Edinburgh. As the collection grew in size and importance, however, concern about its long-term future led to the transference of responsibility for its housing and financing to

the government in 1859, in return for which the society agreed to give the collection to the nation. In 1890, the museum was moved to a purpose-built museum and portrait gallery in Queen Street; an ornate building was designed by Rowand Anderson in the Italianate Gothic style.

The museum had become the National Museum of Antiquities of Scotland, and the society had rooms, including a splendid library, in the new building. An act of Parliament in 1954 relieved the society of the management of the museum, but the library remained mutual and the society continued to be housed by the museum. The name of the museum was changed to the Royal Museum of Scotland when it was amalgamated by an act of Parliament in 1985 with the Royal Scottish Museum under the overall title National Museums of Scotland. Before the end of the twentieth century, the Scottish collections were to be redisplayed in a new building in Chambers Street, and the society was to move into new rooms there.

Members of the society are known as fellows and are admitted by election. There were 50 fellows in 1780 and almost 3,000 in the 1990s. Membership is worldwide and includes both professional and amateur archaeologists and historians. There are also up to 25 honorary fellows, elected in recognition of their services to

Scottish or international archaeology and history. Office-bearers consist of a president, three vice-presidents, a treasurer, and an editor, and there is currently a professional staff of three, headed by the director of the society. The society celebrated its bicentenary in 1980 with special meetings and exhibitions, and a commemorative medal was struck in bronze for fellows and in silver as a presidential badge of office. A volume of essays about the society, the museum, and leading antiquarians was published to mark the bicentennial year (Bell 1981).

From the 1850s onward, reports of excavations featured strongly in the *Proceedings,* and the society sponsored its own excavations from the 1890s to the 1930s, including work on the Roman forts at Birrens, Ardoch, Inchtuthil, and Newstead; the native forts at Dunadd and Traprain; the broch at Gurness; and the Viking settlement at Jarlshof in the Shetland Islands. Although the society no longer conducts excavations today, it supports excavation and research through grants awarded from its research fund and through conferences.

A leading fellow of the mid-nineteenth century, A.H. Rhind, funded an annual lectureship that began in 1876-1878 with a series of lectures on Scottish ethnography by Sir Arthur Mitchell; these lectures were published as *The Past in the Present* (1880). The next series was given by Joseph Anderson, the keeper of the society's museum from 1869 to 1913. His lectures represented a milestone in Scottish archaeology because of their scientific analysis of sites and artifacts, and they were published in two volumes as *Scotland in Early Christian Times* (1881) and in another two volumes as *Scotland in Pagan Times* (1883-1886). The prestigious Rhind Lectures still continue to provide a platform for scholars to present the most up-to-date research in a wide variety of archaeological, historical, architectural, and ethnographical fields.

Apart from the *Proceedings,* there have been occasional publications such as the great tome *The Early Christian Monuments of Scotland* (1903) by J. Romilly Allen and Joseph Anderson, and since 1982, the society has published its own series of monographs, mostly recording excavations in Scotland. From its inception, the society has been consulted on important developments relating to Scottish history and archaeology, and it continues to have a powerful voice on matters concerning Scotland's heritage and the management of archaeology in Britain.

Anna Ritchie

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Society of Dilettanti

Founded in 1734 in London by a group of gentlemen who had taken the grand tour of Europe, the primary purpose of the Society of Dilettanti was to promote the study of classical antiquities. The society gained great fame during its history by funding research, the most important being a survey of Athenian monuments by James Stuart (artist) and Nicholas Revett (architect), which took place between 1751 and 1754, and a highly detailed survey of the ruins of Ionia by Richard Chandler beginning in 1765. The society sealed its place in the history of archaeology by publishing both surveys. Stuart and Revett produced the four-volume *Antiquities of Athens* (1762-1816), and Chandler brought out *The Antiquities of Ionia* (1769-1797).

Tim Murray

See also

Elgin, Lord; Greece; Turkey

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Solutré

Solutré, an open site in the Ardèche region of southeastern france, was selected in 1869 as the type site for the Solutrean industry. The site is located at the base of a cliff and dates from about 30,000 b.p. to 17,000 b.p. Solutré contains an excellent sequence of French Paleolithic industries from the Mousterian to the Magdalenian, but it is most famous for the presence of the distinctive laurel leaf points and shouldered points that are characteristic of

Scottish or international archaeology and history. Office-bearers consist of a president, three vice-presidents, a treasurer, and an editor, and there is currently a professional staff of three, headed by the director of the society. The society celebrated its bicentenary in 1980 with special meetings and exhibitions, and a commemorative medal was struck in bronze for fellows and in silver as a presidential badge of office. A volume of essays about the society, the museum, and leading antiquarians was published to mark the bicentennial year (Bell 1981).

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Tim Murray

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Lithic Analysis

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South Asia

Introduction

Considering the enormous geographical area involved, the number of its modern nation states, and the rich spectrum of its archaeology, one would expect the literature on the history of archaeology in South Asia to be fairly analytical and detailed. This is not the case. Straightforward narrative accounts, sometimes viewed in relation with contemporary government policies and other historical factors, are available for the period up to 1947 when the British rule of the subcontinent ended (*see* Roy 1953, 1961; Ghosh 1953; Allchin 1961; Imam 1966; Chakrabarti 1988a, 1988b; Possehl 1990; Mirsky 1977). These histories deal fully (*see* Roy 1961; Chakrabarti 1988a) or partly with the history of archaeology in British India, which was dominated almost exclusively by the official Archaeological Survey of India that came into existence, although tentatively, in 1861. But at least two other dimensions of this period remain unresearched. First, some major "native" states of the subcontinent that enjoyed varying degrees of autonomy during British rule, such as Hyderabad, Mysore, Travancore, Gwalior, Kashmir, Baroda, and Nepal, ran, on the British Indian model, their own archaeology departments. The history of these departments lies untouched. Second, the different nuances between archaeology and nationalism provide great scope for research, especially in view of the long struggle for Indian independence, but this is another field of study that remains neglected. The development of the concept of an Indian past among the different sections of Indian people is closely related to this issue. The main source of study in this case is the great amount of vernacular literature from the second half of the eighteenth century onwards in different parts of the country in different major languages. This concept has to be seen separately from the Western concept of the past of India. In any case, the interaction between these two major concepts of the Indian past should provide a separate field of study in itself.

After 1947 the history of subcontinental archaeology becomes the history of archaeology in its different nation-state components. For obvious historical reasons, one of which is the difference in majority religion between these countries (Hinduism in India and Nepal, Islam in Pakistan and Bangladesh, Buddhism in Bhutan), the concept of the past in these individual nation states need not exactly be the same. Still, the model of archaeological organization in them has a lot in common because of close ancestral links with the pre-1947 Archaeological Survey of India, and, more significantly, this possible difference in attitudes to the past has not changed the pattern of archaeological research in these countries. Also, the interaction between the Western concept of the past of South Asia and the concept of the past developed by South Asians themselves merits close study even in the post-1947 period, mainly to analyze the extent to which the hegemonic ideas of Western Indology still retain their grip over the intellectual tradition in a Third World region like South Asia.

The Beginning

The middle of the eighteenth century is as convenient a starting point for South Asian archaeological studies as any. At about this time Anquetil du Perron, a Frenchman with knowledge of Oriental languages, and Karsten Niebuhr, a Danish engineer and voyager, wrote about the need to open up India as a field of scientific inquiry. They also prepared measured drawings of the West Indian monuments of Elephanta and Kanheri, both easily accessible to Europeans because of their proximity to Bombay. In fact, these and other conveniently located monuments had been drawing the attention of European travelers and sailors since the sixteenth century, and although most of these descriptions were fanciful and deprecatory, some writers like the Italian Pietro della Valle of the seventeenth century insisted on some accuracy, aided in the case of della Valle by a few temple plans. There are two other reasons for selecting the mid-eighteenth century as our starting point. First, in 1753 J.B. D'Anville, a French geographer, published a book on Indian geography with detailed discussions of the locations of some ancient sites mentioned in classical writings on India. Second, in the writings of the French philosophers of Enlightenment, which attempted to move away from Judaeo-Christian thought, there was a strong emphasis on India as the original center of culture and religion (seeMitter 1977; Chakrabarti 1988a, 1-15).

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The Asiatic Society of Bengal

An institutional focus of inquiry into the history and antiquities, the arts, sciences and literature of Asia was provided by the Asiatic Society of Bengal, established on 15 January 1784 in the contemporary British Indian capital of Calcutta with the Governor General Warren Hastings as its patron and William Jones, a senior judge, as the president. The ascending British supremacy in India, the trend of forming "societies" for scientific and other investigations in contemporary Britain, and a concern with "how far the products of India could be turned to account" explain the establishment of this institution. A major focus of interest was to understand Indian civilization in light of the contemporary notions of Universal History, which, because of its implicit acceptance of the biblical theory of creation, found no difficulty in believing that all human families were related and that one of the major tasks of historical investigation in India was to seek out proof of such relations. Having argued that the race he called Indian was descended from Ham, one of the three sons of Noah, Jones traced the ramifications of this concept in various fields of Indian endeavor, including Sanskrit, the speakers of which were supposed to have "had an immemorial affinity with the old Persians, Ethiopians and Egyptians, the Phoenicians, Greeks and Tuscans; the Scythians or Goths, and celts; the Chinese, Japanese and Peruvians…" (Jones 1788). Interests in India both as the original center of civilization and for the identification of its ancient sites continued during this period. Among other things, Indian priests were supposed to have moved out of a climatically more equable central Asia, spreading civilization wherever they went (Chakrabarti 1976). In the field of historical geography there were some significant publications, notably those by James Rennell, whose *Memoir of a Map of Hindoostan,* which combined both modern and ancient data, "one illustrating and explaining the other," underwent three editions between 1783 and 1793 (Chakrabarti 1988a, 14, 16-18).

The Leadership of james prinsep

Field archaeology gained no momentum until the 1830s, although some major archaeological sites were noticed by then in a few regional surveys (Roy 1953). The man who inspired field-archaeological studies was James Prinsep, Assay Master of the British mint in Calcutta, Secretary of the Asiatic Society of Bengal, and the principal decipherer, in collaboration with Indian traditional language scholars, of the ancient Indian scripts of Brahmi and Kharoshti. His attitude toward field research is clear from his statement, "What the learned world demands of us in India is to be quite certain of our data, to place the monumental record before them exactly as now exists, and to interpret it faithfully and literally" (Prinsep 1838).

One of the major developments of the period was the enumeration and excavation of Buddhist funerary remains, called stupas, in the northwestern part of the subcontinent. Leadership in this matter was given by some European army officers in the employ of the contemporary Sikh ruler of the region, Ranjit Singh, but nobody expressed it better than Alexander Burnes of the Bombay Army, who in his quest for the stupas and "Grecian remains" found himself referred from place to place "like one in search of the philosopher's stone" (Burnes 1833). None, however, was more extensive in his observations and collections in this region than Charles Masson (Possehl 1990), an alias for James Loews, who deserted from Bengal Horse

The Asiatic Society of Bengal

An institutional focus of inquiry into the history and antiquities, the arts, sciences and literature of Asia was provided by the Asiatic Society of Bengal, established on 15 January 1784 in the contemporary British Indian capital of Calcutta with the Governor General Warren Hastings as its patron and William Jones, a senior judge, as the president. The ascending British supremacy in India, the trend of forming "societies" for scientific and other investigations in contemporary Britain, and a concern with "how far the products of India could be turned to account" explain the establishment of this institution. A major focus of interest was to understand Indian civilization in light of the contemporary notions of Universal History, which, because of its implicit acceptance of the biblical theory of creation, found no difficulty in believing that all human families were related and that one of the major tasks of historical investigation in India was to seek out proof of such relations. Having argued that the race he called Indian was descended from Ham, one of the three sons of Noah, Jones traced the ramifications of this concept in various fields of Indian endeavor, including Sanskrit, the speakers of which were supposed to have "had an immemorial affinity with the old Persians, Ethiopians and Egyptians, the Phoenicians, Greeks and Tuscans; the Scythians or Goths, and celts; the Chinese, Japanese and Peruvians…" (Jones 1788). Interests in India both as the original center of civilization and for the identification of its ancient sites continued during this period. Among other things, Indian priests were supposed to have moved out of a climatically more equable central Asia, spreading civilization wherever they went (Chakrabarti 1976). In the field of historical geography there were some significant publications, notably those by James Rennell, whose *Memoir of a Map of Hindoostan,* which combined both modern and ancient data, "one illustrating and explaining the other," underwent three editions between 1783 and 1793 (Chakrabarti 1988a, 14, 16-18).

The Leadership of james prinsep

Field archaeology gained no momentum until the 1830s, although some major archaeological sites were noticed by then in a few regional surveys (Roy 1953). The man who inspired field-archaeological studies was James Prinsep, Assay Master of the British mint in Calcutta, Secretary of the Asiatic Society of Bengal, and the principal decipherer, in collaboration with Indian traditional language scholars, of the ancient Indian scripts of Brahmi and Kharoshti. His attitude toward field research is clear from his statement, "What the learned world demands of us in India is to be quite certain of our data, to place the monumental record before them exactly as now exists, and to interpret it faithfully and literally" (Prinsep 1838).

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Artillery in 1827. In the southern part of the country there was a period of “barrow-hunting,” when megalithic burials of various kinds were dug in their hundreds by British officials in the cool of the Nilgiri hills or literally in their backyards. At Jiwarji in the Deccan, Captain Meadows Taylor (1851) in his digging employed more care and precision than others. On the north Indian plains some major historical sites were identified or recorded during this period, the foremost coming from alexander cunningham, a military engineer and a close associate of Prinsep. In the newly translated itineraries of the two famous Chinese pilgrims to India-Fa-Hian (early fifth century a.d.) and Hiuen-Tsang (the first half of the seventh century a.d.)-he found an important geographical base for conducting ground investigations. One could follow the pilgrims in their travels and mark out the places they reported. In 1843 he discovered the location of the early historic city-site of Sankisa in Uttar Pradesh by following this method (Cunningham 1843), but systematic surveys had to wait until 1861 when the government established an organization for the purpose, with Cunningham (then retired with the rank of Major General) at its head. In 1865 the Archaeological Survey of India was disbanded, to be reorganized in 1871 with Cunningham again in charge, this time with the services of two assistants, J.D. Beglar and A.C.L. Carlyle. Beglar left this job in 1880 and was succeeded by H.B.W. Garrick.

The Surveys of Alexander Cunningham (1861-1865, 1866-1885)

Cunningham conducted his surveys across the entire area between the northwestern hills and the Bengal delta, including the Vindhyan orbit in central India, eastern Rajasthan, the Chhotanagpur hills, and Orissa in eastern India. Some of the work was done by his assistants but the principal work was done by Cunningham personally. The results of these surveys were incorporated in twenty-three volumes published between 1871 and 1887 (Imam 1966).

The standard features of a Cunningham report are the following: a ground survey studying the height, character and extent of the mounds, including their structural features and the plans and measurements of the more important of them; the record of their local traditions; the mention, if any, of the place in the ancient Indian literary texts; the description in Hiuen-Tsang's and/or Fa-Hian's records; an attempt to identify the various sacred spots, monasteries, stupas, etc. in Hiuen-Tsang's and Fa-Hian's account of the place with the various surviving features on the ground; and the mention of the still available coins, images and inscriptions at the place with notes on them. To do all these even in the context of a single site would require a strong measure of versatile scholarship and practiced eyes. What lends Cunningham's survey work great distinction is that he could set down these points for hundreds of sites of different types throughout north India.

(Chakrabarti 1988a, 59)

The basic achievement of these surveys was the mapping out of sites on a large scale and this was something like the achievement of the Great Trigonometrical Survey of India, which mapped out the Indian landmass in considerable detail.

Archaeology as Architecture (1885-1901)

There was a sharp contrast in archaeological attitude between Alexander Cunningham and his successor James Burgess (1886-1889), who had considerable prior experience as an architectural surveyor in Gujarat and the Deccan and to whom archaeology was nothing but architectural study (Burgess 1905). The last quarter of the nineteenth century witnessed the publication of many studies of ancient and medieval monuments, principally by “provincial” surveyors, such as James Fergusson and R.L. Mitraand, under Burgess, and some by Burgess himself. At the same time the study of ancient Indian epigraphy was undertaken by a specially appointed government epigraphist and a curator of ancient

monuments, to which Captain H.H. Cole (1880-1883) was appointed. This marked a departure from the earlier government attitude, reflected by its resolution to auction the Taj Mahal for the value of the marble of its construction-a resolution mercifully abandoned later. One of the significant field-archaeological

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investigations of this period was the exploration of the ancient city of Pataliputra, modern Patna, by L.A. Waddel of the Indian Medical Service. In the course of a hurried visit to Patna in 1892 he was surprised to find that not only was the ancient city practically intact but that "most of the leading landmarks of Asoka's palaces, monasteries and other monuments remained so very obvious" as to enable him "in the short space of one day to identify many of them beyond all doubt" (Waddel 1903). Excavations began at this site under the Public Works Department in 1894 and the general identifications, proposed by Waddel on the basis of his keen eye for the details on the ground and a close familiarity with the literary data on the topography of the place, were confirmed.

The John Marshall Era (1902-1944)

The fortunes of archaeological research in India changed considerably during the Viceroyalty of Lord Curzon, who took personal interest in such a non-revenue-earning matter as archaeology. Curzon imported the 26-year-old john marshall, an alumnus of King's College, Cambridge, with some archaeological experience in greece and turkey, and appointed him the director general of archaeology. As subsequent developments proved, he could not have chosen better. To begin with, various aspects of archaeology in India-explorations, excavations, conservation of ancient monuments, and epigraphy-were consolidated within the aegis of the Archaeological Survey of India. Archaeological research and the task of conservation came to be considered as permanent government responsibilities, which in itself was a very big step forward. The director general could now lay down clearly defined policies for his officers in various regions. Moreover, a system of publishing annual reports containing detailed accounts of the manifold activities of the survey was introduced right from the first year of Marshall's office (1902-1903). These volumes, the publication of which continued up to 1937, were substantial scholarly and administrative endeavors. Finally, there was a system of awarding annual research scholarships, one for Sanskrit and another for Persian and Arabic, to two students at Indian universities, enabling the induction of Indians at a superior level in the survey, which fostered over many years a strong core of primary scholarship. Epigraphical studies received much-needed impetus with the regular publication of *Epigraphia Indica.* On the whole archaeology was put on an even keel right from the early days of Marshall's director generalship.

In field archaeology the first great achievement of the Marshall era (notwithstanding his personal retirement in 1928-1929) lay in the excavations of major historical sites in virtually all areas of the subcontinent, which continued until 1944. It is true that many of them were mapped out by Cunningham but the details still needed working out with the help of physical excavation. From the Indian perspective, throughout the nineteenth century there was a constant discussion in vernacular literature on the theme of India's past, especially India's ancient past. This was primarily based on literature and partly on the study of standing monuments, but there was a need for the knowledge of archaeological details. Marshall's own early works were at Charsada in the northwest and Bhita and Rajagriha in the Gangetic valley, but after these he was mostly busy with excavations at Taxila, where the landscape reminded him of Greece and where there were numerous finds to illustrate the subcontinent's link with the West Asian and Mediterranean world. Marshall's personal report on Taxila (Marshall 1951) came out in three volumes in 1951, its earlier publication being reputedly prevented by the destruction of his notes during the London blitz. The people he recruited were busy at other sites, many of which enjoyed great reputation in the annals of early historic India-Pataliputra, Vaisali, Purushapura or Peshawar, Amaravati, Nalanda, Sravasti, Kusinara, and others. In each case, as in the case of Marshall's own work at Bhita, which arrived at stratigraphy based on floor levels, the work was largely horizontal and successful in offering a visual image of the famous cities and monuments of ancient India.

The second great field achievement of the period was the discovery of the Indus Civilization, the first

formal announcement on which was made in the *Illustrated London News* on 20

September 1924. This was based on D.R. Sahni's work at harappa between 1920 and 1921 and rakal d. banerji's work at Mohenjo Daro between 1921 and 1922. It was Mohenjo Daro that received major attention, because a large section of the ruins at Harappa were destroyed by the brick-robbing activities of the contractors of the Lahore-Multan railway. The results of work at Harappa were published in 1940. However it was the three-volume *Mohenjodaro and the Indus Civilization,* edited by Marshall and including a long introduction and discussion by him on religion and art, chronology, and the like, that brought out the first integrated image of this civilization. Its town planning, its concern with water supply and sanitation, its excellently crafted glyptic art and well-ordered rows of short inscriptions on seals, the evidence of its internal and external trade, a distinct level of technological excellence, and an art and a religious system whose principal elements were carried into the later historic periods-all of these suggested to Marshall a strong factor of continuity between this Bronze Age civilization and modern India. The discovery of this unique civilization, as unique in its own way as the civilizations of Egypt, was a great achievement of the Archaeological Survey of India under Marshall. With independence in 1947, India, in the eyes of western scholarship, became part of the Third World. But Marshall never had the compulsion to denigrate India's unique antiquity, believing that the origins of historic India, including its major religion, Hinduism, could be traced back to the Bronze Age Indus civilization.

During the world Depression in the 1930s and World War II in the 1940s, archaeology survived somehow in India, although its budget was severely cut. N.G. Majumdar's surveys in Sind elucidating the antecedents and transformations of Indus civilization and the excavations by K.N. Dikshit at the major Buddhist monastery of Paharpur in eastern India belong to this period. In 1939 the government of India decided, for unexplained reasons, to seek the opinion of the famous British archaeologist leonard woolley of ur on the state of Indian archaeology. The resultant “Woolley Report,” no worse and no better than many such pontificatory reports on India by Western experts, suggested, among other things, prolonged excavations at a major historic site for “in-service” training of the survey officers and the appointment of another famous British archaeologist, sir eric mortimer wheeler, as the director general for four years.

Mortimer Wheeler (1944-1948)

Wheeler knew the value of vertical sequences established on the basis of layers, he appreciated archaeology as an academic discipline in its own right, and he fully understood the potential of the application of natural-scientific techniques in archaeology. His work at Taxila, where he operated a training school for survey recruits and university students, and at Harappa, Arikamedu, and Brahmagiri were exercises both in stratigraphic layer-based digging and in pursuing specific issues. In retrospect Wheeler's contribution to Indian archaeology lay in his determination to develop archaeology as an academic discipline in Indian universities, and this overall concern is obvious in his own writings during his stay in India in an annual publication he himself created, *Ancient India.* From the Indian academic point of view “he was no Elizabethan hero or a 'mad sahib' set among the natives to stampede them into a frenetic albeit well-ordered archaeological activity.... His role in India was basically that of a university teacher with firm, single-minded commitment to his subject” (Chakrabarti 1988a).

Prehistory until 1947

Until Wheeler organized a prehistory section in the survey, there was no official interest in prehistory, which had a checkered history of investigations in India since the early years of the twentieth century. During the second half of the nineteenth century, especially after the discovery of a hand-axe near Madras by Geological Survey of India officer robert b. foote, there were many prehistoric discoveries that were initiated almost exclusively by geologists. In 1923 an Indian teacher of anthropology at Calcutta University (Mitra 1923) published a book called *Prehistoric India.* In the 1930s, in the wake of stone tool discoveries in the outer Himalayan

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The Post-1947 Situation

After 1947, the year of Partition and Independence from British rule, the history of South Asian archaeology becomes the history of archaeological research in five nation-states: India, Pakistan, Bangladesh, Nepal and Bhutan.

Bhutan and Nepal

There are no positive reports of early sites in Bhutan, and to the best of our knowledge there has been no detailed survey work either. The Himalayan kingdom of Nepal, on the other hand, has an established government archaeology department, complemented by archaeology and ancient history teaching at Tribhuvan University, Kathmandu. Considering the nature of sites in the Kathmandu valley and the tarai region of the country, the orientation of Nepalese archaeology has always been toward sites associated with the life of the Buddha and generally Buddhism (for a comprehensive survey, *see* Slusser 1982; for a representative excavation report, *see* Mitra 1971). At one point there was a great reluctance to come to terms with the fact that the site of Kapilavastu, the capital of the kingdom where the Buddha's father was king, was, as the discovery of Kapilavastu monastic seals by an Indian team showed, at Piphrawa on the Indian side of the Nepal-India border (Rijal 1979). The birthplace of the Buddha has always been, of course, on the Nepalese side of the border. The standard archaeological publication of Nepal is *Ancient Nepal,* officially published by the government department of archaeology.

Bangladesh

Bangladesh became an independent nation state in 1971 and archaeological research there between 1947 and 1971 was conducted by the Pakistan Department of Archaeology. The principal sites are the Buddhist monastery of Mainamati, which had its heyday in the seventh and eighth centuries a.d., and Mahasthangarh, one of the most imposing early historic city-sites of the subcontinent, dating back certainly to the third century b.c. when it was a provincial administrative center of the Mauryan empire, which stretched from south Afghanistan to Bengal. Buddhist monastery sites remain the focal point of contemporary Bangladesh archaeological research. Among its official publications *Bangladesh Archaeology,* of which regrettably only one issue has been published, must be considered the most important. Archaeology is taught at only one Bangladesh university, Jahangirnagar University near the nation's capital of Dhaka. The only evidence of Stone Age industry in Bangladesh is a late Acheulean/Upper Paleolithic industry made from the locally abundant fossilwood in the Lalmai hills (Chakrabarti 1993).

Pakistan

Archaeology in Pakistan has concentrated on protohistory and on the elucidation of the process of cultural development leading up to the development of Indus civilization. Initially Baluchistan received close archaeological scrutiny, notably with the beginning of a new phase of protohistoric research in this

area by W.A. Fairservis, who was soon followed by a host of other researchers, notably B. de Cardi, G.F. Dales, and, more recently, J. Jarrige, who established the beginning of wheat-barley and cattle-sheep-goat domestication at around 7000 b.c. in the Bolan Valley site of Mehrgarh. From the point of view of subcontinental archaeology, the discovery of this level at Mehrgarh was a

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Bangladesh became an independent nation state in 1971 and archaeological research there between 1947 and 1971 was conducted by the Pakistan Department of Archaeology. The principal sites are the Buddhist monastery of Mainamati, which had its heyday in the seventh and eighth centuries a.d., and Mahasthangarh, one of the most imposing early historic city-sites of the subcontinent, dating back certainly to the third century b.c. when it was a provincial administrative center of the Mauryan empire, which stretched from south Afghanistan to Bengal. Buddhist monastery sites remain the focal point of contemporary Bangladesh archaeological research. Among its official publications *Bangladesh Archaeology,* of which regrettably only one issue has been published, must be considered the most important. Archaeology is taught at only one Bangladesh university, Jahangirnagar University near the nation's capital of Dhaka. The only evidence of Stone Age industry in Bangladesh is a late Acheulean/Upper Paleolithic industry made from the locally abundant fossilwood in the Lalmai hills (Chakrabarti 1993).

Pakistan

Archaeology in Pakistan has concentrated on protohistory and on the elucidation of the process of cultural development leading up to the development of Indus civilization. Initially Baluchistan received close archaeological scrutiny, notably with the beginning of a new phase of protohistoric research in this

area by W.A. Fairservis, who was soon followed by a host of other researchers, notably B. de Cardi, G.F. Dales, and, more recently, J. Jarrige, who established the beginning of wheat-barley and cattle-sheep-goat domestication at around 7000 b.c. in the Bolan Valley site of Mehrgarh. From the point of view of subcontinental archaeology, the discovery of this level at Mehrgarh was a

region, H. de Terra, a geologist from Yale, and T.T. Paterson, an archaeologist from Cambridge (England) formulated a scheme of river terrace successions associated with lithic industries in the Soan River Valley of Panjab (now in Pakistan). The Soan terraces were related to the evidence of four glacial phases in Kashmir, which in turn were related to the four-fold glacial cycle in the Alps, thus bringing a sense of geochronology to Indian prehistoric studies. This work enjoyed influence for a long time and generated further interest in prehistoric studies in different parts of the country. In the 1940s stuart piggott , then in the Royal Air Force in India, studied protohistoric material from Baluchistan, arranging it into regional cultures with ties to central and west Asia. But on the whole prehistoric and protohistoric studies had to wait for an upsurge in interest until the postcolonial era.

The Post-1947 Situation

After 1947, the year of Partition and Independence from British rule, the history of South Asian archaeology becomes the history of archaeological research in five nation-states: India, Pakistan, Bangladesh, Nepal and Bhutan.

Bhutan and Nepal

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momentous event. French research in this part of Baluchistan has continued, and this and other activities in this region may best be seen as the continuation of a long preoccupation in archaeological literature to understand Baluchistan as an intermediate zone between the Gulf, Central Asia, Iran, Afghanistan, and the Indus valley. In the Indus valley itself the antecedents of the Indus civilization have been highlighted by excavations at a number of sites, notably Kot Diji and Amri. The steady sequence of development toward the Indus civilization has been traced through the excavation of the dried-up drainage system of the Ghaggar-Hakra to the east of the Indus valley in Bahawalpur. R. Mughal's work in this area has revealed not only the largest agglomeration of mature Harappan sites in a single area but also the successively earlier Kot Diji/early Harappan and Hakra Ware phases, the last one possibly going back to the fifth millennium b.c. The ramifications of different protohistoric levels all over Pakistan constitute the general theme of archaeological investigations in Pakistan, and excavations at sites such as Rehman Dheri in the Gomal valley, Jalilpur near Multan in the Indus valley, Saraikhola near Rawalpindi, Lewan, and Tarakai Qila and Sheri Khan Tarakai in Bannu, have contributed to our understanding of the protohistoric cultural picture of the subcontinent. Among the classic sites Mohenjo Daro, excavated further between 1964 and 1965 with some interesting results, formed the subject of intensive ground surveys and structural documentation in recent years. Harappa has an ongoing phase of excavations with specific targets in the eastern part of the ancient city. In the area between Swat and Chitral a sequence from the third millennium b.c. has been established and is best known for the distinctive grave assemblage known as Gandhara Grave Culture. Prehistoric studies gained some prominence in recent years with the claim of 2-million-year-old artifacts at Riwat to the south of Rawalpindi, and there are other finds in the Sukkur-Rorhi hills. Among the universities, Peshawar has a full-fledged teaching program in archaeology, with one or two other universities following suit. In addition to the central government department of archaeology, there are government archaeology departments in each province of Pakistan.

India

Continuity of the pre-1947 Archaeological Survey of India is most obvious in India, partly because of the rich diversity of archaeological remains and partly because of a much greater number of archaeology-teaching universities than in the other nation-states. Indian archaeologists began where Mortimer Wheeler left off. The building up of vertical sequences and the widening of the dimension of what was already known were pursued with great vigor, which was commensurate with other spheres of national activity, such as laying the base of industrialization. Within about twenty-five years of independence Indian archaeology had undergone a sea-change in terms of activities. Before the nature of some of these activities is outlined, it is necessary to emphasize the somewhat-changed character of the relevant institutional focus. Whereas the old survey went on opening more “branches” and “circles,” now archaeology and museum directorates came up on state or provincial levels, each entrusted with the care of monuments and other archaeological activities within their own regional jurisdiction. In addition, from 1960 onwards a number of universities (twenty to twenty-five) began to offer postgraduate courses in archaeology leading up to master's and Ph.D. degrees in the subject. At about the same time, the Archaeological Survey of India began to run its own School of Archaeology for the training of university students and its own in-service officers. The universities that offered archaeology courses had usually their own excavation and exploration programs in the same way that the state departments ran their own field programs. A radiocarbon laboratory started functioning in the early 1960s. In the field of prehistory the initial cue was from the Terra-Paterson work mentioned earlier, and gradually the issues of prehistoric stratigraphy and geochronology came into focus. There was a great spurt in prehistoric discoveries, and in this field the survey was soon overtaken by the universities, where a new crop of Ph.D. students preferred to study regional prehistory and protohistory (*see* Sankalia 1974).

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Stratigraphy and typology have formed the basic archaeological parameters of Indian prehistoric studies because that was what was needed first and because geoarchaeological techniques and the necessary adjunct of radiometric dating remain undeveloped. In view of this there is an increasing emphasis on the "settlement-subsistence" approach, based on modern analogies (Paddayya 1978; Murty 1985; Nagar and Misra 1989; Misra 1989) or on the amalgamation of prehistoric data in the long-term settlement history of a geographical region (Chakrabarti 1993). Fossil evidence does not extend beyond the Mesolithic except in one case where a skull cap, presumably associated with late Acheulean artifacts and found in the cliff section of the Narmada river in central India, has been interpreted either as an Asian variety of *Homo erectus* or as an archaic *Homo sapiens.* Some cultural details are available from the Upper Paleolithic but earlier primary occupation sites associated with organic remains are still to be discovered, and their climatic background also remains to be worked out on a pan-Indian level, some regional efforts notwithstanding (*see* Agrawal 1992).

In the field of protohistory the discovery of Indus civilization sites on a large scale within Indian territory was among the primary archaeological targets after Independence, and the rapidity with which the vast space of Gujarat, Rajasthan, Haryana, eastern Panjab, and western Uttar Pradesh came to be dotted with "Harappan" sites of early, mature, and late denomination is enviable by any standard of archaeological research (for maps, *see* Joshi, Bala, and Ram 1984). Major excavations of Harappan sites in modern India include those at Rupar, Lothal, Kalibangan, Surkotada, Banawali, and Dholavira, all undertaken by the archaeological survey. Another major breakthrough in this context has been the discovery of a late Harappan phase in Maharashtra and Malwa. The regional protohistoric data are ever increasing in quantity. All major agricultural regions of India have their protohistoric antecedents, and again the discovery of this horizon is among the bright spots of archaeological research since 1947 (*see* Sankalia 1974).

Discoveries of the historical period have been no less abundant, and there is now a much clearer appreciation of early historic and later India as parts of the cultural development with protohistory and prehistory at its roots. Both civic and religious sites have been identified and excavated all over the country.

Dimensions of Archaeological Research in the Third World: Examples from Modern India

In any global survey of the history of archaeological research it would be invidious not to draw a distinction between the contexts of this research in the First and Third Worlds. Archaeological literature unconsciously hides this distinction because, generally speaking, data from the Third World are discussed primarily on the basis of the work done in those areas by experts from the First World and published in First World languages. However well meaning such archaeologists and their publications are, they have taken upon themselves the task of interpreting the past heritage of a very large number of people who belong to various nation states and who may themselves like to interpret their own past. No understanding of the context of archaeological research in India can be meaningful unless it is put firmly in the context of the broader framework of archaeological research in the Third World done by Third World archaeologists themselves. If Third World archaeology is to go anywhere, it must first learn how not to imitate the fashions and jargons of First World archaeology, with which, for various historical reasons, it cannot cope satisfactorily anyway. It has to pose problems that are meaningful and necessary in its own contexts and that can be pursued and solved by its own resources. To begin with, it has to be vigorously empirical and at least try to reach a position in which the basic questions regarding the past of the nation concerned can be answered in a way that will be understood by most of the population.

One of the unifying features of Third World archaeology is that there is far less money to spend on conservation and archaeological research. This paucity of money is glaringly manifest in the general

absence of scientific analytical

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Spain

The development of archaeology in the territory of the Spanish state has been marked by the long history (beginning in the fifteenth century) of that state's unity and by the discipline's strong dependence on state institutions. The latter factor enables us to link the general situation in Spain to the trajectory of archaeological practice in its various historical subdivisions (prehistoric, proto-historic, classical, medieval, American, Oriental). Thus, the history of Spanish archaeology can contribute to the debate on scientific neutrality by demonstrating the interdependence between science and society in a particular case.

The intellectual currents that marked Spanish archaeology's development are analogous to those in other European countries (Suarez Otero 1993, 331): (1) the antiquarianism and learning that largely inspired classical archaeology from the Renaissance to the nineteenth century; (2) the enlightened concern, linked with the natural sciences, with the antiquity of humanity and its early cultures that led to the origin of prehistoric archaeology in the last third of the nineteenth century, and (3) the ideologically motivated search for, and celebration of, national identity (Gilman 1988, 47-50) that influenced all archaeological practice-more specifically, medieval (Salvatierra 1990, 71-72) and proto-historic (Ruiz Zapatero 1993a, 40)-as well as Spanish archaeological research abroad. In all these instances, the goals of research shift from the universal to the particular.

Preliminaries: Antiquarianism from the Fifteenth to the Eighteenth Centuries

During the classical period and throughout the Middle Ages, there were treasures (war booty, votive offerings) but no collections (Barril 1993, 39-42), but in the fifteenth century, collections acquired a scientific and educational value linked to humanism. The Greek and Roman world, natural wonders, and objects brought from the New World were at the center of attention. In Spain, a prominent collector was Cardinal Mendoza, counselor to the Catholic kings.

In the sixteenth century, Charles I and Philip II encouraged collecting, so the duke of Villahermosa wrote a treatise on Roman religion based on Roman antiquities, and other courtiers opened their collections to scholars such as Lucio Marinero Siculo, Ambrosio de Morales, and Antonio Agustín (sometimes dubbed the "first Spanish archaeologists"). In the seventeenth century, connections with foreign scientific

circles to exchange, borrow, and acquire pieces became very important.

Those are the roots of eighteenth-century collecting. The monarchy and the enlightened aristocracy used archaeology to legitimize and give prestige to their power, to justify reforms (Mora 1991, 31), and to display and reinforce Spain's foreign image, which had been brought into question by other European powers.

This archaeology consisted of branches of classical erudition (epigraphy, numismatics, iconography, topography, mythology) that were secondary to literary sources. The monarchy created *gabinetes de antigüedades y de historia natural* ("cabinets of antiquities and natural history," which included archaeological remains), libraries, and academies. It financed archaeological excavations, scientific expeditions (Malaespina in 1789), and "literary journeys" inside the country itself. In addition, it gave legal protection

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to the country's antiquities. Some of these initiatives were in response to European educational thinking (Barril 1993, 44); others, to specific subjects, such as the study of the situation in the colonies or the defense of royal rights against the papacy (Mora 1991, 31).

The most prominent institutions were the private Sociedades de Amigos del País (Societies of Friends of the Country) and, among the public ones, the Real Academia de la Historia (Royal Academy of History, founded in 1738) the Real Academia de Bellas Artes de San Fernando (Royal Academy of Fine Arts of San Fernando, 1752), the Librería Publica (Public Library, 1716, the forerunner of la Biblioteca Nacional [National Library], which was founded in the nineteenth century), and the Gabinete de Historia Natural (Cabinet of Natural History, 1773), whose collections constitute the original nucleus of the present Museo Arqueológico Nacional, Museo Etnológico y Museo de America (National Museums of Archaeology, Ethnology, and the Americas).

The documentation and material preservation of archaeological monuments and finds were one of this period's great advances (Barril 1993, 45). Archaeological excavations were carried out to enlarge collections and to identify those ancient cities (Munda, Numantia, Segobriga, Saguntum) that had once contributed to the glory of the nation. In a sense, the appreciation of these ruins more for their aesthetic and picturesque than for their historical value prevented studies as broad as those that Charles III, as king of Naples, had sponsored at pompeii, herculaneum, and Stabia (Fernandez 1988, 384; Mora 1991, 32).

Beginnings of Scientific Archaeology

In the nineteenth century, archaeological research was carried out against a social background of civil and colonial wars and sharp conflict over the organization of the state. And it was carried out not by public sponsors, but by private initiatives. These initiatives, in the political and intellectual context of the times, were increasingly centered on local and national concerns. At the same time, isolation was broken by reading, contact with foreign researchers (Gran-Aymerich and Gran-Aymerich 1991), participation in international congresses (Ayarzaguena l99l, 69), and universal expositions (Barril 1993, 50). Basic to this broadening of outlook was the establishment of the Institución Libre de Enseñanza by Francisco Giner de los Rios in 1876 (Moure 1993, 206-207), which had the patriotic goal of understanding and renewing Spain. Against Catholic conservatism, it represented a secular and innovative attitude and sought to renew Spanish secondary and university education by encouraging studies abroad and receptivity to French, British, and German pedagogical approaches (Jutglar 1971, 148-153).

Scholarly and scientific societies (numismatic, archaeological, and so on) began to be established early in the nineteenth century, and their publications, generally local, played a fundamental role in the popular and scientific spread of culture and education. Some demanded the protection and recovery of ancient monuments (Salvatierra l990, 22); others participated in debates on evolution and prehistoric archaeology, topics censored until the Revolutionary Sexennium, a revolutionary period between 1868 and 1874 (Ayarzaguena 1991, 69). These initiatives, and those of booksellers, maintained the interest in knowledge of the past. The state sought to centralize that interest through institutions that would define a historic heritage common to the whole national territory: royal academies, museums, and (after 1900) universities, whose activities had hitherto been unimportant in the development of archaeology in Spain (Cortadella I Morral 1991, 161; Pasamar and Peiró 1991, 73).

The cabinets and royal academies were converted into public museums with ever more specialized collections. As a result of their participation in the *juntas cientifico-artisticas* (“scientific- artistic councils”) and the *comisiones de monumentos provinciales y central* (“provincial and central monuments commissions”) established to recover ecclesiastical properties after the disentailments

decreed between 1835 and 1843 (Barril 1993, 47), the royal academies widened their work of protecting and collecting the cultural heritage. The Academy of History likewise devoted its efforts to the promotion of archaeological

University of Barcelona was an exception (Pasamar and Peiró 1991, 75).

Research became institutionalized at the national, regional, and local levels and, for a brief time, abroad. The Junta para la Ampliación de Estudios e Investigaciones Científicas (Board for the Expansion of Study and Scientific Research, 1907) had among its missions the establishment of scientific exchanges abroad. It created the Escuela Española de Historia y Arqueología en Roma (Spanish School in Rome for History and Archaeology, 1910), which did not outlast World War I, and sections on Spanish archaeology both within the Centro de Estudios Históricos (Center for Historical Studies, 1910) and the Comisión de Investigaciones Paleontológicas y Prehistoricas (Commission for Paleontological and Prehistoric Research, 1912). The commission had prestigious members (the marquis of Cerralbo, the count of la Vega del Sella, Juan Cabre, Eduardo Hernandez Pacheco, Hugo Obermaier Grad, Paul Wernert) and collaborators (Pere Bosch Gimpera, Hubert Schmidt, henri breuil) and carried out a vast program of systematic research and publication. Its foundation was encouraged by research in the region of Cantabria financed by Prince Albert I of Monaco.

The Servei d'Investigacions Arqueologiques (Archaeological Investigation Service, 1915) of the Institut d'Estudis Catalans (Institute for Catalan Studies, 1907) was established as part of the program of cultural modernization advocated by the Catalan bourgeoisie first through the Mancomunitat and later through the Generalitat (Cebria, Muro, and Riu 1991, 83; Dupre and Rafels 1991, 175). As in the case of analogous services established by provinces (Valencia and Sevilla) and cities (such as Madrid), the service represented the culmination of a process started the century before by local scholars and naturalists.

French research in Spain also became institutionalized. On Pierre Paris's initiative, the Escuela Francesa de Arte y Arqueología (French School of Art and Archaeology), or Casa de Velazquez, was established in Madrid in 1928 (Gran-Aymerich and Gran-Aymerich 1991, 117). In turn, German archaeology's great influence in Spain arose as the result of training that important Spanish archaeologists received in Germany and of work in Spain by scholars such as Georg and Vera Leisner on megaliths; Adolph Schulten on proto-history; Hans Zeiss on funerary archaeology of the Visigothic period; and Helmut Schlunk, who later became the first director of the Madrid branch of the deutsches archäologisches institut (German Archaeological Institute), on late Roman and early medieval art and archaeology (Grunhagen 1979; Marcos 1993, 80).

As this period closed, only prehistory had succeeded in freeing itself from a philological and art-history perspective (Arce 1991, 209; Pasamar and Peiró 1991, 75; Rosello-Bordoy 1986, 8-9), which it had managed to do because of its empirical orientation and the national and international importance of discoveries in the Cantabrian region-altamira by Marcelino Sanz de Sautuola in 1879-and the southeastern part of the peninsula-Los Millares, El Argar, and Villaricos by Louis Siret (Moure 1993, 207-210). In general, field archaeology did not involve stratigraphic controls or a detailed register of data, but enough evidence was available to permit Bosch Gimpera to create the first great federalist synthesis of pre- and proto-history, *Etnología de la Península Iberica*, in 1932 (Ruiz Rodriguez 1993, 308; Ruiz Zapatero 1993b, 47-48).

Meanwhile, classical and medieval archaeologists were concerned not so much with research as with the restoration of cities, ecclesiastical buildings, and large Islamic architectural complexes (Salvatierra 1990, 40-49). All of this initial structuring of Spanish archaeology was truncated by the Civil War of 1936-1939.

Institutionalization of the 1950s and 1960s

The Franco regime suppressed centers of debate and institutions of regional self-government but maintained other organizations (the network of provincial museums, universities) once their memberships had been purged. Academic institutions were particularly affected; for example, Pere Bosch Gimpera and Jose Miguel de Barandiaran were exiled, and Leopoldo Torres Balbas was compelled to retire. In other instances, such as Martin Almagro Basch's

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Prehistória (Institute of Spanish Prehistory, 1958) and the Instituto Rodrigo Caro (Rodrigo Caro Institute, 1951) of classical archaeology, directed by Martin Almagro Basch and Antonio Garclia Bellido, respectively. These are still the only institutions of the central government specifically dedicated to archaeological research, and their journals, *Trabajos de Prehistória* and *Archivo Español de Arqueología,* have become among the most important in their respective specialties. As this period ended, Spain had a centralized administrative infrastructure responsible for the growing number of sites of all periods throughout its territory, and meetings of specialists and numerous publications made known the state of research. Antonio Beltran organized the Archaeological Congresses of Southeast Spain, which began in 1946, became national congresses in 1949, and have met biennially since then. In turn, the less regularly scheduled Symposia for Peninsular Archaeology established by Juan Maluquer de Motes in 1959 have served as important points of reference.

Academic Expansion and the "Science of Archaeology" in the 1960s and 1970s

Spain's general development in the 1960s and 1970s had very positive consequences for archaeology, such as the expansion of university education as the first members of the baby boom of the 1950s and 1960s came of age and an increase in funding both for university personnel and for archaeological field and laboratory research. In contrast, theoretical and methodological debate was tardy and scanty, and the centralization of archaeological policy, tied to the interests of an elitist academic community, limited the discipline's social impact.

During this period, Spanish archaeological missions were sent to Central and South America (Anonymous 1987) and to the Sudan, Egypt, jordan, and Syria (Perez Die 1983). The importance of universities to Spanish archaeology was reinforced by the general increase in the number of students and professors and, toward the end of the period, by the creation of specialized degree programs in prehistory or prehistory and archaeology in the larger universities (Ruiz Zapatero 1993b, 51). Museums were revitalized formally and functionally as exhibits were remodeled and outreach programs were expanded. Martin Almagro Basch's directorship (1968-1981) of the National Museum of Archaeology exemplifies this pattern (Marcos 1993, 95). A very important monographic series, Excavaciones Arqueológicas en España, began to be published by the central government in 1962, and various university and museum journals appeared.

A strongly positivist research orientation characterized the first decade of this period, but at the end of the second, this orientation began to be questioned by a minority group of newly appointed university professors in Barcelona, Jaen, and Madrid. Fieldwork improved, with a better appreciation of stratigraphy and more detailed recording becoming prevalent. Prehistoric research increasingly (but other branches of archaeology only rarely) involved collaboration with the natural sciences. Meetings on scientific archaeology held in the late 1970s promoted the formation of the incipient Spanish infrastructure in this area (Chapa 1988, 137). In general, the role of biologists and archaeologists from Germany (M. Hopf, J. Boessneck, A. von der Driesch, E. Sangmeister, H. Schubart, W. Schule, W. Grunhagen, K. Raddatz, W. Hubener, T. Hauschild, H. Schlunk, T. Ulbert, Ch. Ewert) and France (Arlette and andré leroi-gourhan, françois bordes, C. Domergue) was decisive in these developments, as was North American research on the Paleolithic period (C. Howell, K. Butzer, and L.G. Freeman at Torralba, Ambrona, and Cueva Morin) (Moure 1993, 217).

Throughout this period, Spanish archaeology was centered on the prehistoric and classical periods, and medieval archaeology was included in the National Archaeological Congresses only from 1971 on (Rossello-Bordoy 1986, 8). Americanist archaeological research developed completely independently from Old World archaeology, as the Museum of the Americas, with its own premises (subject to long closures) as of 1965 (Cabello 1989, 51-52), did not encourage a convergence.

At the end of the 1970s, several factors led to a reconsideration of the disciplinary tradition and laid the groundwork for future debate. The editorial work of the members of the Departamento

de Antropología y Etnología Americanas (Department of American Anthropology and Ethnology) of the Complutense University of Madrid resulted in the publication of contributions on archaeological epistemology and European pre- and proto-history by lewis binford, C. Renfrew, and david clarke, and a new generation of archaeologists became aware of the enormous disproportion between the technical means of the discipline and the historical knowledge it had attained. At the same time, the increasing amount of radiocarbon dating demonstrated the inconsistencies of traditional archaeological chronologies and weakened the authority of the theoretical approaches they embodied (Vicent 1994, 219). Finally, the greater intellectual freedom resulting from the new political situation-the end of the Franco regime and the transition to democratic government, the great increase in the number of university students and professors, and the generational turnover among the latter-favored the development of attitudes critical toward academic authority, which was generally elitist and conservative (Riu 1992, 10; Vicent 1994, 220).

Decentralization and Popularizing of Archaeology in the 1980s and 1990s

The restoration of democracy and the approval of the new constitution of 1978 led to the decentralization of the state. From 1979 on, responsibility for archaeological policy began to be transferred to the seventeen autonomous communities into which Spain was divided. The important Ley de Patrimonio Histórico Español (Law on Spanish Historical Heritage, 1985) responded to this new political reality and established the framework for the archaeological legislation of the autonomous governments (Garcia Fernandez 1989). This process coincided with the high points of the country's liberalization: joining the Common Market in 1985 and joining the North Atlantic Treaty Organization in 1986.

The new organization of the state had a pervasive effect on archaeological activity. It produced large differences in regional policies with respect to the legal and administrative frameworks for archaeology, the available infrastructure, and the degree of governmental intervention. Generally, the management, protection, and conservation of archaeological heritage, such as surveys, mapping, cataloging and restoration projects, and emergency excavations (Jimeno, Recio, and Moreno 1993; *Jornadas* 1991), particularly in urban areas (*Arqueología* 1985; *Primeras jornadas de arqueología* 1983), have taken precedence over research as such (long-term excavations, analyses, dating, publications). Public financing has increased but has focused on the management of archaeology, with the new “contract” archaeologist being responsible for its execution (Querol et al. 1994).

At the same time, the academic world has lost its previous position of almost exclusive dominance, precisely at the time when the increasing specialization of archaeology by historical periods, research projects, and theoretical and methodological outlooks has diversified and increased archaeological activities and their financial cost. A solution to this paradox has been sought through increased participation by research centers and, above all, universities; in projects funded by regional governments; and by an increased appeal to private or other public patronage (bodies responsible for landscape planning and public works).

The teaching of prehistory and classical archaeology still receives most funding, and the two fields had 145 and 62 permanent professors, respectively, by the mid 1990s. The greater influence of prehistory is owing to its role in the discipline's methodological renewal. American and Oriental archaeology have not seen their limited presence in universities compensated for by the possible impact of archaeological expeditions abroad. Those expeditions are either sporadic and strongly dependent on Spanish foreign policy or are organized by the National Museum of Archaeology (Perez Die 1993), which (given the current trend toward decentralization) does not have the administrative structure and the resources required to achieve an impact.

Medieval archaeology has become increasingly important in terms of practice, but its academic presence continues to be small. The increased importance of urban archaeology has led to its scientific consolidation, an association

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and other scientific disciplines more favored by governmental priorities. Foreign collaboration in part mitigates this problem. The whole of Spain has one thermoluminescence and three radiocarbon-dating laboratories, eleven teams working on paleobotany (mainly palynology), seven working on paleontology, and two devoted to archaeometallurgy. The majority of these specialists and specialist laboratories were established in order to serve regional research favored by the ongoing administrative decentralization.

The Future of Spanish Archaeology: The Challenge of Decentralization

Archaeology was an element in all of the nationalist claims to legitimacy made in Spain from 1800 to 1936. As in other European countries, the *españolista* ("Hispanicizing," a term used to refer to an identification between what is Spanish and what is Castilian, in the broad sense of claiming a single historical tradition for all the peoples of Spain) oligarchy and the various regional elites (especially in the Basque country and Catalonia) traced their national roots at least to the peoples that resisted the Roman conquest (Ruiz Zapatero 1993a). This archaeologically justified nationalism was reflected in the literature (Olmos 1992a) and in the plastic arts. Modern events presented in ancient guise were combined with direct allusions to events in antiquity so as to glorify either Hispanic or regional individuality.

Archaeological cultures were used quite differently in the construction of each national identity. Thus, the Vascones would have avoided a Roman occupation of the Basque country, creating a clear break between that region and the rest of the peninsula, as it had been completely Romanized (Dupla and Emborujo 1991). This notion could be combined with a claim for the homogeneity and continuity of the Basque people from the Paleolithic period on (Diaz Andreu 1993, 79; Rua 1990, 207-209). For its part, Spanish Hispanicist nationalism appealed to antiquity to reinforce ideas such as independence, liberty, and heroism and to the Middle Ages and the Renaissance to promote key concepts such as unity, religion, and monarchy (Quesada 1994, 39), in line with traditionalist historical thinking. This defense of the essential continuity of the Spanish as defined by Catholicism established a trajectory from the late empire to the Catholic kings and the Habsburg empire by way of the Christian "reconquest" of the peninsula from the Arabs by the fifteenth century (Salvatierra 1990, 72-73). Meanwhile, Catalans emphasized their Greek roots, using Ampurias as an emblem (Guitart and Riu 1989, 28).

The governments of the Second Republic (1931-1936) were attuned to decentralizing, federalist political goals and assisted in the institutionalization of nationalist (regionalist) archaeologies, the most successful program being the Catalan Generalitat's (Dupre and Rafels 1991, 175). The Franco uprising put a violent end to this process, and the regime that emerged from the Civil War was characterized by a centralism and Hispanicism (Diaz Andreu 1993) that disappeared only after the restoration of democracy in 1975. During the 1940s and 1950s, all the nineteenth-century historical clichés were revived, illustrated, and incorporated in the textbooks (Prieto 1979; Valls 1993), and all other nationalist (regionalist) manipulations of the archaeological record were prohibited. In the years of nationalist Hispanicist self-assertion, the Iberian Iron Age was repeatedly interpreted as a precedent for leadership by a caudillo and as the origin of essential Spanish traits that were still part of the folklore and supposed national character (Olmos 1992b, 10-12). This ideological policy was most important in the years immediately after World War II when the Franco regime was internationally isolated and striving for self-sufficiency. In the later Franco years, Spanish archaeology gave greater emphasis to technical issues.

The present regionalization of archaeology has not led to a direct return to the process of inventing regionalist traditions interrupted by the Civil War. Other factors are more important, although the lack of specific studies on the most recent period could occasionally leave any interpretation open to question. On the one hand, interest in the social history of Spanish archaeology is still in its infancy and mostly oriented toward the early periods of the discipline's

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Spitsyn, Aleksander Andrevich

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St. Acheul

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near Amiens. The Acheulean stone tool industry has been found in sites in western and central Europe, over much of Africa, and in Asia as far east as India.

The area of St. Acheul has long been known as a source of flint tools. As early as 1854, stone tool finds were recorded in this area, and, consequently, in 1859, Albert Gaudry of the Académie des Sciences commented very favorably on Amiens as a locality for studying early human history. In recognition of this fact, in 1872 gabriel de mortillet named the distinctive industry based around biface hand-axes the Acheulean industry.

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See also

Lithic Analysis

Steenstrup, Japhetus

(1813-1907)

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theory of the three-age system and, as importantly, showing that archaeologists could use environmental changes to help them understand social, technological, and cultural changes. Steenstrup, archaeologist jens jacob worsaae, and geologist J. Forchammer were members of the kitchenmidden committee that excavated mounds of shells found in Denmark to ascertain their origin and, subsequently, contributed to the knowledge of the Mesolithic period in northern Europe.

Tim Murray

See also

European Mesolithic; Shell Midden Analysis

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Stein, Sir (Mark) Aurel

(1862-1943)

Aurel Stein was born in Budapest. Educated there and in Dresden, Germany, and at the universities of Vienna and Leipzig, he received his Ph.D. in 1883 from the University of Tübingen, where he studied Persian and Indian archaeology. Between 1884 and 1887, he studied classical and oriental archaeology and languages at Oxford University and the British Museum, where he met, and was greatly influenced by, sir henry rawlinson.

Sir Aurel Stein

(Image Select)

In 1888, Stein traveled to India to become the principal of the Oriental College at Lahore and registrar for the Punjab University. For the next ten years he spent his vacations on antiquarian and geographical research in Kashmir in northern India and on the North-West Frontier (now northern Pakistan and eastern Afghanistan) and his spare time learning and translating Sanskrit. He became well connected with the civil and vice-regal establishment of British colonial India.

In 1900, with the support from Lord Curzon (the viceroy of India) and the Survey of India, Stein led his first expedition into central Asia, where he was to lead three more in 1906-1908, 1913-1916, and 1930. He took different routes each time to and from Turkistan, surveying, exploring, mapping, and excavating as he went. He traveled huge distances and brought back to India and England thousands of artifacts and, it is rumored, intelligence information for the British government. He became a naturalized British subject in 1904, and between 1910 and 1929 was directly employed by the Archaeological Survey of India. He was knighted in 1912. Stein's achievements were substantial-here was a whole area of the world that was unknown archaeologically, and its history was little known as well. Stein filled in this huge gap.

On his first expedition he explored the southern oases of the Taklamakan Desert, and at settlements in the Khotan region he discovered numerous documents in ancient Tibetan, Chinese, and Kharoshti. On the second expedition, he explored the dried-up Lop Sea bed and traced the long-used caravan route between china and the West by following the trail of Neolithic implements, metal objects, beads, and

ancient Han coins. He visited the watchtowers of the ancient Chinese frontier, and at the site of Miran in what is now Chinese Central Asia, which had been abandoned in the third century b.c., he found wall paintings of classical design. Stein's greatest find was not only the fabulous “Cave of the Thousand Buddhas” but the large

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number of documents and temple paintings at the same site, which had been undisturbed since the eleventh century a.d.

Stein's third expedition completed his circuit of the Taklamakan Desert via Russian territory, and he traced the Silk Route to Samarkand, returning south through eastern Persia to Baluchistan. The difficult political situation in central Asia between the two world wars prevented the completion of his fourth trip-but he did manage to travel 2,000 miles around the Taklamakan once more. The scientific record of Stein's trips was published in *Ancient Khotan* (1907, 2 vols), *Serindia* (1921, 5 vols), *Innermost Asia* (1928, 4 vols), and *Memoir on Maps of Chinese Turkistan and Kansu* (1923), and his narrative accounts of the same appeared in *Sand-Buried Ruins of Khotan* (1903), *Ruins of Desert Cathay* (1912, 2 vols), and *The Thousand Buddhas* (1921).

Difficulties traveling in central Asia led Stein to travel in Baluchistan and Persia between 1927 and 1936 to explore the connections between the Indus Civilization, unearthed by sir john marshall in what is now Pakistan, and the civilizations of the Euphrates in the Near East. He discovered extensive Chalcolithic and Neolithic remains and published *Archaeological Reconnaissances in North-Western India and South-Eastern Iran* (1937) and *Old Routes of Western Iran* (1940). In 1929, with the help of the Royal Air Force, Stein had carried out an aerial survey of the Roman frontier in Iraq and the Jezira, and he investigated these finds on the ground and in detail between 1938 and 1939.

As a consequence of his travels throughout the Near East and central Asia, Stein became interested in searching for traces of Alexander the Great's eastern campaigns between 331 and 323 b.c. He had already found some evidence of Alexander in southwestern Persia near persepolis and in the Greco-Buddhist remains in the Swat Valley of northern Pakistan. In 1931, Stein traveled from Taxila east of the Indus River to the Jhelum River, where he located the site of the defeat of Poros and explained Alexander's tactics. In 1943, at the age of eighty, Stein's last expedition traced the retreat of Alexander's army through Baluchistan. He then went on to visit Kabul, in Afghanistan, where he died suddenly.

In many ways, Stein was the last of the great nineteenth-century explorers: physically tough, fearless, possessed of a brilliant intellect, a superb linguist, independent, and able to travel with only loyal and local colleagues and guides as companions. In other ways, he was unique in the breadth of his achievements. Stein was a nomad with no home base to speak of, and on his occasional visits to England he stayed at Corpus Christi College, Oxford. He never married, but he had many close friends and he supported relatives in Hungary after World War I. He left his estate to create the Stein-Arnold Fund to be used for the geographic and antiquarian exploration of central and southwestern Asia. He received the founder's gold medal from the Royal Geographical Society in 1904, the gold medal of the Royal Asiatic Society in 1932, that of the society of antiquaries of london in 1935, the Flinders Petrie Medal in 1928, the Huxley medallion, and honorary degrees from the universities of Oxford, Cambridge, and St. Andrews.

Tim Murray

See also

Iran; South Asia

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Steno, Nicolas

(1638-1686)

Born in Copenhagen, Nicolas Steno went to Amsterdam to study anatomy and became the physician of the grand duke of Florence, Ferdinand II, in 1665. Steno became interested in geology, and in 1669 he published a landmark geology book on basic crystallography in which he claimed that fossils were the remains of ancient living organisms and that many rocks were the result of sedimentation. He also proposed that the chronological history of the earth could be understood by studying the earth's strata (stratigraphy) and that landscape was the result of changes in the earth's crust. Although he believed that all of this change had occurred over a long time, he was restricted by religious dogma to only being able to estimate 6,000 years for the entire history of the earth.

Steno abandoned science and converted to Catholicism in 1667. He became a priest in

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1667 and a bishop in 1677 and died in Schwerin in Germany. His discovery of the parotid salivary duct was named “Stensen's duct” for him, as is his work on the faces and angles of crystals, which is known as “Steno's law.”

Drawing by Nicholas Steno in 1671, illustrating his theory of how rock strata can fold and produce different formations

(Image Select)

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Stephens, John Lloyd

(1805-1852)

John Lloyd Stephens was born in New Jersey and studied classics at Columbia College, after which, in 1822, he studied law. He was a successful lawyer in New York City for eight years until ill health caused him to embark on a two-year voyage to the Mediterranean and eastern Europe. He began to publish accounts of his travels, which were so successful that he became known as “the American traveler.” He met and befriended the English architect and draftsman frederick catherwood and collaborated with him on *Incidents of Travel in Egypt, Arabia, Petraea, and the Holy Land* (1837) and *Incidents of Travel in Greece, Turkey, Russia, and Poland* (1838). Both books proved to be popular and made Stephens enough money to finance his first expedition to Central America.

In 1839, with personal recommendations from U.S. President Martin Van Buren and in the company of Catherwood, Stephens traveled to belize and then through the dense rainforest of the Yucatán to the site of Copán in western Honduras, which had to be cut out of the forest. He left Catherwood to draw the site and traveled on to guatemala and el salvador, then to costa rica and nicaragua, and then back to Guatemala where he again met up with Catherwood. Together they traveled to mexico under difficult and dangerous circumstances via palenque, a classic Maya site in Chiapas, and visited the ancient city of Uxmal. By this point, the health of both was dire and they were carried on stretchers to the boat back to New York. The resulting book, *Incidents of Travel in Central America, Chiapas, and Yucatan* (1841, 2 vols.), with text by Stephens and illustrations by Catherwood, became a best-seller.

Although Stephens was no archaeologist, he had seen enough archaeological monuments in Egypt, the Near East, and eastern Europe to understand that the New World sites were astounding and rivaled Old World sites in their artistic achievements. He was more than able to convey their power and significance and his own excitement, and his books attracted great interest in the United States.

In late 1841, Stephens and Catherwood returned to Uxmal to finish their work by taking new daguerreotypes, and they then visited the site of chichén itzá. Once again, they had to clear a site in order to survey it. After Chichén Itzá it was on to Cozumel and Tulum before returning to New York where the two men published another book, *Incidents of Travel in Yucatán* (1843).

Stephens became the promoter and director of a steamship company and then became involved in building railways. Between 1849 and 1851 he helped to survey and prepare for the construction of the Panama railway, where the malaria he had caught during his earlier explorations flared up again and forced him to return in 1852 to New York City, where he died.

Tim Murray

Steward, Julian

(1902-1972)

Born in Washington, D.C., Julian Steward studied zoology and geology at Cornell University. He completed a Ph.D. in anthropology in 1929 at the University of California, Berkeley, and then worked for the Bureau of American Ethnology at the smithsonian institution.

Steward began his ethnographic career among the western Shoshone Indians, one of the most simple of societies, and moved on to study complex cultures such as those in Puerto Rico. By the end of his career he was managing a cross-cultural, worldwide inquiry into the modernization of peasant societies. In 1943, he became director of the Smithsonian's Institute of Social Anthropology; from 1946 to 1952, he was professor of anthropology at Columbia University; and from 1952 until he retired in 1970, he was professor of anthropology at the University of Illinois.

Steward is best known for his theories about “cultural ecology,” which held that a society's environmental resources and available technology determine the kinds of labor used by them and, consequently, inform their entire social system-an ecological, neo-evolutionist, and materialist view of human behavior. He formulated a theory of “multilinear evolution,” which described the ways in which societies progress toward greater complexity.

He was one of the few ethnologists of his time who was interested in archaeological data and its potential for contributing to the study of human behavior over long periods of time, and he had a great impact on the development of archaeology in the United States after World War II. He taught and supported a number of archaeologists, such as robert braidwood and Richard MacNeish, who undertook pioneering multidisciplinary research programs into the origins of food production in the Near East and mesoamerica . And he inspired many others, such as gordon willey, who initiated the use of settlement archaeology in the virú valley in peru.

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See also

United States of America, Prehistoric Archaeology

References

Harris, M. 1968. *The Rise of Anthropological Theory.* New York: Crowell.

Stična

Stična (or Vir pri Sticni or Stiski cvinger, as it is also called) is an early-Iron Age site in lower Carniola, in slovenia, a center for the Dolenjska (lower Carniola) group of the Hallstatt culture. The hill-fort type of settlement covers an area of more than 21 hectares.

The settlement was intensively excavated between 1967 and 1974 by stane gabrovec and several other collaborators. The excavations were limited to the hill-fort ramparts and revealed three main early-Iron Age occupation phases (contemporary with the nearby barrow cemetery) and a late-la tène phase. The cemetery was partly excavated during the twentieth century by the duchess of Mecklenburg (1905-1914), rajko lozar (1936), jožef kastelic (1946, 1952- 1953), and Gabrovec (1960-1964).

The burial rites are almost exclusively inhumations in earthen barrows. Approximately 125 barrows were documented in an area approximately 15 to 50 meters in diameter. The number of inhumations in a barrow varies from a few graves (e.g., in Mecklenburg's Glogovica barrow, 3 graves) to more than 150 graves (e.g., barrow 48 has 183 graves). On average there are 20-30 graves per barrow.

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The cemetery covers the period between the eighth and fourth centuries b.c. The graves vary considerably in the amount of grave goods they contain, from very poor graves to warrior graves containing weaponry (mostly axes and spears) to so-called princely graves containing body armor, helmets, weapons, horse-riding equipment, decorated bronze vessels *(situlae),* buckets, and great quantities of personal ornaments and ceramic vessels. Grave goods, especially those imported from or influenced by the Etruscan culture, indicate a distinguished and well-stratified community with very rich individuals at the top that flourished between the seventh and fifth centuries b.c.

Peter Turk

See also

Celts; Etruscan Archaeology

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Stone, Doris Zemurray

(1909-)

Doris Stone was one of the pioneers of Central American archaeology. She was educated at Radcliffe College and conducted fieldwork in Honduras and costa rica while she was research associate for the Middle American Research Institute of Tulane University and for the peabody museum, Harvard University.

Born the daughter of Samuel Zemurray, an early developer of the banana trade in Central America, Stone spent parts of her formative years in Honduras and Costa Rica. As an undergraduate at Radcliffe College, she was able to attend classes offered by Alfred M. Tozzer, Harvard's specialist in Mayan archaeology. She was not encouraged to continue studying archaeology after receiving her undergraduate degree in 1930 and returned to New Orleans, her home town.

Stephen Williams (1986) identifies an unpublished study of Ulua Valley figurines that was filed at Tulane University in 1930 as Stone's earliest known written work. In that same year, she donated a pottery figurine found near La Lima, Honduras, to Harvard's Peabody Museum. Williams speculates that the figurine paper was completed for Tozzer's senior research course. The date of the manuscript makes this theory plausible, but there is no sign of it in Tozzer's papers, now in the archives of the Peabody Museum, or in the manuscript holdings of the Tozzer Library at Harvard University. It was not until much later that Stone was actively encouraged by Tozzer. Her early research was sponsored by the Middle American Research Institute (MARI) at Tulane University, of which her father was a supporter, and she was appointed an associate there in 1930. By 1934, she was publishing field reports based on her own work in Honduras in the MARI-affiliated journal, *Maya Research.* MARI also published her landmark comparative study of the Ulua marble vases (Stone 1938) that was based on collections in multiple institutions, including both MARI and the Peabody Museum.

When Honduran archaeology received renewed attention during the 1930s, Stone, already in the country, was instrumental in encouraging the interests of first MARI and later the Peabody Museum. Stone's own approach centered on identifying linguistic groups described in the sixteenth century with archaeological remains, which encountered some resistance on the part of the director of the Peabody's

Honduran expedition, william duncan strong. Despite the reservations of Harvard archaeologists about Stone, which is well documented in Tozzer's correspondence at the Peabody, by the end of the 1930s she had established herself as an authority on Honduran archaeology. Although Tozzer, in his "Foreword" to her first monograph on Honduran archaeology, went so far as to state that "her indefatigable energy, her enthusiasms and her intuitive impressions have, at times, been handicaps" (Stone 1941, v), he acknowledged that the handicaps he ascribed to her "have all contributed to the ultimate success of her work." He cited as the foundation of her strength as an authority on Honduran archaeology Stone's laboring "for long periods and in all possible seasons" in the country. The same claim to authority was featured by Stephen Williams in his introduction to her general study of Central American archaeology: "her numerous journeys on mule

Stone downplays the difficulties she faced as a woman in archaeology, she has been a significant benefactor of women in academia, endowing a tenured position at Harvard and supporting Radcliffe's research centers, and thus ensuring others opportunities she did not have herself.

Rosemary A. Joyce

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Strong, William Duncan

(1899-1962)

Born in Portland, Oregon, William Duncan Strong became a major figure in U.S. anthropology, distinguished in archaeological research as a theorist and as a teacher. After serving in the U.S. Navy in World War I, he went to the University of California, Berkeley, and received his B.A. in 1923. From an early interest in natural history he turned to anthropology as a result of the influence of Alfred A. Kroeber, with whom he worked on material excavated in peru many years earlier by max uhle. Strong's 1926 Ph.D. dissertation, "An Analysis of Southwestern Society," combined archaeological and ethnological data on the house-lineage-fetish complex.

He joined the staff of the Field Museum of Natural History in 1926 and took part in a fifteen-month

expedition to Labrador where he spent a winter living with and studying the Naskapi Indians. In 1929, he moved to the University of Nebraska and began two years of archaeological research that completely revised the prehistory of the Great Plains. Instead of the mounted bison hunters of historic times being preceded only by nomads hunting and foraging on foot, he showed that there had been a long period of settled farming villages. Strong also excelled as a teacher, especially in informal, work-related settings, and several of his students at Nebraska went on to have distinguished careers in anthropology.

From 1931 to 1937, Strong was a member of the Bureau of American Ethnology of the smithsonian institution and began archaeological research in Honduras. Like the Great Plains, this was a relatively neglected area, and he quickly identified key problems and laid the foundations for answers, particularly by establishing a firmer chronology of past occupations.

After Strong was appointed to the anthropology faculty of Columbia University in 1937, he turned again to Peruvian archaeology. In 1941, he headed one of ten field parties, under the sponsorship of the Institute for Andean Research, in a program of survey and stratigraphic excavation in lesser-known areas of Latin America. He worked at Pachacamac on the coast of Peru with gordon willey and John Corbett as student assistants. When he published the results

of all ten field parties in 1943, he included a tabular presentation of cultural sequences for twenty regions from the United States to chile, aligned to permit continentwide comparisons of cultural development. This and later comparative studies by Strong reflect the change taking place in U.S. archaeology, with emphasis being placed on functional interpretations rather than local chronological sequences.

During World War II, Strong directed a new federal Ethnogeographic Board, which provided the military with information from anthropological sources on little-known parts of the world. In 1945, he returned to his teaching at Columbia, and he was in the field in Peru again the next year with the viru valley program, a combined geographical, ethnographic, and archaeological study of a single Peruvian valley. It was a landmark in coordinated research and in introducing new concepts and improved chronology. His last work in Peru was in 1952.

Strong's career was cut short by his sudden death. His research combined the details of ceramic sequences with hemispheric comparative studies, and he was influential in moving archaeology toward greater concern with cultural growth and change.

Richard B. Woodbury

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For references, see *Encyclopedia of Archaeology: The Great Archaeologists, Vol. 1,* ed. Tim Murray (Santa Barbara, CA: ABC-CLIO, 1999), pp. 422-423.

Stukeley, William

(1687-1765)

William Stukeley can be regarded as the last of the great English antiquarians and the first of that country's reliable archaeologists. He was born in Lincolnshire, England, the son of a country lawyer and attended Cambridge University from 1704 to 1709. He then moved to London to train as a doctor and later practiced medicine in Boston, Lincolnshire. From 1710 until 1725, he undertook an annual antiquarian tour on horseback to different parts of England viewing churches, abbeys, remarkable buildings and gardens, and sites of historic interest. A competent draftsman, he made many drawings on these tours, and these were published in 1724 in a well-illustrated volume, *Itinerarium Curiosum* [List of Curiosities].

William Stukeley

(Science Photo)

Stukeley returned to London in 1717 and became the secretary of the newly revived society of antiquaries of london. He became interested in stone circles and their association with the Druids after reading a copy of john aubrey's *Monumenta Britannica.* For the next few years, he applied himself to elucidating the many problems raised by megalithic monuments, effectively advancing the work that Aubrey had begun. He gathered notes on circles and allied monuments from all over the British Isles and undertook intensive fieldwork on the two major sites of Stonehenge and avebury in Wiltshire. His work at Avebury was especially valuable because the local landowner had begun its wanton destruction, breaking up the great stones for building materials and lime. Without Stukeley's meticulous record of the location of every stone, and his perceptive tracing of depressions and contours, current knowledge of

the monument would be greatly reduced.

Similarly, Stukeley carried out intensive fieldwork at Stonehenge over the same period.

He was able to identify that the stone circle was part of a much larger site comprising avenues and ditches and an earthwork enclosure. He was also the first to notice the significance of the orientation of Stonehenge and its potential astrological significance. Stukeley and his patron and friend, the earl of Pembroke, engaged in some limited excavations within the stone circle and learned that the monoliths had been levered into holes in the solid chalk floor of the plain and then packed in with flints for stability.

Accurate measurement, precise draftsmanship, intelligent understanding of the relationship of monuments to landscape, and an ability to make rewarding comparisons with similar sites and structures-all of these qualities made Stukeley a pioneer in field archaeology. He became a minister of the church in 1726 and gave up field archaeology to work on his books *Stonehenge* (1740) and *Avebury* (1743). His record of the sites as they stood in the early-eighteenth century were invaluable to archaeologists of the twentieth century.

Graham Parry

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For references, see *Encyclopedia of Archaeology: The Great Archaeologists, Vol. 1,* ed. Tim Murray (Santa Barbara, CA: ABC-CLIO, 1999), p. 49.

Su Bingqi

(1909-1997)

Su Bingqi was the major archaeological theoretician in the People's Republic of china. Born in Gaoyang (Hebei Province), he graduated from Beiping Normal University in 1934 and then worked at the Society (after 1936, the Institute) for Historical Studies of the National Beiping Academy. As an assistant to the historian Xu Xusheng (Xu Bingchang, 1888-1976), who sought to substantiate archaeologically the then-novel theory that China's early dynasties each had different ethnic origins, Su had his first taste of fieldwork when he participated in excavations at Doujitai, Baoji (Shaanxi Province) in 1934-1937. After the academy had relocated to Kunming in Yunnan Province in southern China during World War II, Su wrote an archaeological report on the Doujitai tombs (published in 1948), applying the method of Swedish archaeologist oscar montelius in his meticulous typological analysis of ceramic vessels.

After the Communist takeover in 1949, the Beiping Academy was dissolved. In 1950, both Su and his teacher Xu Xusheng were appointed research fellows at the newly founded Institute of Archaeology of the Chinese Academy of Sciences (since 1977, the Chinese Academy of Social Sciences) in Beijing. Su participated for a time in the institute's fieldwork, and his chronology of late Zhou tombs at Luoyang (Henan Province), excavated in 1955, was long followed as the standard yardstick for cross-dating finds from all over China.

In 1952, Su was appointed professor in the History Department of Beijing University, where he founded mainland China's first academic archaeology program. He served as the program's chair until 1983, simultaneously maintaining his position at the Institute of Archaeology. In 1958, students targeted Su in their criticism of archaeology, which they found insufficiently concerned with real people and society. This spurred Su to conceptualize a new system for the study of prehistoric cultures, enriched with elements of Marxist social theory and an analysis of historical texts. The resulting “Chinese school of archaeology,” tailor-made to accommodate the characteristics of Chinese history as well as contemporary political strictures, became widely influential.

Leading his students in excavations at Neolithic sites in Shaanxi Province in 1958-1959, Su first applied

Montelian principles in working out the filiation of chronological and regional phases of the Yangshao culture. He subsequently worked out a general theory of simultaneously developing and interacting regional networks and sequences of cultures from which the Chinese civilization gradually emerged. In the 1980s and 1990s, Su traveled widely across China to inspect Neolithic and early-Bronze Age finds, refining and expanding this grand framework.

During the Cultural Revolution (1966- 1976), Su was subjected to criticism and sent to perform manual labor in the countryside (1970-1972). Marginalized at the Institute of Archaeology because of differences with its

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director, xia nai, Su developed an independent power base with his former Beijing University students, many of whom came to occupy important positions in the provinces. As provincial-level archaeology became increasingly important in the course of China's economic reforms, their adoption of Su's ideas have shaped a new, regionalist discourse in Chinese archaeology.

Lothar von Falkenhausen

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For references, see *Encyclopedia of Archaeology: The Great Archaeologists, Vol. 2,* ed. Tim Murray (Santa Barbara, CA: ABC-CLIO, 1999), pp. 597-599.

Sumerians

The Sumerians were the first recorded occupants of the southern half of mesopotamia; the northern half of this region was referred to as Akkad, with the line of demarcation at Nippur. Famous as the earliest literate society, the Sumerians were unknown until the decipherment of the cuneiform tablets in the nineteenth century revealed the existence of a language (Sumerian) that predated the languages of the Babylonians and Assyrians (which were related to Akkadian, the language of the people of Akkad). The Sumerians are thought to have migrated from the mountains of Elam, almost certainly before the fourth millennium b.c., to the swamps at the head of the Persian Gulf. They drained the swamps, developed means of using floodwaters for irrigation, and established agriculture in the region. Agricultural surpluses became a basis of Sumerian wealth and underpinned intensive participation in long-distance trade as far east as the Indus Valley. Although the Sumerians influenced areas far outside their borders in southern Mesopotamia (certainly through the use of writing), the core of the culture lay in the great city-states such ur, Eridu, Lagash, Larsa, Nippur, and Uruk, which were often at war with each other. Notwithstanding shared language and strong cultural and religious ties, political volatility and instability were common threads through Sumerian history at least until the sacking of Ur in 2004 b.c.

Gudea, ensi (governor) of Lagash, ca. 2100 B.C.

(Image Select)

Tim Murray

See also

Indus Civilization; Woolley, Sir Leonard

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Crawford, Harriet. 1990. *Sumer and the Sumerians.* Cambridge: Cambridge University Press.

Postgate, J.N. 1992. *Ancient Mesopotamia.* London: Routledge.

Sutton Hoo

Sutton Hoo, a site located in Suffolk, England, was the cemetery of the Anglo-Saxon kings of East Anglia. It has been argued that it is the burial of the sixth-century king Raedwald (a.d. 599-635). The site (which comprises two mounds) was excavated in 1938-1939, with the first mound being explored

under the direction of archaeologist Charles Phillips. He found a large ship burial with spectacular grave goods. Of particular note are a helmet, sword, and shield, but the grave goods include items of personal adornment in gold and glass, gold coins, and an array of silver vessels. The grave goods, now part of the collection of the british museum,

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Anglo-Saxon helmet and mask from the Sutton Hoo burial site

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Tim Murray

See also

Society of Antiquaries of London

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Bruce-Mitford, Rupert L.S. 1975-1983. *The Sutton Hoo Ship-Burial.* London: British Museum Publications.

Swahili Coast of Africa

Introduction

The Swahili towns on the East African coast have attracted the attention of scholars for many years. Colonial accounts of the origins of this widespread complex of sites, with visible architectural features comprising tombs, mosques, and palaces and substantial subsurface deposits, underplayed the indigenous contribution to the growth and development of the Swahili civilization. Recent archaeological and historical scholarship has gone some way toward reestablishing the urban identity of the peoples of the coast, and the Swahili are now recognized as centrally important in the western Indian Ocean system linking the Middle East, India, and the far interior of Africa.

The great majority of Swahili settlements and towns along the East African coast are found in a narrow coastal strip of sandy soils that support the Zanzibar-Inhambane vegetational mosaic (White 1983). In the northern zone, the Somali-Maasai mosaic provides a dry hinterland that is most suited to herding and hunting while to the south, the vast Zambezian forested areas provide resources for mixed agriculture and hunting and, of course, gold on the Zimbabwean plateau. The offshore island archipelago of the Comoros, which is partly volcanic, and northwestern madagascar, with its sheltered bays and richly forested interior, provide substantial opportunities for subsistence, trade, and urban development.

Hafun, near the Horn, which dates from the early centuries b.c. to about a.d. 200, is the earliest trading site yet located on the East African coast (Smith and Wright 1988)-quite possibly, it was one of the entrepôts mentioned in the Periplus of the Erythraean Sea (a document written ca. a.d. 50 in Greek and Egyptian, author unknown, describing contact with East Africa). Southward, the coastal zone is punctuated by a series of important rivers that provide access to the interior and often have trading sites at their mouths. The earliest town site in eastern Africa, that of Rhapta (known from the Periplus), has still not been located, but it was perhaps situated in the Rufiji delta where finds of early trade goods dated approximately 200 b.c.-a.d. 200 have been recently located by Felix Chami.

The existence of a town at that time might presuppose a settlement hierarchy of early farming community sites. Sites of the Kwale Matola tradition dating from the b.c.-a.d. transition to ca. a.d.400 are known to have existed in a great distributional swath along the coastal hinterland from Kenya down to southern Mozambique and into South Africa (Sinclair 1987; Soper 1971). The possibility that these early sites of

iron-using farmers constituted a prestate settlement system

were not displayed until after World War II.

Anglo-Saxon helmet and mask from the Sutton Hoo burial site

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The great majority of Swahili settlements and towns along the East African coast are found in a narrow coastal strip of sandy soils that support the Zanzibar-Inhambane vegetational mosaic (White 1983). In the northern zone, the Somali-Maasai mosaic provides a dry hinterland that is most suited to herding and hunting while to the south, the vast Zambezian forested areas provide resources for mixed agriculture and hunting and, of course, gold on the Zimbabwean plateau. The offshore island archipelago of the Comoros, which is partly volcanic, and northwestern madagascar, with its sheltered bays and richly forested interior, provide substantial opportunities for subsistence, trade, and urban development.

Hafun, near the Horn, which dates from the early centuries b.c. to about a.d. 200, is the earliest trading site yet located on the East African coast (Smith and Wright 1988)-quite possibly, it was one of the entrepôts mentioned in the Periplus of the Erythraean Sea (a document written ca. a.d. 50 in Greek and Egyptian, author unknown, describing contact with East Africa). Southward, the coastal zone is punctuated by a series of important rivers that provide access to the interior and often have trading sites at their mouths. The earliest town site in eastern Africa, that of Rhapta (known from the Periplus), has still not been located, but it was perhaps situated in the Rufiji delta where finds of early trade goods dated approximately 200 b.c.-a.d. 200 have been recently located by Felix Chami.

The existence of a town at that time might presuppose a settlement hierarchy of early farming community sites. Sites of the Kwale Matola tradition dating from the b.c.-a.d. transition to ca. a.d.400 are known to have existed in a great distributional swath along the coastal hinterland from Kenya down to southern Mozambique and into South Africa (Sinclair 1987; Soper 1971). The possibility that these early sites of

iron-using farmers constituted a prestate settlement system

is widely accepted and increasingly they are also believed to have had the potential to have undergone an urban transformation.

Archaeology on the East African coast from the 1950s through the 1970s was concerned mainly with visible architectural remains. The tombs, temples, and palaces of the Swahili coast were located stratigraphically through archaeological excavation, chronologically by using imported ceramics, and architecturally in relation to better known building styles from the Middle East and India. These often very impressive scholarly efforts were strongly influenced by colonial ideology, which tended toward invasionist interpretations based on ethnic definitions expressed in terms of "Africans," "Arabs," or "Austronesians" and often underestimated the creativity of the indigenous peoples of the coast. The limited excavations on the Kenyan coast of stone buildings of "the Arab city of Gedi" and Ungwana (Kirkman 1954, 1966) were superseded by investigations of the Portuguese Fort Jesus in Mombasa (Kirkman 1974) and extensive excavations of the mosque and palace complexes at the major urban site of Kilwa on the southern Tanzanian coast (Chittick 1974).

In the 1980s, extensive archaeological excavations by Chittick (1984) at Manda in the Lamu archipelago off the east coast of Kenya were followed by excavations at Takwa, a site off the coast in an archipelago (Wilson 1980; Wilson and Omar 1996, 1997). Detailed stratigraphic excavations by M. Horton (1996) at Shanga in the same archipelago provided fine resolution chronological sequences and spatial layout of mosque construction and house forms. G. Abungu (1989), working at Ungwana, extended previous work by J.S. Kirkman (1966) and followed the settlement pattern inland up the river Tana. Work at Pate (located again in the same archipelago) by T. Wilson and A.L. Omar (1996, 1997) produced new insights into urban structure.

On the southern Kenyan coast, work by Wilding and later by C. Kusimba (1996) at Mtwapa was carried out in conjunction with investigations at Mombasa. First steps to investigate the role of symbolic values in shaping architectural features, especially Swahili houses, were implemented by L.W. Donelly (1982) on the Kenyan coast. This cognitive approach was extended to the settlement level by S. Kus (1982) in highland Madagascar.

The central coast of Tanzania has been the focus of numerous recent excavations, notably those by Felix Chami of the University of Dar es Salaam, which have transformed our view of the first millennium a.d. chronology and external trading contacts of the early farming communities of this area (Chami 1994, 1998). On Zanzibar and Pemba, a series of surveys focused on stone-built sites have been carried out and followed by excavations (e.g., Clark and Horton 1985; Juma 1996; La Violette and Fleisher 1995). Recent excavations at Unguja Ukuu on Zanzibar have demonstrated trading contact with Roman Egypt as early as the mid-fifth century a.d. (Horton 1996; Juma 1996).

By the eleventh century, the Swahili settlements extended more than 3,000 kilometers along the coastal strip from Somalia to Mozambique, and more than 400 sites were occupied before the sixteenth century (Horton 1987). The settlement system also encompassed the Comoros and the northwestern coast of Madagascar (Vérin 1986, Wright 1984), which were important foci of East African urban development from at least the ninth century a.d. on. The subsistence economy was based on hunting, fishing, cultivation, and livestock and included pottery and ironworking. Trade commodities included slaves, ivory, salt, rock crystal, animal skins, and cloth as well as iron and also gold from the south.

The earliest architectural evidence for the adoption of Islam from the latter first millennium a.d. comes from Shanga in the Lamu archipelago (Horton 1996) and early mosque construction at Sima in the Comorian archipelago. The 1100s and 1200s a.d. saw the widespread adoption of Islam, and this period is marked by a marked increase in settlement area (Wright 1993).

On the Comoro Islands, small fishing and farming communities were established in the late first millennium a.d. (Allibert, Argant, and Argant

1990; Wright 1984), and they maintained trading contact with the East African coast. Early settlements with stone mosques, for example, at Sima on Anjouan, developed into a network of stone-built trading towns. In northwestern Madagascar, traces of human activity occur from ca. a.d. 770.

A number of settlements were established, and these were at first called trading *échelles* by Pierre Vérin (1986) and later discussed in terms of being towns and city-states or part of larger states (Vérin 1992). At Mahilaka in Ampisindava Bay, one such settlement, established ca. a.d. 900, grew to be a large walled town greater than twenty hectares in extent in the thirteenth and fourteenth centuries. Mahilaka maintained extensive trading contacts and had an estimated population of 3,500 before it declined in the fifteenth century (Radimilahy 1998).

The Southern Swahili Coast

Far to the south, in Mozambique, a series of publications concerning work on Portuguese remains on the Sofala coast was produced by, among others, G. Liesegang (1972) and L. Barradas (1967). Further north, a number of Swahili towns and settlements have been recognized, particularly in the Querimba archipelago at Ilha de Mocambique, near Nacala (Duarte 1993), and at Angoche. Farming community sites of the coastal area and interior of Nampula have been extensively investigated, particularly by Adamowicz (Sinclair et al. 1993).

In Vilanculos Bay, the Bazaruto Islands provided safe settlement locations, such as at Ponta Dundo, while on the mainland, where the River Govuro runs parallel to the coast, a settlement and trading entrepôt developed at Chibuene. From at least about a.d. 650, Chibuene maintained contacts deep into the interior, furnishing imported pottery and glass beads from the Persian Gulf as far as Palapye in eastern Botswana and there is evidence of extensive ironworking activities at Chibuene (Kiyaga Mulindwa 1992; Sinclair 1982, 1987). Later, the settlements along the Mozambique coast played an important role in linking the states of the Zimbabwean plateau with Kilwa and other Swahili trading cities.

The Swahili settlements were established initially as small local farming and fishing villages at a number of different places along the coast and the offshore islands. With the growth of overseas trade and the consolidation of internal production sectors, they underwent major expansion until they culminated in the Muslim towns of the fourteenth and fifteenth centuries. Although most settlements remained small villages, several towns expanded greatly in size and population. The larger towns exceeded ten hectares and had buildings of coral rag stone and wood-and-daub houses. Examples of classic Swahili cut coral architecture are best known from spectacular major sites such as Kilwa and Gedi, but they occur more widely. The settlements were small by modern standards, and even at their peak, in the fifteenth century, few were larger than twenty hectares. Their populations must have been small; for example, in the fourteenth century, the important town of Shanga had 220 masonry houses within seven hectares and an estimated population of 3,000 (Horton 1996, 58).

The main towns developed into city-states and had very little political control over their hinterlands. These major towns, from the Lamu archipelago, Ungwana on Tana, Malindi, Gedi, Mombasa, and Tongoni, as well as the towns on the southern Tanzanian coast and islands of Zanzibar and Pemba, represented larger population centers on a quite densely populated coast with numerous smaller villages in between. Initial investigations of parameters of settlement location and a spatial analysis of settlement size by J. De V. Allen (1980) and T. Wilson (1982) established a site hierarchy, which is still in use today, consisting of isolated structures, hamlets, and small settlements of less than 2.5 hectares; medium-sized sites occupying about 2.5 to 5 hectares; larger stone town sites 5-15 hectares in size; and town sites greater than 15 hectares. The Comoros apparently had similar urban networks, and in northern Madagascar, at least one of the coastal settlements, Mahilaka, grew into a large, walled urban

settlement with extensive trading contacts with other parts of the western Indian Ocean system.

Current Issues

In general, controlled stratigraphic excavations at major settlements on the East African coast, dated by imported ceramics, go some way toward providing a general framework for stone town urban development. They still fall short, however, of providing clear estimates of the volume and spatial extent of nonstone-built residential areas and the relation of the country towns to the archaeologically better known stone towns, for example, Shanga (Horton 1996). The recognition of clusters of coastal settlements, for example, by Abungu (1998), points to the need for a detailed investigation of an area larger than an individual site. The need is to establish the contemporary size and spatial layout of the sites that made up the settlement clusters, which might provide significant insights into subsistence, craft specialization, and the political organization of the Swahili city-states.

Trade and Urban Development

Interregional trade knowledge, which is often based on evidence of imported ceramics, has been seen as fundamental for the growth of towns in East Africa (Horton 1987; Kusimba 1999; Middleton 1992; Wright 1993). The limited concept of "the Swahili corridor" as a conduit of trade has been expanded with the recognition of a lattice of trading hubs linking the offshore islands and the East African coast extending far into the various interiors (Sinclair 1995). Wilson (1982) pointed out that Swahili town sites were situated, not only to facilitate trade, but also in terms of local agricultural potential. The distinction between coast and interior has begun to crumble with the progress of historical and archaeological research that focuses on local production and exchange (Haaland 1994-1995; Horton and Mudida 1993; Kusimba 1993; Mutoro 1998; Radimilahy 1998; Wright 1984). New methods of retrieval of evidence from archaeological excavations and computer-aided remote-sensing applications such as geographic information systems (GIS) are being developed to better address these issues.

Socioeconomic and Political Organization

Although archaeological and documentary evidence tell us something about the physical characteristics of the Swahili towns, we still know very little about their socioeconomic and political organization prior to the nineteenth century. Using scattered travelers' accounts from the tenth century on, supplemented by Portuguese sources from the sixteenth and seventeenth centuries and ethnographic sources, numerous authors have attempted to reconstruct the sociopolitical and local and regional economic relationships of the Swahili (Allen 1993; Mazrui 1995; Middleton 1992; Nurse and Spear 1985; Pouwel 1987).

Current discussion focuses upon the difficulties encountered in trying to provide dynamic models of culture change and urban development. The roles of external-forcing mechanisms and human-induced environmental change in system collapse have also been the focus of recent discussion (e.g., Kusimba 1999; Sinclair 1995) as has been the suitability of different concepts of city and state in describing Swahili political organization (Kusimba 1999).

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Swartkrans

Swartkrans is a cave in South Africa with deposits dating from 1.7 to 1 million years ago that contain hominid fossils. The first of these

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fossils was recovered by R. Broom and J.T. Robinson in 1948. Work has continued at the site (most notably by C.K. Brain since 1965), and more than 100 representatives of *Australopithecus robustus* have been identified. This human ancestor is substantially more "robust" than the smaller gracile East African *A. afarensis* and *A. africanus,* although it is younger than them at one million years old. The site has gained additional significance through the discovery of fossils of *Homo erectus* in the same deposits as those of the australopithecines, which indicates that at some time in the early Pleistocene period, both hominids were contemporaneous.

Tim Murray

See also

Africa, South, Prehistory

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Sweden

Not only is Sweden's antiquarian/archaeological history closely related to that of the other Scandinavian countries, but the subject has also been influenced by theories from other disciplines as well as by currents of thought in Europe. Sociopolitical changes in Sweden have also contributed to this history. The antiquarian/archaeological discourse thus consists of a multitude of more or less connected assertions that must be understood against this background. A summary of such a multitude is made at the expense of other material, and this article is an attempt to show how the subject successively changed and finally developed. The history is therefore more a question of discontinuities rather than one of continuous development, and the changes can only be understood in relation to earlier ways of thinking.

The 1500s

In the mid-fifteenth century, the first chronicle was written about the history of the Swedish state until the reign of Karl VIII (1448-1457). The author is unknown but was most likely a monk closely connected to the regent. Thus, history was closely tied to power. The chronicle began with the Flood, and Swedish history was associated with myths about Noah. Scyths and Geats, historically known peoples from around the Black Sea and ancient Thrace, are mentioned. This chronicle was also the first example of the Gothic interpretation of history. The author used older sources, which fueled speculations, and the chronicle's influence on sixteenth-century historians is very apparent.

On 6 June 1523, Gustav I (1496?-1560) was crowned king, and a new era began in Sweden. The country converted to Protestantism, and the entire Swedish society was reformed, including the interpretation of history. One of the more influential reformers was Olaus Petri (1493?-1552), who wrote, at the end of the 1530s, *Svenska krönika* [Swedish Chronicle] as a reaction against the biased nature of the older chronicles. Characterized by a certain freedom from national prejudice, Petri's chronicle was the first original work to be written in the modern Swedish language, and thousands of copies were printed and distributed. According to Petri, the historian should be impartial and seek the truth, but in spite of this claim, the chronicle should be judged in the context of political and religious changes. Petri expressed, for example, doubts about the Goths' migration from Sweden, but he also found fault with Gustav I's church politics and government. Didactic intentions can also be discerned.

Petri believed there was very little knowledge available about Swedish history between the birth of Christ and the introduction of Christianity. Only medieval history was completely clear, because written evidence, such as sealed letters and documents, existed from that time. Petri was also interested in runes, which resulted in a separate work.

If Petri tried to shorten historical perspective, the opposite is true of Johannes Magnus (1488-1544), Sweden's last Catholic bishop. His view of Swedish history in his *Historia de omnibus gothorum sueonumque regibus,* published in 1553 in Rome, was from the perspective of 4,000 years. Although it was supposed to reflect a desire for truth, rather than a desire for eloquence, it hardly succeeded. Instead, the work was characterized by uncritical views of history and pure fabrication. Magnus saw, for

fossils was recovered by R. Broom and J.T. Robinson in 1948. Work has continued at the site (most notably by C.K. Brain since 1965), and more than 100 representatives of *Australopithecus robustus* have been identified. This human ancestor is substantially more "robust" than the smaller gracile East African *A. afarensis* and *A. africanus,* although it is younger than them at one million years old. The site has gained additional significance through the discovery of fossils of *Homo erectus* in the same deposits as those of the australopithecines, which indicates that at some time in the early Pleistocene period, both hominids were contemporaneous.

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Not only is Sweden's antiquarian/archaeological history closely related to that of the other Scandinavian countries, but the subject has also been influenced by theories from other disciplines as well as by currents of thought in Europe. Sociopolitical changes in Sweden have also contributed to this history. The antiquarian/archaeological discourse thus consists of a multitude of more or less connected assertions that must be understood against this background. A summary of such a multitude is made at the expense of other material, and this article is an attempt to show how the subject successively changed and finally developed. The history is therefore more a question of discontinuities rather than one of continuous development, and the changes can only be understood in relation to earlier ways of thinking.

The 1500s

In the mid-fifteenth century, the first chronicle was written about the history of the Swedish state until the reign of Karl VIII (1448-1457). The author is unknown but was most likely a monk closely connected to the regent. Thus, history was closely tied to power. The chronicle began with the Flood, and Swedish history was associated with myths about Noah. Scyths and Geats, historically known peoples from around the Black Sea and ancient Thrace, are mentioned. This chronicle was also the first example of the Gothic interpretation of history. The author used older sources, which fueled speculations, and the chronicle's influence on sixteenth-century historians is very apparent.

On 6 June 1523, Gustav I (1496?-1560) was crowned king, and a new era began in Sweden. The country converted to Protestantism, and the entire Swedish society was reformed, including the interpretation of history. One of the more influential reformers was Olaus Petri (1493?-1552), who wrote, at the end of the 1530s, *Svenska krönika* [Swedish Chronicle] as a reaction against the biased nature of the older chronicles. Characterized by a certain freedom from national prejudice, Petri's chronicle was the first original work to be written in the modern Swedish language, and thousands of copies were printed and distributed. According to Petri, the historian should be impartial and seek the truth, but in spite of this claim, the chronicle should be judged in the context of political and religious changes. Petri expressed, for example, doubts about the Goths' migration from Sweden, but he also found fault with Gustav I's church politics and government. Didactic intentions can also be discerned.

Petri believed there was very little knowledge available about Swedish history between the birth of Christ and the introduction of Christianity. Only medieval history was completely clear, because written evidence, such as sealed letters and documents, existed from that time. Petri was also interested in runes, which resulted in a separate work.

If Petri tried to shorten historical perspective, the opposite is true of Johannes Magnus (1488-1544), Sweden's last Catholic bishop. His view of Swedish history in his *Historia de omnibus gothorum sueonumque regibus,* published in 1553 in Rome, was from the perspective of 4,000 years. Although it was supposed to reflect a desire for truth, rather than a desire for eloquence, it hardly succeeded. Instead, the work was characterized by uncritical views of history and pure fabrication. Magnus saw, for

example, a connection between the European Goths and the Swedish “Göter,” a mythological people, and traced Swedish history back to Japhet's son Magog.

The chronicle was nevertheless a significant work, and the only publications that can compete with it in influence are Petri's reformatory works. Successive Swedish kings and statesmen directly or indirectly obtained their historical knowledge from the chronicle, and Gothicism greatly influenced the sixteenth- and seventeenth-century view of history.

The 1600s

During the 1600s, Sweden became a great power through its victories during the Thirty Years' War, and in that context, antiquarian research went in a direction that had little in common with what had preceded. Sweden's first antiquarian and, moreover, director of national antiquities was johan bure (1568-1652). In 1599, he devised a system to interpret runes, and in the same year he received a permit from King Karl IX (1550-1611) to travel around Sweden and document rune stones and locate ancient monuments. Bure was a pioneer in rune research, as Petri's documentation had been fairly insignificant.

Although Bure's contributions were limited, his close contact with the kings of Sweden drew their attention to antiquarian research, and as a result, official antiquarian research took shape. On the advice of Bure, King Gustav II Adolf (1594-1632) issued, for example, an “antiquities instruction” whereby he ordered the nation's antiquarians to collect antiquities, and consequently, the Central Board of National Antiquities developed.

Bure's successor, Johan Hadorph (1630- 1693) traveled throughout the countryside with draftsmen and scribes and documented about 1,000 runic inscriptions. One of the draftsmen was Elias Brenner (1647-1717), a student of Olof Verelius (1618-1682), who was professor of antiquities at Uppsala. It was, however, from Johannes Schefferus (1621-1679) that Brenner received his first insights into numismatics, which he elevated to a science in the 1690s. Hadorph researched both ancient monuments and artifacts as well as folk traditions. During the mid-1680s, he also conducted archaeological excavations in the Viking town of Birka. Verelius had also undertaken fieldwork, and so had Olof Rudbeck (1630-1702), who investigated royal Iron Age burial mounds in Old Uppsala.

Place-name research by Petter Dijkman (1647?-1717) developed alongside antiquarian research. Dijkman communicated with Schefferus about his numismatic studies under Brenner, and Dijkman's *Bua Haiti,* one of the first attempts at place-name research, was published in 1711. Dijkman was influenced by Kilian Stobaeus's uncle Anders Stobaeus (1642-1714), a historian, Latin scholar, and poet. One of Dijkman's more important works was published posthumously in 1723. It contained a selection of material from seventeenth-century rune research and was particularly concerned with the Christian faith's influence on the inscriptions. Dijkman made use of previously published material, and of the ninety inscriptions he discussed, some seventy are found in Bure and Verelius.

Hadorph was primarily an organizer and viewed himself as a materialist. In 1666, he was appointed director of national antiquities, and he became powerful within the Antiquities Committee, which was established during the same year. The committee's tasks were to preserve the country's ancient monuments; publish Icelandic sagas and ancient Swedish laws; create a Swedish dictionary; document rune stones, coins, and seals; and carry out archaeological excavations. The committee was first based in Uppsala but was moved in 1690 to Stockholm. Gradually, its organization was tightened, and it was renamed the Antiquities Archive. The chairman had the title of secretary and functioned as the director of national antiquities.

Hadorph also became secretary of the Antiquities Archive but died soon afterward. After the demise of

the last secretary in 1777 there was no appointment of a new one, and in 1780, the archive was dissolved. After the reorganization of Queen Lovisa Ulrika's (1720-1782) Literary Academy in 1786, the Academy of Literature, History, and Antiquities took over the duties of the Antiquities Archive, and its secretary became the director of national antiquities.

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Archaeological excavations were consequently carried out, and Schefferus wrote Sweden's first archaeological dissertation, a work that discussed a bronze sword found in Scania and three gold bracteates. In spite of this work, most of the academy's interests were focused on literary sources and, in particular, on Icelandic ones. During the late seventeenth century, patriotism and Gothicism reached the height of their popularity. Gothicism identified the Goths with the *hyperborés,* an ancient mythological people, a theory that was supported by some evidence from Icelandic material. Olof Rudbeck, in his monumental work *Atlantican* (1679-1702), claimed that Sweden was the lost civilization of Atlantis. Although the work was received with enthusiasm outside of Sweden, it soon lost its standing and was criticized by Schefferus and Hadorph, who had little sympathy for such speculation. Perhaps the most interesting critique of *Atlantican* was by the German philosopher Gottfried Wilhelm von Leibniz (1646- 1716), who was one of the forerunners of the scientific revolution. Leibniz's critique was ironic and was an indication that new scientific viewpoints were developing in Europe.

Various bills to protect ancient monuments were issued in 1666 and renewed in 1669, 1676, and 1684, and they laid the groundwork for more organized antiquarian research. Priests and public officials were ordered to participate in field surveys and to send the results of any pillaging of monuments to the Antiquities Committee, and ancient monuments were more closely linked to royal power. During the 1600s, there was still no organized research that focused on the material culture and artifacts associated with ancient monuments. Artifacts were collected and documented but then compared to literary sources. It was unthinkable to view them as something outside the literary historical field.

The 1700s

In 1718, King Karl XII died, and Sweden's period as a great power came to an end. During the following years, known as “the period of liberty,” parliamentary power took shape. An unsuccessful war against russia (1741-1743), bureaucracy, and a disorganized monetary system caused many problems for Sweden during this period. Later, after a successful reorganization of the monetary system, closer ties with England, and the establishment of ties with Russia, the first Swedish law concerning freedom of the press was instigated.

During this period, antiquarian research was still faulty and descriptive, its results were mainly compilations, and any conclusions it drew were speculative and lacked cohesion. Historians continued to interpret Sweden's earliest times. Jacob Wilde (1679-1755) was one of Sweden's first modern historians, and he often dealt with problems with source material. Wilde demolished Johannes Magnus's list of regents and criticized Olof Rudbeck's fantasies. Wilde's work dealt with three historical periods-ancient times, the Middle Ages, and modern times-and his divisions were later accepted by several historiographers. The ancient period was divided into two ages: a “dark age,” knowledge of which must be sought among classical authors, and a “mythological age,” ca. 120 b.c.-ca. a.d. 1150. Within the latter age, three phases were identified: the cairn age, the cremation age, and the mound age. It was a historical division, based on Icelandic sagas and not on archaeological material. There was no comprehension of a prehistory that demanded an independent chronology. Wilde was followed by Olof von Dalin (1708- 1763), Anders af Botin (1724-1790), and Sven Lagerbring (1707-1787).

The doctor and antiquarian Kilian Stobaeus (1690-1742) and the philosopher Andreas Rydelius (1671-1738) taught Dalin in Lund. Stobaeus occupied Lund University's first chair of natural science in 1728 but exchanged it for a professorship in history in 1732. The great philosopher Carolus Linnaeus was one of his many pupils. Stobaeus taught natural science, history, numismatics, and antiquarian research. He donated his significant collection of artifacts and natural objects, known as Museum Stobaeanum, to Lund University in 1735.

Dalin began a state administrative career in Stockholm in 1727 and at the same time, together with Johan Ihre (1707-1780), competed for the position of state historiographer. Although

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had far more impact than Dalin. He contributed to the publication of thirty-six dissertations on Scania's medieval archaeology, and he was also the first to discuss the historical source value of Icelandic literature in a modern way. Lagerbring taught geography, a significant subject for archaeology, and he helped ensure that the eighteenth century was a golden age for recording the details of provinces, towns, and parishes, a descriptive tradition begun by Dijkman and Stobaeus. Lagerbring also made lasting contributions to the organization of the Cabinet of Coins, which was kept for a long time inside his house. He saw truth, founded in historical criticism, as the historian's guiding star. His method of delivery was original in that it was not organized chronologically, as all earlier histories had been. In accordance with Voltaire, and in a manner similar to that of Botin, Lagerbring arranged source materials by subject matter.

Contrary to Dalin, Lagerbring drew a sharp distinction between source and literature, and he made two new demands on the historian: source references and source evaluation. With source references, statements or suppositions could be checked. For source evaluation, the cardinal rule was that the more certain the contemporary nature of the document, the greater its reliability. Agreement among several sources was important as a criterion of truth. But Lagerbring had a didactic and pedagogical delivery, and he viewed history in the light of his contemporary society's political conditions and according to the rational critique of the eighteenth century. He evaluated ancient and medieval religious conditions in the same way as most scholars of the Enlightenment, with little sympathy for medieval people and a belief that monks were frauds.

The 1800s: Period of Transition

The beginning of the nineteenth century was full of change. Sweden surrendered finland to Russia, a new constitution was written in 1809, and foreign policy was changed. The French field-marshal Jean-Baptiste-Jules Bernadotte, one of Napoleon's generals, ascended the Swedish throne as King Karl XIV Johan in 1818, and during the 1830s, liberal political forces grew stronger.

It is this context Nils Henrik Sjöborg (1767- 1838) outlined a three-age system in 1797 even though its structure remained unclear. Sjöborg used a comparative ethnographic perspective, inspired by Anders Jahan Retzius (1742-1821), to help formulate his system. Stobaeus had also used ethnographic analogies to confirm that stone artifacts were used as tools before iron artifacts. Retzius, an early natural science student and a pupil of Linnaeus, donated his collection of prehistoric stone tools and natural history to Lund's museum between 1805 and 1811. He also divided the Museum Stobaeanum into separate natural history, art history, and history departments.

Natural-scientific systematization gradually overtook the historical view. Magnus Bruzelius (1786-1855) began as a physical anthropologist but turned to antiquarian research. Modern European geology, which traced nature's successive development, was also a significant influence, contrasting catastrophe theory with biblical chronology, which had dominated historical research since the sixteenth century.

First Half of the 1800s

A new chronological and ethnographical perspective on history took shape during the early nineteenth century. Its founders were christian jürgensen thomsen (1788-1865) from denmark and the Swede sven nilsson (1787- 1883). Thomsen's three-age system replaced a chronology that was just a step above confusion. The Swede Magnus Bruzelius had formulated a similar system in the 1820s, based on archaeological find-contexts. Thomsen's system was, however, more composite and it schematized find observations. He was also the first to publicize the system, partly in museological form and partly through communication with colleagues (Gräslund 1987, 18). Nilsson later gave this system a culture-historic shape.

As a scientist, Nilsson was a systematizer, but he was also educated in history and philosophy. He made significant contributions not only to archaeology but also to several subjects within the natural sciences. He collaborated with the English geologist sir charles lyell, the English archaeologist Sir John Lubbock (lord avebury), and their compatriot Charles Darwin. Nilsson

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carried out fieldwork and collected archaeological and ethnographical objects, and through his experiments in flint knapping he was able to confirm the function of knapping stones.

The idea of primitive people had existed since the seventeenth century, and during the nineteenth century, it became the object of classification and development theories within the natural sciences. Nilsson preferred natural science and comparative, ethnographic archaeology, which he formulated on the basis of the French paleontologist and geologist Georges Cuvier's (1769-1832) natural-scientific method, with archaeological methods above historical analogies. Nilsson was the first scholar in Sweden to use the term *prehistory* (Welinder 1991).

This change in the discourse was, among other things, linked to the Enlightenment's division of society into different subject areas, a way of thinking that both Botin and Lagerbring had borrowed from Voltaire. The need to view society from an evolutionary and holistic perspective developed and was related to the popularity of German Romanticism and its advocates Johann Gottfried Herder (1744-1803) and Georg Wilhelm Friedrich Hegel (1770-1831). Thus, Nilsson viewed development as a whole, with everything in nature, including man's culture, evolving from the lowest stages to the highest. Hidden behind the material world was the development of reason. The process was predetermined.

At first (in 1835), he divided the development of mankind into three economic periods: savage, nomad, and agriculturalist. This system and its divisions were completely separate from Thomsen's three-age system, as the two men were not familiar with each other's work at the time. Later, however, they were in close contact. In the late 1830s, Nilsson added a fourth stage: the agriculturalist, with a written language, production, and a division of labor among the members of society (Nilsson 1838-1843).

The three-age system, on the other hand, was not based on an a priori interpretation of cultural development but neither was it socioeconomic. It was chronological, and since it was related to archaeological find-contexts, it had a great impact because it had empirical and scientific proof. It was not an intuitive, practical method of arranging finds but rather the chronological means of assistance for further investigations (Gräslund 1987, 27).

Mid-1800s

It was through Thomsen and Nilsson that antiquarian research became separate from history and modern archaeology took shape. Gradually, comparative ethnography lost its influence because of its alienation from find-contexts. Instead, it became important to improve on Thomsen's three-age system.

The Dane jens jacob worsaae (1821-1886) laid significant groundwork for archaeology during the mid-nineteenth century. European cave finds of extinct animal species discovered in stratigraphic connection with cultural remains, finds that Lubbock later called Paleolithic, may have been important for Worsaae's initial division of the Stone Age into two periods. Later Worsaae divided the Stone Age into three periods, with cave finds constituting the earliest period, kitchen middens the middle period, and stone chamber graves the youngest period. Today, these periods are called Paleolithic, Mesolithic, and Neolithic.

The division of the Bronze Age into two parts was first expressed in 1854 by the Swede Nils Gustaf Bruzelius (1826-1895). The division was based on stratigraphy and on the fact that cremation burials overlay inhumations. Through various bog finds, Worsaae formulated a division of the Iron Age into two parts, which was successively confirmed by new finds, and the concept of the Iron Age became common in the Scandinavian countries during the 1850s and 1860s.

After a visit to Hallstatt, austria, in 1858, Bruzelius asserted that the Iron Age in southern and central

Europe must have begun a couple centuries before the birth of Christ. He also noted a sharp border between the Bronze Age and the Iron Age. He did not, however, compare this observation with conditions in Scandinavia. Instead, it was the Dane Emil Vedel (1824- 1909) who asserted that the transition between the Bronze and Iron Ages in Scandinavia occurred before the birth of Christ. He drew this conclusion after investigations at Bornholm between

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1868 and 1872. Thereafter came a division of the so-called Roman Iron Age (a.d. 0- 450) into two parts, formulated mainly by the Danish archaeologist sophus müller (1846- 1934).

Antiquarian/archaeological research changed from being a political and didactic instrument to an empirical, critical science, and archaeology was finally free from the literary historical analogies. It was no longer a matter of writing a country's history; instead, it was important to organize and systematize the country's nonhistorical source material, and the leaders in the change were Thomsen and Nilsson.

Typology

The chief characteristic of the last half of the nineteenth century was the division of the three-age system into subperiods and the formulation of culture-historic guidelines. Find-contexts played an important role. Within Iron Age research, historical analogies were used in the sense that historically datable, Continental material was comparable with Scandinavian conditions. Numismatics also had a high priority in Iron Age research. Around the year 1870, the nature of archaeological discourse changed again, with chronological work directed toward making shorter time divisions while the intensity of research and the amount of source material increased. The increase in material was seen to be connected with the intensification of agriculture, as well as with increased industrialization in general. By this time, researchers and museum scholars both had a specialized university education. It was in this context that a new archaeological discourse on typology was formulated.

The background of typology was empirical. Changes in form had been described by oscar montelius (1843-1921) and hans hildebrand (1842-1913) as “development” in accordance with the language of the time. The idea that development was continuous and unbroken was thus the basis of typology. This meant that development could also be observed and traced without the support of find-contexts. With the aid of typology, correct chronological conclusions could be drawn entirely on the basis of changes in form, and in this area, statistics were an important aid. Typology was, however, formulated in a diffuse way and the term consequently has a broad definition.

It was to mark these new methodological directions that Hildebrand formulated the typological method, but typology was of less importance for him than it was for Montelius (Gräslund 1987, 97). Montelius's famous *Tidsbestämning* [Dating in the Bronze Age] (1885, English edition in 1986) was based, to a greater extent, on different find-contexts than on typology. Determining time sequences in the Bronze Age did not require the development of typological analysis. Thus, Montelius worked not only typologically but also, and especially, by empirically combining different find-contexts.

Müller criticized Montelius for neglecting the relationship between the context of artifacts and the typological series and implied that it was impossible to classify artifacts typologically without taking these contexts into account. In other words, Montelius did not differentiate between typology and find-context analysis.

Yet it was Montelius himself who popularized his image as a typologist. After Darwin's works were published in Swedish, Hildebrand and Montelius began to hint at a connection between typology and Darwinism. However, unlike Hildebrand, Montelius never referred to the theory of natural selection, and as a result, the relationship to Darwinism is vague (Gräslund 1987, 104). Typology belonged more to a pre-Darwin theory of development, a way of thinking that had existed during the eighteenth century, a fact that Nilsson emphasized strongly. But typology also belonged to neo-Kantism and to the advance of positivism within historical research. Hildebrand and Montelius never claimed that Darwinism had given rise to typology (Gräslund 1987, 105). Rather, typology was associated with Darwinism only after the relationship became apparent, and it should therefore be viewed as a scientific-political move.

The most decisive “discovery” of the time was, however, Montelius's dating of the Bronze Age and indirectly also providing dating for the Stone and Iron Ages. A more exact dating of the Stone Age had to wait, however, for the scientific methods that first became possible during

the 1970s. The Iron Age in Scandinavia acquired the dates of the sixth century b.c. to eleventh century a.d.

In *Tidsbestämning,* Montelius synchronized historically datable comparative finds from the Mediterranean and Middle East with Scandinavian conditions. In so doing, he could set the span of the Bronze Age from 1500 to 500 b.c. In comparison with the eighteenth-century Bible-based datings and the nineteenth-century vague chronological interpretation (Worsaae, for example, maintained in the 1850s that the Bronze Age reached its peak at around the birth of Christ), this was an enormous step forward.

Early 1900s

During the first half of the twentieth century, archaeological source materials increased considerably, new perspectives opened up, and old methods were refined. In general, research was directed toward settlement history and the history of style.

Settlement history had existed during the nineteenth century, but during the first decades of the twentieth, it became more focused and systematic, and better known to a wider circle of researchers. Investigations of regional complexes of settlement remains also began at this time. Oscar Almgren (1869-1945), together with the botanist and Quaternary geologist Rutger Sernander (1866-1944), made early advances in this field. In 1901, they investigated Uppland's settlement history, encouraged by the discovery of the first Middle Neolithic settlement (ca. 2800 b.c.) in central Sweden.

In 1907, Knut Stjerna (1874-1909) initiated extensive archaeological provincial investigations in southern and central Sweden, focusing on the Stone and Bronze Ages. It was hoped that the project would eventually encompass all of Sweden, and the intention was to study the typology and chronology of the artifacts found as well as their topographical distribution. The project resulted in several dissertations and publications, but never encompassed all of Sweden.

Geographical, geological, and ecological factors were all important to an understanding of settlement development. Place-name research and historical and ethnological analogies were applied to the Iron Age. The Royal Place-Name Committee began to publish *Sveriges Ortnamn* [Swedish Place-Names] during the early twentieth century. Within the history of style, typology was more important, visible, for example, in Hanna Rydh's (1891-1964) doctoral dissertation of 1919, the first thesis in archaeology to be written by a woman.

The term *primitive* was used regularly. Within the history of style it was used to characterize the development of different elements of style, and there were also reference to prototypes, manufacturing processes, and industries. These terms coincided with typological and chronological questions. The term *settlement history* was used in debates on ethnicity and race. The basic question to answer was how different Mesolithic cultures developed into Neolithic cultures. A dualistic relationship was sought, which implied either that immigrating people, or people of other races, who had a higher technological and intellectual level had suppressed the first cultural phases or that the Neolithic level had been achieved within the country's boundaries and that more-primitive hunting cultures had been suppressed or assimilated.

In that context, ethnographical and ethnological analogies had some importance. The choice of language revealed uncertainty in the relationship to the “primitive” Mesolithic peoples, which gave rise to theories that implicitly, or occasionally explicitly, expressed a reluctance to accept the idea that such comparative “primitive” cultures had existed in Scandinavia at the same time as the cultures of the Bronze and Iron Ages. On the other hand, the more “developed” and artistically more “talented” cultures of the Bronze

and Iron Ages did not have the same problems concerning identification. One could accept and even identify with Neolithic cultures because they depended on agriculture and livestock. The means of distancing oneself from the “primitive” cultures of the Mesolithic was to transfer them into being part of the natural world, and thus to being governed by the laws of nature. In the case of the Bronze and Iron Ages, one could easily identify with the creative powers and great initiatives of these cultures. This pattern has certain parallels with

ideas of the eighteenth century and their erratic views of earliest history.

During the early twentieth century, archaeology lacked composite theories about the composition of and changes in different cultures. This lack does not mean that such questions were ignored-now and then references were made to religious and social conditions-but above all it was a case of diffusionist explanations and an implicit view of man and society. In general, the scientific ideal was empirically inductive with a natural-scientific undertone. Most works were descriptive and pragmatic in character.

A prehistoric petroglyph or vase painting from a Bronze Age site in Tanum, Bohuslan, Sweden, depicting three figures standing on the deck of a boat

(Hulton Getty)

Later 1900s

From the end of the 1930s until the 1950s, style-historical research (the use of style in material culture to determine the direction of historical change) in archaeology predominated. During the 1950s, several human geographers took an interest in settlement-history questions, and at the same time, several large field projects were initiated. These resulted in extensive and detailed publications of material. The inductive tendency of these works, as well as the lack of more explicit theories about human society, led to a crisis that developed into a debate on method and theory.

Criticisms burgeoned during the 1950s and 1960s, and especially influential at this time was criticism by Bertil Almgren and mats malmer. Generally speaking, their arguments pointed in two different directions: Almgren took an art-historical, hermeneutics/phenomenological direction while Malmer upheld a rationalistic, positivistic, and scientific ideal or direction. Berta Stjernquist represented a third approach. She worked with traditional typology and also with ecology and ethnicity, and she argued that it was important to give greater emphasis to factors that had influenced the material. This approach demanded theoretical and anthropological knowledge as well as situation studies like those of anthropologist Bronislaw Malinowski (Stjernquist 1955, 2).

The renaissance of settlement historical archaeology during the 1960s is linked to that crisis/debate. Through extensive archaeological excavations, historical maps, and surveys of ancient monuments, an attempt was made to acquire knowledge of the colonization process, settlement structure, and economic conditions during, above all, the Iron Age in Sweden. Attention was given especially to economic variables. Collaboration between archaeologists and human geographers was strengthened, and even place-names and medieval fiscal material were used.

Greater emphasis was placed on local economic factors than on diffusionist factors. Economic aspects were considered to be the basis for man's production possibilities and for living conditions. These could be studied geographically, zoologically, and geologically. Since the beginning of the twentieth century, settlement historical archaeology had been influenced by advances within quantitative methodology. In the area of analysis that has “hardware” as its point of departure, statistics were important along with diagrams and models. These were some of the preconditions for the introduction of the new archeology into Sweden during the 1970s.

As early as 1963, Carl-Axel Moberg (1915- 1987) had been in contact with lewis r. binford (b. 1929). By the end of the 1960s, Moberg was arguing that a rationalization of archaeology was necessary since the constant increase of material had given rise to a collecting and publishing crisis. In this context, he

pointed out the possibilities of processual archaeology as

well as the practical revolution that computerized data implied (Moberg 1969, 16-18).

In so doing, Moberg put his finger on the crisis that has been the subject of discussion since the 1960s. He maintained that the cause was a crisis in education, that new directions were needed within archaeology, and that, in the long run, new archaeologists were needed. It was necessary to educate archaeologists in theoretical knowledge and change the goals of archaeology, which implied that an archaeology based on inductive knowledge would be replaced by more objective observations. Technological development would contribute to the globalization of archaeology and the fusing of different archaeologies into one. There were two possible paths: the regional picture could be broadened to include the history of mankind in both time and space; alternatively, world archaeology could be achieved via anthropology. The idea was to determine general laws of human behavior by using deductive methods (Moberg 1969, 21).

Thus, the deductive, scientific ideal was formulated for the first time within Swedish archaeology, and Moberg's future expectations would be realized during the 1970s. At this point, however, we should consider one of the more theoretically knowledgeable and independently active researchers in Sweden during that decade. In Stig Welinder's dissertation on the Scanian Mesolithic (1971), there is no reference to processual archaeology and its aim to trace changes in the environment by conducting natural-historical investigations. In a later work (1975), on the other hand, there are several references to processual archaeology, or "the new archeology." Welinder even eliminated the "a" in the combination "ae" in archaeology and was working explicitly with models and system-theoretical questions. His point of departure was the axiom that the surrounding milieu and technology were society's base. In order to prove this axiom, it was necessary to work system theoretically. Welinder's thinking was similar to that expressed by the English archaeologist david clarke's ecological paradigm (Clarke 1972), and Welinder was also interested in Clarke's view of the sociocultural system (Welinder 1975, 22). Economic, ecological, and demographic aspects composed the foundations of his model. In the long perspective of prehistory, war, trade, religion, social organization, etc. were of secondary importance. Settlement historical conditions could only be understood from an ecological perspective, and societies were interpreted as composite economic/technological complexes (Welinder 1975, 20).

Welinder sometimes doubted the possibility of creating laws for diffusion and social structures, since culture-historical processes and human societies are not repeated in time and space. In his opinion, the model sometimes deviated from the models normally used by the new archeologists (Welinder 1977, 15). Neither could it be used as an explanatory model. Instead, its strength lay in its description of basic structures in the cultural landscape. On a later occasion (Welinder 1979, 24), however, he implied that if it were possible to formulate such laws, then the preconditions could be found within demography. This archaeology could be called "human paleoecology," "ecological archaeology," or "population anthropology" (Welinder 1979, 25). Welinder's thinking has been used as an example of the tendencies of the 1970s, but it should be noted that they are not representative of the subject as a whole. Alongside them there was a traditional, inductive, and typological archaeology. However, Welinder's archaeology, to a certain extent, was representative of a more theoretically oriented archaeology.

Thus, archaeology during the 1970s became more natural-scientific in character. Attempts were made to reduce the preconditions for the formation of society to a single basic norm. The decisive factor was the relationship between man and his surrounding environment, with the latter constituting the basic variable. This line of thinking was linked to the positivistic ideals that were predominant within Swedish society as a whole. Generally speaking, the political model for Swedish society has been characterized by standardization in a positivistic spirit.

Archaeology Since the 1980s

During the 1980s, the reductionist viewpoint was called into question, not only within the

sciences but also within Swedish politics. Multiplicity became the political slogan. But this questioning has not implied, and will not cause, the disappearance of the deductive and inductive ideals. Rather, archaeology's relative homogeneity began to break down, and in the future a broad front of disparate archaeologies will probably develop. On scientific-theoretical grounds, it is difficult to give priority to one archaeology above another. It is therefore no longer clear how Swedish archaeology should be defined.

The possibility, or risk, is that research will be divided up into more and more problem areas. This idea may sound like an exaggeration, but it should be remembered that archaeology has always depended on different auxiliary sciences. In practice, a closer relationship can be established with any subject. We can therefore expect a wide spectrum of archaeologies. The risk is that barriers may be erected among them and each may fight the others' existence. There is the possibility that certain scientific-ethical grounds will be established so that the flood of ideas runs freely and various alternatives develop not only in different directions but also in close relationship with one another. It will be decisive in this context that discourses are not hindered by supposed scientific ideals.

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Swedish Cyprus Expedition

See Gjerstad, Einar

Switzerland

As long ago as a.d. 1490, excavations financed by the authorities were reported in Switzerland. An early Middle Age cemetery had been fortuitously uncovered during the alterations of Saint Maurice Church in Schotz (Lucerne). The skeletons, seemingly holding their skulls in their hands, were considered to be the martyrs of the Theban legion, put to death with their leader, Saint Maurice, because of their Christian faith.

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Syro-Palestinian and Biblical Archaeology

The history of Syro-Palestinian archaeology, or the archaeology of the southern Levant (ancient Canaan; modern coastal and southern Syria, Lebanon, jordan, and israel), and the history of the specialized branch of this discipline, usually called “biblical archaeology,” will be examined.

Roots in the Nineteenth Century: The Exploratory Era

The archaeology of the Holy Land, in the broad sense of the exploration of biblical topography and antiquities, goes back centuries to hundreds of pilgrims' accounts since the Byzantine period. The modern discipline of Palestinian archaeology, however, can be said to have begun with the pioneering visits of the U.S. biblical scholar Edward Robinson to the Holy Land in 1838 and 1852, an account of which was published as *Biblical Researches in Palestine and the Adjacent Regions* (1853). Robinson and his traveling companion Eli Smith correctly identified dozens of long-lost ancient sites. The first modern maps, however, after those made by Napoleon's cartographers, were drawn up by C.R. Conder and H.H. Kitchener for the great *Survey of Western Palestine* (1872-1878; published in six volumes in 1884). This work was sponsored by the British Palestine Exploration Society (1865-), which also undertook the first actual fieldwork, C.W. Wilson and C. Warren's soundings around the Temple Mount in Jerusalem (1867-1870).

In Egypt and mesopotamia, dramatic archaeological discoveries, which began in the 1840s partly by chance and because of the results of the first deliberate excavations, soon drew attention to Palestine, largely because of its biblical connections. Several foreign societies soon joined the British Palestine Exploration Fund: the German Deutsches Palastina-Vereins (1878-); the French Ecole Biblique et Archéologique in Jerusalem (1892-); and the american schools of oriental research (1900-).

Despite mounting interest, however, true excavations did not begin in Palestine until the brief campaign of the legendary English archaeologist sir william matthew flinders petrie at Tell el Hesy in the Gaza area (possibly biblical Eglon) in 1890, which was soon followed by American work there under F.J. Bliss in 1893. It was Petrie who laid the foundations of all subsequent fieldwork and research by demonstrating, however briefly and intuitively, the importance of detailed stratigraphy of Palestine's complex multilayered tells, or mounds, and the potential of comparative ceramic typology and chronology.

This first, formative era of archaeological exploration and discovery in Palestine in the nineteenth

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This first, formative era of archaeological exploration and discovery in Palestine in the nineteenth

century was characterized by adventurism, by nationalism and competition among the colonial powers, and by growing expectations that archaeology would shed a unique light upon the biblical world. Yet ancient Syria had scarcely been touched, although some archaeological exploration there had begun as early as the 1860s under French scholars like Ernest Renan.

From the Turn of the Century until World War I: The Formative Period

The first two decades of the twentieth century constituted a sort of "golden age" in Syro-Palestinian archaeology, one that saw the first large-scale, reasonably well-staffed and well-funded field projects. These included the work of the Americans at Samaria (1908-1910); of the British at Tell Gezer (1902-1909); and of the Germans at TaCanach (1902-1904), Megiddo (1903-1905), Jericho (1907-1909), and the Galilean synagogues (1905). In Syria, Howard Crosby Butler's splendid surveys of Byzantine Christian sites (1904-1909) for Princeton University deserve mention, but by and large, Syria was ignored as being peripheral to the Holy Land. None of these excavations, however, with the exception of george a. reisner's work at Samaria (results of which were not published until 1924), demonstrated more than the rudiments of stratigraphy. Pottery chronology was off by centuries, and the publication volumes, although sometimes lavishly illustrated, are largely useless today. An almost exclusively architectural orientation, and/or biblical biases, marred most of the work.

All of these and other projects were brought to a halt by the onset of World War I, but the foundations of both Syro-Palestinian and biblical archaeology had been laid. Nevertheless, neither an academic discipline nor a profession had yet emerged in this second, formative period.

Between the Great Wars: The Classification Period

Following the corrupt bureaucracy of Ottoman Turkish rule, Palestine became a British mandate in 1918 at the close of World War I. The British government opened a Department of Antiquities, promulgated modern antiquities laws, and undertook the first systematic, comprehensive program of archaeological investigation of the entire area, including Transjordan. During the ensuing period, the foreign schools in Jerusalem flourished, particularly the American School of Oriental Research, which now dominated the field under the direction of william f. albright (1920-1929; 1933-1936). Albright, one of the most eminent orientalists of the twentieth century, was then followed by his protégé Nelson Glueck, who was famous for his explorations in Transjordan.

It was Albright who became known as "the father of biblical archaeology" through his unparalleled mastery of the pottery of Palestine, of the broad ancient Near Eastern context in which the results of Palestinian archaeology needed to be placed to illuminate them properly, and of the vast scope of biblical history with which individual discoveries often seemed to correlate. Although Albright himself sometimes used the term *Syro-Palestinian archaeology*, his overriding concern was with the biblical world. Through his genius; his towering status; his own excavations at Tell el-Fûl (1922), Bethel (1934), and especially at Tell Beit Mirsim (1926-1932); and his innumerable disciples, Albright dominated "biblical archaeology" from the early 1920s through the 1960s. One of his protégés, G. Ernest Wright of Harvard, carried on the tradition by coupling "biblical archaeology" more specifically with the "biblical theology" movement that flourished in the 1950s-1970s. A transitional figure, Wright trained most of the older American generation still working in the field today.

Many of the U.S. excavations in Palestine between the two world wars, under Albright's influence, were at biblical sites, staffed by Protestant seminarians and clergymen, and supported by funds from church circles. These included Albright's own excavations and those at Tell en-Nasbeh (1926-1935), Beth-shemesh (1928- 1933), and many smaller sites. Nevertheless, there was a parallel, secular U.S.

tradition, especially in the large projects of the University of Pennsylvania at Beth-Shan (1926-1933); of the Oriental Institute of the University of Chicago at Megiddo (1925-1939), well funded by the Rockefellers; and of Yale University at Jerash in Transjordan

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(1928-1934). These, too, were biblical sites, but the secular stream of U.S. Palestinian archaeology never captured the imagination of the public or succeeded in perpetuating itself as the Albright school did. In retrospect, it seems that, in the United States at least, archaeology in “poor Palestine” was not thought to be able to justify itself without the biblical connection.

British work in Palestine between the two wars combined biblical and nonbiblical interests. The principal excavations were those at Ashkelon (1920-1922); Dor (1923, 1924); Petrie's at Tell Jemmeh (1926, 1927), Tell el Fara (1927-1929), and Tell el Ajjul (1930-1934); the Mt. Carmel prehistoric caves (1925-1934); Petra (1929-1936); Athlit (1930-1933); Samaria (1930-1935); Jericho (1930-1936); Lachish (1932-1940); Kh. Mefjer (1935-1948); and, of course, many projects in Jerusalem.

The French approach between the wars was similar, the major excavations in Palestine being those at Ai (1933-1935), Teleilat al-Ghassul (1929-1938), and several prehistoric sites. The same combination of secular and religious interests characterized the German school, with excavations at Mambre (1926-1928) and Kh. el-Minyeh (1932-1939). However, neither the British, French, German, or any other international school combined Palestinian and biblical archaeology in the deliberate, almost exclusively biblical, and often theological way that much of the American work did.

British advantages during the Mandate period notwithstanding, biblical archaeology in Albright's unique style seemed triumphant on the eve of World War II when all fieldwork came to a halt. Nevertheless, despite differences in approach among the various schools, archaeology in Palestine had made enormous strides in this third era, which may be characterized as “the classification period,” when the stratigraphy of the major sites was first worked out and the chronological-cultural history was outlined for the first time from the Paleolithic to the Islamic periods.

The Heyday and the Decline of Biblical Archaeology: 1950-1970

American-style biblical archaeology reached its zenith soon after the resumption of post-World War II fieldwork in Palestine in the early 1950s. Principal excavations were those of Wright at Shechem (1957-1968), J.B. Pritchard at Gibeon (1956-1962), J.A. Callaway at Ai (1964-1969), P.W. Lapp at Teller Rumeith, Tell el Fûl, and TaCanach (1964-1968), and Pritchard at Tell esSaCaidiyeh (1964-1967). All of those excavations, which were affiliated with the American school in Jerusalem, were at biblical sites; the directors in every case were clergymen and professors of theology or religion; the agenda was often drawn from issues in biblical studies; and funds came largely from religious circles. In addition, the generation of younger American archaeologists who would come to the fore in the 1970s was trained at these sites.

In addition, a series of publications by Albright, Wright, and others attracted international attention to American biblical archaeology and provoked heated controversy in Europe. At issue were both fundamental questions of method in general (biblically biased or not) and certain specific historical questions in biblical studies (the historicity of the patriarchs and the Israelite conquest, Moses and monotheism, Israelite religion and cult, etc.). Neither Albright nor Wright was a fundamentalist (although certainly conservative by more recent standards), yet outside of the United States suspicions prevailed. The misgivings were prescient, for by the early 1970s, biblical archaeology (along with the biblical theology movement, an outgrowth of postwar neo-orthodoxy) was moribund, if not dead.

In retrospect, the demise of biblical archaeology was probably inevitable, for many reasons. First, what may be called the internal weaknesses of the movement were numerous: its reputation for amateurish fieldwork, naive or biased scholarship, and poor publication; its parochial character, related as it was largely to the conservative (if not fundamentalist) character of so much of religious life in the United

States; its reactionary nature, locked into dated theological issues, which left its practitioners unable to respond creatively to new developments in or outside the field; its resistance to growing trends toward specialization and professionalism; and, above all, the fact that it failed

The French École Biblique et Archéologique in Jerusalem excavated at Tell el-FarCah (1946- 1960), Qumran (1951-1956), Munhata (1962- 1967), and Tell Keisan (1971-1976). Preliminary reports appeared in the "Chronique Archéologique" of the *Revue Biblique.* The Dutch, although without an in-country institute, carried out important excavations somewhat later at Tell Deir CAlla in the Jordan Valley (1976-1978).

The 1967 Arab-Israeli war had a considerable impact on archaeology, at least in Palestine if not in Syria. In effect, Palestine was now repartitioned, and the West Bank now fell under Israeli control. The Israelis initiated a surface survey of this area almost immediately as well as launching a large-scale clearance around the Temple Mount in Jerusalem and somewhat later in the restored Jewish Quarter in the Old City. Following the Israeli takeover of the Old City, the British, French, and German schools in Jerusalem maintained a nominal presence, but in practice they transferred their field operations to Jordan, where in time they opened new institutes in Amman. Only the Americans aligned themselves with the Israeli authorities, reconstituting the old American Schools of Oriental Research by changing its name in 1968 to the William Foxwell Albright Institute while at the same time opening a new branch in Amman under the name American Center for Oriental Research.

The result of the shifts was to leave archaeology in "Palestine" after 1967 in the hands of the Israelis, with some American participation; in the occupied territories on the West Bank (now called "Samaria" and "Judea") in the exclusive hands of the Israelis; and in Jordan in the hands of the foreign archaeologists but with growing Jordanian control. In Syria and Lebanon, most foreign work diminished as political instability increased, and at the same time, the nascent national schools found themselves beleaguered.

The Maturation of the Discipline: The 1970s-1980s

In the development of archaeology in Palestine we have noted two parallel streams, as it were, sacred and secular, particularly as the discipline(s) evolved in the United States. Beginning about 1970, however, the new archaeology began to eclipse the old-style biblical archaeology. The latter had always been merely an enterprise, a kind of "applied" archaeology, or what Wright called "armchair archaeology," but it had never evolved into a profession or an academic discipline. Indeed, biblical archaeologists had often resisted specialization, apparently cherishing their amateur status and content for their work to remain an adjunct of biblical studies. By the 1970s, however, both the internal weaknesses of biblical archaeology and the challenge of the new archaeology and other external threats resulted in a separation of the "two archaeologies," gradual at first, but soon virtually complete. And with the ascendancy of Syro-Palestinian archaeology, more in the style of the 1920s and 1930s, biblical archaeology was soon passé. Even the name was largely abandoned, Albright's original term *Syro-Palestinian archaeology* now being generally preferred.

The debate that continued throughout the 1970s was not, as some thought, merely a semantic quarrel. What really happened was the separation of Syro-Palestinian archaeology from its parent, biblical studies, so that the entire enterprise became, for the first time, an independent academic discipline with its own methods and specific aims. This discipline was no longer just a branch of biblical history (much less theology) or even the "handmaiden of history" generally. Syro-Palestinian archaeology now began to be considered as a regional-cultural branch of Near Eastern archaeology, like Anatolian, Egyptian, Mesopotamian, or Iranian archaeology. Its adherents also wished, without denying the natural connections with the history of the ancient Near East, including the biblical period, to allay themselves more with other disciplines. Paramount was anthropology, for its more sophisticated theory and use of cross-cultural comparisons. But the natural sciences were also seen as valuable allies for their analytical methods, even if archaeology, still a discipline within the humanities, could not attain the precision of the

so-called hard sciences.

The newer theoretical approaches first began

versus new archaeology, which raged for a decade or more in the United States, was not replicated in Europe.

The situation in Israel is in many ways unique and thus deserves separate comment. The Israelis claim that they connect with the biblical past not necessarily by means of formal religion and certainly not theologically, since most of the archaeologists are neither personally observant nor academically trained in the Bible and religion, but emotionally and directly. They maintain that the Hebrew Bible is, after all, the virtual constitution of the modern state of Israel and, furthermore, that for Jews displaced for centuries, even secular Jews, digging for their past in the soil of the Holy Land and searching for their roots is a vital matter of identity, an existential quest that no one has the right to deny them. They have a point, although the argument is somewhat disingenuous and can lead to nationalist extremes. In any case, Israeli archaeologists who use the phrase "biblical archaeology" for popular consumption, or for an English-speaking audience, do so with a meaning that differs from typical American usage, and partly to avoid the awkward term "Palestinian." (In Hebrew, the common designation is simply "the archaeology of Eretz Israel," or the state of Israel, exactly parallel to the archaeology of Jordan or Syria.)

National Schools Come to the Fore

The 1970s and 1980s saw not only the maturation of Syro-Palestinian archaeology as an overall discipline but also the ascendancy of national schools in the Middle East, the Israeli school being the prime example. This school, which had its roots in Jewish archaeology in mandatory Palestine in the 1930s, was rooted in the European academic tradition of ancient Near Eastern studies in history, philology, and art but also deeply influenced by Albright and his long years in Palestine. It is grounded in the realia of the landscape, sites, material culture, and long history of the country and is pragmatic in approach, with scant use for theory, including that of the new archaeology. It is characterized less by stratigraphic detail than by large-scale architectural exposure and stress on assemblages of pottery from living surfaces. It is, and always has been, secular and professional, largely separated from other departments in universities and organized in institutes of archaeology, and often in conflict with the religious establishment rather than allied with it. In recent years, surface surveys and regional projects have become prominent emphases.

The Israeli school really grew out of Yigael Yadin's excavations at Hazor in 1955-1958, where the first generation of Israeli archaeologists was trained. In the 1960s and 1970s, many large projects were carried out, producing another new generation of archaeologists. Archaeological enterprise in Israel is well supported by the Israel Antiquities Authority, institutes of archaeology at four universities, the Israel Exploration Society, many publication series, including the periodicals *Israel Exploration Journal* and *Tel Aviv,* and the national Israel Museum as well as dozens of municipal and regional museums. Not surprisingly, the Israeli school dominates the local scene and has done so almost from the beginning. American field projects (often joint projects) still continue under the auspices of the American school in Jerusalem, but the British, French, German, and other schools transferred most of their operations to Jordan after the founding of the state of Israel in 1948. The latest syntheses by Israeli archaeologists are Amihai Mazar's *Archaeology of the Land of the Bible 10,000- 586 b.c.* (1990) and Amnon Ben-Tor's edited volume *The Archaeology of Ancient Israel* (1992).

In the modern Hashemite kingdom of Jordan, which inherited eastern Palestine or Transjordan after the end of the British Mandate, another national school flourishes. There is a vigorous Department of Antiquities, which publishes annually; programs of archaeology at the University of Jordan and Yarmuk University; a large group of professional archaeologists, most with doctorates from European universities; and dozens of field projects. Foreign archaeological work is much more prominent here than in Israel and is sponsored chiefly by American, British, German, and other institutes in Amman. Although

the archaeology of Jordan still lags somewhat behind archaeology in Israel, some idea of its rapid progress may be gleaned

from such works as the four-volume *Studies in the History and Archaeology of Jordan* (1982-1992). There is no biblical archaeology of any persuasion in Jordan.

Archaeology in Syria has scarcely been covered because Palestine has loomed relatively larger in terms of interest and fieldwork. Yet coastal, central, and southern Syria (plus modern Lebanon) constitute the major part of ancient Canaan, or the southern Levant. The relative neglect is probably because of the area's isolation from Albright's original concept of Syro-Palestinian archaeology because of modern Middle Eastern politics and the instability of the region. Nevertheless, large and important excavations have been carried out in the above areas of Syria and Lebanon since the 1920s. The sites include American work in the Amûq and at Sarafand (the latter in Lebanon); Italian work at Tell Mardikh/Ebla; French work at Ugarit, Byblos (now in Lebanon), Qatna, Qadesh, and many other sites; Danish work at Hama; German work at Kamid el-Lôz and the Bega Valley (in Lebanon); and more recent Syrian-sponsored excavations, especially at Islamic sites. American work has been undertaken recently only on a small scale, principally in connection with the international salvage campaign when the Al-Thawra dam was being built on the Upper Euphrates (1963-1971).

The Syrian Directorate General of Antiquities and Museums continues the traditions of the long French Mandate. There are major museums in Aleppo and Damascus, and important publications include the periodicals *Syria* and *Annales Archéologiques Arabes Syriennes.* Potentially far richer in archaeological remains than Palestine, Syria may well have spectacular prospects in future. In any case, Albright's early intuition that Syria and Palestine were part of the same cultural sphere in antiquity, and should be studied in conjunction, appears to have been well founded, despite the modern political fragmentation of the area. The same may yet be true of Lebanon (part of ancient greater Syria or Canaan), where disruption of the country since the early 1970s has hampered almost all archaeological activities.

Current Status of the Discipline

In the post-biblical archaeology era, the fact that Syro-Palestinian archaeology is no longer a province of biblical studies but a discipline in its own right poses a challenge that must be faced. The only way to relate this new/old discipline and its results to biblical studies is through an interdisciplinary dialogue among professionals. That prospect may seem threatening to some, but there is no acceptable alternative. Certainly the professionalization of Syro-Palestinian archaeology is the only way to guarantee the survival of the field in the United States (as has long since been recognized in the Middle East), and it is also the only means of ensuring healthy growth in all the interrelated disciplines.

What, then, remains of biblical archaeology? What is it, or What can it be? Biblical archaeology, or, to put it more accurately, “the archaeology of Palestine in the biblical period,” is not a surrogate for Syro-Palestinian archaeology, or even a discipline at all in the academic sense. It is only a branch of biblical studies, an interdisciplinary pursuit that seeks to utilize the pertinent results of archaeological research to elucidate the historical and cultural setting of the Bible. In short, biblical archaeology is what it always was, except for its brief bid for dominance of Syro-Palestinian archaeology during the Albright-Wright era. The crucial issue for biblical archaeology, properly conceived as a dialogue, has always been (and is even more so now) an understanding and use of archaeology on the one hand, an understanding of the issues in biblical studies that are fitting subjects for archaeological illumination on the other, and the proper relationship between the two.

What are the prospects for the discipline of Syro-Palestinian archaeology now that it has come of age? First, it is obvious that with the colonial era long since past, the various national schools in the Middle East will increasingly dominate the scene. That is already true in Israel, and with the maturation of the

national schools in Jordan and Syria it will soon be true in those countries as well. European and North American archaeology will thus inevitably become somewhat peripheral, based less on fieldwork and firsthand materials and becoming more synthetic

1990s, much of the pretense of science and the positivism of the new archaeology had faltered, although the ecological orientation and interdisciplinary thrust seemed likely to become permanent fixtures. Out of this frustration, came "postprocessual archaeology," which is more particularistic and focuses once again on culture-history. It is also more eclectic and less dogmatic than the previous approaches. Not surprisingly, the historical orientation of postprocessual archaeology is more congenial to Near Eastern archaeologists, who possess a long and textually documented history with which to deal.

Another aspect of the theoretical flux of the early 1990s is a spin-off of postmodernist, poststructuralist critical theory. In this perspective, archaeology should no longer be seen as "antiquarianism" but as a means of applying archaeological reconstructions to current social environmental, socioeconomic, and other problems, an archaeology as "cultural critique" or even political ideology.

Conclusion

Syro-Palestinian archaeology has had a long and checkered history, but it remains a uniquely interesting and significant branch of Near Eastern archaeology. It contributes to our understanding of the Bible by illuminating the context in which it originated, thus giving it tangibility and a certain kind of credibility. Perhaps more important, however, is the contribution that Syro-Palestinian archaeology can make to elucidating the origins of civilization and the long process of social and cultural change along the periphery of the Fertile Crescent between its two principal foci in ancient Mesopotamia and Egypt. The "archaeological revolution" predicted by our forerunners is not over; it has scarcely begun.

William G. Dever

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PREV NEXT

T

Tabon Caves

From 1962 through 1966, staff members from the Philippine National Museum led by Robert B. Fox excavated a number of caves located at the limestone formation of Lipuun Point, Quezon, on the southwestern coast of Palawan Island in the philippines. Collectively called the Tabon Caves, the excavations and the subsequent analyses of excavated materials revealed a wealth of archaeological data that have extended and detailed the frontiers of Philippine prehistory up until 50,000 years ago.

The findings have profound implications for the Philippine, Southeast Asian, and Pacific region's archaeology because they reveal that “the ancient Filipinos were not only the recipients of cultural complexes from Asia but contributed to the historical developments of neighboring areas” (Fox 1968, 2).

Tabon Cave is the most important cave in the area, revealing a date range from 30,500±1100 b.p. and 9,250±250 b.p., well within the late Paleolithic period in the Philippines. It is large, with the cave mouth measuring sixteen meters wide and eight meters high. Located on higher ground, over thirty meters above the present sea level, the cave is nearly forty-one meters in length. It is bathed by sunlight throughout the day and is generally dry even during the rainy monsoon seasons, making it ideal for extended habitation.

Excavations have established the presence of Pleistocene man in the archipelago and revealed six levels with Paleolithic assemblages. The cave was inhabited continuously during the last glacial period, a time when the sea level was low and the shore, presently just below the cave, was about thirty kilometers away. The presence of a land shelf in this area, as revealed by geological and geomorphological findings, is validated by the total absence of marine shells from all the levels excavated at Tabon Cave.

The habitation levels indicate the ubiquitous presence of chert-flaked tools and waste materials. Attesting to the manufacture and use of stones for tools by the former inhabitants of the cave, thousands of waste flakes and unused cores were recovered in the course of the excavation work at Tabon Cave. One important result of the excavations was the recovery of human fossil bones of at least three individuals. The finds include a large fragment of a frontal bone, including the brow and parts of nasal bones. Although found in a disturbed area of the cave, available comparative data indicate that the fossil finds may be tentatively dated between 22,000 and 24,000 years ago. The late phase at Tabon Cave indicates a jar-burial complex. Archaeological excavations “also yielded jade and stone beads, bracelets, earrings, a few glass beads, and bronze, but no iron” (Fox 1970, 44). Tabon Cave was used for jar burial from about 200 to 500 b.p.

Manunggul Cave was discovered nearly two years after the excavations of Tabon Cave had started. This jar-burial cave was found tucked into the face of a sheer cliff with a majestic view of the South China Sea. It is over 115 meters high from present sea level and has four chambers. The cave has three openings but only two of the chambers, A and B, were used for jar burials. Chamber A contained large jars and covers, smaller decorated and painted vessels, human skulls, and parts of hematite-painted human

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tradeware ceramics from China dating to the Song and Yuan dynasties (from the tenth through the fourteenth centuries a.d.) were found.

Archaeological work in the Tabon Caves has revealed more than 50,000 years of Philippine prehistory. The excavations of the caves were a boost to archaeology in the area and have contributed significantly to a better understanding of the prehistory of Southeast Asia and the Pacific region.

Jade ear pendant found in Duyong Cave

(Wilfredo P. Ronquillo)

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See also

Island Southeast Asia; Philippines

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Taiwan

See Island Southeast Asia

Tallgren, Aarne Michaël

(1885-1945)

Born in Ruovesi, finland, Aarne Tallgren was a professor of archaeology at the University of Tartu (Dorpat), Estonia, from 1920 to 1923, a professor of archaeology at the University of Helsinki from 1923 to 1945, chairman of the Finnish Society of Archaeology (later the Finnish Antiquarian Society) from 1930 to 1942, and a specialist in east European and north Asian prehistory. Tallgren was also the editor of *Eurasia Septentrionalis Antiqua* (published in Helsinki from 1926 to 1938, with a supplementary volume in 1954).

Tallgren can be regarded as the most renowned Finnish archaeologist of the twentieth century. His international fame was largely due to his achievements in the systematization and cultural synthesis of east European and Siberian Bronze Age and early Metal period materials and his involvement in the publication and editing of the journal *Eurasia,* a unique international forum for archaeological discussion in the interwar years.

In 1903 Tallgren enrolled at the University of Helsinki to study history and receive instruction in archaeology, which was not yet an official academic subject. Graduating in 1905, he continued his studies in Stockholm and Uppsala under oscar montelius and O. Almgren. Tallgren's early research concerned the so-called Ural-Altaic Bronze Age as outlined by J. R. Aspelin, the founding figure of Finnish archaeology in the 1870s and 1880s. Aspelin's Bronze Age was in fact ultimately related to the semiromantic quest for the prehistoric homeland of the “Finnish race”-the ancestors of the Finno-Ugrians-which had defined the orientation of early archaeological scholarship and prehistoric research in Finland. Tallgren reformulated the problems set out by Aspelin, pointing out that the assumed Ural-Altaic Bronze Age culture did not exist as a single entity; he stressed that the original ethnic interpretation had to be reconsidered.

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Tanum

Tanum, an area of northern Bohuslän, southern sweden, has a tremendous wealth of rock art sites, most of them attributed to the Bronze Age, about 3,000 years ago. At that time, the sea level was twenty-five meters higher than at present, and many of the images were carved very close to water. There are thousands of petroglyphs (rock carvings), most of which are figures of warriors (armed men), circles, boats, vehicles, oxen, or plows at Tanum.

Many of the decorated rock surfaces face the sun, and the most visited have now been painted in for easy viewing and photography by the public, a practice that is now frowned on by most specialists-it is possible that they were painted in the Bronze Age, but there is no evidence for this. The so-called Cobbler figure at Backa was the subject of the earliest known rock-art drawing in Europe (seventeenth century b.c.).

Tanum was also the place where Carl Georg Brunius (1792-1869), son of the local parson, made his pioneering drawings of the petroglyphs, a major milestone in rock-art studies that remains almost unknown outside Scandinavia. Today, the best-known and most-visited site is the huge rock of Vitlycke, which has almost 300 figures including the famous “bridal couple.”

Paul Bahn

See also

Rock Art

Taylor, Joan du Plat

After earlier involvement in archaeology in Great Britain, Joan du Plat Taylor became assistant curator of the Cyprus Museum in 1932, a post she held until the outbreak of World War II, when she served in the Ministry of Information. She was later, for twenty-five years, librarian in the Institute of Archaeology, London University. She undertook numerous minor excavations in cyprus, but her most important work was at two late-Bronze Age sites: Apliki (excavated in 1939) and Myrtou-Pighades (1950-1951).

Apliki, in the northern foothills of the Mount Troodos, remains the only good example of a mining village of the late Cypriot Bronze Age. The excavations at Myrtou-Pighades (a joint project of the ashmolean museum, Oxford, and the University of Cyprus) exposed the earliest intramural cult center known in Cyprus within one of the most extensive settlements in the northwestern part of the island.

David Frankel

Taylor, Walter W.

(1913-1997)

Walter Willard Taylor was born 17 October 1913 in Chicago, Illinois, and was raised in Greenwich,

Connecticut. A Yale University graduate (A.B., 1935), he conducted archaeological fieldwork in Georgia, Arizona, New Mexico, and Coahuila, mexico.

Taylor enlisted in the U.S. Marine Corps in 1942 and was sent to Algeria after earning his Ph.D. from Harvard University (1943). He served with distinction in Algeria, Italy, and France (receiving the Bronze Star with citation and the Purple Heart). Captured and interned by the Germans, he taught anthropology and geology in two prisoner of war camps; among the prisoners he taught was an Englishman, Philip J. C. Dark, who, with Taylor's help, earned his Ph.D. in anthropology from Yale in 1954 and became a noted authority on African and Melanesian art.

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Kokkonen, Jyri. 1985. *aarne michaël tallgren and* Eurasia Septentrionalis Antiqua. Finland: Fennoscandia Archaeologica II.

Tanum

Tanum, an area of northern Bohuslän, southern sweden, has a tremendous wealth of rock art sites, most of them attributed to the Bronze Age, about 3,000 years ago. At that time, the sea level was twenty-five meters higher than at present, and many of the images were carved very close to water. There are thousands of petroglyphs (rock carvings), most of which are figures of warriors (armed men), circles, boats, vehicles, oxen, or plows at Tanum.

Many of the decorated rock surfaces face the sun, and the most visited have now been painted in for easy viewing and photography by the public, a practice that is now frowned on by most specialists-it is possible that they were painted in the Bronze Age, but there is no evidence for this. The so-called Cobbler figure at Backa was the subject of the earliest known rock-art drawing in Europe (seventeenth century b.c.).

Tanum was also the place where Carl Georg Brunius (1792-1869), son of the local parson, made his pioneering drawings of the petroglyphs, a major milestone in rock-art studies that remains almost unknown outside Scandinavia. Today, the best-known and most-visited site is the huge rock of Vitlycke, which has almost 300 figures including the famous “bridal couple.”

Paul Bahn

See also

Rock Art

Taylor, Joan du Plat

After earlier involvement in archaeology in Great Britain, Joan du Plat Taylor became assistant curator of the Cyprus Museum in 1932, a post she held until the outbreak of World War II, when she served in the Ministry of Information. She was later, for twenty-five years, librarian in the Institute of Archaeology, London University. She undertook numerous minor excavations in cyprus, but her most important work was at two late-Bronze Age sites: Apliki (excavated in 1939) and Myrtou-Pighades (1950-1951).

Apliki, in the northern foothills of the Mount Troodos, remains the only good example of a mining village of the late Cypriot Bronze Age. The excavations at Myrtou-Pighades (a joint project of the ashmolean museum, Oxford, and the University of Cyprus) exposed the earliest intramural cult center known in Cyprus within one of the most extensive settlements in the northwestern part of the island.

David Frankel

Taylor, Walter W.

(1913-1997)

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than intellectual. Furthermore, because Taylor had not yet published the supporting materials for his "conjunctive approach" on how archaeology should be carried out, most readers were skeptical of his arguments. In the short term, the book generated far more heat than light.

Consequently, although Taylor received a Guggenheim Fellowship (1950-1951) and recognition as a scholar (made a Fellow of the American Anthropological Association in 1946 and a Fellow of the American Association for the Advancement of Science in 1954), he could not obtain a permanent academic position during the decade following the book's publication. Instead, he held a series of part-time visiting appointments at six institutions, mostly in Mexico.

In 1958, at age forty-five and with the help of his colleague and former Harvard classmate, J. Charles Kelley, Taylor was hired as professor and chair of the newly formed Department of Anthropology at Southern Illinois University- Carbondale (SIU). Over the next five years he developed a strong curriculum and created a highly regarded Ph.D. program at that institution. The death of his wife in 1960 and other personal problems led him to resign the chair in 1963, but he accepted a research professorship, which he held until his retirement from SIU in 1974 as professor emeritus.

Despite his recognized administrative abilities, Taylor was never nominated for an office in any major archaeological or anthropological society. Students found it difficult to work with Taylor, so although he must be considered a "founder" of the new archaeology, there is no cadre of Taylor's students to carry on his work, as there is for lewis binford, James Hill, and William Longacre. This fact, combined with a modest publication record (although there are some important papers and *A Study of Archeology* is now in its seventh printing), Taylor's failure to publish the long-awaited Coahuila report, and residual anger on the part of some people (after so many years), has meant that Taylor has been less influential in American archaeology than might otherwise have been expected.

Taylor's last public involvement with archaeology was at the Fiftieth Annual Meeting of the society for american archaeology, held in Denver, Colorado, in 1985, and his last publication was the mainly descriptive monograph *Contributions to Coahuila Archaeology* (Carbondale: Southern Illinois University Center for Archaeological Investigations, 1988). He resided on the Oregon coast until his death on 14 April 1997.

Jonathan E. Reyman

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For references, see *Encyclopedia of Archaeology: The Great Archaeologists, Vol. 2,* ed. Tim Murray (Santa Barbara, CA: ABC-CLIO, 1999), pp. 698-700.

Tello, Julio Cesar

(1880-1947)

Julio Cesar Tello was born in peru of inca background, was educated in Lima, and began his Ph.D. studies in medicine in San Marcos, Peru, where he also worked in the National Library and the Raimondi Museum. In 1909, he won a scholarship to study anthropology at Harvard University in the United States, where he was taught by anthropologist Franz Boas and archaeologists ales hrdlikca and frederick ward putnam. He finished his M.A. in anthropology in 1911 and traveled to France, England, and Germany, where he studied the conservation and interpretation of archaeological materials at major museums.

He returned to Peru in 1913 as director of the archaeological department of the Museum of Anthropology and Archaeology (formerly the Museum of Natural History). He accompanied U.S. archaeologists, such as Hrdlicka and Alfred Kroeber, into the field, participated in many other expeditions, and was the first Peruvian archaeologist to excavate scientifically. Tello's early fieldwork was in the Peruvian highlands, where he was the first anthropologist to encounter and study the chavín culture and Chavinoid materials. The site of Chavín in the Peruvian northern highlands comprises a town and temple complex, built and inhabited between 900 and 400 b.c. The Chavín style of art-in sculpture, carvings, textiles, and metallurgy-is distributed across northern, coastal, and central Peru. By the 1930s Tello had worked all over Peru. This diversity in archaeological experience and expertise in the Chavín culture led to his theories about the autochthonous

highland origins of Andean civilization, which he published in *Origen y desarrollo de la civilizacion andina* (Origin and development of the Andean civilization) in 1942. He also wrote newspaper articles on archaeological topics, and these helped to popularize the subject and interest the Peruvian people in it.

Tello became director of the University Museum at San Marcos in 1923, director of the National Archaeological Museum in 1924, and professor of general archaeology at San Marcos in 1923; then at the same institution he became professor of American and Peruvian archaeology in 1928, a position he kept for the rest of his life. He was also briefly professor of anthropology at the Pontifical Catholic University (1931-1933). Through all of this work, Tello influenced and trained a generation of Peruvian archaeologists.

He was drawn into Peruvian politics, which proved ultimately to be to his personal and professional disadvantage, and he was a member of the National Congress from 1917 to 1928. He was honorary curator of archaeology at Harvard University; a fellow of the Royal Anthropological Institute, London; and an executive board member of the Institute of Andean Research.

Tim Murray

See also

Moche

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Tenochtitlán

The capital city of the aztec empire, Tenochtitlán was founded in a.d. 1325 and fell to the Spaniards under Hernando Cortés on 13 August 1521. In less than 200 years, the island city had a remarkable growth and development, and by the time the Spaniards arrived it was one of the largest cities in the world. Certainly, it was one of the most beautiful: the Spaniards were in awe of it as they gazed upon the city shortly before meeting the Aztec emperor Motecuhzoma (Montezuma). In the words of one eyewitness, the Spanish foot-soldier Bernal Díaz del Castillo:

And in the morning we arrived at a wide causeway and we continued marching toward Iztapalapa. And from the causeway we saw so many cities and towns in the water, and other great towns on the lakeshore, and that straight and level causeway leading to Mexico [Tenochtitlán] made us marvel, and we said that it was like the enchantments that are written about in the tale of Amadis, on account of the great towers and pyramids and buildings that rise from the water, and all built of stone masonry. And some of our soldiers wondered aloud if the things that we saw were not a dream.

(Matthews 307-308)

Aztec descriptions of the city were understandably no less glowing: “The city is spread out in circles of jade, radiating flashes of light like quetzal plumes. Beside it the lords are borne in boats: over them extends a flowery mist,” elegized one poet.

According to legend, Tenochtitlán was founded at a nadir in Aztec history. The Aztecs had just been driven out of a city where they had served as mercenaries, having committed atrocities that disgusted their hosts. The Aztecs were forced to flee to a group of low, swampy islands that lay in the western part of Lake Texcoco, the largest of a series of lakes that formed the heart of the basin of mexico where

Mexico City now stands. It had long been prophesied that they would be given a divine sign by their patron god, Huitzilopochtli, when the time was right to build their city and become ancient Mexico's “chosen people.” This sign would be an eagle eating a snake and perched on a prickly-pear cactus, and the Aztec priests saw that sign on those swampy islands in Lake Texcoco.

The Aztecs settled on the islands, driving wooden stakes into the grounds as piles to anchor their building foundations, and gradually their fortunes improved. In a.d. 1428, they attacked and beat the most powerful city in the basin of Mexico, and from that time they were the most powerful nation in the region. The city grew rapidly in both grandeur and size, ultimately reaching a population of 150,000-200,000 people and covering perhaps twenty square miles.

By the time of the Spaniards' arrival, the city was a metropolis of gleaming white houses and temples interspersed by canals and linked to the mainland by a series of causeways. In the center

of the city was a sacred precinct, surrounded by a wall and containing the great temples of the city, a ball court, and a “skull-rack”-a structure that contained the skulls of tens of thousands of sacrificial victims skewered on wooden stakes. All buildings were dominated by a huge pyramid topped by twin temples: one was the house of the Aztec rain god, Tlaloc; the other, that of Huitzilopochtli, the war god and patron of the Aztec people.

Outside the precinct wall, but still at the heart of the city, were the palaces of the various Aztec emperors. Beyond these were the houses of the nobles and commoners laid out in a grid with canals serving as streets (many of the Spanish conquerors compared Tenochtitlán most favorably with Venice). The city was divided into quarters, each quarter was divided into smaller units called *calpulli,* and by all accounts, the city was very clean, orderly, and efficiently run. The great market of the Aztecs was in another city, Tlatelolco, immediately to the north of Tenochtitlán. There, some 60,000 people would pour into the market to exchange wares brought in from every corner of the empire.

After conquering the Aztecs, the Spaniards razed the city and began to build their own capital of New Spain-the city now called Mexico City. The Spaniards reduced most of the beautiful Aztec buildings to rubble, reusing many of the stones in their own constructions. Even so, the rubble reached in some parts to a height of three to four meters, which means that in many parts of Mexico City there are preserved remains of Tenochtitlán. Almost any deep excavation in the central part of the city will reveal such remains, and in 1968, excavations to extend Mexico City's subway system uncovered a perfectly preserved Aztec temple. It was kept as the centerpiece of the Pino Suárez subway station.

In 1978, a huge carved stone was found by electrical workers in central Mexico City. The stone was decorated with the relief of an Aztec moon goddess, Coyolxauhqui, sprawled dead and dismembered on the ground. In fact, the Coyolxauhqui stone was at the base of a stairway leading to the temple of Huitzilopochtli and recalled the Aztec myth telling how Huitzilopochtli killed his half-sister Coyolxauhqui, dismembered her, and threw her body down from Coatepec (Snake Hill). The Aztec Great Temple of Tenochtitlán, then, was the physical reconstruction of Coatepec, with the broken body of Coyolxauhqui at its base.

Subsequent excavation of the Great Temple has revealed the way in which the structure was enlarged over the years, each construction being larger and more elaborate in direct reflection of the growing fortune of the empire. The Great Temple was the ritual heart of the empire, and it was at the very center of Tenochtitlán.

Peter Mathews

See also

Teotichuacán

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Teotihuacán

A huge ancient city that dominated central mexico for most of the first millennium a.d., Teotihuacán is located in the northeastern part of the basin of Mexico, about forty kilometers northeast of modern Mexico City.

In 1500 b.c., the basin of Mexico was dotted with small agricultural villages. Gradually, some of these villages grew in size and local power, a process that culminated in the dominance of just one city, San Cuicuilco, which today lies underneath Mexico City's southern suburbs. By 300 b.c., San Cuicuilco had an estimated population of more than 10,000 people-perhaps one-third of the basin's entire population. At the time, the vast majority of the population of the basin of Mexico was in the south. The northern half of the basin (which was generally drier and more prone to frosts and which also had saltier lakes than those in the south) was relatively unpopulated, although some small agricultural villages were beginning to farm the Teotihuacán region in the northeast. The pattern was soon to change, however: the villages in the Teotihuacán region grew rapidly (in part perhaps owing to

the culprits were, they seemed to have shared Teotihuacán's belief system, for this was not wanton destruction by invading barbarians.

A restored painting found in Teotihuacán

(Gamma)

Although Teotihuacán's political power was gone after 750, the city had a sizable population for centuries. For instance, the city still had 40,000 inhabitants in 950. In Aztec times, although the population of Teotihuacán was much reduced, the city was a place of pilgrimage. It was revered by the Aztecs and their contemporaries as the home of the gods, and according to Aztec legend, the current world age was created by the self-sacrifice that the gods made at Teotihuacán. Ironically, that self-sacrifice was done by fire: the gods leaped into a sacred fire to create the sun and other elements of the cosmos.

Despite the tremendous amount that is now known about the great city of Teotihuacán, there is still a great amount that is not known. Even the language that the ancient people of Teotihuacán spoke is not known for certain. Although more is now known about the organization of the city, details of the sociopolitical organization of the city and of the nature of Teotihuacán rulership remain elusive. It is clear, however, that Teotihuacán was the largest and most powerful city in Mesoamerica until the rise of the Aztec capital tenochtitlán in the fourteenth and fifteenth centuries a.d.

Peter Mathews

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Terracotta Warriors

One of the great archaeological discoveries of the twentieth century was made by accident in the spring of 1974. Peasants from the village of Xiyang in Lintong, Shaanxi Province, in the People's Republic of china, were engaged in digging a well and discovered pottery figures and tiles. The similarity between the tiles discovered in the village well and those unearthed by farmers in the vicinity of the tomb of Qin Shi Huang (China's first emperor) was noted. Excavation of the site by a team from the Shaanxi Provincial Relics Bureau began in July 1974, and within two years, it

had become clear that the terracotta warriors (and horses) were indeed part of a buried army related to the mausoleum of Qin Shi Huang.

Excavation at the site has continued ever since, with three major pits being opened, and further explorations in the area surrounding the great mausoleum have revealed new sites. Thus far, over 8,000 warriors and horses have been recovered, along with over 100 wooden war chariots. A major museum has been constructed at the site of Pit 2 displaying many of the weapons found with the warriors, and another housing the incomparable bronze chariot and horses has opened recently.

Part of a buried terracotta army related to the mausoleum of China's first emperor, Qin Shi Huang

(Gamma)

Tim Murray

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Thompson, Sir J. Eric S.

(1898-1975)

One of the greatest scholars of the ancient maya civilization, J. Eric S. Thompson was born and educated in England. He fought in World War I, and in the early 1920s, he spent some time as a gaucho in Argentina.

In 1926, Thompson traveled to mexico to work at chichén itzá. From 1926 to 1935 he worked for the Chicago Natural History Museum, and in 1935 he joined the staff of the Carnegie Institution, where he spent the rest of his career. Thompson traveled widely in the Maya area and published works covering the archaeology, ethnography, history, mythology, and hieroglyphic writing of the Maya. He was a prolific scholar, writing over 200 books and articles that ranged over a wide array of subjects, from the uses of tobacco among the Maya to legends concerning the moon. Many of Thompson's books were written for the general public, and, along with his great contemporary sylvanus morley, he was largely responsible for popularizing the temples and sites of the Maya area. He also published several major scholarly books, one of which, *Maya Hieroglyphic Writing* (1950), was for its time as complete a statement about Maya hieroglyphics and calendars as could be made.

Maya hieroglyphs were Thompson's great love, and it is ironic that Thompson was wrong

concerning both of the two most important issues involving Maya writing. The first concerned the content of the thousands of surviving Maya carved stone monuments: Thompson believed that they were carved to commemorate the passage of time and that it would have been sacrilegious for any Maya to glorify individual achievements. This view was dramatically overturned in 1960 when tatiana proskouriakoff showed that the Maya monuments do indeed have historical content; to his credit, Thompson immediately and graciously accepted Proskouriakoff's arguments.

The second issue concerned the nature of the script. Thompson never wavered from his deeply held conviction that Maya hieroglyphic writing was a logographic system (in which signs represent entire words), but it has now been convincingly demonstrated that the script is a "mixed" one, containing both logographs and syllabic signs. Even though Thompson, were he alive today, might not approve of the methods of decipherment, he would be gratified to know that over 90 percent of Maya hieroglyphs have now been deciphered.

Thompson made many great contributions in the advancement of our understanding of the Maya culture. The correlation between Maya and Christian calendars is essentially the one proposed by him in the 1920s, he published a catalog of Maya hieroglyphs that is still widely used today, and one of his last publications was a detailed study of the most famous surviving Maya book, the Dresden Codex.

Peter Mathews

See also

Belize; Guatemala; Maya Epigraphy; Mesoamerica

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Thomsen, Christian Jürgensen

(1788-1865)

Born in Copenhagen the son of a wealthy businessman, Christian Jürgensen Thomsen worked in the family business while pursuing his antiquarian interests part-time. He began to collect coins and antiquities and in 1816 was appointed national antiquary and secretary of the Antiquaries Commission. As such, he began to expand and rearrange the collections of the Museum of National Antiquities in Copenhagen. To do this work Thomsen had to devise a chronology or method of explanation for the display of archaeological artifacts and material, and he chose the three-age system of stone, bronze, and iron to organize them and make them coherent. This chronology was put into place in the museum between 1818 and 1825 and appeared in print in the museum's guidebook *(Guide to Northern Antiquities)* eleven years later.

Thomsen was not the first to devise the three-age system, but he was the first archaeologist to formulate, define, and illustrate it with archaeological materials and the first to publish it. Thomsen defined the metal ages primarily on the basis of types of weapons and tools and, as importantly, on their find contexts. Like the great numismatists hans hildebrand, bror emil hildebrand, and sir john evans, Thomsen found that his numismatic background was of great benefit when investigating the typologies of other material. He was a formidable organizer and administrator, an innovative thinker, and a nationalist-keen to describe and celebrate the origins of denmark and the Danish people through the collections in the museum.

Owing to his extensive connections in scientific circles within Scandinavia, Thomsen advised Bror Emil Hildebrand on the arrangement of the collections of Lund University in sweden, which was also based on the three-age system. Hildebrand used the system again in the Stockholm Museum, and it had an impact on the collections in the museum at Christiana (Oslo), Norway, by 1835. By the time it was published the next year, the system had already been widely accepted in archaeological circles across Scandinavia. Consequently, Sandinavian archaeological collections were the first in Europe to be organized both regionally and culturally, and they were homogenous, large, and coherent enough to make the next stage in the development of archaeology-that of scientific analysis, periodization, and more detailed chronology-possible.

In 1839, Thomsen was appointed curator of the Art Museum and Collection of Paintings in

See also

Worsaae, Jens Jacob

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Three-Age System

Rightly regarded as being one of the most significant conceptual advances in prehistoric archaeology, the three-age system had a long gestation that drew on the writings of classical historians and geographers, Enlightenment philosophers, antiquarians in Scandinavia, and the large collections of the Museum of National Antiquities in Copenhagen. Historians of archaeology are fond of demonstrating that the idea of producing a sequence of human history tied to a gradual evolution in the complexity of technology and material culture (from Stone Age to Bronze Age and then to Iron Age) is as old as the ancient Greeks. Certainly, the discovery of contemporary peoples in the Americas (and the Arctic) who used stone tools and who were believed to be in a comparatively uncivilized state provided strong support for such ideas. It is also true, as Swedish archaeologist Bo Gräslund (1987) has argued, that other antiquarians such as the German Freidrich Lisch (1801-1883) were persuaded that the writings of the ancients, the philosophers, and the explorers might provide a valuable key to unlocking the secrets of European prehistory. Nonetheless, it was the Dane christian jürgensen thomsen (1788-1865) who did the most to develop and promote the three-age system.

It is significant that it is easier to discuss the impact of the three-age system through Thomsen's book-*Ledetraad til nordisk Oldkyndighed* (1836), published in a very bad English translation as *Guide to Northern Archaeology* (1848)-than it is to recount the steps Thomsen took to develop the system. Historians of archaeology have stressed that the system was the outcome of Thomsen's desire to rearrange the collections of the Museum of National Antiquities in Copenhagen in a strict chronological form. Gräslund has argued that this process occurred sometime between 1818 and 1825, when the exhibition was completed. He has also noted that this work was achieved at least ten years before the publication of the *Ledetraad* and that the system had been exported to Sweden and Norway by the early 1830s.

Thus, the *Ledetraad* is a museum guidebook that provides an explanation of the objects in the collection within the context of a broader exposition of how archaeologists create information and how artifacts can be dated. In this exposition, Thomsen went well beyond a description of technology to include discussions of a wide range of objects and site types, focusing particularly on the association of artifacts in sites. This more complex understanding of how archaeologists could define chronology in ways that could be directly confirmed by field discoveries was a significant reason for the early and widespread acceptance of the three-age system in Scandinavia and northern Germany. For an understanding of how the system was "exported" from the north to the rest of Europe we need to turn to the advocacy of Thomsen's successor, jens jacob worsaae, especially the English translation of his book *The Primeval Antiquities of Denmark* (1843), and German scholar ludwig lindenschmidt (1809-1893).

Tim Murray

See also

Dating; Denmark

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Tikal

One of the largest and most important classic Maya sites, Tikal is situated in northern guatemala, and its archaeological sequence spans the years from ca. 800 b.c. to a.d. 900. At its height, during the Maya classic period (a.d. 250-900), Tikal was a massive site, covering some sixty-five square kilometers and containing thousands of structures-the population of Tikal at its height was perhaps 100,000.

Tikal was rediscovered only 150 years ago, and for the second half of the nineteenth century it was visited by a succession of early researchers. It was not until the 1950s, however, that excavations began. From 1955 until 1969,

See also

Worsaae, Jens Jacob

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Three-Age System

Rightly regarded as being one of the most significant conceptual advances in prehistoric archaeology, the three-age system had a long gestation that drew on the writings of classical historians and geographers, Enlightenment philosophers, antiquarians in Scandinavia, and the large collections of the Museum of National Antiquities in Copenhagen. Historians of archaeology are fond of demonstrating that the idea of producing a sequence of human history tied to a gradual evolution in the complexity of technology and material culture (from Stone Age to Bronze Age and then to Iron Age) is as old as the ancient Greeks. Certainly, the discovery of contemporary peoples in the Americas (and the Arctic) who used stone tools and who were believed to be in a comparatively uncivilized state provided strong support for such ideas. It is also true, as Swedish archaeologist Bo Gräslund (1987) has argued, that other antiquarians such as the German Freidrich Lisch (1801-1883) were persuaded that the writings of the ancients, the philosophers, and the explorers might provide a valuable key to unlocking the secrets of European prehistory. Nonetheless, it was the Dane christian jürgensen thomsen (1788-1865) who did the most to develop and promote the three-age system.

It is significant that it is easier to discuss the impact of the three-age system through Thomsen's book-*Ledetraad til nordisk Oldkyndighed* (1836), published in a very bad English translation as *Guide to Northern Archaeology* (1848)-than it is to recount the steps Thomsen took to develop the system. Historians of archaeology have stressed that the system was the outcome of Thomsen's desire to rearrange the collections of the Museum of National Antiquities in Copenhagen in a strict chronological form. Gräslund has argued that this process occurred sometime between 1818 and 1825, when the exhibition was completed. He has also noted that this work was achieved at least ten years before the publication of the *Ledetraad* and that the system had been exported to Sweden and Norway by the early 1830s.

Thus, the *Ledetraad* is a museum guidebook that provides an explanation of the objects in the collection within the context of a broader exposition of how archaeologists create information and how artifacts can be dated. In this exposition, Thomsen went well beyond a description of technology to include discussions of a wide range of objects and site types, focusing particularly on the association of artifacts in sites. This more complex understanding of how archaeologists could define chronology in ways that could be directly confirmed by field discoveries was a significant reason for the early and widespread acceptance of the three-age system in Scandinavia and northern Germany. For an understanding of how the system was "exported" from the north to the rest of Europe we need to turn to the advocacy of Thomsen's successor, jens jacob worsaae, especially the English translation of his book *The Primeval Antiquities of Denmark* (1843), and German scholar ludwig lindenschmidt (1809-1893).

Tim Murray

See also

Dating; Denmark

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Tikal

One of the largest and most important classic Maya sites, Tikal is situated in northern guatemala, and its archaeological sequence spans the years from ca. 800 b.c. to a.d. 900. At its height, during the Maya classic period (a.d. 250-900), Tikal was a massive site, covering some sixty-five square kilometers and containing thousands of structures-the population of Tikal at its height was perhaps 100,000.

Tikal was rediscovered only 150 years ago, and for the second half of the nineteenth century it was visited by a succession of early researchers. It was not until the 1950s, however, that excavations began. From 1955 until 1969,

Tikal is famous for its lofty pyramid temples and other impressive architecture. The heart of Tikal, the so-called great plaza, is flanked on the east and west side by two great pyramids (Hasaw Chan K'awil was buried in the eastern pyramid); on the north side of the plaza is the ritual heart of the city, and on its south side is the great palace where the kings lived, received tribute, and held court.

Today, Tikal is surrounded by one of Guatemala's national parks, and there is dense tropical forest on all sides. The site has been well developed for tourism, and access to it is very easy-certainly quite different from the several days' ride on muleback that was the only way of access until the 1960s.

Part of a wooden door lintel from Temple IV,Tikal

(Image Select)

Peter Mathews

See also

Maya Civilization

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The professional career of the Australian zoologist, anthropologist, and archaeologist Norman Tindale began in 1917 when he joined the staff of the South Australian Museum in Adelaide. After early zoological work in Cape York and the Gulf of Carpentaria, Tindale moved into anthropological fieldwork in the 1930s, first (1933) in the Mann Ranges of South Australia and subsequently (1935) in the Warburton Ranges of Western Australia.

Tindale is most famous for his work at Devon Downs, a rock shelter on the Murray River in South Australia where the first evidence of cultural change in Australian prehistory was collected. Tindale also gained notoriety for his explanation of these changes as being the product of movements of prehistoric populations.

Tim Murray

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Australia, Prehistoric

Tiwanaku

See Bolivia

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Toltecs

Toltecs is the name given to a group of people who were considered by the aztecs and most of their contemporaries to have represented “the golden age” in Mesoamerican history. The name “Toltec” means “people of the place of reeds,” and Tollan (Tula), “the place of reeds,” figures in the origin myths of many Mesoamerican peoples from the Aztecs to the Maya. Descriptions of Tollan as a mountain surrounded by reedy swampland may well have been an evocation of the environment of mesoamerica's first civilization, the olmecs, and their human-made mountains in the swampy lowlands on the southern borders of the Gulf of Mexico.

Ruins of the Toltec city of Tula

(Corel)

Because of the widespread origin myths involving Tollan, there are actually many places in mexico that have used or incorporated the name (which was corrupted by the Spaniards to Tula). Archaeologically, the Toltecs have been identified specifically with the site of Tula, some seventy kilometers north of Mexico City. This site was first occupied during the eighth century a.d., as the ancient city of teotihuacán, which had dominated Mexico for the first millennium a.d., was declining. By a.d. 900, Tula was a major site, and in the following 300 years, it came to dominate central Mexico.

At its height during the eleventh and early twelfth centuries, Tula covered thirteen square kilometers, and had a population of up to 60,000 people. The central part of the site had broad plazas punctuated with temple pyramids, ball courts, and colonnaded palaces. Toltecs who were farther down on the social scale lived in flat-roofed houses with sleeping rooms arranged around open patios where many of the daily activities would be undertaken. Family altars and shrines have been found in the patios of several houses, and the houses themselves were connected by passageways and alleys. There is evidence that much of the city was laid out in a rough grid. Workshops abounded in Tula, especially for work in obsidian and ceramics. Agriculture was carried out with the aid of irrigation (rainfall is low and undependable in the area), and the dozens of small farming hamlets that have been found within fifteen kilometers of the city must have provided much of Tula's food supply. In the Mesoamerican tradition, additional food and other commodities would have flowed into the city as tribute from subject regions.

By the late twelfth century, Tula was in trouble. The central ceremonial part of the site was sacked and burned, and there are signs of destruction in the suburbs as well, for some courtyards and altars were looted. Later historical accounts mention a civil war in the city, but the final collapse of Tula may well have been at the hands of barbarians from the north, the "Chichimeca" peoples.

Despite the devastation of the city, the Toltecs left an important legacy. Tollan was considered to be the metaphor in Mesoamerica for civilized life, and the Toltecs were eulogized as master craftsmen and artists. Later peoples went to great lengths to claim Toltec heritage. For example, the ruling families of the cities in the basin of Mexico all claimed descent from Toltec royal lines, and those groups that didn't have Toltec blood sought to marry into lineages that did: having royal Toltec ancestry was a major prerequisite of legitimacy. The Aztecs were one such group, and their leaders went to great pains to obtain Toltec ancestry through marriage. Once they had achieved that end, the Aztecs reinforced their "Toltec heritage" by looting the site of Tula and incorporating its sculptures and other relics into their own imperial capital's buildings and ritual offerings.

Peter Mathews

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Tomb of Tutankhamun

See Tutankhamun, Tomb of

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See Turkey

Troyon, Frederic

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Frederic Troyon was one of the first and most important Swiss archaeologists of the nineteenth century. In 1838, when archaeology was still in its infancy in switzerland, Troyon discovered burial places on his family estate of Bel-Air in Cheseaux (in Vaud Canton), which he correctly determined as Burgundian. He soon abandoned theological studies and devoted himself to the new discipline of archaeology. Within three years, he had completely excavated the 162 tombs, and, remarkably, he published the richly illustrated results as early as 1841. That same year, Troyon took the almost revolutionary initiative of trying to make an archaeological map of the canton of Vaud by sending a precise questionnaire about antiquities and monuments observed in the region to all the local authorities, both public and religious.

As a tutor to the royal family of sweden (1843-1846), Troyon passed on his interest in archaeology to the future king Charles XV and helped to create a Swedish institution for the preservation of antiquities. He also took advantage of his stays abroad to acquire a vast archaeological knowledge, and he built up a considerable collection of drawings and watercolors, copies of artifacts in most of the museums of Germany, russia, and Scandinavia that he visited.

A keen advocate of the three-age system, of which he would be one of the main promoters in Switzerland and france, Troyon was moreover one of the pioneers of comparative ethnology, using data on "primitive peoples" (as observed in the New World) provided by contemporary travelers. He also

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Appointed curator of the Museum of Antiquities of Lausanne in 1852, Troyon undertook numerous excavations and explorations, including one of the first known underwater excavations in Morges (Vaud) in 1854 with fellow Swiss archaeologists Adolf Morlot and Forel (Ruoff 1990, 29). His interpretations, however, which were often integrated into a mystical and religious network of ideas, are now out of date. He considered the succession of prehistoric ages the result of brutal and successive invasions, and he meant to prove this theory by demonstrating changes in burial ritual: the incinerating celts were supposed to have arrived in Switzerland with bronze technology, then to have been supplanted by the mound-builder, iron-working Helvetians.

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Nevertheless, Troyon did enjoy the sort of influence he deserved at the time because of his independent nature. Taking a stand against the tutelary figure of Swiss archaeologist ferdinand keller, with whom he fell out, Troyon refused to attribute all lake dwellings to the Celts. Finally, however, as a victim of a fraud, his reputation was besmirched, and some people went so far as to wrongly accuse him of perpetration and collaboration with the fraud's instigators (Vayson de Pradenne 1932). Troyon's work maintains great value today. He had the praiseworthy habit of writing careful and accurate reports and of recording elements that he did not understand, which makes the reinterpretation of his excavations easier.

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Turkey

The most conspicuous geographic feature of Turkey is division, for it is a land of complex terrain partitioned by complicated mountain chains. Anatolia (as the land is known locally) is a mosaic of environmental zones, ranging from coastal fringes through a vast central plateau to the rugged geography of the eastern highlands, offering a range of ecological options for pastoralists (stockbreeders), farmers, and fishing communities alike. In antiquity this broken landscape engendered, for the most part, a spectrum of cultural diversity, which often displayed vigorous local traditions capable of absorbing new cultural stimuli that found their way along the many natural highways that cross the land.

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Tim Murray

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Turkey

The most conspicuous geographic feature of Turkey is division, for it is a land of complex terrain partitioned by complicated mountain chains. Anatolia (as the land is known locally) is a mosaic of environmental zones, ranging from coastal fringes through a vast central plateau to the rugged geography of the eastern highlands, offering a range of ecological options for pastoralists (stockbreeders), farmers, and fishing communities alike. In antiquity this broken landscape engendered, for the most part, a spectrum of cultural diversity, which often displayed vigorous local traditions capable of absorbing new cultural stimuli that found their way along the many natural highways that cross the land.

PREV NEXT

Nevertheless, Troyon did enjoy the sort of influence he deserved at the time because of his independent nature. Taking a stand against the tutelary figure of Swiss archaeologist ferdinand keller, with whom he fell out, Troyon refused to attribute all lake dwellings to the Celts. Finally, however, as a victim of a fraud, his reputation was besmirched, and some people went so far as to wrongly accuse him of perpetration and collaboration with the fraud's instigators (Vayson de Pradenne 1932). Troyon's work maintains great value today. He had the praiseworthy habit of writing careful and accurate reports and of recording elements that he did not understand, which makes the reinterpretation of his excavations easier.

Marc-Antoine Kaeser

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In the nineteenth century an initial interest in Anatolia's past was fueled by the desire to uncover the remnants of civilizations mentioned in the Greco-Roman and biblical historical traditions. Accordingly, the Aegean coast received much attention from early archaeologists, who commenced excavations at ephesus, Pergamum, Miletus, and Troy (Hissarlık), perhaps the most celebrated site. Soon after, the Bronze Age cultures on the central plateau, homeland of the Hittites, attracted interest, most especially the extensive site at bogazköy (ancient Hattusha). In recent decades the tempo of archaeology in Turkey has increased considerably as dozens of international rescue projects record cultural heritage threatened with destruction by the waters of several dam lakes. Investigations began in the Keban region of east-central Turkey (running from 1964 to 1974), but the focus has shifted to the southeastern regions, where the ongoing development project known by the Turkish acronym GAP has necessitated rescue operations at many sites along the Euphrates and Tigris Rivers and their tributaries (*American Journal of Archaeology* 1955; Tuna and Öztürk 1999).

The Earliest Stages

Although Paleolithic and Mesolithic remains have been found at many sites, especially in the southwestern area, the earliest stages of human occupation of Anatolia are relatively unexplored. We gain a glimpse of the Lower Paleolithic at Yarımburgaz Cave, but the most complete Paleolithic sequence has been attested at Karain Cave near Antalya, noted for its Middle Paleolithic (Mousterian) industry and Upper Paleolithic rock art (Joukowsky 1996). Microlithic stone traditions of the Mesolithic (or Epipaleolithic) at Karain and nearby sites, including Beldibi Cave, bring us to the threshold of the earliest sedentary communities of the Neolithic around 11,000 b.c., when Anatolia experienced a period of climatic amelioration.

The Neolithic

As late as the mid-1950s no archaeologist was prepared to accord Anatolia a Neolithic period, believing that the formative processes that led to the domestication of plants and animals, which gradually changed the fundamental basis of subsistence economy in prehistory, took place south of the Taurus Mountains. Then, in 1961, James Mellaart began excavations at Çatal Huyük, which dazzled an unsuspecting discipline with its preservation and rich finds (Matthews 1998; Mellaart 1967). The largest site of its time (late seventh to mid-sixth millennium b.c.), covering 21 hectares, the settlement consisted of blocks of tightly clustered rooms, with rooftop access, and small courtyards. Some of the rooms, called shrines by Mellaart, were decorated with vivid wall paintings, plaster reliefs, and the skulls of horned animals fixed into the walls. Two broad categories of scenes are portrayed on the walls: representational scenes, featuring humans, animals, and birds, and geometric scenes, with patterns that perhaps imitate textile designs. Such exuberance and symbolism, unparalleled in a prehistoric building, likely reflect the community's belief system, which has been a focus of the renewed excavations at the site (Hodder 2000; Matthews 1998). Relatives were buried under the floors of both shrines and houses, and grave goods suggest a modest degree of social differentiation. The funerary gifts, among them Mediterranean shells, metal ores, obsidian, cinnabar, serpentine, and other exotic commodities, do confirm, however, the existence of a significant exchange network.

Today at least four distinct areas attest to intensive Neolithic settlement: the Urfa-Diyarbakır region of the southeast, the Konya-Aksaray region in the center, the Lake District of the southwest, and the Marmara region of the northwest (Özdogan and Başgelen 1999).

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The Chalcolithic

In terms of lifestyle, the transition from the Neolithic to the early stages of the subsequent cultural period, the Chalcolithic, was virtually seamless (Yakar 1985, 1991). But by the end of the Chalcolithic (ca. 3200 b.c.) there was an upsurge in technological innovations and cultural interaction. Although new sites were established in many parts of Anatolia, several large cultural zones can be discerned, largely on the basis of geography and contacts.

The Euphrates Valley and southeastern regions were much influenced by Mesopotamian and Syrian traditions, with the Taurus Mountains, mostly an obstacle to easy communication, determining the degree and nature of interaction with the northern districts (Joukowsky 1996). Although southern interconnections in these districts were pervasive throughout the Chalcolithic and subsequent early Bronze Age, they were more directional than uniform. Initial contact from the south, suggested by the presence of Halaf pottery at several sites, was followed by an expansion into the Middle Euphrates to exploit natural resources, where a late-Ubaid tradition is well documented at Degirmentepe. By the late Chalcolithic period the area below the Taurus Mountains, the northern reaches of mesopotamia, experienced intensive contact with southern merchant-venturers. Contact between indigenous communities and Uruk Mesopotamia is indicated at several places, especially at Hacınebi, whereas at Hassek Höyük there is evidence of an actual colony of late-Uruk type. Repercussions of this activity were felt north of the mountain range, especially in the Malatya and Elazıg regions, where local cultures adopted Mesopotamian forms of administration. At Arslantepe (Level VIA) centralized economic activity is reflected in a well-preserved complex that contained many bullae (seal impressions) and wheelmade pottery. Emerging connections with different cultural environments farther east, most notably with Transcaucasia, are also clearly indicated by the presence of handmade red-and-black burnished pottery.

West, north, and central Anatolia formed an independent culture province in the Chalcolithic period, with strong links to the Balkans and beyond to the Hungarian plains (Joukowsky 1996). Connections between the Karanova VI and Vinça D traditions of southeastern Europe and Anatolia are best seen at Ilıpinar, Alişar Höyük, Çadır Höyük, and I·kiztepe, where curvilinear-decorated and graphite-slipped pottery have been found. In the southwest, Beycsultan and sites in the Elamlı plain demonstrate continuity of late-Neolithic traditions. Architecture varied according to geography and climate. Mud brick was a ubiquitous building medium, though timber and wattle-and-daub houses, usually freestanding, were also common along the wet Pontic zone.

The Bronze Age

In the early Bronze Age (ca. 3200-2000 b.c.) sites displayed distinctive regional traits in every aspect of material culture (Yakar 1985). A unifying thread within this diversity was the impact of innovative metal technologies, especially in the third and final phase of the period, when even pottery imitated metallic vessels through highly burnished surfaces and angular shapes. Anatolian smiths made full use of their land's extensive mineral and polymetallic ore resources. Copper was the metal most widely used at the turn of the third millennium b.c., but attempts to combine it with tin (and in some cases with arsenic) were under way by early Bronze Age II. Despite an ever increasing amount of bronze production, actual sources of tin, perhaps the most highly prized metal at that time, have remained elusive, though crucibles

at Göltepe have traces of tin claimed by its excavators to have been mined at Kestel.

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indigenous (Hattic) and foreign cultures, especially Hurrian and Babylonian, producing its own distinctive blend. Their cities had two sectors surrounded by massive stone fortification walls: a citadel, with two- or three-story buildings (archive, storage and administrative buildings, and residence of the ruler) on stone foundations with a superstructure of mud brick and timber, and a lower, residential area (Seeher 1999). Access into the city was by a gate flanked by towers and protected by guardian creatures or by a postern gate-the best-known example of which at Bogazköy through the Yerkapī rampart, has a corbeled roof and is 71 meters long. Religious worship featured prominently among the Hittites. Bogazköy alone has revealed some thirty temples at this stage, and nearby is the rock sanctuary at Yazılıkaya with its relief panels. The temple complex was situated in a colonnaded courtyard that was surrounded by numerous storage rooms. Other important Hittite sites are Masat, Alaca, Kuşaklı, and Kaman-Kalehöyük.

In the clay tablets found in the archive at Bogazköy, mention is made of the Ahhiyawa, often cited as the Mycenaeans, whose presence is attested along the west coast of Anatolia at about this time. Indeed, the quest to identify Homer's Troy with either Level VI or VIIA, despite the difficulties of disentangling the complicated fabric of that great narrative, has continued unabated. One thing is certain-the internationalism between Anatolia, the Aegean, and Syria-Palestine is evident in the flourishing trading networks vividly reflected by the rich cargo found on board the Uluburun shipwreck.

East-central Anatolian sites in the Malatya-Elazıg region were heavily influenced by trends in the central plateau, as evidenced by the increase in the size of the sites, fortification systems at Arslantepe VB and Korucutepe F, and affinities in ceramic styles. Along the foothills of the southern Taurus Mountains, settlements such as Lidar Höyük (Levels 8-9) have an assemblage indistinguishable from those at sites in the Amuq Plain, including Alalakh VII, which was built by Yarimlim, a vassal of the Yamkhad kingdom based at modern Aleppo.

Still farther east, in the modern provinces of Erzurum, Kars, and Van, the scene in the second millennium b.c. was quite different, and the axis of influence was eastern rather than southern. No city-states were to be found in these highlands. At Sos Höyük there is clear evidence that the earlier Kura-Araxes cultural complex continued to endure in a modified form (Sagona 2000). Dwellings were different, now solidly built and multiroomed, but, significantly, the deceased were buried in deep shaft graves and supplied with grave goods that have marked similarities to the Trialeti kurgan barrow burials of Transcaucasia, which may point to the arrival of newcomers.

The Iron Age

The stable and prosperous late-Bronze Age kingdoms of Anatolia suffered sociopolitical and economic collapse between about 1250 and 1150 b.c., as did many of Anatolia's neighbors in the Aegean and the Near East. The impact of the invasions that brought about the decline in Anatolia had severely shaken the land and radically changed the map of the subsequent Iron Age. New ruling classes emerged in the centuries that followed, often described as a “dark age” because both archaeological and written records are meager, allowing scholars to sketch only the broadest political and social divisions of Anatolia in the Iron Age (Çilingiroglu and Matthews 1999; Joukowsky 1996).

Eastern Greeks established a number of city-states along the Aegean coast, among them Miletus and Ephesus. Western and central Anatolia was the domain of the Phrygians, the Mushki of the Assyrian records, who had formed a kingdom with centers at Gordion and Midas City by the ninth and eighth centuries b.c. The very few inscriptions in Phrygian, some in beeswax, were written in a new alphabetic script devised by the Phoenicians, which was also adopted by the Greeks, Carians, Lydians, and Lycians. Along the Pontic and in parts of the Hittite homeland, the Kaska, a feared mountainous folk,

reigned supreme, whereas the southeast was occupied by the East Luwians, who were ethnically and culturally related to the Hittites. These Luwian-speakers were organized into a number of small neo-Hittite

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Tutankhamun, Tomb of

The discovery in 1922 of the intact tomb of the eighteenth Dynasty king Tutankhamun (ca. 1333-1323 b.c.) ranks as perhaps the single best-known event in archaeology during the twentieth century. The discovery was the culmination of a methodical search undertaken between 1917 and 1922 by howard carter with the patronage of the Earl of Carnarvon. The subsequent excavation of the tomb by Carter, assisted by a team from the Metropolitan Museum of Art in New York, received an unparalleled degree of attention from the international news media; it was the first archaeological project to be the subject of such press coverage. The debate over the fate of the artifacts was responsible for the rescinding of Egypt's until-then liberal antiquities laws, which had formerly permitted equal division of artifacts between the Egyptian Antiquities Service and foreign archaeological projects.

Tutankhamun's tomb is located in the Valley of the Kings, on the west bank of the Nile near the modern town of Luxor (ancient Thebes) in southern Egypt. The Valley of the Kings, a secluded desert wadi five kilometers west of the Nile, was the burial place of nearly all of the pharaohs of the New Kingdom (Dynasties 18-20, ca. 1550-1070 b.c.). The tomb of Tutankhamun was the only one of these to be preserved virtually intact. Most of the others had been plundered by local tomb robbers by the close of the New Kingdom. Although briefly penetrated within a century of the king's burial, the entrance to Tutankhamun's tomb was later obscured and protected by debris created during the construction of the

tomb of Ramses VI (Dynasty 20), located just above it.

Tutankhamun's tomb itself is modest in scale, consisting of only four rooms (antechamber, annexe, burial chamber and treasury). Objects that would normally have been deposited in an orderly fashion were piled together. The first two rooms contained an enormous volume of personal possessions including furniture, wooden caskets containing clothing, weapons, chariots, games, jewelry, and ritual couches, as well as containers of food, wine, oil, and other funerary offerings. The king's body was buried in a nested sequence of sarcophagi and shrines that filled most of the burial chamber. The fourth room, the treasury, contained the king's canopic shrine as well as an array of religious and ritual items closely connected to the person of the pharaoh.

Although Tutankhamun's life was comparatively short, his reign falls at the end of one of the most widely discussed periods of ancient Egyptian history: the period of the heretic king Akhenaten. The seventeen-year reign of Tutankhamun's father, Akhenaten (called the Amarna Period), witnessed the abandonment of traditional state religion and the sole veneration

of the sun-disc, the Aten. Court life was centered on a newly constructed royal city, Akhetaten (modern el amarna in Middle Egypt). Tutankhamun, originally named Tutankhaten, was responsible for the restoration of the traditional state religion and the abandonment of the short-lived royal capital at El Amarna. At the time of the discovery, it was hoped that Tutankhamun's tomb would shed light on the history of the Amarna period. The tomb, however, is devoid of written documents. The vast majority of material represents either funerary objects specifically produced for the royal burial or personal possessions of the king. Archaeologically, the tomb represents an unparalleled example of an intact royal burial from the height of Egypt's New Kingdom, but provides little historical information relevant to understanding Tutankhamun's reign.

Gold sarcophagus of Tutankhamun

(Image Select)

Despite the meticulous recording by Carter and the Metropolitan Museum team, as well as a series of popular books (Carter and Mace, 1923-1933), the full scholarly publication of the tomb of Tutankhamun was never completed. The records of the excavation, mostly unpublished, are at the ashmolean museum, Oxford. Today the body of Tutankhamun remains in his innermost coffin in his tomb in the Valley of the Kings. The artifacts are housed in the Cairo Museum.

Josef Wegner

See also

Egypt, Dynastic; Karnak and Luxor

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Tylor, Sir Edward Burnett

(1832-1917)

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or both (“academic” archaeology), and that driven by conservation and, of recent, protective legislation, herein termed *cultural resource management* (CRM). Because these kinds of work are differently motivated, they have often developed along divergent lines.

Histories themselves are usually driven by common sense-and that is why, until recently, the word *history* basically meant the history of western culture. One cannot get very far with that tack in examining a discipline that includes common sense as part of its subject. It is not necessary, however, to erect a detailed theoretical structure here. Elucidating but a few concepts will suffice to generate a sufficient framework to analyze American archaeological development. First, since science has played such a role in American developments, it is essential to be crystal clear on what the term *science* denotes. In this context science is an *explanatory system* that uses *theory* to explain phenomena and employs an *empirical epistemological standard,* that is, things don't explain things, events don't explain events, and whether something “works” in physical terms is the arbiter of correctness. All of the commonly cited features of science (i.e., the elements of scientific method) can be traced to these two features (Dunnell 1982).

Second, because of archaeology's particular focus, it is also critical to realize that there are two kinds of structures that meet these general criteria: essentialist (functionalist) science and materialist (historical) science, with the first identifying the ontological position on the significance of variation and the second recognizing different ontological positions on the significance of time. Essentialism sees the variable world as constituted by a finite number of fixed kinds (entities, classes, etc.) between which fixed relations (laws, “generalizations” in the social sciences) obtain. The methodological imperatives that flow from this view can be characterized as ones of “discovery.” Explanation in this view takes the form of timeless, spaceless laws that are often characterized as predictive. They are not, of course; they have this appearance and effect only because in this framework time is an elapsed quantity, not an age; thus, there is, strictly speaking, no past or future. Some sciences (e.g., physics, chemistry) operate wholly within this framework or nearly so. Materialism (not to be confused here with the term as used in anthropology) sees the same variable world as in a state of becoming. Because there are no empirical kinds in this view (kinds are analytic tools), there can be no fixed relations or laws, and without laws there is no appearance of prediction. Kinds are created, not discovered, in order to render variability explicable. Explanation takes the form of sets of contingencies interacting with content-free mechanisms to produce a special kind of “history.” Realistically, although these two approaches have often been opposed (e.g., Kroeber 1935, 1942; Spaulding 1968), there are no strictly materialistic sciences. Rather, disciplines such as evolutionary biology combine both, using the latter to organize the former so that, though there are no laws of history, all history is a consequence of the operation of laws (Popper 1961).

These aspects of our discipline have been discussed at length in other venues (e.g., Dunnell 1982, 1986a, 1992a), and interested readers can consult those items directly. But such aspects require recitation here because they are integral to an attempt to understand the conceptual development of archaeology in the Americas and its present condition in anything other than the most superficial way.

Coming to Grips with the U.S. Archaeological Record

U.S. archaeology is often taken to have begun with the prescient work of thomas jefferson in the excavation and reporting ([1784] 1801) of a small and, as it turned out, rather atypical burial mound at Monticello, Virginia (Heizer 1958; Lehmann-Hartleben 1943). His contribution was by no means isolated. Jefferson's observations and their reporting were certainly unique for the time, but he was in contact both with European scholarship, hardly advanced over his own work in most respects, and with Americans exploring the “west” in North America. For example, Henry Brakenridge, an important explorer of the southeastern (at that time the southwestern) United States, corresponded

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that the museum became the first institution and intellectual seat of archaeology. More important, however, concern for conservation of the archaeological record led to the development of a particular kind of archaeology in the United States-CRM. But in the nineteenth century and indeed up until the 1970s, these concerns were pursued by the same people who were developing academic archaeology. Through lobbying by professional societies such as the American Anthropological Association and Section H of the American Association of the Advancement of Science, an active government role in preservation began with the creation of the casa grande National Monument in Arizona (1892). Legislation protecting archaeological materials on federal property was adopted shortly thereafter (the Antiquities Act of 1908).

The great amount of time it took for even these modest efforts to be realized can be related, at least in part, to the historical character of archaeology and its lack of scientific standing. The lack of scientific standing meant that archaeology did not enjoy the public support that science as a whole did in the late nineteenth and early twentieth centuries. It remained an esoteric activity without any obvious justification. Archaeology's historical character, however, served to prevent it from being embraced by physical scientists whose essentialist (sometimes obliquely characterized as “generalizing”) approach rejected all history as storytelling and seemingly precluded empirical testing. U.S. archaeologists would periodically be consumed by misguided efforts to make their field a generalizing discipline in pursuit of their scientific grail throughout the twentieth century. The same scenario has plagued biology (Mayr and Provine 1980).

The Emergence of Archaeology from Natural History

Although archaeology continues to be pursued as natural history today in the form of the various “amateur”societies of historical sciences, in which data have unique time-space coordinates, retain a role for amateurs long after their contributions to the ahistorical sciences cease. But the late nineteenth and early twentieth centuries saw the emergence of archaeology as a distinct discipline for the first time. Key was the development of a sense of professionalization, first through its incorporation into museums, most notably the smithsonian institution through the National Museum and the Bureau of Ethnology (later the Bureau of American Ethnology, or BAE). Universities, further contributing by training archaeologists, solidified this sense of profession.

These settings saw the first systematic efforts at artifact description. This, in turn, required the development of theory, that is, some principles or rules for how to conceive, tabulate, and discuss archaeological remains independently of common sense. The initial efforts were modeled on the physical sciences and focused on chipped-stone artifacts (e.g., Rau 1876; Wilson 1899; see Dunnell 1986b and references therein). Chipped-stone artifacts in North America meant “arrowheads, spearheads, and knives” (Wilson 1899); that they were tackled first when ceramics have since proved so much more efficacious reveals something of the inner working of the transition from common sense to archaeological theory. Object naming in English is largely functional, based on what the object does. Consequently, it “made sense” to organize only objects that had all their parts. Because sizable collections of whole chipped-stone tools were amassed in advance of more delicate whole ceramic pots, the former were deemed the “logical” starting place. Ceramics, which would come to dominate U.S. analytic efforts for those periods that produced them, followed somewhat later as, on the functional models, pots (and not shards) were deemed the relevant objects of typology (e.g., Holmes 1886a). Charles Rau and Thomas Wilson's efforts based on geometric shape did not bear any intellectual fruit (no temporal or spatial patterns) and thus gained no currency (Dunnell 1986b).

william henry holmes's ceramic analyses (1886a, 1886b) were more successful. His “philosophic approach” (Mason 1886) allowed him to crudely distinguish what today we would call functional and stylistic attributes, a distinction that would later prove critical to method

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development. Furthermore, he identified most of the parameters now routinely used in ceramic analysis. His most enduring result, the geographic groups of ceramics (Holmes 1903), was largely a fluke, however, being accidental combinations of geography and the chronology of the custom of including vessels in graves. The first lasting accomplishment of U.S. archaeologists, beyond the recognition and accumulation of samples of the record itself, arose at this time as well-the appreciation and understanding of the technology of U.S. artifacts. Here, too, Holmes was a leader, as he "figured out" (via intuitive combinations of engineering, physics, and ethnographic accounts) how virtually all major classes of American artifacts were manufactured (e.g., 1886a, 1886b, 1890, 1897).

The First Paradigm: Culture History-Science at Last

Archaeology as an ad hoc assemblage of common sense and analogies with ethnographic observation was rather limited in its prospects despite the accumulation of descriptions and objects, even if they were systematic. Although trained as an artist, Holmes was a committed scientist in archaeological matters (Meltzer and Dunnell 1992), and his "philosophical" approach, a step in the right direction, still fell short of qualifying as a general theory. His guiding principles were clearly evolutionary, but, as is so often the case in archaeology, his evolution muddled scientific evolution (e.g., Holmes 1892) and with a more Spenserian evaluation, which was actually influenced by lewis henry morgan et al. (1877) progress-driven framework, little differentiated from Victorian optimism. As crucial as his work has proved to be, Holmes himself lived to see (but never really participated in) archaeology's first and closest approach to becoming science, his lifelong goal.

Three developments proved fundamental to developing a discipline-wide consensus on method, language, and, most important, problem-in short, what Thomas Kuhn (1962) characterized as a paradigm. This consensus has since become known as *culture history*. The first element was the development of a language of observation and an approach to the classification of artifacts. Although critically important, this revolution was confined largely to potsherds, with minor extensions to lithics (stone tools) and bone tools, and it remained restricted to the scale of the portable, discrete object. The second element was adopting a materialist ontology. Like classification, this innovation was far from general in application, being restricted to a narrow methodological role. The final critical ingredient was quantification. Prior to this time, although objects, monuments, and mounds might be enumerated, there was no effort to generate archaeologically meaningful numbers. This new effort entailed wholesale changes in the ways in which archaeologists generated data. What made it all come together as a consensus was that it worked-and for the first time archaeologists could produce conclusions that could be tested empirically like those of other scientists, and they gained a measure of respect that had thus far eluded them.

The so-called stratigraphic revolution (Willey and Sabloff 1980, 84-93) had little to do with stratigraphy per se. It was not an epiphany on the relevance of the geological notion of superposition; U.S. archaeologists from Jefferson on had routinely understood and made stratigraphic observations. Rather, it depended on the coincidence, largely accidental, of the three innovations just named: quantification, materialism, and classification. The success of Europeans using stratigraphy (e.g., de Mortillet 1883; Lubbock 1865; Worsaae 1848) to create archaeological chronologies was not unnoticed by U.S. Archaeologists. They specifically sought out the kinds of deposits that had been key to the European success (especially caves and rock shelters-e.g., Nelson 1917). Even when expanded to include such obviously stratified deposits as shell middens (e.g., Dall 1877; Nelson 1910; Uhle 1907; Wyman 1875), these efforts were unrewarded because they continued to look at the record in qualitative, essentialist terms. European sequences, because of the vastly greater amounts of time involved, yielded coarse chronological kinds or "periods" under such assumptions but not so the much shorter U.S. record.

Repeatedly, U.S. archaeologists would observe strata but then conclude they

were unchallenged. Even radiocarbon dating had little intellectual impact beyond putting absolute dates to archaeological chronologies and improving between-chronology correlation. Almost unnoticed, radiocarbon dating did confirm the accuracy of seriation-based chronology.

Cultural Resource Management

Field methods that could yield the kinds of data required to do culture-history were codified in the late 1930s. The context for codification was provided by an explosion in the number of field archaeologists needed to direct the large-scale excavations that were funded by the federal government to provide work for unskilled laborers during the depression. The ad hoc procedures employed by trained individuals who could be trusted to make the right decisions had to be replaced with a set of rules (in this case, forms) that could be counted on to generate usable data. One rationale for the federal programs lay in conservation (Quimby 1979), even if strategy was determined by political necessity. Still, the locations selected for excavation were usually chosen by professionals-typically to fill in time-space gaps and save spectacular sites-so this federal work contributed directly to the emerging culture-historical syntheses. The program came to an abrupt end with World War II.

Post-World War II conservation archaeology, now nearly synonymous with federal archaeology, restarted with the River Basin Survey program in the Missouri Valley, under the direction of the Smithsonian Institution. New legislation enlarged the federal mandate, especially during the 1960s. The Reservoir Archaeological Salvage and Archaeological and Historic Preservation Acts (1960) put the National Park Service (NPS) in charge of all federal archaeology, a position it maintained until 1974 when the Archaeological Resources Act (or the "Moss-Bennett" act of 1974) gave federal archaeology more stable funding and involved all federal land-managing agencies in archaeological conservation and research.

When the NPS oversaw federal archaeology, CRM was still done by academicians as a part-time activity. A benevolent and informal client-patron relationship between the NPS and universities existed. As the amount of money involved grew and the number of agencies increased, so did the formality of contractual arrangements. This expansion of federal funding and the involvement of less-benevolent agencies than the NPS coincided with a dramatic downturn in academic employment as the first of the bloated crops of Ph.D.'s created by the expansion of university archaeology programs in the 1960s entered the job market. For the first time a separate class of CRM archaeologists emerged, the for-profit contractors. And as luck would have it, this major organizational change took place at the very time that archaeology was in intellectual turmoil. The warranting legislation itself had been framed by culture-historians. That culture-history relied upon common sense was probably an essential ingredient in its passage, but by the time the impact was felt, culture-history was passé and in disrepute but had not yet been replaced by a paradigm of comparable robustness. During the critical years in which archaeologists ought to have been instructing new agencies in why cultural resources were valuable, what archaeology was, and how it was done, no leadership was forthcoming. In such an intellectual vacuum, procedure came to dominate process; compliance-compliance with the law-became the raison d'être. The amount of money spent on archaeology by federal agencies was staggering by previous standards, and soon the bulk of all archaeological fieldwork was CRM.

The Second Paradigm: Processualism-Theory without Practice

One of the distinctive features of U.S. archaeology is that, in spite of its natural history beginnings, it has been in close association with anthropology from the days of the BAE on. Indeed, nonclassical archaeology in the United States is usually called "anthropological archaeology" whenever its intellectual roots are called into question. Why this should have happened in the United States (and in the other

places it did) is not obscure. The early linkages were institutional and to some extent political. But the association was lasting and effective in large measure because the methodological problems facing

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functional ones. Partly because radiocarbon dating seemed to have relieved archaeologists of any chronological responsibility beyond the collection of dating samples and partly because archaeological chronologies were seemingly well established in most areas, the functional approach was cast as an alternative to, not a supplement of, culture-history's historicism.

Processualists handled epistemological problems (at least they recognized there were some-not an issue in U.S. archaeology for half a century at that point) by adopting a confirmationist rather than falsification strategy in hypothesis evaluation; analogy (ethnographic and otherwise) effectively replaced empirical testing (Binford 1966; Watson, LeBlanc, and Redman 1971). Deprived of empirical standards for hypothesis evaluation, a pretense of "scientific" rigor could be maintained only by focusing epistemological questions on methods. The correctness of a conclusion was to be judged not by how it worked in the empirical world but by how it was reached, which is a ritualistic view of science (e.g., compare Spaulding 1953 and Ford 1954). The processualist product did not replace culture-historical understandings of the past; those remain strongly in the culture camp (e.g., Fagan 2000; Wenke 1999), albeit with a functionalist-reconstructive overlay but still no better warranted (although infinitely more obscure) than before. In fact, the typical product was either an isolated, never-to-be-used-again demonstration of a method or an exemplary interpretation.

This revolution differed from the culture-historical one in another important respect. Culture-history emerged as a consensus from a natural history context. In fact, the key synthetic pieces (e.g., Ford 1954; Krieger 1944; Willey and Phillips 1958) occurred long after the consensus was in hand. Processualism had to contend with an extant program, and so it was, of necessity (Kuhn 1962), polemical. It had to start with programmatic assertion (Watson, LeBlanc, and Redman 1971). Culture-history was demonized (e.g., Binford 1966, 1968b; Flannery 1967) to make a space for processualism. And, importantly, processualist claims were explicit: science *and* anthropology. As a result, the failure of processualism to achieve its scientific objectives was equally apparent. With no product to show, the enormous burden-both intellectual (stuff you have to know) and empirical (data quality, quantity, and analytic methods)-imposed by adopting scientific procedure was too much to bear. Processualism was doomed from the outset.

The Modern Ennui: Isms and Schisms-Fatal Division?

One cannot be very analytical about contemporary U.S. archaeology; all analysts have vested interests. The foregoing does, however, provide something of a framework within which a few comments may give perspective. The death of processualism as a paradigm that can be defended in public (it, like culture-history, continues on in practice) is different from the preceding two revolutions. One saw the creation of a paradigm where there had been none; the other saw the replacement of one by the other. Both were rationalized by trying to become scientific and thus like the model of science prepared by the philosopher of science Thomas Kuhn in structure. But with the abandonment of this goal in some quarters, no discipline-wide epistemological basis for constructing a replacement exists. Three strands, some more tightly wound than others, have emerged.

One might be viewed as a continuation of the ideals of processualism but with a new methodology and explicit theory-evolutionary theory (e.g., Dunnell 1978, 1980, 1992c; O'Brien 1996; Teltser 1995). Although there is a growing literature, normal science is still some distance in the future. Use of an explicit theory makes it painfully obvious that facts are created by theories and that one has to start virtually from scratch in generating data that can be explained. After years of no product, this is too much for many who want to get on with the show. Many also have an almost hysterical reaction to the word *evolution;* regrettably, it is the only scientific theory that deals with change. Yet the basis for broad appeal exists. Evolution is undeniably science and can deliver testable hypotheses, allowing us to achieve

our historical goal, to say nothing of the benefits that might accrue from knowing why we are the way we

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University of Pennsylvania Museum of Archaeology and Anthropology

One of the leading institutions of its kind in the world, the University of Pennsylvania Museum (UPM) has played an important role in the development of archaeology for more than a century. It was founded in 1887 and sent its first field expedition to Nippur, in what is now Iraq, in 1889 and recovered a significant number of cuneiform tablets. The first building of the current UPM complex was erected in 1899, and four additional buildings have been added since then, with a fifth addition soon to be constructed (Haller 1999). The UPM has had eight directors-Stewart Culin, George Byron Gordon, Horace H.F. Jayne, George Vaillant, Froelich G. Rainey, Martin Biddle, Robert H. Dyson, Jr., and Jeremy A. Sabloff-and three acting directors-Jane M. McHugh, Marian Angell Godfrey Boyer, and James B. Pritchard-since its founding. The UPM's collections number approximately 1 million objects, the large majority of which were obtained as a result of the museum's field research. The UPM has been an active sponsor of archaeological and ethnographic fieldwork since its

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1996) and of U.S. archaeology in general. Although many of the museum's early expeditions were focused on the gathering of objects for its collections, the overall collections are distinguished by their abundant scholarly documentation. Furthermore, in the 1970s, the UPM was an early and visible proponent of the United Nations Educational, Scientific, and Cultural Organization's convention on looted archaeological materials.

More than a century after the museum's founding by a group of wealthy and civic-minded Philadelphians and enlightened university administrators under the leadership of William Pepper, it is interesting to note that the UPM, with geographically extensive field projects, cutting-edge laboratory research, a successful traveling exhibit program, active conservation and loan programs, an award-winning website, and a highly regarded education department, has retained the same general mission that its founders established in the late nineteenth century. That is to say, through research, care, and study of collections, and dissemination of knowledge to both the scholarly world and the public at large, the museum is still wedded to its original mission of advancing an understanding of the world's cultural heritage.

Jeremy A. Sabloff

See also

Mesopotamia

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Ur

A major Sumerian city most closely connected with the excavations of sir leonard woolley, Ur was first explored in 1854 by J.E. Taylor, a representative of the british museum. sir henry rawlinson, the prominent nineteenth-century linguist, identified the name of the site from cuneiform cylinder seals that were brought

back to the museum. In 1918 and 1919 further explorations and some tests were carried out, but it was not until 1922 that the British Museum (in association with the university of pennsylvania museum) began serious work in the area, under Woolley's supervision. Between 1922 and 1934 Woolley recovered some of the most magnificent artworks of the ancient world from the cemeteries excavated at the site. Although Ur is justly famous for extraordinary objects made of gold and lapis lazuli, Woolley's excavations also revealed much about the changes in religious architecture and the evolution of the city and its elites.

Ziggurat and ruined walls of the ancient Sumerian city of Ur in Iraq

(David Lee/Corbis)

Tim Murray

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Ussher, James

(1581-1665)

Born in Dublin, James Ussher was one of the first students of Trinity College, Dublin, which was founded with the help of his family. Ussher studied divinity, Greek, Hebrew, and Latin and became interested in chronology and ecclesiastical antiquarianism. He abandoned the study of law to become a minister in the protestant church of Ireland in 1601. He traveled to England to acquire books for Christ Church College, and while there he met many other Puritan and religious intellectuals and the antiquarians John Camden and Robert Cotton.

Ussher was appointed professor of divinity at Trinity College, Dublin, in 1607, but his title was later changed to professor of theological controversies in recognition of his stance against the Roman Catholic Church and his popularity as a preacher. He was involved in the organization of the Anglican Church in Ireland and came to the notice of King James I, who was impressed by his scholarly vindication of the Protestant and Reformed Church's position in defense against ongoing Roman Catholic attacks.

James Ussher-an engraving by George Vertue after the portrait by Sir Peter Lely

(Ann Ronan Picture Library)

Ussher was vice-chancellor of the Trinity College, Dublin, and was made a bishop in 1620 and archbishop of Amagh, the primate of Ireland, in 1625. From 1623 to 1626 he lived in London researching his projected work on the antiquities of the British church, which resulted in *A Discourse of the Religion Anciently Professed by the Irish and British* (1623 and 1631), a defense of the independence of the church in England and Ireland based on the history of the ancient Gallic, Celtic, and British churches before their “contamination” by Rome. In the same vein, he published *Britannicarum ecclesiarum antiquitates* in 1639, an account of the spread of Christianity in Britain until the seventh century a.d., when St. Augustine arrived in England.

In the last years of his life, Ussher became interested in establishing a universal chronology for the whole of human history, and in 1650, he published *Annales veteris et Novi Tesamenti* (the English edition, *Annals of the Old and New Testament; Or, The Annals of the World Deduced from the Origin of Time,* was published in 1658). This work involved research in different oriental languages, comparisons of ancient calendars, and the recalibration of different political and national years with astronomical years, and it was built on the work of other Reformation scholars in France and Holland. The work was a triumph of scholarship and it was *the* acknowledged universal chronology for as long as the Bible was regarded as absolutely true-until well into the

middle of the nineteenth century. Ussher's findings were so incontestable that his dates were printed in the margins of Bibles for the next few centuries. He is still remembered for precisely dating the flood to 1656 b.c. and the Creation to 6 p.m., Saturday, 22 October 4004 b.c.

Tim Murray

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Uvarov, Count Aleksei Sergeevich

(1828-1884)

Born into an aristocratic Russian family as the son of Czar Nicholas I's nationalist ideologue, Aleksei Sergeevich Uvarov promoted archaeological study and helped to organize scholarly associations of archaeologists in the Russian Empire of the nineteenth century. He helped to found the Russian Archaeological Society (in 1864), the first archaeological congress (in 1869), and the Historical Museum in Moscow.

In the 1850s, he excavated burial mounds around Moscow and Vladimir and at the site of the ancient Greek city of Olbia in the Chersonese. In 1877, he excavated the Upper Paleolithic site of Karacharovo on the Oka River. He was regarded as a dilettante by modern scholars of archaeology, but he greatly helped to establish the study of archaeology in Russia.

Tim Murray

See also

Russia

V

Valcamonica

Valcamonica is a glaciated valley in the Alpine foothills of Lombardy, italy, that contains a rich collection of prehistoric rock art conventionally divided into four chronological phases (Neolithic, Copper Age, Bronze Age, and Iron Age) with subdivisions. Thousands of images were pecked into the glacially smoothed rock surfaces, and they include daggers, chariots, warriors and warfare, sun motifs, hunting and plowing scenes, men and animals, and geometric designs. Certain images are interpreted as huts while some at the site of Bedolina in Valcamonica are usually thought to be maps of settlements.

The known rock art comprises around 300,000 petroglyphs, although hundreds of decorated rocks probably remain buried. The art was first pointed out by a shepherd in 1914, but serious study really began decades later. This was the first rock art in Europe to be named a World Heritage Site by the United Nations Educational, Scientific, and Cultural Organization (UNESCO). The major set of decorated rock surfaces that is arranged for public visitation, with walkways, etc., is that of Naquane (another part of this site).

Paul Bahn

See also

Rock Art

Van Giffen, Albert Egges

(1884-1973)

Born in Holland, Albert Egges Van Giffen graduated from the University of Groningen, where he studied biology and theology. He became interested in archaeology through his analysis of the faunal remains from prehistoric dwelling mounds or *terps.* He was appointed a keeper in the National Museum of Antiquities in Leiden in 1912, and he began to excavate and publish the results of a number of important sites. He finished his Ph.D. in 1913.

Van Giffen is best known for his skill as an excavator, to which he rigorously applied biological methods. In his early work, structure, periodization, and environmental data took priority over archaeological artifacts. He specialized in coastal geology and archaeozoology and always sought the expertise of paleobotanists, soil scientists, physical anthropologists, and chemists. His multidisciplinary approach to archaeology served widely as a model.

He founded the Biological-Archaeological Institute in 1920 at Groningen University and the Institute of Pre- and Protohistory at Amsterdam University in 1950. In 1947, he became the first head of the State Service for Archaeological Research, and he was responsible for archaeological collections at the Assen (1916- 1955) and Groningen Museums (1917-1955). From 1929 to 1973, he was responsible for the protective governmental acquisition, maintenance, and restoration of megalithic tombs in the netherlands. The quantity and chronological range of his excavations-from prehistoric *terps,* barrows, and urnfields to provincial Roman *castellum* (forts) and medieval Cistercian abbeys-have ensured that his scientific legacy continues to play a major role in Dutch archaeology.

H. T. Waterbolk

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Vatican Museums

Although the papal museums and galleries were based on the earlier work of Popes Clement IX and Pius VI, it was Pope Gregory XVI who founded the Etruscan Museum in 1837 and the Egytian Museum in 1839. The Vatican used the Etruscan Museum to house material recovered from excavations in southern Etruria, which were begun around 1828. The Egyptian Museum housed not only materials acquired by the Vatican from Egypt but also pieces from its collection of classical (Greek and Roman) artifacts. Since that time, the vast archaeological and ethnographic collections of the Vatican have grown in richness and complexity and are open to the public.

Tim Murray

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Pietrangeli, C. 1993. *The Vatican Museums: Five Centuries of History.* Rome: Quasar, Biblioteca Apostolica Vaticana.

Ventris, Michael

(1922-1956)

Although trained as an architect, Michael Ventris was an accomplished cryptographer who played a significant role in the decipherment of the Linear B script. Ventris published his first paper on the issue at the age of eighteen, but because of war service, he had to wait until 1949 to resume work on the decipherment. In 1952, he announced that he had cracked the secrets of Linear B and had established that it was based on an archaic form of Greek. That same year he was introduced by sir john l. myres to the Cambridge philologist John Chadwick, and together they collected further evidence that Ventris's approach was correct. The 1953 publication of “Evidence for Greek Dialect in the Mycenaean Archives” was a clear and effective statement of their work.

Tim Murray

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Linear A/Linear B

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Vergil, Polydore

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Polydore Vergil was born in Italy at Urbino about 1470 and studied at the Universities of Bologna and Padua. He became secretary to the duke of Urbino and went on to become chamberlain to Pope Alexander VI. Made famous by two early works, *Proverbiorum libellus* and *De inventoribus rerum,* he was sent by the Pope to England in 1501 as a subcollector of Peter's pence (an annual tribute of a penny paid by each householder in England to the Pope). Vergil so impressed the English king, Henry VII, that in 1505 he was commissioned to write the history of England-the *Anglica Historia,* which was finished by 1512 but not published until 1534. Vergil was made archdeacon of Wells, and on 22

October 1510, he was naturalized as an English subject. Falling out with Cardinal Wolsey in 1514, he was imprisoned in the Tower of London and was not released until the Pope personally intervened.

Polydore Vergil has often been described as the first of the modern historians who placed great store on detailed source criticism and rational argument woven into a continuous narrative. It was Polydore Vergil who first seriously questioned the value of geoffrey of monmouth's legends of the role of the Trojan Brutus in the foundation of England. Vergil left England after the death of King Edward VI in 1553 and returned to Urbino, where he died.

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Although the papal museums and galleries were based on the earlier work of Popes Clement IX and Pius VI, it was Pope Gregory XVI who founded the Etruscan Museum in 1837 and the Egytian Museum in 1839. The Vatican used the Etruscan Museum to house material recovered from excavations in southern Etruria, which were begun around 1828. The Egyptian Museum housed not only materials acquired by the Vatican from Egypt but also pieces from its collection of classical (Greek and Roman) artifacts. Since that time, the vast archaeological and ethnographic collections of the Vatican have grown in richness and complexity and are open to the public.

Tim Murray

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Ventris, Michael

(1922-1956)

Although trained as an architect, Michael Ventris was an accomplished cryptographer who played a significant role in the decipherment of the Linear B script. Ventris published his first paper on the issue at the age of eighteen, but because of war service, he had to wait until 1949 to resume work on the decipherment. In 1952, he announced that he had cracked the secrets of Linear B and had established that it was based on an archaic form of Greek. That same year he was introduced by sir john l. myres to the Cambridge philologist John Chadwick, and together they collected further evidence that Ventris's approach was correct. The 1953 publication of “Evidence for Greek Dialect in the Mycenaean Archives” was a clear and effective statement of their work.

Tim Murray

See also

Linear A/Linear B

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Vergil, Polydore

(ca. 1470-1555)

Polydore Vergil was born in Italy at Urbino about 1470 and studied at the Universities of Bologna and Padua. He became secretary to the duke of Urbino and went on to become chamberlain to Pope Alexander VI. Made famous by two early works, *Proverbiorum libellus* and *De inventoribus rerum,* he was sent by the Pope to England in 1501 as a subcollector of Peter's pence (an annual tribute of a penny paid by each householder in England to the Pope). Vergil so impressed the English king, Henry VII, that in 1505 he was commissioned to write the history of England-the *Anglica Historia,* which was finished by 1512 but not published until 1534. Vergil was made archdeacon of Wells, and on 22

October 1510, he was naturalized as an English subject. Falling out with Cardinal Wolsey in 1514, he was imprisoned in the Tower of London and was not released until the Pope personally intervened.

Polydore Vergil has often been described as the first of the modern historians who placed great store on detailed source criticism and rational argument woven into a continuous narrative. It was Polydore Vergil who first seriously questioned the value of geoffrey of monmouth's legends of the role of the Trojan Brutus in the foundation of England. Vergil left England after the death of King Edward VI in 1553 and returned to Urbino, where he died.

Tim Murray

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Vilanova y Piera, Juan

(1821-1893)

Juan Vilanova y Piera's father was a lawyer, and the son received his primary education in Alcalá de Chisvert in Valencia, spain. Also in Valencia, he read humanities in the Jesuit Real Colegio de San Pablo, and later, he studied medicine, surgery, and sciences. In 1845, he graduated in medicine. In Madrid, he worked toward a doctorate in the Museo de Ciencias Naturales (Museum of Natural Sciences), which is part of the Universidad Central (Central University), and

the nineteenth century. On the international level, he was one of the promoters of international geological congresses.

However, it was in prehistory that Vilanova y Piera's research was its most innovative. He was the first naturalist full member of the Royal Academy of History, through his research activities and his diffusion of prehistory. His interest sprang from discussions with European geologists and through the association of Paleolithic industries with extinct fauna, which was also observed by Casiano del Prado on the banks of the river Manzanares in San Isidro, Madrid (1862). Vilanova y Piera was the author of two unique treaties on the prehistory of the Iberian Peninsula: *Origen, naturaleza, y antigüedad del Hombre* (The Origen, Nature, and Antiquity of Man)(1872) and, with Juan de Dios de la Rada Delgado, *Geología y Protohistoria Ibéricas* (The Geology and Protohistory of Iberia)(1894) in the Historia General de España edited by the Royal Academy of History. He also took part in all the congresses on archaeology and prehistoric anthropology that took place in Europe and in the associations aimed at achieving their institutionalization. By 1869, he was, along with J. F. M. Tubino, the official Spanish representative at the Copenhagen International Archaeology Congress.

In prehistory, Vilanova y Piera is associated with the introduction of a first Copper Age within the Metal Age and with the defense, even at the cost of his scientific credibility, of the authenticity of the altamira cave paintings discovered by Marcelino Sanz de Sautuola in 1879.

Throughout his life, Vilanova y Piera endeavored to incorporate European knowledge on the subjects with which he was involved into Spanish science and to present Spanish contributions to this knowledge at the different meetings and congresses that he attended abroad. His task had two main limitations. First, as a naturalist, the very extension of his work involved significant information gaps. Second, his religious attitudes, extreme on certain subjects such as evolution, reduced his objectivity in spite of his attempts to keep within the limits of science.

Isabel Martínez Navarrete

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Virchow, Rudolf

(1821-1902)

Rudolf Virchow was born in Germany and educated at the University of Berlin, where he received his Ph.D. in medicine in 1843 and where he established an archive of anatomy and physiology. In 1849, Virchow became professor of pathological anatomy at the University of Würzburg, and in 1856, he returned to Berlin as professor of pathological anatomy and director of the newly created Pathological Institute, where he included lectures in prehistory in his courses.

Rudolf Virchow

(Ann Ronan Picture Library)

PREV NEXT

He encouraged the development of the discipline of anthropology in Germany by helping to found the National Anthropological Association (1870) at the same time as Germany unified politically and the Berlin Museum für Volkstrachten was founded (1888). He also contibuted to the development of the collections of the Berlin Museum für Volkerkunde (Berlin Museum of Folk Studies) and edited a national journal of ethnology. He excavated in Pomerania and took an interest in the work of heinrich schliemann, traveling to Hisarlik in turkey in 1879 to advise Schliemann on the excavating.

Unlike his student Ernst Haeckel, Virchow was not a Darwinist. He was involved in debates about developments in human paleontology, and he regarded the first Neanderthal discovery at the Feldhofer Cave in the Neander Valley in Germany as a pathological specimen and not a new species of hominid. He also refused to accept Dutch paleontologist eugene dubois's discovery of a fossil hominid in Java as evidence of human evolution.

Tim Murray

See also

Kossinna, Gustaf

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Virú Valley

The small Virú Valley on the coast of peru was the site of a landmark study in the development of archaeological survey methodology. Research in the valley began in 1946 with the cooperation of U.S. and Peruvian scholars, but it was the innovative work of gordon willey in the field of settlement archaeology that lifted the program from being yet another site survey. Although Willey (who was much influenced by anthropologist julian steward) was certainly interested in exploring the ecology of 1,500 years of human settlement in the region, he chose to do so against a background of a detailed analysis of the location and distribution of sites within the region. Using both surface and subsurface survey techniques, Willey was able to chart the distribution of sites in the region over time, and he demonstrated the fact that the environmental (both natural and cultural) context of human settlement was also time-dependent and not simply “read off” from surface indications.

Tim Murray

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W

Waverly Plantation, Mississippi

George Hampton Young founded Waverly Plantation in 1841, and it remained in the Young family until 1963. This National Historic Landmark contains one of the South's finest plantation houses, complete with its own gas plant and swimming pool, built in the 1850s. Young founded the University of Mississippi and was a prominent political figure in Mississippi. He owned 3,420 acres and controlled much more; with 217 slaves, he was a big planter. In 1893, the National Fox Hunters Association was organized at Waverly.

After the American Civil War, a tenant and sharecropping system was established, which lasted until the 1930s. In 1979, archaeological excavations were conducted at six tenant farmer sites, a general store, a brick kiln, and a steam-powered cotton gin and sawmill under the direction of William H. Adams, Timothy B. Riordan, and Steven D. Smith. Historical geographer Howard Adkins researched the documentary history of this tenant-farming community. Folklorists David F. Barton and Betty J. Belanus interviewed eighty-nine informants, forty-three extensively, and their recordings are in the Library of Congress, the Mississippi Department of Archives and History, and the Indiana University Folklore Archives. This study marked the first archaeological investigation of tenant farming in the South. The community approach used to study tenant farmers and planters provided a broader historical context for the material recovered. Adams and Smith compared the purchases recorded in the general-store ledger with the artifacts from those tenant sites to evaluate what kinds of items were not being recovered archaeologically.

William H. Adams

See also

United States of America, Prehistoric Archaeology

Wheeler, Sir Eric Mortimer

(1890-1976)

After an illustrious career as an archaeologist of the British Iron Age, Eric Mortimer Wheeler was the director-general of the Archaeological Survey of India between 1944 and 1948 and served as the archaeological adviser to the government of Pakistan in the 1950s. His major excavations in the subcontinent as director-general were at Taxila, harappa, Arikamedu, and Brahmagiri and on behalf of the Pakistan Department of Archaeology, at Charsada and Mohenjo Daro. Among his publications on the subcontinent mention should be made of the “Indian” chapters in the autobiographical *Still Digging* (Wheeler 1954) and *Rome beyond the Imperial Frontiers* (Wheeler 1955) and the books *The Indus Civilization* (Whee1er 1968) and *Early India and Pakistan* (Wheeler 1959). His “Indian” writings were published mainly in Ancient India, an official publication of the Archaeological Survey of India, which he himself edited.

His major achievements in the field of South Asian archaeology were the establishment of a training school at Taxila in 1946 to make Indian students familiar with his layer-based method of digging and the basic academic results of his excavations, which included, among other things,

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the discovery of and a cross-section through the Harappan defenses at Harappa; the identification of a Roman trading station at Arikamedu; and the establishment, on the basis of ceramic correlations with the dated ceramic sequence at Arikamedu, of a chronological sequence for southern Indian archaeology from the Neolithic stage upward. Among other issues, he emphasized the need for prehistoric and proto-historic studies, establishing a separate prehistory branch in the survey, and he underlined the importance of spreading archaeological studies beyond the confines of a government department to the portals of universities in India. Within the short span of time available to him for archaeological researches in the subcontinent, what he achieved and influenced must be considered remarkable.

Sir Mortimer Wheeler

(Image Select)

Barry Cunliffe

See also

Indus Civilization; South Asia

References

A longer discussion of Wheeler's life may be found in the *Encyclopedia of Archaeology: The Great Archaeologists,* Vol. 1, ed. Tim Murray (Santa Barbara, CA: ABC-CLIO, 1999), pp. 371-383, and in *Mortimer Wheeler: Adventurer in Archaeology* by Jacquetta Hawkes (London: Weidenfeld and Nicolson, 1982).

Who Owns the Past?

It is a commonplace that archaeological knowledge is not and never has been produced in a cultural and political vacuum. Yet this fact was not formally recognized by archaeologists until the twentieth century. In the 1800s, when the fundamental structures of the discipline were created, the bulk of practitioners (and the general public, which avidly followed their work) firmly believed that archaeologists produced rational, objective, scientific knowledge about the past. Further, the search for knowledge about human history, at least as undertaken by archaeologists, was of sufficient cultural significance to be self-evidently worthwhile. A scientific archaeology was to provide an objective history of humanity, and this history (in the eyes of commentators such as Sir John Lubbock [lord avebury]) should become the foundation upon which rational societies of the future would be built.

This same search for universal edification (undertaken or controlled by Europeans or, later, North Americans) had been a major factor in fostering the work of collecting expeditions to italy, greece, and Asia Minor in the eighteenth and nineteenth centuries, which were followed by major expeditions in Egypt and the Middle East. In an important sense the pasts of countries that lay outside the borders of metropolitan Europe were considered to be resources that could be articulated by archaeologists and antiquarians in the search for an understanding of human (read European) history. Thus the great excavations in mesopotamia, Egypt, Asia Minor, and Greece that began in the nineteenth century and continue to this day were initially launched to explore the roots of Judeo-Christian civilization and to bring back to London, Paris, Berlin, or New York the material representations of that great journey toward civilization.

It is also no coincidence that these explorations outside Europe (especially in Africa, the Americas, and Australia) fulfilled two roles at the same time-providing a reconnaissance of contemporary human diversity and fostering a consideration of the relationship between the histories of such places or people and the history of Europe. The museums of “man” or “natural history” that sprang up all over the western

predecessors) have consequences for the peoples whose pasts they investigate.

Outside Europe the "loss of innocence" has been even more dramatic since World War II. Indeed, since the 1960s, much of our modern thinking about matters related to the ownership and control of pasts has developed in North America, Australasia, and, more recently, in Africa. In these regions recognition by governments and by archaeologists of the rights and interests of indigenous peoples has completely transformed the archaeological landscape. The practice of archaeology in these places is now highly regulated by legislation (such as the U.S. legislation Native American Graves Protection and Repatriation Act), and former collection and excavation practices have been replaced by models of negotiation and consultation. It is also now far more widely accepted that archaeologists cannot consider the scientific importance of their inquiries to be of such significance as to make their interests automatically more valuable than those of any other group. In Australia, as in some other countries, it is explicitly acknowledged that indigenous people "own" their pasts-an acknowledgment that requires that work can only proceed on the basis of informed consent. Archaeologists now spend a good deal of time developing research projects that produce knowledge of interest and value to indigenous communities, not just to nonindigenous institutions such as museums, universities, or academic disciplines. But again, notwithstanding the great changes that have occurred in the practice of archaeology in these contexts, significant challenges remain.

Against this background of transformation in the social, cultural, and political contexts of archaeological knowledge, at least three matters remain unchanged. Foremost is continued looting of archaeological sites and the theft of cultural properties for sale on the illegal antiquities market. Efforts persist to restrict if not stamp out this trade, but its power to destroy the past remains undiminished. Second, the preservation or conservation of archaeological sites and landscapes requires that all members of society (not just archaeologists) acknowledge the many values of such properties-an acknowledgment that accepts that those values can be diverse and that they must be balanced against other rights and interests existing in society. Third, archaeologists in all countries still need to recognize that interpretation must never be completely free from empirical demonstration and that it is up to them to clearly distinguish between interpretation and demonstration in their writings. It is imperative that archaeologists be honest with their readers-honest about the limits of their interpretations and honest about their biases and presuppositions. Some archaeologists have (wrongly) supposed that if archaeological knowledge is a social and cultural product, then this must mean the end of science as a model for the production of knowledge. Indeed, the history of archaeology aptly demonstrates that no science is or ever has been practiced in a vacuum, but this does not mean (and never has meant) that all opinions about archaeology are equally valid.

Tim Murray

See also

Society of Dilettanti

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Willey, Gordon Randolph

(1913-)

Gordon Randolph Willey, the foremost Americanist among archaeologists, was born in Chariton, Iowa, and grew up in Long Beach, California. He took his undergraduate and masters degrees at the University of Arizona and pursued doctoral work at Columbia University, completing his dissertation in 1942. A year later, he joined the Bureau of American Ethnology at the smithsonian institution. In 1950, he accepted the Bowditch Professorship in Central

American Archaeology and Ethnology at Harvard University, which he held until 1987. During his productive career, he directed major fieldwork projects in belize, guatemala, Honduras, mexico, Nicaragua, panama, and peru. Within the united states, he has worked in Arizona, Georgia, Louisiana, and Florida.

Willey is perhaps best known for creating the subfield of "settlement pattern" archaeology. For him, the distribution of human settlements provided a natural starting point for the functional interpretation of archaeological cultures. Different sites were best understood, not in isolation, but as part of complex economic, social, and political landscapes. Willey devised his settlement pattern approach under the aegis of the virú valley project, one of the first multidisciplinary research programs in the New World. The widespread popularity of Willey's approach is due to its workable methodology for addressing questions of social structure, demography, and subsistence patterning.

Willey is the preeminent "grand synthesizer" of American archaeology. From 1953 to 1955, in a series of publications with Philip Phillips, he laid out the baseline for the prehistory of the New World. In 1965, he revised this framework in a comprehensive survey of North and Middle American archaeology. Spanning some 40,000 years of prehistory, his book covers the continent from Alaska to Panama. This project was quickly followed by a second volume on South American archaeology. More than any other work by a professional archaeologist, these lavishly illustrated books served to acquaint a popular audience with the broad diversity of past cultures and their rhythms of horizonal integration and regional florescence.

Willey has maintained a strong interest in the professional development of American archaeology. He prepared his first historical essay in commemoration of the one-hundredth anniversary of the peabody museum of archaeology and ethnology in 1966, and this essay emphasizes the growing professionalization of the field and its increasing claim to scientific status. In 1973, collaborating with Jeremy Sabloff, Willey completed his first major book-length history. This volume differs from Willey's earlier essay by embracing much of the new archaeology, an explicitly scientific approach grounded in positivism. In the third edition, Willey and Sabloff substantially revised their appraisal of the new archaeology and pointed out some of its excesses.

The influence of Gordon Willey on American archaeology is immense. His work on settlement archaeology is regarded as the starting point for all investigations of culture process and social change, his syntheses of New World prehistory and the history of American archaeology are considered classics and are widely used as textbooks, and his writings on functionalism, culture process, and ideology have anticipated many of the recent trends in archaeology since the 1980s. One of Willey's most distinguishing characteristics is his balanced view of archaeological explanation, and throughout his career, he has consistently sought to bridge the tensions between humanist and scientific traditions.

Robert Preucel

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For references, see *Encyclopedia of Archaeology: The Great Archaeologists,* Vol. 2, ed. Tim Murray (Santa Barbara, CA: ABC-CLIO, 1999), pp. 709-712.

Williamsburg, Colonial

Williamsburg, the eighteenth-century capital of Virginia, earned its place in the annals of archaeology through the pioneering techniques used there to uncover the remains of British colonial buildings and then reconstruct them. In 1928, by excavating and rebuilding the colony's capitol, architects employed by

John D. Rockefeller began to turn Williamsburg into a living museum in an ongoing archaeological, architectural, and curatorial process that has continued into the twenty-first century.

The methods developed by the architects and their draftsmen that exposed foundations but ignored stratigraphy and the potential testimony of artifacts were replaced in 1957 after the arrival of British archaeologists who used methods employed in the Old World by the great stratigraphers sir mortimer wheeler and kathleen kenyon. Emphasis on site cleanliness

and the introduction of a process that came to be known as artifact cross-mending greatly improved the excavators' ability to interpret the sequential interrelationships between structures and other on-site features. Through the following quarter century, Colonial Williamsburg publications demonstrating the importance of potsherds and a wide range of other artifacts as a means of reading the colonial past had a lasting impact on the birth and growth of the discipline now globally known as historical archaeology.

Reconstructed dwelling at Colonial Williamsburg

(Spectrum Colour Library)

In 1969, the Colonial Williamsburg Foundation expanded its interpretive interests to include the nearby Carter's Grove plantation, where archaeologists found the remains of the Martin's Hundred settlement (1619-1645), much of which had been destroyed in an Indian uprising in 1622. The settlement's administrative center, Wolstenholme Towne, has been partially reconstructed, and a subterranean museum displays the arms, armor, and other artifacts found there.

Ivor Noël Hume

Wilson, Daniel

(1816-1892)

Daniel Wilson was the first person outside Scandinavia to practice the prehistoric archaeology that had been pioneered by christian j. thomsen and jens jacob worsaae. He also elucidated, if he did not invent, the term *prehistory*. Wilson was born in Edinburgh, Scotland, 5 January 1816. Between 1837 and 1852 he worked as an engraver, writer, and shopkeeper. The romanticism of Sir Walter Scott motivated him to use his considerable artistic skills to record old buildings that were being demolished in the course of Edinburgh's urban renewal. *Memorials of Edinburgh in the Olden Times* (1848), which contained many of his more interesting sketches accompanied by a rambling account of the history of the city, consolidated his reputation as a leading Scottish antiquarian.

Wilson was invited to rearrange the collections of the society of antiquaries of scotland according to the three-age system that Thomsen had devised for the National Museum of Antiquities in Copenhagen. His work on this collection and study of prehistoric monuments led him to publish *The Archaeology and Prehistoric Annals of Scotland* (1851), the first comprehensive work of prehistoric archaeology in the English

language. It is not clear whether Wilson understood the seriational principles on which Thomsen's work was based or merely copied his sequence. Wilson's major achievements were to distinguish history and prehistory not merely as time periods but as different approaches to the past, and to realize the potential of material objects as a rounded source of information about how human beings lived in the past.

In 1853, Wilson became professor of history and English literature at University College in Toronto, Canada, where in 1857, he began offering a course on ancient and modern ethnology. His encounters with Indians still living in a traditional fashion convinced him that the New World constituted a "laboratory" for studying European prehistory and understanding better the "essential characteristics" of all human beings. In *Prehistoric Man* (1862), Wilson used physical anthropological data to refute claims that American Indians constituted a separate species; interpreted archaeological findings as evidence of parallel, if unequal, cultural development in the Old and New Worlds; and interpreted what had happened to Europeans, Africans, and aboriginal peoples in the Western Hemisphere since 1492 as evidence that all peoples possess the same basic drives and abilities and, hence, could participate in cultural development. Wilson continued to uphold the principles of the eighteenth-century Enlightenment as they had been understood in the Edinburgh of his youth.

Wilson also continued to adhere to a biblical chronology. It was not until the 1870s that he was prepared to admit that human beings might have evolved from other animals, and even then he refused to consider an evolutionary origin for human reason or moral sense. Wilson continued to publish anthropological papers, but the problems he had in coming to terms with Darwinian evolution prevented him from becoming one of the leading anthropologists of the late nineteenth century. In his later years, Wilson continued to publish important works of literary criticism and was increasingly preoccupied with academic administration, which culminated in his becoming president of the University of Toronto in 1887. He died in Toronto 6 August 1892.

Bruce G. Trigger

References

For references, see *Encyclopedia of Archaeology: The Great Archaeologists, Vol. 1,* ed. Tim Murray (Santa Barbara, CA: ABC-CLIO, 1999), pp. 91-92.

Winckelmann, Johann Joachim

Winckelmann was born on 9 December 1717 in Stendal, Germany. He went to the local grammar school and later spent a few months at the Collnisch Gymnasium in Berlin. For two years (1737-1739) he studied theology in Halle and then moved to Jena in 1741, where he enrolled for classes in mathematics and medicine. In 1743 he took a post as associate rector at a school in Seehausen, which he held for five years, a period of intensive study of the classics. He was taken on by Heinrich von Bünau as librarian in Nothnitz near Dresden in 1748; here he did research on the Ottonian emperors for Bünau's *History of the Empire.*

Winckelmann's earliest unpublished writing was notes from a lecture on recent general history in which he brought out the close connections between art and history. He moved to Dresden and published *On the Imitation of the Painting and Sculpture of the Greeks* in 1755, a depiction of classical Greece in which art could develop freely and free citizens could live in a state that was founded on liberty and democracy. Enthusiastic descriptions of the Laocoon group and the Herculanean Vestals form a contrast to the way he conceived his own times. In his theory of imitation he established the need to copy the natural and ideal beauty of Greek sculpture, its "noble simplicity and calm grandeur." He converted to

Catholicism and, helped by a stipend from the Saxon court, went to Rome in 1755. He began an inventory of Roman works of art, commenting on them both as iconography and in terms of restoration and described the Belvedere statues in the Vatican. At the same time he was striving for a language that would be appropriate to art and would reflect the essence of the works of art in question. His descriptions had a great influence on German scholarly prose. From his inventory there emerged a new system of historical classification, based on the criteria and the style of nations,

periods, and artists, of the rise, development, flourishing, and decline of the art of different nations, the whole connected with the attempt to classify each individual work of art. He exemplified this theory in his great work, his *History of the Art of Antiquity* in 1764, the work that marked the height of his fame. He described the art of the Egyptians, Phoenicians, Persians, and Parthians; of the Etruscans and Italians; as well as the style of Greek art, which he divided into four separate styles, the more ancient style, the grand, the beautiful, and the style of the imitators. He maintained that, besides nature, climate, and education, it was freedom that had produced the artistic flowering of Greece. In 1757 he became librarian at the Vatican and a year later entered the service of Alessandro Albani. In 1758 he visited Naples, Portici, herculaneum, and pompeii for the first time and went to the temple at Paestum. In 1762 his *Remarks on the Architecture of the Ancients* appeared and was instrumental in bringing the temple of Paestum to European attention. He saw that Vitruvius had not gone far enough in answering the question of the origins of Greek architecture and that its uniqueness and development could only be made clear through drawings and reproduction. In later writings, *Open Letters from the Discoveries at Herculaneum* (1762) and *News of the Most Recent Herculanean Discoveries* (1764), he reported on significant finds at Herculaneum and Pompeii. He also described in detail the Roman frescoes and artifacts from daily life and pointed out the artistic and aesthetic aspects of Roman handicrafts. In 1760 he published his *Description of Ancient Gems* by the late Baron de Stosch in Florence, which introduced methodologically significant elements into archaeology as he recognized that many of the themes or images taken from Greek mythology needed to be explained. In 1767 were published two volumes of *Monumenti antichi inediti,* in which he tested out his archaeological-hermeneutic methodology and tried to decipher the mystifying content of classical works, as well as attempting to determine their style and thus their date. In another work, *Attempt at an Allegory, Particularly for Art* (1766) Winckelmann undertook to provide artists with a supply of significant classical themes as a stimulus for their own works. Its impact was to help fertilize the intellectual ground for the rise of Neoclassicism in Europe. On 8 June 1768 he was murdered in Trieste.

Johann Joachim Winckelmann

(Ann Ronan Picture Library)

Max Kunze; translated by Judith Braid

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Woolley, Sir (Charles) Leonard

(1880-1960)

Charles Leonard Woolley was born in London and won a scholarship to New College, Oxford, where he studied humanities and theology. He graduated in 1904 and then traveled to Germany to study modern languages. In 1905, Woolley was appointed assistant to sir arthur evans, keeper of the ashmolean museum in Oxford.

Woolley traveled to the Near East in 1907 to excavate in nubia with D. Randall-MacIver from the university of pennsylvania museum. He excavated the Meroitic cemetery at Karanog, unearthing rich finds and receiving an excellent training in field archaeological methods and the management of

excavations. In 1912, Woolley was appointed to lead a british museum expedition to Carchemish where he discovered Neo-Hittite

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temples, palaces, and fortifications. He also worked closely with another young archaeologist, T. E. Lawrence, who was to become famous later as “Lawrence of Arabia.” Together, after the digging season had finished, they made an archaeological survey of Palestine north of Aqaba toward the southern end of the Dead Sea and managed to observe and note the Turkish government's military strengths and weaknesses in the area at the same time.

Sir Leonard Woolley

(Image Select)

The excavation at Carchemish was interrupted by the outbreak of World War I, during which Woolley was an intelligence officer in Egypt and spent two years in a Turkish prison camp after surviving being blown up at sea off the coast of Asia Minor. In 1919, he returned to Carchemish, where completing the excavation was made difficult because of its location between the French and Kurdish armies. Funded by the egypt exploration society, Woolley moved to Egypt and excavated the house quarter of el amarna.

In 1922, Woolley began thirteen years of excavation in mesopotamia at the mound of ur, where he unearthed a long sequence of cities going back to the Ubaid period of the fifth millenium b.c. He unearthed Sumerian temples, palaces, and whole towns, and the most famous discovery of the expedition-the royal cemetery of Ur and its wonderful treasures from before 2500 b.c. He also unearthed some of the earliest literature in the world, many remarkable small finds, sculptures, and metal work. He published *The Sumerians* (1928), *The Development of Sumerian Art* (1935), *Abraham* (1936), *The Royal Cemetery* (1934), and *The Ziggurat and Its Surroundings* (1939) on the excavations at Ur. His popular books, such as *Digging Up the Past* (1930), *Ur of the Chaldees* (1929), and *Excavations at Ur: A Record of Twelve Years' Work* (1954), were best-sellers.

Woolley continued to excavate. At Al Mina, an ancient port city near Antioch in Syria, he found ten levels of occupation from between the eighth and third centuries b.c., which shed light on the nature of the trade between Syria and the Aegean. At Tell Atchana, the site of ancient Alakakh in northwestern Syria (1937-1939 and 1946-1949), he discovered seventeen phases of middle and late-Bronze Age occupation, exposing residential, palace, and religious monuments and material culture and archives dating to the fifteenth century b.c.

In 1938, Woolley traveled to India to advise the government on a program of archaeological work for the subcontinent. During World War II, he served as a lieutenant-colonel, and in this capacity he managed to save many of the monuments, art works, museums, archives, and libraries of Europe from invading armies and bombs. He was knighted in 1935, received honorary degrees from the Universities of Dublin and St. Andrews, was awarded the Flinders Petrie Medal in 1957, and unfortunately died just before he received the gold medal of the Royal Society of Antiquaries.

Tim Murray

See also

Egypt: Dynastic; Turkey

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Warburg.

World Archaeological Congress

The World Archaeological Congress (WAC) is an international forum concerned with all aspects of archaeological theory and practice

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World Archaeology

The first edition of the journal *World Archaeology* appeared in June 1969, and the opening issue set out the journal's objectives concisely: “to synthesize the best contemporary thought on matters of common interest to archaeologists the world over. It is the voice, essentially, of a fresh generation of professional archaeologists.” With those words, the founders of the journal allied themselves with the methodological revolution that was affecting Anglo-American archaeology during the late 1960s. This stance is particularly clear because they described *World Archaeology* as “designedly a journal of debate” and sought to organize the contents of most issues around a clearly defined theme.

From the start, the journal was run from England, and only occasionally has it drawn on editors outside the British Isles. Until recently, most of the editors have been associated with the Universities of Oxford, Cambridge, or London and have represented the archaeology of those parts of the world in which they have had special interests.

The journal has retained its thematic character, although the nature of the topics selected for particular issues have changed over the years. Early issues tackled broad themes such as subsistence, population, and trade, and sometimes they were concerned with questions that only became really topical some years later, such as archaeology and linguistics. After the first decade, however, the topics became rather more specific, and there was greater emphasis on empirical data and on particular analytical techniques. On the one hand, there were issues concerned with such topics as waste management, ceramics, or archaeology and musical instruments; on the other hand, there were groups of papers on early chemical technology and photogrammetry.

More recent editions of the journal show a subtle change of direction. There is less emphasis on appointing editors to represent particular areas of the world, and some issues have returned to the broader themes first explored in the early years of the journal, such as architectural innovation, craft production, and specialization or concepts of time and the ancient world.

There have also been changes in the authors writing articles for *World Archaeology*. Although contributors who were relative newcomers to archaeology were always encouraged, the early issues contain the names of many people whose careers were already well established. For example, françois bordes, j. desmond clark, mary leakey, Colin Renfrew, Jeremy Sabloff, and Bruce Trigger all contributed to *World Archaeology* during its first five years. Others were soon to make international reputations for themselves, indeed, the very first issue contained an early article by African prehistoric archaeologist glyn isaac. Relatively few of the contributors to the early editions of *World Archaeology* are still writing for the journal, although there are exceptions such as Charles Higham and Bruce Trigger. More of the articles are submitted by graduate students or by archaeologists who are just beginning their careers.

Last, there have been striking changes in the regions discussed in the journal. Not surprisingly, more articles are concerned with Europe than with other areas (approximately a third), but in the first ten years *World Archaeology* was published, a substantial number of articles also discussed material concerning Africa, mesoamerica, and South America. Over the next decade, however, the proportion of articles concerned with the New World declined, probably because other journals had been established dealing with just those areas, and *World Archaeology* carried significantly more articles discussing material from the Near East and Southeast Asia. Throughout its history, the journal has published relatively few articles concerning India, Australia, the united states, or the Pacific, although there are signs that the balance may have started to shift. No doubt there will be many more changes over the next quarter century, for the “journal of debate,” which was such a radical venture in 1969, still has a role to fulfill.

Richard Bradley

See also

Antiquity; World Archaeological Congress

Worm, Ole

(1588-1654)

Ole Worm was born in denmark and educated at the University of Copenhagen. He was successively professor of pedagogy, Greek, physics,

World Archaeology

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Worm, Ole

(1588-1654)

Ole Worm was born in denmark and educated at the University of Copenhagen. He was successively professor of pedagogy, Greek, physics,

and medicine before becoming personal physician to Christian IV, king of Denmark. Worm was a contemporary and colleague of the Swedish antiquarian johan bure and had similar interests in rune stones and collecting archaeological and ethnographic artifacts and other antiquities. He corresponded widely with other antiquarians across Europe, learned Old Norse from Icelanders in order to translate runes, and speculated about tumuli with the English antiquarian Sir Henry Spelman. In 1626, he organized a royal circular to be sent to all of the clergy throughout Denmark to submit reports on any rune stones, burial sites, or other historic remains and then sent draftsmen out to record them. The resulting mass of information was the basis of Worm's six volumes on Danish monuments published in 1644, the antiquarian record of Denmark with illustrations and maps.

Ole Worm

(Ann Ronan Picture Library)

He also established the Museum Wormianum, a kind of extended cabinet of curiosities, to display his collections and the donations of others. This collection was passed on to King Frederick III after Worm's death. It was installed in the old castle in Copenhagen and then moved in 1680 to a new building in Christiansborg, where it was opened to the public as the Kunstkammer (Royal Collection), which in time became a part of the Danish National Museum of Antiquities.

Tim Murray

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Wormington, Hannah Marie

(1914-1994)

One of the first female archaeologists in North America, Hannah Marie Wormington made significant contributions to Paleo-Indian archaeology. She was born and attended schools in Denver, Colorado, and she would live and work in this city as an adult for over thirty years. Wormington began studying medicine and zoology at the University of Denver, but under the influence of French archaeologist E. B. Renaud, she became interested in the prehistory of the Americas and participated in fieldwork in Colorado and New Mexico.

In 1935 she traveled to Europe, where she met and was greatly impressed by the renowned English archaeologist dorothy garrod. Wormington, whose mother was of French origin, studied in Paris and joined Paleolithic excavations in the Dordogne. She returned to work at the Colorado Museum of Natural History (later the Denver Museum of Nature and Science), where she began studying Paleo-Indian material in the collection. This typological work was the subject of her first paper, presented in 1937 at the International Symposium of Early Man in Philadelphia, Pennsylvania. It was so well received that it established her as a major contributor to the current debate around and study of Paleo-Indians.

Her later publication, *Ancient Man in North America* (1939); was based on this paper and was the first summary and synthesis by an archaeologist of the evidence for Pleistocene and early-Holocene occupations in North America. The book went through four editions (the last in 1957) and is still

regarded as a classic in Paleo-Indian studies.

In 1937 Wormington began postgraduate study at Radcliffe College, where she was the first doctoral student in anthropology. She also attended classes at Harvard University and was

only the second woman to study in the Department of Anthropology. Over the next seven years Wormington continued to work at the museum, and she undertook fieldwork, studied for her Ph.D., married, and volunteered with the Red Cross during World War II. She excavated sites in Alberta, Canada, for her doctoral fieldwork and received her Ph.D. in 1954.

Four years later Wormington traveled to the USSR, and in 1961 and 1964 she returned there to study Siberian archaeological collections, looking for similarities to and differences from Clovis material in the United States. There were none, and she came to believe that the Clovis people were not the earliest North Americans. Her final fieldwork in the mid-1960s was at the Frazier site near Greeley, Colorado. Many of the next generation of prehistoric archaeologists worked with her at this important Paleo-Indian site, dated to 9500 b.p.

In 1968 Marie Wormington was elected the first female president of the Society for American Archaeology, having served two terms as a vice-president (1950-1951 and 1955-1956). After thirty-one years she left the Denver Museum in 1968 to teach at Arizona State University (1968-1969); she then taught at Colorado College (1969-1970) and the University of Minnesota (1973), and from 1972 to 1986 she was an adjunct professor at Colorado College. In 1983 she became the first female archaeologist to win the society for american archaeology's Distinguished Service Award.

Tim Murray

See also

United States of America, Prehistoric Archaeology

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Worsaae, Jens Jacob

(1821-1886)

As a boy in denmark, Jens Jacob Worsaae carried out excavations and published his first archaeological study at the age of seventeen. Worsaae came into contact with christian thomsen at the National Museum of Antiquities in Copenhagen and worked as his assistant while studying law.

In 1843, Worsaae wrote and published *The Primeval Antiquities of Denmark* (published in 1849 in English), a result of his work with Thomsen, in which he observed that the three-age system was particularly dependent on the find associations of artifacts (ie. the stratigraphic contexts of the artifacts-where and with what other materials they were found). Unlike Thomsen, Worsaae did not just work in museums-his great strength was that he also worked in the field and was an excavator. In 1844, Worsaae became a full-time antiquarian, and in 1847, he became the inspector of ancient monument preservation in Denmark.

Between 1846 and 1847, Worsaae traveled extensively in Europe, England, and Ireland. He was the first archaeologist to undertake a survey of German archaeological material-which was scattered among dozens of provincial museums, reflecting the fragmentation of Germany's politics. He saw that the preoccupation of English and French archaeologists with Roman monuments had led them to neglect their prehistory and that Thomsen's three-age system could be used across Europe. He understood that

as a result of reorganization and their national character, the Scandinavian archaeological collections were unique and provided an opportunity to develop a “scientific” archaeology -and that in this regard they were well ahead of the rest of Europe.

There is no doubt that without Thomsen's and Swedish antiquarian bror emil hildebrand's collections, Worsaae would not have formulated his important chronological advances-his divisions of the Stone Age and the Bronze Age into two periods and the Iron Age into three. On the basis of these collections and his great knowledge of European archaeological material, Worsaae became the first archaeologist to place prehistoric monuments in a wider and comparative context, both socially and historically-as a result, he received the title of “founder of comparative archaeology.” In 1854, Worsaae became a professor, and in 1865, he became director of both the Museum of Nordic Antiquities and the Ethnographic Museum in Copenhagen.

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X

Xia Nai

(1910-1985)

The British-trained Xia Nai was the premier archaeologist of Communist china. Born in 1910 at Wenzhou (Zhejiang Province), Xia graduated in history from Qinghua University in Beijing in 1934 and subsequently participated in the excavations at anyang. Studying at the University of London from 1935 to 1940, he majored in Egyptology and participated in British excavations in egypt and Palestine. He returned to China in 1941, joining the Institute of History and Philology, part of the Academia Sinica, in 1943. In spite of wartime conditions, Xia undertook important excavations at Neolithic sites in Gansu Province in 1944 and 1945. He was awarded a Ph.D. from the University of London in 1946.

In 1950, one year after the Communist takeover of his homeland, Xia was appointed deputy director of the newly founded Institute of Archaeology of the Chinese Academy of Sciences (since 1977 the Chinese Academy of Social Sciences) in Beijing. From the outset, Xia almost single-handedly ran the institute, which he led as its director from 1962 to 1982. A member of the Communist Party since 1959, Xia was criticized and sent to the countryside during the Cultural Revolution (1966-1976) but allowed to resume scholarly activities as early as 1971. From 1982 until his death in 1985, he served as deputy director of the Chinese Academy of Social Sciences.

A brilliant organizer and administrator, Xia established the institute as the paramount archaeological institution in China during a time of tremendous state-sponsored expansion. He was instrumental in creating structures for training, fieldwork, and publication and in framing relevant laws and regulations. During the 1950s Xia launched many major fieldwork projects, personally directing the excavations at Hui Xian (1950) and Changsha (1951), the salvage excavations near the Yellow River dam near Sanmenxia (1956-58), and the 1956 excavation of an imperial Ming tomb near Beijing.

Xia kept abreast of the archaeological discoveries of all periods everywhere in China, editing two syntheses. As the editor of several archaeological journals and a monograph series, he was concerned with divorcing scientific archaeology from antiquarian treasure hunting, and he insisted that excavated evidence should be treated as a separate class of data and scrutinized extensively before being integrated into historical frameworks. Xia's own publications mainly concern the history of technology and Sino-western connections, two areas in which he could capitalize on his knowledge of foreign languages, rare among Chinese archaeologists. Though not completely eschewing a nationalistic agenda or Marxist rhetoric, his work adhered to the highest scholarly standards. In it Xia tried to demonstrate the relevance of archaeology to the scientifically minded Communist elite, as well as strengthen his own position as the representative of Chinese archaeology in the international arena.

Because post-Cultural Revolution Chinese diplomacy used archaeology to generate international goodwill, Xia was frequently sent abroad, where he was showered with academic honors. Although his manner of running Chinese archaeology centrally through the Institute of Archaeology has become impractical since

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Y

Yemen

See Arabian Peninsula

York

York is a prominent city in northeastern England with a long history of invasion, settlement, and trade. Known as Roman Eboracum in the first century a.d., York became the Anglo-Saxon capital of Northumbria in the seventh century and was conquered by the Danes in a.d. 866-867. In both a.d. 700 and 1050 York was the premier settlement in northeast England in political, ecclesiastical, and economic arenas. The archaeological history of York follows the history of archaeology itself. Early studies focused on grave goods; early methods included creating typological series, relative dating, distribution in settlement patterns, and comparison of artistic motifs. The study of artifacts and environment in York continues at present and detailed studies are published in *The Archaeology of York*.

No direct historical documentation exists on the early history of York, although there are some coinage and runic inscriptions. Heathen Vikings lacked writing, but the neighboring people wrote observations of the Vikings. Most written records are from contemporary Anglo-Saxons and Irish. Other sources include West Saxon writers hostile to the Scandinavians; English monastic writers who include Scandinavian descendants; and the Icelandic sagas that blend fact, fiction, and folklore, but contain detailed records of the twelfth to fourteenth centuries. Recent archaeological evidence now supports the historical sources.

The early fifth century was a period of political, economic, and social change in Britain. At York, the archaeological evidence shows the end of town life after Roman withdrawals, between the fifth and eighth centuries (O'Connor 1990). Long-term excavations show the same at London (Vince 1990) and at Winchester (Biddle 1973). The early Anglo-Saxon settlements that followed were small rural villages. One of the difficulties in York is the problem of the palimpsest factor (approximately all of the site's stratigraphic elements), which creates a confusion of close dates between late Anglian and early Anglo-Scandinavian. The archaeological record does show continuity in land use, agriculture, and animal husbandry practices. Crabtree's work (1982, 1984, 1989a, 1990) and analysis of faunal remains shows continuity in the patterns of raising cattle, sheep, and pigs from the Iron Age to the Anglo-Saxon period.

Viking activity in the British Isles was part of the struggle between Danes and Norwegians for territorial expansion and control of the trade route from the Irish Sea to southwest Norway. The *Anglo-Saxon Chronicle* recorded the first Viking raids in a.d. 793. Archaeological research and place names show that Shetland, the Orkneys, and the Hebrides were colonized by Norwegian pirates by a.d. 800. Danish sailor-raiders known as Vikings attacked churches, farms, towns, and villages. With their shallow-draft boats of fifty men, the Vikings could travel up rivers. They established winter camps at the conquered sites; eventually they settled, converted to Christianity, and brought in family or married into local families. York became a trading center.

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York is a prominent city in northeastern England with a long history of invasion, settlement, and trade. Known as Roman Eboracum in the first century a.d., York became the Anglo-Saxon capital of Northumbria in the seventh century and was conquered by the Danes in a.d. 866-867. In both a.d. 700 and 1050 York was the premier settlement in northeast England in political, ecclesiastical, and economic arenas. The archaeological history of York follows the history of archaeology itself. Early studies focused on grave goods; early methods included creating typological series, relative dating, distribution in settlement patterns, and comparison of artistic motifs. The study of artifacts and environment in York continues at present and detailed studies are published in *The Archaeology of York*.

No direct historical documentation exists on the early history of York, although there are some coinage and runic inscriptions. Heathen Vikings lacked writing, but the neighboring people wrote observations of the Vikings. Most written records are from contemporary Anglo-Saxons and Irish. Other sources include West Saxon writers hostile to the Scandinavians; English monastic writers who include Scandinavian descendants; and the Icelandic sagas that blend fact, fiction, and folklore, but contain detailed records of the twelfth to fourteenth centuries. Recent archaeological evidence now supports the historical sources.

The early fifth century was a period of political, economic, and social change in Britain. At York, the archaeological evidence shows the end of town life after Roman withdrawals, between the fifth and eighth centuries (O'Connor 1990). Long-term excavations show the same at London (Vince 1990) and at Winchester (Biddle 1973). The early Anglo-Saxon settlements that followed were small rural villages. One of the difficulties in York is the problem of the palimpsest factor (approximately all of the site's stratigraphic elements), which creates a confusion of close dates between late Anglian and early Anglo-Scandinavian. The archaeological record does show continuity in land use, agriculture, and animal husbandry practices. Crabtree's work (1982, 1984, 1989a, 1990) and analysis of faunal remains shows continuity in the patterns of raising cattle, sheep, and pigs from the Iron Age to the Anglo-Saxon period.

Viking activity in the British Isles was part of the struggle between Danes and Norwegians for territorial expansion and control of the trade route from the Irish Sea to southwest Norway. The *Anglo-Saxon Chronicle* recorded the first Viking raids in a.d. 793. Archaeological research and place names show that Shetland, the Orkneys, and the Hebrides were colonized by Norwegian pirates by a.d. 800. Danish sailor-raiders known as Vikings attacked churches, farms, towns, and villages. With their shallow-draft boats of fifty men, the Vikings could travel up rivers. They established winter camps at the conquered sites; eventually they settled, converted to Christianity, and brought in family or married into local families. York became a trading center.

Glossary

Acheulean

Lower Paleolithic technology based around the production of bifacially flaked chopping tools. Acheulean industries are found on sites in Africa, Central and Eastern Europe, and in Asia east to India.

actualistic studies

Studies undertaken by archaeologists on contemporary materials and processes so that they might gain a clearer understanding of the processes that form the archaeological record.

Age of metal

That time succeeding the Stone Agewhich first saw the introduction of metal artifacts into prehistoric assemblages.

agropastoral

Referring to prehistoric agricultural economies.

amino acid racemization

An experimental technology used to date bone that can be up to 100,000 years old. It is based on determining the rate of transformation in amino acids from living bone to dead bone.

amphorae

Large two-handled jars used to store liquids.

anthropology

The discipline that is devoted to the study of human beings (particularly their cultural, physical, and social forms).

antiquarian

A person interested in many of the issues and perspectives that coalesced in the mid-nineteenth century as the disciplines of history and archaeology. Antiquarians used documents, oral histories, and artifacts to write about the history of humanity.

applied transformism

In Gabriel de Mortillet's terms, the use of archaeology to demonstrate the reality of transformationist ideas in human evolution.

arboriculture

The use of fruit and nut trees as part of prehistoric economies.

archaeomagnetic

A dating technology based on the fact that hearths or kilns (as heat sources) are sources of paleomagnetism.

archaeometric

Relating to archaeometry.

Archaic, early, late, terminal

North American sites and contexts that exhibit broad-spectrum foraging, ground stone artifacts, and evidence of increasing sedentism.

assemblage

A collection of artifacts that are thought to constitute a single unit of analysis-either by site or by period.

Aterian

Group of Upper Paleolithic tool assemblages with little flakes, some blades, and tanged points that was spread throughout northern Africa and the Sahara, dating roughly from 170,000 to around 30,000-20,000 b.p.

Aurignacian

An Upper Paleolithic industry that spread from the Levant to Spain and France.

Australopithecine

An ancestral genus to *Homo* found in East and South Africa. Skeletal remains (which date from about 3.7 million years ago) are classified into species such as *Australopithecus afarensis* (found in Ethiopia) or *Australopithecus africanus* (found in South Africa).

Austronesian

A family of languages found in island southeast Asia, Polynesia, Micronesia, and Melanesia (with the exception of most of Papua New Guinea).

autochthony

Referring to something native, indigenous, or “home-grown.”

backed blades

A stone tool that is a blade shape with one of the longer edges deliberately blunted.

Bandkeramik culture

The earliest Neolithic culture of Central Europe (between 4500 b.c. and 3900 b.c.).

Baradostian

An Upper Paleolithic stone industry found in Iran.

barrow

A mound of earth and stones that in most cases covers a burial or a number of burials.

Bell beaker barrow

A burial mound associated

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