

STEELE

THE INDUSTRIAL REVOLUTION



THE GREENWOOD ENCYCLOPEDIA OF HOMEWORK

HOMES THROUGH WORLD HISTORY



VOLUME THREE

The Greenwood Encyclopedia of Home Design and Architecture

STEELE

THE RENAISSANCE TO THE INDUSTRIAL REVOLUTION



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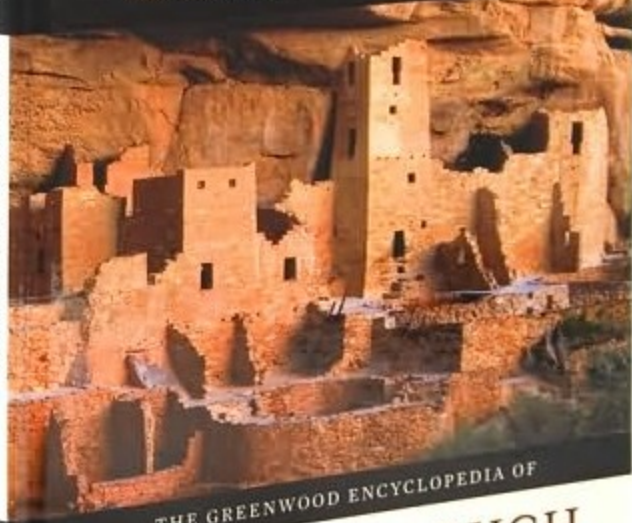


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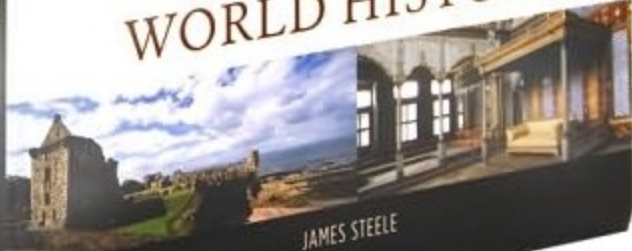
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THE GREENWOOD ENCYCLOPEDIA OF HOMEWORK
VOLUME ONE
From Ancient Times to the Late Middle Ages, 6000 BCE-1200



THE GREENWOOD ENCYCLOPEDIA OF HOMEWORK

HOMES THROUGH WORLD HISTORY



VOLUME ONE

The Greenwood Encyclopedia of Home Design and Architecture

JAMES STEELE

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*The Greenwood
Encyclopedia of Homes
through World History*

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*The Greenwood
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Volume 1

From Ancient Times to the Late
Middle Ages, 6000 BCE–1200

James Steele

With research by Olivia Graf



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Introduction

THE HOUSE AS THE TANGIBLE RECORD OF SOCIOLOGICAL INTERACTION AND ENVIRONMENTAL ADAPTATION

Histories of architecture in both the near and distant past have concentrated exclusively on the Western tradition or on cultures that could convincingly be rationalized as contributing to that tradition. It is only recently that non-Western societies have begun to be represented in their own right, and this series is part of that movement toward the recognition and celebration of diversity in the world and its expression in the art and craft of architecture. It focuses on the house, which is the most personal and descriptive of social artifacts, revealing cultural mores and values in a way that other methods of collective expression cannot. The series does not aim to be encyclopedic, but rather to present enough of a representative sampling of examples from around the world to be able to highlight some important recurring themes and some critical comparisons.

Chapter headings have been selected to allow that sampling to be as global as possible, and every effort has been made to ensure that the sections within each chapter, which are the individual examples, are well balanced, qualified only by the amount of information available at the time of writing, in what is still largely unexplored territory. The chapters are the following: The Americas, Africa, Asia and Australasia, Europe and the Western Mediterranean, and East and Southeast Asia. The titles reflect recently expressed regional preferences, and groupings, with "Australasia," which has the same politically freighted content as the recent use of the term "West Asia," instead of the "Middle East," indicating a new point of reference in those areas of the world.

PRECEDENTS

Henri Lefebvre, in his landmark work *The Production of Space*, which first appeared in French in 1974 and then in English in 1991, epitomizes the substantially different kind of examination of domestic architectural artifacts now being undertaken by spatial geographers. Lefebvre was one of the first to theorize extensively about the spatial implications of the various categories of social difference. His book superseded Michel Foucault's theory about the contextualization of power and expanded it to an international scale in parallel with the growing phenomenon of globalization. Lefebvre admittedly had an agenda of advancing what he described as "the meta-Marxist critique of the representations of power" to include the spaces used in everyday life as the new arena where the struggle for control is acted out. This made the house, to him, just as important as the workplace, or other obvious places where surveillance is carried out by the state, such as a prison, as a subject for consideration in this argument, which has been given far more visibility by Foucault. Lefebvre, however, has convincingly proposed that the global geography of capitalism has substantially changed, and his hypothesis about space includes developing and developed nations alike. This is in direct contradiction to common assumptions about the homogenizing effects of globalization. His work has had the direct effect of heightening the importance of theoretical and practical questions related to the investigation of architectural space in general and houses in particular.¹

At the same time that *The Production of Space* first appeared, Pierre Bourdieu published his masterpiece, "The Berber House," which has now become a paradigm of a description of the interaction between human values and behavior and the domestic setting that those values formulate and then modify, in return. His methodology in that study is to constantly juxtapose his description of a part of the house with the deeper cultural significance it has for the family, so that various layers of meaning related to it are eventually revealed. He says that

The low and dark part of the house, [for example,] is opposed to the high part as the feminine is to the masculine; besides the fact the division of work between the sexes, which is based upon the same principle of division as the organization of space, entrusts to the woman the responsibility of most objects which belong to the dark part of the house.²

The distinctions between Western and non-Western culture, which play such a critical role for Lefebvre and others in discussions about the history of architecture today, are of little or no consequence during the period covered by this first volume in this series, but do in the other two, given the extent of the cross-fertilization that has resulted from globalization. While the civilizations that are generally considered to have had a function in the development of Western culture are represented here, the part that they played in doing so is a post-materialistic construct and is hardly objective.

A WELLSPRING OF RECOGNITION

The theoretical revolution instigated by Lefebvre and Bourdieu, of reaching a broader cultural understanding of diverse societies through the analysis of housing types, has not been confined to architectural historians, but has also engaged archaeologists, anthropologists, social scientists, semioticians, human geographers, ethnographers, and environmental psychologists as well. Although the methods that have been used in each case have been specific to each discipline, the basic multivalent premise is the same. It is that the historical monuments that have survived have done so because they are built of durable materials that could only be afforded and built by the more economically advantaged segment of society, but that these are not fully representative of it. The remnants of the houses of all classes must be considered to present a more balanced view. That view seeks to understand individual behavior as a barometer of the cultural values of a given society at a specific time, and to extrapolate these from the built remainder rather than focusing on stylistic issues alone.

There have been several pioneers in each of the fields mentioned as well, who have been engaged in what has been referred to as “ethnoarchaeological” research, some since the early 1960s.³ But one concentration, which is relatively recent and common to all these fields, is the interactive, or sociological-ecological model. It has been described as proposing that

the relationship between the environment and behavior [is] interdependent and mutually determinative. This model stresses the dynamic interaction within a people-built environmental system, involving both change and adaptation. Human behavior influences the organization of the built environment, and the built environment influences behavior; each can be modified by the other.⁴

Within this model, seven factors have been identified as the determinants of house form, regardless of social, cultural, or geographic identity. These are the following: climate, topography, available materials, level of technology, economic resources, function, and cultural convention.⁵ These have informed the discussion that follows.

COMMON THEME

In addition to these seven factors, there are several common themes that begin to emerge related to the housing types discussed in this first volume, prior to the standardizing mechanisms introduced during the Industrial Revolution. The first of these, in no particular order of appearance, is that of sophistication. The Prehistoric Period of human development worldwide was far more complex and advanced than is commonly thought. New archaeological discoveries have now forced us to reevaluate our opinion of human culture, including our ability to produce art, think symbolically, engage in ritual, and understand mathematics and astronomy, as well as the deep human need to make sense of the cosmos through formalized religion.

The Lascaux caves, for example, provide a perfect case and point. They were sealed shortly after they were painted and were like new when they were discovered, even though the carbon dioxide produced by hundreds of thousands of tourists that have visited since then have caused irreparable harm to the paintings on the walls there. A nearly 50 feet long subterranean hall along with its subsidiary chambers contains a breathtakingly realistic frieze of animals, which has been foreshortened to make the best use of the space, and is dominated by a line of six large bulls, painted in black outline, that is nearly 18 feet long. Another frieze of deer seems to overlap them, balancing the composition.

These friezes in the Lascaux caves are an astonishing display of human perception and sensitivity painted by different artists from the same time to a unified, pre-arranged plan, sometime between 15,000 and 10,000 B.C. Archaeologists feel that they were painted by hunters of the Magdalenian culture as a gesture of sympathetic magic, in which the hunters felt that by representing these animals, they would ensure themselves and their dependants a constant supply of food. One problem with this theory, however, which hints at an even more mystical purpose for the paintings, is that reindeer, which are known to have been a favorite food source during the Paleolithic Period, are not included here.

The caves were closed in 1963 because of a fungus that started to form on the paintings and on the cave walls and floor because of the large number of visitors that trooped through them. Before that happened, however, Pablo Picasso was able to see them and said, after he did so, that “we are incapable of producing anything as beautiful and have learned nothing since.”

ÇATAL HÜYÜK

If sympathetic magic was the motive behind this Prehistoric equivalent of the Sistine Chapel, it appears again in an equally impressive way about 4500 B.C. near Konya in Turkish Anatolia in a Neolithic settlement called Çatal Hüyük. This Prehistoric town, which covers about 26 acres, was uncovered by archaeologist James Mellaart in 1967 and continues to surprise those who have come after him because of its sophistication and complexity.

The houses were all made of sun-dried brick and were arranged in a honeycomb pattern, with entrances on flat roofs, on the south side, to keep away from the cold, prevailing wind. Several houses usually shared a communal court, with one unit, which seemed to serve as a shrine that was decorated with the heads and horns of cattle, either real or plaster. Painted murals covered plastered walls. The houses had raised platforms for inhumation burials; that is, the bones were stripped of flesh first, and then wrapped. The skulls were colored with red pigment. This settlement marks an important transition point between the hunters of Lascaux in Paleolithic times and a people adapting themselves to life in a community. There is a bit of uncertainty that can be seen in their testing of nearly 14 different food plants, which they tried to cultivate. The murals, tools, pottery, and weapons show artistic craftsmanship of a very high level.

Çatal Hüyük has been only partially excavated, and it is much larger than originally thought. It is known to have carried out trade with villages nearly 100 miles

away. It is also the largest site in the Near East and Asia Minor, with the first evidence of domesticated cattle. There were probably 1,000 houses there, with an overall population of 5,000 to 6,000 people. The high level of standardization and deliberate planning seen in the architecture and furnishings of the houses show a high level of cohesion and cooperation within the community, and suggest an organizing authority, which extended to ritual activity, and the specialization of labor.

A similar discovery in Jericho, Israel, which dates from the eighth century B.C. shows that Çatal Hüyük was not an isolated phenomenon. Flat-roofed dwellings of a similar kind can also be found much later, in Mesa Verde, Colorado, and Chaco Canyon, New Mexico, which were both built about 350 A.D., and continuously inhabited for over 800 years. These had sacred, subterranean rooms called *kivas*, where religious and magical rites were performed. These early achievements, and others that now seem to be continuously coming to light, reinforce the tide of changing opinion about the level of sophistication of our prehistoric ancestors, and this is underscored in the presentation of the houses of that period from different parts of the world that are discussed here.

THE RELATIVITY OF THE AGRICULTURAL REVOLUTION

A second theme, conveyed more extensively elsewhere by such notable historians of domestic architecture as Norbert Schoenauer, is that the “Neolithic revolution” in which nomadic hunter-gatherer societies supposedly adopted agriculture and became more sedentary in urban environments did not happen all at once, but in stages that occurred at different times in different ways throughout the world. This layering of settlement patterns had direct implications on housing typologies.

As indicated in the development of Çatal Hüyük, the transfer from a hunting and gathering culture to agricultural communities is one of the most momentous events in human development. This was brought on by climatic changes that took place after the Ice Age, which reached its peak about 18,000 B.C. Over the next 10,000 years there was a progressive rise in temperature, which encouraged agriculture in the Near East, and cities were the result. Agriculture demands a stationary, rather than nomadic, lifestyle, good organization, planning, astronomy, and mathematics for record keeping, which also give rise to architecture. These sprang up almost at the same time in both Egypt and Mesopotamia, which had an important influence on both the East and the West. Archaeologists usually use the two criteria of writing and the creation of cities as the basis for civilization, but urban settlements existed in the Protoliterate Period, that is, before written history in the Fertile Crescent as well. Pictographic writing came first, then cuneiform by 3000 B.C.

The crops and animals that were the basis of the first agricultural economies were two types of wild wheat, mild barley, legumes and lentils, domesticated cattle, sheep, goats, and pigs. As people began to rely on agriculture, social behavior began to change. A year’s supply of grain for a family of four, which is about one metric ton, can only be harvested during a brief period in the spring when the crop

ripens, and it cannot be carried around. So then need for stability is key, and permanent settlements are the result.

The first literate, urban society was during the “Uruk” period in Mesopotamia, and by 4000 B.C., there were a number of cities in Sumeria that each had a high degree of economic independence. Warka, which is 150 miles southeast of Baghdad, and 12 miles from the Euphrates, is one of the largest cities in this period, covering 3.5 square miles

SOCIAL STRATIFICATION

A third theme that transcends cultural difference is the variation of housing types found in each region related to class distinctions. Select egalitarian exceptions aside, settlement prompted, or even necessitated, social stratification, and the archaeological evidence behind each of the examples presented here point to a wide range of habitation used by several social levels. Because those of higher economic means could afford better, and more durable, building materials, their houses have tended to last longer than those of the less fortunate, which were more perishable. With better technology available to them and more sophisticated techniques now being used, archaeologists have been more confidently able to determine what those more ephemeral dwellings looked like, but large gaps in our knowledge of them still exist.

TRADITIONAL WISDOM ABOUT THE ENVIRONMENT

What is becoming increasingly clear, and is a fourth theme here, is that in many cases the way that the common people have lived has remained unchanged for millennia in many parts of the world. The remains of houses that have been uncovered in the Mayan Kingdom of Mesoamerica seem to be identical to those of the *milpas* that can be seen in Yucatan today. The mud brick houses of Ur in Mesopotamia in 2000 B.C. are very similar to village dwellings in parts of Iraq right now. Carvings on the walls of Angkor Wat and the Bayon in Cambodia also show that the basic house form of the Khmers, who provided the sustenance for that culture and helped to build those extraordinary monuments, was remarkably similar to the houses that can be seen in the agricultural villages spread throughout the country today. The ancient houses of the common people have perished, but the type has survived. Why? These similarities lend credibility to the view that once a successful residential prototype, such as the igloo or the Bedouin tent or the yurt, evolved in response to singular environmental and cultural imperatives and represent a precious reposition of hard-won collective wisdom. New kinds of socioeconomic pressure have forced and tempted people in various cultures to change. Air-conditioned, bunker-like concrete block cells are quickly replacing the traditional wooden *rumah ibu* throughout Malaysia, in spite of the fact that it is a masterpiece of environmental responsiveness and such an indelible part of Malaysian identity. The desire to conform to developed world standards and models is a powerful

force for change in spite of the efficacy and longevity of proven vernacular convention. This pattern prevails throughout the developing world, from Alaska to Zimbabwe, but there are some holdouts still surviving that give us the chance to see building traditions that have remained the same for centuries because they have proven socially, economically, and environmentally effective.

The issue of environmental appropriateness and sensitivity is an important determinant in both the form, layout, and materials used in houses in each of the regions presented here. A growing awareness of this relationship has led architects and planners to revise their attitude about vernacular houses, from that of regarding them as a quaint curiosity to a new appreciation of the accumulated human wisdom that they embody and the lessons they collectively have to teach us now. The smugness and sense of superiority that seemed to typify the manifesto issued by those in the Modern Movement, who regarded tradition as irrelevant and looked to technology to solve every problem, are slowly being replaced by a respect for historical solutions to environmental conditions and differences. This shift is due, in no small part, to the recent validation of scientific studies of global warming and climate change, showing that technology presents as many problems as it does solutions.

CULTURAL PRIORITIES

A sixth theme related to that of the fragility and impermanence of the houses of people at the lower end of the social ladder, irregardless of which region they lived in, is the issue of the relative importance of public spaces over private life, or a preference for the *res publica* over domestic comfort. Time and again, in the Pharonic, Khmer, Mayan, Megalithic, and Greek cultures perhaps more obviously than others, the emphasis was on the collective rather than the individual. The result was that the focus of energy and resources was on the building of monuments and ceremonial centers, with less emphasis given to houses, especially that of those with fewer advantages.

THE APPRECIATION OF AUTHENTICITY

A seventh and final theme that is prevalent throughout this volume is the tendency of a younger culture to borrow from an older more established one. This involves a pattern of conscientious syncretism, which runs the gamut from the deliberate borrowing of easily recognizable symbols to the total assimilation of architectural forms. There are many examples of this tendency here, from the Incan adaptation of Chimu culture, to the extensive borrowing that characterized the Romans' relationship with the Etruscans, who were their predecessors in Latium, or the Byzantine influence on the Ottoman Turks, although the list is far more extensive. Within this syncretism, however, in each case, individual residential proclivities eventually emerge, as collective identity begins to solidify and become more confident, reinforcing the strong connection between cultural patterns and domestic form.

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The Americas

HOUSES OF THE ADENA TRIBE IN THE OHIO VALLEY

Hundreds of mounds, which have been attributed to the Adena tribe and which dot the landscape throughout the northeastern United States, have occupied archaeologists since the beginning of the nineteenth century. But as with other ancient monument-building civilizations, little attention has been focused on how the Adenas lived their daily lives. The mounds they built, which mysteriously have forms that are best appreciated from the air, occur in several sizes and shapes. These can be categorized as either geometric or representational, depicting animals or reptiles that the Adenas held sacred. Thomas Jefferson advocated documentation of the different tribes and their monuments. Explorers such as Meriwether Lewis and George Rogers Clark helped in this process with their famous eponymous expedition and uncovered and documented several of the many different mounds in the Ohio area. Albert Gallatin, Secretary of the Treasury during Jefferson's presidency, supported Ephraim George Squier and Edwin H. Davis in their writing of *Ancient Monuments of the Mississippi Valley*, as well as documenting many tribal rituals. These visionaries have helped to raise awareness about monuments that would otherwise have been destroyed. Early archaeologists, as a product of the rationalist Enlightenment tradition, categorized them as having either a functional purpose or merely an aesthetic one. They further classified them, if functional, into material used (earth or stone) and possible purpose (enclosure or ceremonial). If they considered the mound to have not had a functional purpose, it was classified as being either "ornamental" or "sculptural."¹

Centered in the Northeastern United States

The Adena culture was centered around what is now Chillicothe, Ohio, with evidence that its influence spread as far east as the Chesapeake Bay. The earliest artifacts that have been found date from about 300 B.C., but it is believed that the Adena occupied this region from a much earlier date. The Hopewell tribe, which

represents a parallel culture, also built large earth and stone landforms and had a territory that overlapped that of the Adena. The societies have so many similarities that archaeologists originally believed that they coexisted. The Hopewell tribe, however, favored octagonal forms while the Adena mounds in the geometric category were far less complex. The most obvious and famous example of this may be the two attached Adena fortifications that were the basis for what is now Circleville, Ohio, surveyed by Caleb Atwater in 1820. He described it as being

two forts, one being an exact circle and the other being an exact square, the former is surrounded by two walls, with a deep ditch between them. The latter is encompassed by one wall, without any ditch. The former was 69 rods in diameter . . . the latter is 55 rods square . . . the walls are at least 20 feet in height . . .²

The pristine geometric beauty of this extremely important historical site did not survive for long, however, after the town of Circleville was built on top of it.

The Use of the Mounds

The Adena used the mounds for temples and tombs, based on the artifacts that have been found in them. Although many of them have been looted, pottery and jewelry associated with burials have been found inside. These burials indicate that this culture was deeply attuned to rituals related to the cycle of life and the seasons, as well as to agriculture and the passage of time. The tombs were raised well above the flood plain, and some of them contain several generations of individuals who were buried in successive layers in the same crypt. There is evidence that these burial mounds grew as the population increased, and in one case, in Portsmouth, Ohio, several large circular burial mounds have smaller mounds surrounding them.³

In other instances, excavation of mounds have indicated that some of them formed sacred areas used as temples, which were burned before the mounds were built on top of them.⁴ Based on the artifacts that have been found, these temples had a wood frame and mud walls, and were about 12 feet high inside. Whether the temples were burned deliberately or were destroyed as part of a conflagration resulting from an invasion from another tribe is not clear, although destruction by others and the subsequent commemoration of the sacred site by covering it with a mound seems more likely. This is because, unlike other regions in the Americas, such as the central valley of Mexico, this area was very porous and vulnerable to attack, which may explain why it never became the source of highly developed civilizations, such as those in Mesoamerica.⁵ At its western extent, near the Mississippi, the Adena culture was subject to annual flooding, which was also the case near the Ohio River. These rivers also made it easy for enemies to attack them. The mounds, then, were obviously a way of making their territory more secure, giving it a sense of protection and enclosure.

This openness also encouraged interaction between the Adena and the other tribes near them, and a certain degree of interdependence developed, to the extent that they not only traded with each other but also helped to build each others' houses.

The Serpent Mound

The most famous monument built by the Adena is inarguably the Serpent Mound, which is one-quarter of a mile in length. There is a circle in the snake's mouth that is believed to be the representation of a comet, corresponding to the radio carbon date of the early part of the eleventh century for the construction of the mound, and the fact that a comet is shown in a Norman tapestry corresponding to the same date. The Adena used the mounds to bury pottery and other valuable objects, such as jewelry, associated with burials in them.

Habitation

Unfortunately, the houses of the Adena people have not endured as well as the mounds that they are best known for. Archaeologists believe that the paucity of evidence of the way they lived is due to the fact that they did not form villages composed of clustered houses, but of dispersed units, so that no deep village middens or waste dumps that could reveal house forms have been left behind.⁶ Another reason for the lack of evidence of settlement is, ironically, the mounds themselves, since the Adena scraped up any refuse from their shelters and put it in them, including the bodies of the deceased that were cremated. Since they lived in river valleys with high water tables and flood plains, much evidence has also been destroyed by ground moisture, so that all that has survived are stone implements, copper tools and jewelry, and mica ornaments.

Rock Shelters

But, the recent discovery of rock shelters at higher elevations in the foothills of the mountains in eastern Kentucky that have now been unmistakably attributed to the Adena have given us new insight into their culture and living patterns. These shelters have also preserved a great deal of the organic material in them, which has increased that knowledge a great deal. The shelters have protected the material from moisture, and the soil in the area is rich in nitrates, which has preserved the organic material.⁷ These shelters were also high enough to not be easily accessible and were well hidden in the forest, so they were usually not disturbed. The floors of the houses are typically covered with a four-inch thick layer of ash, which has protected the refuse level beneath it. Thirty-eight shelters were found in this area, which extends across Indee, Menifee, Powell, and Wolfe Counties. These houses were apparently temporary, used by hunters as shelter on a seasonal basis in the winter. They provide some tantalizing clues about the construction methods and details used in their more permanent habitation, as a typological model. The ages of these shelters were confirmed by radiocarbon dating to be contemporary with the Adena mounds, with a date of about 2,600 years old, plus or minus 300 years. Their location, in eastern Kentucky, is within 150 miles circumference of Chillicothe, Ohio, as well as the Scioto River Valley, which is the heartland of Adena culture.

The houses were circular, with a timber frame of individual columns holding up a timber roof and stone used to fill in the spaces between the posts. Sometimes these columns were paired for additional strength. Prairie grass, which was used as bedding and which provided the radiocarbon dating of the houses, was found inside. Personal objects that have been found in the shelters, consistent with their

use as camps for hunting parties, include flint blades, arrowheads, stone mortars and pestles, awes, spoons, pottery, and flint axes. Fabric in both plain and twill patterns has also been found in them, as were several graves, which included cremations and bundled inhumation burials.

The circular form, timber frame, and stone infill typology is consistent with that of a 45 feet diameter structure that was built of 68 pairs of columns around its circumference, found near a mound at Cowan Creek, Ohio. The paired columns were one foot seven and a half inches apart, center to center, and the distance between the pairs was four feet six and a half inches. Similar structures have subsequently been found after this site was excavated in the late 1950s. These have included circular houses with an outer and an inner ring of columns, with the second ring near the middle of the house, circling a central fireplace. This would seem to indicate a roof structure above the fireplace that allowed the smoke to escape through a hole, and the second circle was also necessary because of the large span involved. At Cowen Creek the houses were burned intentionally to make space for a burial ground, which was then covered over with a mound, and this pattern was later confirmed at Clough, Ohio, as well.

THE ANASAZI

Because it is the product of one of the most extensive, and in some phases the best preserved, of the ancient cultures in America, Anasazi architecture has been widely studied and published, accompanied by the inevitable level of scholarly debate that results from such a wide level of attention. The irrefutable facts that can be gleaned from all of the divergent theories, however, are as follows.

Pueblo Bonito, which is in Chaco Canyon, New Mexico, is usually identified with the Anasazi culture by the general public because of the level of publicity it has received. But they actually extended much farther south into lower Arizona and even across the border into northern Mexico, far beyond the Four Corners area around Mesa Verde that has conventionally been considered the place from which the Anasazi originated.⁸ This society is a classic example of the relatively new realization that the agricultural “revolution,” which took place somewhere between 4,500 to 5,000 years ago, was not as sudden and definitive as once thought. There was considerable overlap between hunter-gatherer and agrarian cultures competing in the same regions, or even occurring in the same society over a relatively brief period of time. The Anasazi went through phases depending upon the resources available to them and the wealth they could generate from them, starting and ending with pit house villages. These required less material than large aboveground Pueblo communities that were built at intermittent and more affluent periods in between.

One timeline that has been proposed is that aboveground pueblos began to appear in the Four Corners area, along with pit dwellings, about A.D. 750 or 800.⁹ The Anasazi then continued to build up in cycles, predicted by a return to earlier, less resource intensive methods of habitation. As one archaeologist has described this cycle: “pit houses precede major shifts in settlement patterns and reorganization of Anasazi society at roughly 1150, 1220 and 1310—times when



The pueblos of the Anasazi represent a perfect adaptation to the natural environment. In Chaco Canyon that context is barren, hot, and dry for much of the year. *Source:* Ken Breish

they would not have otherwise been expected if one adhered to a neat, unilinear, architectural progression.”¹⁰

This may be the best time to introduce another recent attitude shift, about the degree of environmental stewardship shown by preindustrial societies, which was previously thought to have been exemplary. There is no doubt that the Anasazi pueblos generally demonstrate an exceptionally high level of ecological awareness and adaptive skill, which will be discussed in detail further on. However, the cycling just mentioned was accompanied by the depletion of natural resources. The great pueblos were realized at the expense of water and wood, causing the depletion of both. Pinõn and juniper trees were too twisted for general use, so ponderosa pine and Douglass fir were preferred. At an average of 40 beams per room, it is estimated that 250,000 wooden beams were used to build the pueblos in Chaco Canyon, which deforested an area of about 50 miles in diameter around it.¹¹

Pit Houses

The pit house, which the Anasazi emerged from and returned to when they were forced to go into a survival mode, is reminiscent of a similar kind of structure used by prehistoric societies all over the world, such as the partially subterranean house of the Jomon culture in Japan. The advantage of this strategy is that the walls of the house are the sides of the excavated pit itself, which saves considerably on the amount of material used, requiring the construction of only a roof. The thermal advantages are also high, since heat and cold level off to an average 65 to 68 degrees Fahrenheit at 3 feet or more below ground level, regardless of climactic conditions. It is not such a good idea in areas where it rains frequently, for obvious reasons of



The Anasazi built in stone as well as adobe, or mud brick, specializing in walls without mortar that were constructed so well that they have stood the test of time. *Source:* Ken Breish

flooding, but makes good sense in the high desert where heat and cold can be extreme and rainfall is minimal.

Excellent Masons

The emergence of the Anasazi from beneath the surface to begin the construction of the pueblos, which evokes the image of a caterpillar larvae buried beneath the earth, pushing up and out to become a butterfly, began in earnest in A.D. 800. It started with fairly modest structures that were four stories high made up of about 200 rooms, before leading to the construction of Pueblo Bonito, which had 650 rooms. These were built of stone, wood, and clay. At Chaco Canyon the main material was either tabular sandstone quarried from a flat site above the Canyon's floor or bedded sandstone from the cliff's face. The advantage of the tabular sandstone was that it sheared off into sheets. Skill in masonry construction evolved fairly quickly into what has been referred to as "banded masonry."¹²

It was a natural progression from the use of mud brick within a wooden frame that preceded it, followed by one-story high walls that were only one stone thick, and then finally to the party wall construction that typifies the multistory blocks that archaeologists call the Pueblo I Period. This consists of a load-bearing rubble core faced with a veneer wall on each side. The veneer wall was laid up in several ways, as empirical understanding of what patterns worked best increased. One method was laying sandstone slabs horizontally in random courses on thick beds of mud mortar. A second method, which has since been discovered to provide more flexibility in the event of settlement, was to have rubble in between, predominating over mortar. A third technique used large and small flat stones laid up randomly

and horizontally, with some mortar. A fourth technique was a dry wall of tabular sandstone laid horizontally.¹³ The important thing about each of these techniques is that they make the best use of the natural characteristic of the sandstone, which is a sedimentary rock that is laid down in horizontal beds over time, and so works best in compression in this orientation. The random layering of the large stones, and the use of smaller ones in between, rather than just using mortar, also shows an intuitive understanding of the structural forces at work in a multistory building. This does not mean that the Anasazi builders were completely ingenious, since they sometimes simply butted walls together rather than interlocking them at the corners, and also used sandstone blocks placed vertically in walls, but the adaptations that were made over time were brilliant.¹⁴

The levels of the pueblos ascended on what is known as a platform frame, with each upper story set back from the one below. A series of parallel walls would be built first, followed by the individual roofs over each room. Pine or fir, or sometimes juniper, beams were laid between the walls, which were spaced to allow for fairly short spans. Pine, juniper, or cottonwood joists were then run in the opposite direction, running parallel to the walls. A willow mat woven with yucca lashing was then laid on the joists, topped by a thick layer of tamped clay, as a roof or a floor for the room above, taken from the alluvial soil of the Canyon's floor. As this clay dried, it showered dust down on the space beneath because no matter how tightly the roof mat was woven, dirt would find its way through the spaces between.

Room Finishes

The interior walls of the rooms were also plastered with clay mixed with sand, left natural. But, there have been discoveries of rooms that were coated with white gypsum plaster and decorated with a red wainscot made from iron oxide.¹⁵ The ceilings of the rooms were sometimes up to 10 feet high, and so this wainscot would help to bring the feeling of the space down to human scale and to animate it. This would have been especially important since window openings were small, at best, for the rooms on the periphery, and those in the interior had none at all. Ventilation shafts were cut into the walls and the floor, with the supply vent placed just below the ceiling or the roof of each room. Access was by a ladder through an opening in the roof, which also served as a chimney for a fire pit, below. Doorways between rooms rarely had doors and were usually shut off with an animal skin curtain, stone slab, or reed blind, which could be raised or lowered with a cord. In several cases archaeologists have found the *metate*, which was used for grinding corn into flour, still in place on the floor, with the *manos*, or handheld stone used to do so, on top of it.

Researchers have also found evidence that some rooms in these pueblo complexes were designated as storage bins, and they have discovered huge amounts of refuse, human waste, and even human remains inside them. One team has painted a graphic verbal image of what this says about life inside the pueblos by saying: “the stench from these deposits, the inevitable swarms of bugs and rodents attracted to them, the unsanitary discomforts of close living in dimly lit rooms, stifling with human smells and the smoke of open fires, and the dampness trapped by heavy stone walls . . .” certainly made them no paradise to live in.¹⁶



Although research on the origin of the Anasazi is still ongoing, it is widely believed that their first houses were partially subterranean, and the underground *kiva* substantiates this belief. *Source:* Ken Breish

Life in the Open

This image supports the idea that this was basically a society that spent most of its time outside, working in the fields that were irrigated by the extensive canal system that they dug, living their lives on the plazas in the sky created by the terraced setbacks of the pueblo roofs, and sleeping on them as well, under the stars. This close connection to the sky is also evident in the siting of the pueblos, based on cosmological and astronomical criteria, as well as sun angle, to get maximum shade in the summer and the warm sun for as many hours of the day as possible.¹⁷ When the compact ecological footprint of the pueblos as well as the use of local materials of high thermal mass are added to this, the destruction of the woodland and depletion of water resources mentioned earlier are somewhat offset in the environmental balance.

The Sacred *Kiva* as a Large Subterranean House

The Anasazi were animists, imbuing every element in nature with a life force. They also thought of the earth as their place of origin, believing that they began, as a people, in the womb, or the “shipap” or “sipa” of the earth mother.

The most overt architectural evidence of this mystical, animistic belief in a collective subterranean origin is the great *kiva* found in at least ten of the Chaco Canyon pueblos.¹⁸ One of these was excavated at the Aztec Ruins in 1921. It is 41 feet in diameter, containing 14 arc-shaped rooms at ground level that each have doors to the outside and one large room below, accessed by two stairways. This large worship space was supported by four massive masonry pillars that demarcate a square in the middle of the space, which were each three feet square with a huge

circular stone footing placed on a bed of lignite to carry the concentrated roof load.¹⁹ The floor was coated with many layers of adobe plaster, with rectangular recesses in it that were covered by a trapdoor. These were presumably spaces where the shaman would hide and then magically emerge into the darkened room during the religious ceremony. Masonry benches, which were a luxury not found in the pueblo dwellings themselves, ran around the circular perimeter of the space. There was also a fire pit, from which smoke escaped from a hole in the roof. Another hole on the northern side of the circle was the symbolic connection to the *sipapu* or womb of the earth mother as well as what one researcher has described as “The point of contact between the natural world and the supernatural world, where the spirit people, the *kachinas*, live and where the dead return.”²⁰

To enhance the feeling of being below ground, even if the *kiva* was built on an upper terrace, the interstitial space between its outer circular wall and the rectangular rooms around it was filled with rubble, to add to the feeling of solidity and privacy considered to be desirable for the ceremonies held inside. The roof over the *kiva* was usually also different from those of other rooms in the pueblo. It started with heavy timber beams that formed a square on top of the masonry piers in the middle of the circle and then a series of long beams placed at the midpoint of the square below, forming a “cribbed” or corbelled roof in a series of steps that rose up from the circular edge to an apex at the square center. Sometimes the roof was flat, projecting a considerable distance above the first pueblo terrace.

A Return to Subterranean Beginnings

One plausible theory that has been put forward is that the *kiva* was a commemoration, at a monumental scale, of Anasazi beginnings in pit houses in the distant past.²¹ If that is the case, this society seems to have celebrated the cyclical pattern that it followed over the more than one millennium that it occupied this region, finally returning to houses in the earth when all of the resources that they had used up to build their magnificent pueblos were finally depleted.²²

INUIT SNOW HOUSES

Indigenous shelter, regardless of the historical time period in which it is built or the society that builds it, invariably represents an ingenious adaptation to special climatic conditions and an efficient and appropriate use of local materials. But it is no exaggeration to say that the Inuit snow house, or igloo, is one of the best examples of such ingenuity. It is the result of basic human survival instincts, an adaptation to one of the most extreme climates on earth in the subarctic and arctic regions of northern Canada. There are many variations according to location and tribal group, but there are several generic characteristics that they all share.

The excellent environmental performance of the igloo is due to several simple formal aspects, most essentially its curved shape. Its main chamber, which is dome-like but not necessarily hemispherical, is perfect for deflecting high winds and wind-driven snow, and is also exceptionally strong, being able to resist polar bear attacks. The curved shape allows heat generated by its occupants and their fuel lamps to stratify inside, and it allows the moisture caused by this heat to run down

its curved inner surface. It can also be built quickly, in less than an hour by a skilled craftsman, which is essential in such extreme conditions, and can accept appendages, through vaults cut in its sides.

The Perfect Form

The *igdluling*, or entrance, is frequently compartmentalized to hold the leather harness that is used for the huskies that pull a dogsled and includes a domed antechamber. The entrance, which acts as an air lock, is long, narrow, and often very low, requiring those coming in and out to crawl. The floor of the entrance is also about a foot lower than that of the igloo to prevent air filtration. A block of snow is placed at the entrance to prevent the wind from coming in, acting like a front door. Sometimes this snow block, rather than being loose, is built as a curved wall that extends out from one side of the *igdluling*, like an embracing, protective arm. So, the idealized plan of the Inuit igloo is much more complex than the pure, circular form that many imagine, starting with a hook-like baffle wall to block the wind, connected to the circular, small domed antechamber or *uadling*, followed by the elongated *igdluling* and then the much larger circle of the igloo itself, with semicircular side chambers for food storage attached to it, called *audlitivig*.

Construction Technique

The construction process of what has properly been referred to as the “Canadian Inuit spiral built snow block dome,” rather than the igloo, is just as ingenious as its configuration, formal adaptations, and internal refinements.²³

By mid to late November, with progressively colder weather, the thickness of the sea ice and the increasing accumulation of snow forced the Inuit to abandon their transitional houses and begin building igloos. These were typically built in clusters, with individual houses usually by a family or small group of hunters in an interim or emergency situation. If possible, the cluster was sited on the leeward side of a slope to avoid being covered by wind-driven snow. The consistency of the snow was also important in order to make the right size and shape of block needed, and probing to find just the right type could take the builders just as much time as building the igloo itself. After being satisfied that the snow was neither too soft or too icy, the builders, who usually worked in teams, with one person cutting the blocks and the other putting them in place, marked the circular foundation line of the igloo in the snow, and then began removing it from inside the circle to get to the level of ice that would be the floor. The cutter shaped each block so that it had a slightly rounded surface to allow it to fit into the curved perimeter of the dome, while the person placing them put the blocks making up the foundation row end to end around the circle, cutting each one as necessary to ensure a tight fit

After the first perimeter ring was complete, a diagonal slice was made through one of the blocks and a piece was removed so that the remaining rows would rise upward in a spiral, rather than simply making progressively smaller concentric rings from bottom to top. This may seem unnecessarily complicated, but it is the technique that made it possible to build the dome without internal support, or shattering. It also gave it extra strength, since it would otherwise fail along its

contiguous vertical joints, or latitudes. After the final cap block was inserted from the inside, an air vent was cut near the top and a rudimentary entrance was removed to allow the rest of the family to come in with the lamps and other household items to fit out the interior.²⁴ A rectangular opening was also cut above the entrance so that a slab of lake ice that had been carried along since fall could be inserted, to act as a translucent light source.

The next stage of construction was the building of the sleeping platform and the entrance tunnel. The sleeping platform was fairly straightforward, unless a storage space was incorporated into it, but the entrance was more complex, involving several interconnected chambers of various sizes as well as the carving of an inclined floor plane that would end up being lower than the floor of the main chamber of the igloo, when the two met, to prevent the flow of cold air from coming inside. In the case of clustered igloos, one entry passage would serve all, with a large, circular chamber ending the entry sequence and serving as a hub to which all of the igloos were joined. The builder might use an arched roof over the long narrow part of the entrance chamber or, just as often, use straight, rectilinear slabs of snow, which would span from one vertical side to the other if material of the right consistency was available.

The Living Area

The circular main chamber is divided equally by a central axis that differentiates between a lower floor, about one foot higher than that of the entry chamber, and a raised sleeping platform that is also made of snow blocks and covered with caribou hides for warmth and comfort. The whole family sleeps on this semicircular deck that is approximately three feet high on average, with their heads toward the entrance because there is more headroom toward the center of the curved interior. In some tribes, the level of the sleeping platform is placed higher to take advantage of the warmer air that rises in the igloo. This air is caused by convection of the heat caused by the inhabitants and the one or two, but rarely more, oil lamps that are placed inside, which burn animal fat. The height of the igloo in relationship to that of the sleeping platform also varies from group to group, as does the fuel in the lamps, or even the use of lamps, depending on hunting patterns and diet. Most Inuit subsist predominately on seal during the winter, and so burn seal fat in the lamp, and the height of their igloos at the apex is about three times higher than that of their bed, which is generally covered with the caribou hides that have been collected during the hunting season in the warmer months. But other tribes have different diets and build their igloos in different ways. The Netschilluks, or Netsilik, for example, make the catenary curve of the igloo flatter, reducing the space between the top of the sleeping platform and the apex of the roof to increase the amount of heat from convection inside. They have decided to trade off headroom for thermal comfort.²⁵ This also makes it difficult to use lamps inside because the increased heat raises the dew point, causing condensation that drips straight down because of the flatter surface of the ceiling; so the trade-off for added warmth, which still hovers around freezing, also includes darkness and dripping water. While this applies to the Kinepeetoo Inuit, who live around and to the north of the Chesterfield Inlet, the Oo-quee-sik Salit, near Back's River, have dark interiors because they live on salmon, and so have little sea or walrus blubber for lamp oil.²⁶

The Iwillil and Iglulik, on the other hand, who live along the northern edge of Hudson Bay, have a higher height ratio between their sleeping platform and the apex of the ceiling because they have larger supplies of seal oil. This makes it possible for them to stand up inside the igloo, to make it warm and bright, and to not have water dripping down on them while they are sleeping because the curve of the walls is steeper, making their lives more comfortable.

This dimension or ratio, then, of the height of the curve roof to the level of the floor, represents a fine line, or balance point, between interior warmth and being able to stand up inside, or not, depending upon the availability of lamp fuel and the willingness of the occupants to sacrifice convenience for warmth. It also depends upon the kind of snow available, since a flatter arch cannot be built with a softer variety.²⁷

Fine-Tuning the Living Environment

Several ingenious refinements add to the overall intelligence of the Inuit as masters of environmental adaptation and show the amount of forethought that they give to small things that will immeasurably improve their quality of life at different times during the year.

The first and most important of these is the lamp that stays with the family when they move. More specifically it is the responsibility of the female head of household to care for the lamp, which is frequently given as a wedding gift to a young bride. In one description, the lamp, or *Gullig*, is equated with life itself since “whether warming the air, lighting the house, melting ice for water, drying apparel, or beckoning hunters homeward, the Inuit lamp literally created culture, transforming dark into bright, cold into hot, raw into cooked.”²⁸ Its functional role as a source of survival also extends to the color of the flame, which when white indicates a normal level of carbon dioxide, but when yellow signals the need for more natural ventilation from a vent hole (*gibag*) that could be opened in the roof.

Two additional refinements related to the lamp are the drying rack and a soapstone cooking vessel, which also help to make life in this extreme environment easier. These are suspended above the lamp by ropes hung from the roof or are supported by poles. The drying rack is essential because moisture conducts cold faster, and so, as soon as men come back from hunting, they take off their outer garments to dry them. The rack, which is made in the same way as the Inuit snowshoes, has gut strung both ways across a large circular frame. In addition to the lamp, or lamps, the cooking vessel, and the drying rack, other small details such as an ice window, bed mat, and skin lining help make life inside the igloo more comfortable.

When it is first built, the igloo transmits some light through the snow blocks, but soot from the lamp or reindeer or seal skins attached to the inside of the dome to provide added insulation and to curb condensation and dripping soon block that source. So, at the end of their summer migration, the Inuit cut out a slab of fresh water ice to use as a window when they build their winter igloo, placed over the entrance passage. They do not use salt water ice because it is too murky. They also collect young birch or elm twigs during the spring and summer, which they weave together into a mat used under the reindeer hides that cover the snow platform they use as a bed to keep the hides dry and to provide airflow between the hides

and the snow. The Inuit who hunt whales use baleen strips for the same purpose, since wood is scarce for this group.

On the Move

The Inuit have become so closely identified with igloos in the public consciousness that their nomadic lifestyle may come as a surprise. As with other groups that are still classified as nomads, they are dependant upon changes in the weather and the migratory patterns of their main sources of food. When spring arrived and temperatures began to rise, in April and May, igloos began to melt, but in spite of constant dripping their occupants tried to remain in them as long as possible. If the roof collapsed, or threatened to fall, they would trim the hole, or remove the weak part and patch it with reindeer hide to prolong their stay until their summer food source was abundant and they could move to be near it. Their summer house (or *tupig*) was a tent, constructed just as ingeniously as the igloo.

THE AZTECS

When the Spanish *conquistadors*, under the leadership of Hernan Cortes, arrived at the Aztec capital of Tenochtitlan in 1521, it was the center of an empire that stretched from Michoacan in the north and the border of the Tarascan Empire to the Mayan Empire in the south, and across the neck of the continent from the Pacific Ocean to the Gulf of Mexico. One especially evocative description of the capital, from which the last Aztec emperor, Motecuhzoma Xocoyotzin, ruled this empire, survives from one of the Spanish soldiers that conquered it, named Bernal Diaz Castillo. He describes his disbelief that a relatively small force could defeat such a large army, supposedly unaware of the myth of Quetzauatl, a fair-skinned god, who would return to lead the Aztec people, whom Cortes was mistaken for. Diaz specifically mentions the canals, which made the Spanish advance difficult, lined with houses on each side with a monumental pyramid and public square in the center of this island city in the middle of Lake Texcoco. He describes in graphic detail the nightly ritual of the sacrifice of his compatriots who were unlucky enough to be captured. They were killed by the high priest at the top of this pyramid and then tossed down the steps, which Diaz describes as having been covered in blood.²⁹ Diaz also mentions the fact that the Aztec defenders threw clay tiles from the roofs of the houses down on the *conquistadors*, further hindering their advance. The pyramid, along with the other ceremonial and administrative buildings around the central square, as well as all the houses, was systematically demolished once the city was captured and the rubble was thrown into the lake, eventually forming the first layer of the foundation of the middle of Mexico City, as it is today. This destruction was substantially complete by the end of the sixteenth century, and the same process of the eradication of any evidence of the Aztec civilization was then extended throughout the rest of their empire.

A Few Records Survive

One of the few records of the history of the Aztec people that has survived the massive destruction that took place after the Spanish conquest is known as the

Codex Boturini, or the *Tira de la Peregrinacion*.³⁰ It describes an epic, nomadic journey by the Aztecs from an original island city called Aztlán that had six districts, of which only four decided to migrate. Their wandering ended at Lake Texcoco, in which they simulated their memory of Aztlán. They did this by creating floating rafts called *chinampas* woven of reeds that contained earth and plants and pushing them out into the relatively shallow lake. The plants sent down roots to the lake bottom, and as these became denser, small islands were formed, which eventually joined together to become the foundation of the new city, Tenochtitlán. In some cases, parts of the lake were exposed, using a rudimentary version of a cofferdam, and the foundations of the heavier stone movements, such as the great pyramid, were built directly on the bottom.

The city was divided into four districts, conforming to the four migrating tribes, named Teopan, Moyotlán, Atzacualco, and Cuetzupán, with the Temple Mayor in the middle. It was connected to the encircling shore by three main roads and bridges, which all converged on the central plaza like the spokes of a wheel.

Daily Life in Village and City

Slowly, archaeologists and sociologists have been able to reconstruct both the character and type of dwellings in the capital and those in villages through the rest of the vast Aztec Empire, giving us a more complete picture of the daily life of the people before the Spanish conquest. As in other cultures discussed elsewhere here, the size and quality of construction of the homes depended on social status and economic level. In Tenochtitlán, the royal palaces were at the top of this hierarchical system, with that of Motecuhzoma being the grandest of all. It was the center of government as well as the emperor's residence, and it has been described as containing "court houses, warrior's council chambers, tribute storage rooms, two armories, rooms for bureaucratic officials and visiting dignitaries, a library, an aviary, a zoo, and various courtyards, gardens and ponds."³¹ The life of the common people, or *macehualtin*, by contrast, differed drastically from the *pipiltin*, or nobility. They lived in small, individual adobe huts, with dirt floors covered in woven mats on which they worked, ate, and slept. Food and drink were stored in clay jars, food was served on clay plates, and corn or wheat was pounded with flour for *tortillas* in a stone *metate*, which is still used in this region today. This is basically a rectangular stone slab on which the corn kernels or wheat were placed and crushed with a stone rolling pin by someone kneeling at the short side of the slab. Finer seeds, for ground spices or sauces, were ground in a stone mortar and pestle, called a *molcajete*. The diet of the common people was very simple, consisting of *atolli*, a maize gruel, and one larger meal consisting of *tortillas*, with beans and vegetables. Fish was more plentiful than meat, which was rarely eaten.

Depending on economic circumstances, this single room hut might have been augmented with others of similar size, organized in a square or rectangle to surround a central courtyard. Because it is difficult to make an opening in an adobe or wattle and daub wall without using a substantial amount of wood, these rooms typically had no windows, and daily life, as in Chinese vernacular houses, was lived in the central courtyard, rather than in their dark claustrophobic interiors.

A Similar Pattern

This pattern was repeated on a reduced scale in smaller cities and villages throughout the remainder of the vast Aztec Empire, in which lesser kings ruled and delivered tribute in a pyramidal governmental hierarchy, to Motecuhzoma at its peak in Tenochtitlan. Local nobles came next in this hierarchy, and commoners were at the bottom. What has come as a surprise to archaeologists are their recent discoveries of higher population levels in this empire than originally thought, estimated to have numbered in the millions, with nearly one million in the Valley of Mexico, around Lake Texcoco alone, when the Spanish invaded.³² Commoners were taxed, which all contributed to the tribute paid to Motecuhzoma each year, but, because of the higher population figures now being discovered, this tax was less onerous than previously thought.

A Typical Village

Excavation of a typical preconquest Aztec village called Cuexcomate near current day Cuernavaca has revealed what daily life may have been like for those living in outlying districts. This village was strung out in a line along a main road running through a shallow valley, terminating at a temple and plaza. It demonstrates a clear distinction between the enclave of the nobles on one side of the road and the more dispersed houses of the less privileged on the opposite side. The compound of the nobles, which was organized around a common square central court, was made up of individual rectilinear houses with entrances that faced inside, all built on a raised platform, or plinth. These houses may have been whitewashed, with gable roofs made of straw. The houses on the opposite side of the linear thoroughfare, however, were built on grade and were surfaced more roughly, creating a clear visual and physical distinction between these diametrically different parts of Aztec society.

This was a farming community, surrounded by fields and terraced planted plateaus, which was a technique commonly used to maximize the amount of arable area available, by using stone retaining walls to create raised beds for crops. Cotton was popular because of its use in cloth, and the production of it was a basic cottage industry. So, the houses here probably contained implements for hand spinning, and many ceramic and wooden spindles have been found, along with tripods used to hold them. Remnants of bark from the wild fig tree in other houses implies that paper was also produced here, confirmed by the discovery of basalt slabs used to beat it into fibers. The houses themselves were typically about 15 to 25 square meters in size, with a dirt floor. They had two doors, one in each of the long walls of the rectilinear enclosure walls, probably for cross ventilation. Straw mats were used on the floor for sitting and sleeping. The remains of clay figurines of deities indicate that houses also had a simple shrine inside, with incense burners on the wall nearby.³³ No hearths have been found, so cooking may have been done either in a separate structure to avoid smoke inside the house or in a common bakery as it is in traditional Greek villages today.

A Sharp Contrast between Classes

The houses of those living in the compound of the nobles were larger than those of commoners and contained artifacts that were imported and more costly, such as

polychrome bowls. Artifacts found along the main street indicate that it was also lined with vendors or shops. The archaeologist excavating this site has described this trade by saying that the village

teamed with vendors, buyers and artisans. Here commoners would trade craft goods made in their home—mainly textiles—for salt and painted pottery imported from the Valley of Mexico and other areas, obsidian blades from regions hundreds of kilometers away and needles and other bronze objects from Western Mexico. Local produce and goods such as woven mats, baskets, corn grinding tools and tortilla griddles were also displayed and traded.³⁴

Along with the recently revised estimates of population levels throughout the Aztec Empire there is also a new realization of the extent and quality of the road system that made the variety of objects that were traded possible, like the Roman road system that sustained its vast empire. These also originated at the Aztec capital of Tenochtitlan.

LA GALGADA AND CASMA AND MOCHE VALLEYS OF PERU

Peru is perhaps best known historically for the glorious Inca civilization that existed there prior to the Spanish conquest, but that only represents the final episode in an extended sequence of civilization that preceded it in the region. This started with La Galgada, near Pedregal, Peru, located high above the Tablachaca River, which thrived from 2540 until 1400 B.C. and culminates with the Chimu city of Chan Chan, which played such a large part in influencing the Incas who conquered and assimilated Chimu culture.

La Galgada

La Galgada was primarily a ceremonial center that eventually was converted into a burial ground. It was chosen as the place to settle because of the configuration of the mountain range around it. It was considered to be sacred, and the river that supported this primarily agricultural community helped support this choice. La Galgada is reminiscent of many of the other civilizations of this age studied here since the residential needs of each strata of this society seem to have been a far lower priority than ritualistic and religious preoccupations.³⁵ The site of the settlement is dominated by two large ziggurat-like temples as well as a circular sunken plaza, with a constellation of small circular or oval houses scattered around them, with agricultural fields stretching out beyond. The two stacked temples, which were each accessed by a steep central stair, have been prosaically designated as the North and South mounds by archaeologists, who believe they represented “the personification of the mountains as divine beings” in which the

terreform of mother earth conforms to the widespread ancient belief that west is the direction dominated by the feminine power of the earth, where all the celestial bodies are swallowed up by the earth, their setting taken as an analogy for death.³⁶

This may explain why these mounds were eventually converted from temples to burial sites, to allow the deceased to be in the presence, or literally in the bosom, of their deity.

This walled city has much in common with the Anasazi Pueblos in that it also had subterranean ceremonial buildings, like the *kivas*, which had a central fire pit and a built-in bench running around their periphery, hinting at a fire cult that focuses on a circular plaza.³⁷

The houses at La Galgada were either round or almost so, and were relatively small, at about 14 square meters on average. They were built of fieldstone laid in mud mortar and had thatched roofs. Cooking was probably done outside. Plaster was widely used in larger buildings and may have been used for the floors of the houses as well.

The Casma Valley

In the Casma Valley, at Pampade las Llamas-Moxeke, over 70 mound structures have been found, along with several large buildings that are up to 50 meters long and 5 meters high, and several hundred houses of various sizes.³⁸ These houses differ from those at La Galgada in being either square or rectangular made of stone cavity walls filled with rubble, and some of these may have been covered by a roof held up by wooden columns at the corners, standing free of the walls. There is also evidence of raised floors and round fireplaces in some of the houses.

San Diego

Another residential compound is the Casma Valley, now referred to as San Diego, which dates from between 500 to 300 B.C. It also has plazas, courts, and platform mounds and is unique in that the houses seem to predominate over the ceremonial spaces, with no monumental structures being predominant. Every building was oriented on an axis between 12 and 18 degrees east of north.³⁹ Rather than being built entirely of stone, some of the houses were built of wood, or wattle and daub, referred to here as *quincha*.

The Moche Valley

The Moche Valley is in a V-shaped plain that is the confined delta of the river that gives it its name, with the wide mouth of the “V” facing west, toward the Pacific Ocean. Conditions here were optimal for urban communities to emerge, and many did, between roughly 500 B.C. and A.D. 1480, in continuous sequence.⁴⁰ The first of these is Salinar in Cerro Arena, southeast of the Moche River. The second is Moche, with its prominent Huacas del Sol and de la Luna (or Pyramids of the Sun and the Moon), even closer to the river, as it bends toward the southwest, Galindo, near the base of the mountains to the northeast, and Chan Chan, which was the closest to the coast, to the northwest.

Salinar

The Salinar site, which dates from 200 B.C. to the early part of the first century A.D., is located high above the Moche Valley about 20 miles from the Pacific Ocean, positioned to control passage from the interior to the sea.⁴¹ The settlement, called Cerro Arena, covers about 2 square kilometers and has more than

2,000 buildings, including many houses that sheltered both rich and poor. These have been classified into two types by prominent archaeologist Curtis Brennan. The first, which has several permutations, is a large mixed use house that has living spaces clustered around a courtyard, sharing access to it with other rooms that were obviously set aside for other purposes, all relying upon a single, offset entrance. These house shops were relatively large and angular, if not rectilinear.⁴² In sharp contrast, the second type is very small and round, typically consisting of a pair of single semicircular rooms joined by an entry that acts as a hinge between them. Each has cooking areas inside the house, based on grinding stones found there.

Moche

A very large urban center was established 6 kilometers from the Pacific coast that lasted from A.D. 300 to 550 and takes its name from its proximity to the Moche River to the northwest. It is dominated by the Huaca del Sol, Pyramid of the Sun, and Huaca de la Luna, of the moon, with the civic spaces surrounding them being more advanced than in other sites in this region.⁴³ Also, unlike other sites, the houses at Moche have rooms designated for individual uses with cooking done in one and living in another. One investigator has noted that “this trend toward segmentation seen in the individual residential dwelling can also be clearly seen in the wider intersettlement plan, in which there are three classes of residential architecture designated by construction style, elaboration and room content.”⁴⁴

These range from small houses with walls made of compressed plant fibers at the lower end of the economic spectrum, through larger houses with plastered mud brick walls with stone bases, stairs, and furniture, to even larger houses with extensive storage areas inside them that imply a strategic difference between these and the houses of the lower social level elsewhere.

Galindo

After what appears to have been a major dislocation around A.D. 600, the locus of power shifted from Moche to Galindo, further inland. It was also quite large, with pyramids, a palace, and a new element, called a *carcadura*, which is similar to a theatre, as an enclosed performance platform. These civic buildings were flanked by residential areas on the northwest and southwest, with houses that are even more segmented, divided into cooking, living, and storage areas.

This pattern of divisibility culminates at Chan Chan founded by the Lambayeque dynasty in A.D. 1000. Rather than being an urbanized settlement in the conventional senses, it is a series of walled palace compounds, called *ciudadelas*, more like citadels, which can each be identified with an individual ruler.⁴⁵

THE INCA AND THE CHIMU

When Francisco Pizarro arrived in Peru, he and the nearly 200 *conquistadors* whom he led were amazed to discover an extremely sophisticated and well-organized civilization that was firmly established there. The Incas were led by a

king who was supported by highly efficient governmental bureaucracy. The tightly structured society of about 12 million people that they ruled ran the gamut from a privileged nobility through a priestly class to merchants, artisans, warriors, and farmers. This burgeoning population was fed by a productive agricultural system that included advanced irrigation and terracing techniques that allowed farmers to plant on what would otherwise have been rocky, barren, inaccessible slopes. It was also joined together by more miles of paved roads than the Romans were able to construct at the height of their empire.⁴⁶

Older Than Originally Thought

What is beginning to become increasingly clear, however, is that this kingdom was not only in decline when Pizarro subjugated it but that it is also much older than it was originally thought to be.⁴⁷ It began as a religious community, called the Chavin, about 800 B.C., which supported itself by fishing along the Pacific coast, rather than by agriculture, as it did later on. Even at the beginning, however, economic, military, and religious power was concentrated among an elite ruling class, who controlled the rest of the population by limiting access to the food supply.⁴⁸

The Chimu

In a way that is similar to the Roman appropriation of cultural authority from the Etruscans who had preceded them in Latium, the Incas assimilated a great deal from the Chimu, whom they displaced. The Chimu, in turn, had done the same with the Mochica, or Moche, culture that predated them. Central to each of these appropriations was an advanced irrigation system, perfected by the Chimu, that allowed the Incas to dramatically increase the productivity of the land and support a population that was ten times larger than exists in the same region today.⁴⁹ The key to this ingenious system was the excavation of a series of parallel canals, spaced far enough apart to allow a long field to be planted between them. The factor that governed the width of these intermittent fields was the distance that the mist that rose up from the canals that flanked them could cover, since the canals and the fields worked together in a symbiotic relationship. Once they were dug, the canals were reinforced with battered stone sidewalls that projected up about 5 feet above the bottom of the canals. The fields between them were layered upward like a Roman road, beginning with a thick cobblestone base. This was then topped with a layer of clay to prevent canal water from percolating up and soaking the topsoil, and then layers of increasingly small sizes of gravel, ending with a 3 feet thick layer of topsoil for planting.

The water in the canals was used to irrigate the crops, but also protected them from frost during the cold nights that are typical in the Andean foothills, with average altitudes of 12,000 feet above sea level. The heat that the canal water had absorbed during the day radiated up and over the fields after sunset, protecting them like a warm blanket. The water to fill these canals was diverted by channels that were excavated to follow the contours of the foothills, to more efficiently capture the spring runoff from melting snow. This irrigation system was critical

because of the arid climate with a very low average rainfall. Maize was the main crop grown in the raised fields used throughout the Inca Empire.⁵⁰

Chan Chan

The Incas borrowed much more than this highly productive irrigation system from the Chimu, who had flourished from A.D. 1200 to 1400 along the northern coast of Peru in an extensive empire that extended 660 miles south from what is now the border with Ecuador. By the time the Incas cut their reign short, the Chimu controlled the entire coastline in this region, from their base in their capital city of Chan Chan. This city was located near the present day settlement of Trujillo in northern Peru and at its height housed about 100,000 people, in an area of about 12 square miles.⁵¹

Chan Chan had an orthogonal plan, which was a spatial representation of a clearly defined social organization, centered around large palaces for royalty and the nobility, administrative precincts, temples, and military quarters, as well as storehouses for grain controlled by the government.

Everything in the city, including the walls, the palaces, and the homes of the artisans, merchants, and farmers, was built of adobe, which the Chimu referred to as *tapia*.⁵²

In addition to being orthogonal, the plan of Chan Chan is also distinctly additive with ten separate compounds being connected to the monumental, ceremonial center. The reason for these successive compounds, which were each surrounded by a wall, is not clear, but they were built sequentially and show the distinct evolution of the culture during the two centuries of its existence. Each had its own walled ceremonial plaza, consisting of a religious cluster that typically included a temple.⁵³

Each of these centers was also built at a monumental scale that seems to have been inspired by the vast expanse of the Pacific Ocean nearby, providing an eastern architectural counterpoint to it. One theory put forward for the reason behind the ten separate citadels of Chan Chan, now named Chayhuac, Vihle, Tello, Labertino, Gran Chima, Bandolier, Lekarde, Rivero, Tshudi, and Squier, is that they were built by successive kings of the Chimu Dynasty to represent their individual power. This theory is strengthened by the discovery of separate tombs near the ceremonial plazas in each of them. Labertino, however, lacks a tomb, but has the most extensive area of housing for nobility found in any of the ten, followed by Gran Chimu, which is the largest of the citadels. Gran Chimu has the remains of a royal palace as well as an extensive precinct of large homes nearby, and a more organically organized area for houses and workshops that may have accommodated artisans or merchants.

Adobe

The Chimu raised the skill level of building in mud brick to new levels. They sculpted the walls of each citadel, as well as those of their houses, using geometric motifs, such as squares and swirling circles in addition to representations of fish and birds. But the repetition of these conventions in each of the citadels over time indicates a rigidly structural political system as well as aesthetic standardization at a level that is reminiscent of Egypt during the Old Kingdom.⁵⁴

The Inca Ascendant

Rather than confronting Chan Chan directly, the Incas cut off its water supply at its source in the foothills at the Andes, bringing the two-centuries-old Chimu dynasty to an end. The Incas learned quickly, readily adopting the governmental and bureaucratic structure that the Chimu had used as well as adopting several of the urban planning strategies that they saw in Chan Chan for their own capital of Cuzco. Quite wisely, they also relocated all of the Chimu metalworkers to Cuzco as well, to teach their weapon-making skills to their own artisans, which also thwarted any attempt at a revolt. The Chimu had perfected special techniques of annealing, casting, molding, and hammering bronze weapons, and their *tumi* or sword was highly prized.

The Incas were also innovative builders, considerably improving upon the architectural skills of their predecessors. This is especially true in their adaptation of the use of stone masonry rather than mud brick. Contemporary engineers are still trying to determine how they were able to move stone blocks weighing between 20 and 300 tons, and then fit them together very precisely, without clamps or mortar.⁵⁵

Machu Picchu

These masonry skills are especially evident at Machu Picchu, which was part of the royal estate of Emperor Pachacuti and was a religious compound relocated from Cuzco to an ancient temple of the sun. It was located high in the mountains above the Urubamba River and was so inaccessible that it remained hidden until archaeologist Hiram Bingham, who served as the inspiration for the film character Indiana Jones, uncovered it in 1912. The settlement he found occupied 21 acres (8.5 hectares), had nearly 170 buildings, and was surrounded by agricultural terraces that cascaded down the slopes around it, toward the valley far below. He determined that most of these structures were either temples or houses, divided into distinct groupings.

The steep slope on which Machu Picchu is located has a flat space, or swale, in the center, which seems to have acted as a main court around which the rest of the settlement was organized. This may possibly have also been an important reason for the selection of the site, since it is the only flat space on the entire Urubamba canyon wall.⁵⁶ A monumental stair connects this *pampa* to one of the most important temples in the settlement.

Houses

The houses of Machu Picchu are clustered together into several compounds grouped around open central spaces, with a single entrance into each one. Bingham felt that these must have been allocated to various groups or clans. Each of the houses has a rectilinear plan, with relatively low walls on the long sides and steeply pitched gable ends, all built as one continuous masonry structure. A single door, which was wider at the base than it was at the top, was placed in the middle of the front façade and was capped by a massive long stone that served as a lintel. The Incas solved the problem of how to build a roof on the steeply pitched stone gables of these houses by inserting five equally spaced stone bars between the stone courses. These had a hole drilled into the end that projected up beyond the



Inca House at Machu Picchu. Courtesy of Shutterstock

coursing, so that the girders, which were made of square cut alder wood, could be tied down to the gable ends with rope. Joists were then run in the opposite direction, parallel to the gable ends, and these were then tied to the girders before reed grass thatch was placed over the entire roof structure.⁵⁷

Some houses, in a compound on the southeast side of the site, have more than one door, and those in another have niches cut into the stone walls that are large enough for someone to have stood in them. Bingham speculated that these niches might have held mummies brought to Machu Picchu after the evacuation of Cuzco, perhaps being those of Inca emperors. A house near the Principal Temple has a finely carved built-in bench that seems to have been especially intended for this purpose.

In each case, however, the interiors of the stone walls were covered with lime plaster placed over clay mixed with fine stones, then painted with yellow ochre. The floors were also covered with plaster placed over an 8 to 12 inch thick (20 to 30 cm) bed of gravel and sand. An elaborate drainage system, mostly concealed below ground, kept the entire settlement dry.⁵⁸

THE IROQUOIS LONGHOUSE

Many Native American tribes are now commonly known by the names that Europeans gave them, which were not always complimentary; the Iroquois call



Flowers and terraces at Machu Picchu. Courtesy of Shutterstock

themselves the Haudenosaunee, which means “the people of the longhouse.” They are technically part of what was originally the Iroquois Confederacy, which also included the Senecas, Cayugas, Onondagas, Oneidas, and Mohawks, and was later opened up to also include the Tuscaroras in 1725.⁵⁹ Foundation myths often say much about the character of a people, and the foundation story of the Iroquois revolves around the legendary Peacemaker Deganawida who, along with Hiawatha, or Ayenwatha, first forged the confederation in A.D. 1142.⁶⁰ This was initiated after a total eclipse of the sun, which was taken as a “sign in the sky” leading to the Great Law of Peace, which is believed to have been in August 1142, based on eclipse tables.⁶¹ This preference for peace, for the sake of maintaining a confederacy, was to have important repercussions later when the French and the British were battling for supremacy over the eastern Great Lakes Region and were each trying to recruit the Iroquois to their cause. Realizing that by taking sides they would threaten each of the other of the Six Nations, they negotiated an agreement of neutrality with the French, called the Grand Settlement, in Montreal in 1701.⁶² There was a direct benefit to matrilineal control, in addition to the fact that clans stayed together in individual groupings within each village. As one historian has described it:

women of the same matrilineage or clan segment shared the same structure along with their husbands and children. When a man married, he moved out of his mother’s (or sister’s) longhouse and into the one in which his wife is living . . . matrilineal residence

has the effect of moving men around, physically splitting up brothers and other male relatives. This is a pattern that tends to prevent disputes between groups of related males and provide instead for the mobilization of large group[s] of men⁶³

Village Structure

The criteria for the selection of a site for an Iroquois settlement reflected their transitional place on the timeline from periodic nomadic relocation toward seasonally dependant agricultural domesticity, with a violent history of intertribal warfare as part of the equation, prior to unification by the Peacemaker Deganawida. The mixture of a hunting-gathering and farming lifestyle to ensure subsistence meant that villages were always located on defensible terrain, such as the top of a hill and were surrounded by a wooden palisade. They were placed near a freshwater source with relatively flat land nearby that could be used to plant corn, squash, and beans, which were the main ingredients of the Iroquois diet along with the meat that was made possible by hunting.⁶⁴ There was an average of 2,000 people in a village, and it occupied 8 to 10 acres after the 1500s. Cedar swamps in the vicinity were also favored because wetlands were a good source of migratory birds as well as for fish and plants.⁶⁵

The Garoga site, which was a Mohawk village in Fulton County, New York, provides a useful example. It was located on the top of a hill, with about a dozen longhouses dispersed on it in various orientations intended to make the best use of the land available. The preferred axis used to build a longhouse was east-west, to prevent the long sides from prolonged exposure to the rising and setting sun. But at Garoga, three longhouses, oriented on a southeast-northwest axis, bisect the village on a diagonal line through its center to take advantage of the width of the hilltop there.⁶⁶ The mixed orientation may also have been used for defense purposes, to reduce easy access to the center of the village and confuse an invading enemy running along the 10 to 12 feet wide spaces between the houses that served as the streets and lanes of each village.

In addition to habitation, these villages also had structures that served other uses, such as circular longhouses for cribs for the storage of corn, sweat lodges that served a ritualistic as well as purgative purpose, and outdoor hearths, used for cooking during the summer.

Because of the slash and burn technique of farming, Iroquois villages were relocated after about ten years because the land was played out. The difference between this pattern and the colonial practice of plowing and using cow and horse manure for fertilizer, which allowed them to remain on one plot of land, is often cited as a decisive factor in the displacement of native Americans by European settlers.⁶⁷

The Longhouse

The weather in New York State, where a majority of the Haudenosaunee lived, is hot in the summer and cold and wet in the winter, with heavy snow being typical. Various kinds of wood were prevalent in the forests that covered the area when the Iroquois Confederacy was in full spate, and each type was used in a way that maximized its innate characteristics. Cedar was preferred for the vertical posts that were inserted in the ground at regular intervals as the main components of the long side walls of the longhouse because it is resistant to rot.⁶⁸ These posts were spaced



Iroquois longhouse. Courtesy of Shutterstock

about two feet apart. Holes were dug first using a pointed stake made out of a harder wood before the white cedar columns were inserted, and these were then shimmed with their stone wedges. An extensive sampling of 63 Iroquois longhouses by noted scholar of Iroquois settlements Susan Prezzano has provided an average width of 6.5 meters (or about 24 feet), although wider houses have frequently been described elsewhere. The cedar posts were either forked or notched at the top to hold a horizontal beam that tied the two sides together and also acted as the bottom chord of a roof truss, with a curved arched member acting as the top chord, which supported the roof. Elm bark, called *ganasote* by the Senecas, was stripped and kept wet by laying it out in a stream bed, which also made it easier to work with. Cedar bark was also used, but elm was preferred because it did not burn as easily.

The length of each longhouse depended on the number of families that lived in it. Families occupied a 2 by 6 meters (about 8 by 20 feet) space on either side of a center aisle, which was used for circulation and for the hearths that were shared by each pair of families flanking it.⁶⁹ Each family was made up of four or five people. An average house might then have ten families, or about 50 people in it, divided up into five bays, with a hearth in each bay and with each bay housing two families separated by the central aisle. Houses could get much longer, especially those of chiefs, who used the size of their longhouses to convey their power. These were also used for meetings and ceremonies.⁷⁰

Such an arrangement had advantages and disadvantages. The linear sequence of living quarters and provision of a single door at each end of the longhouse meant that it could be more easily defended, especially when the men were away on hunting or war expeditions. If oriented correctly, the shape of the house also provided maximum heat in the winter and coolness in the summer, when flaps in the outer

bark skin were opened to allow cross ventilation. The major disadvantage was the lack of privacy since people were constantly walking up and down the middle aisle through each of the pairs of family quarters, although lack of privacy was offset to some extent because the house belonged to the one clan. Each family lived on a wooden platform that was raised about a foot off the ground to prevent sleeping directly on the ground, which was cold and damp in the winter. The ends of each longhouse were used as storage areas, which served as an additional layer of insulation, preventing the wind from blowing in. A porch also extended out from each end to provide shade for the entrance, as well as a covering during rainstorms. There were holes in the roof of the longhouse above each hearth to let smoke escape, and these holes were covered with flaps that could be closed with long poles when it snowed or rained.⁷¹

Unhusked corn was hung along the entire length of the longhouse, along with clothing put out to dry and smoked fish, which, along with the smoke from the fire pits and the lack of openings, must have made the interior very pungent.

The average ten-family house would have used about 500 bushels of shelled corn a year, and a large bark silo was used to store 80 bushels, requiring six or seven silos for each longhouse. The processing of this corn into flour was a basic part of the domestic routine since it was a major component of the Iroquois diet, along with beans and squash, the smoked fish mentioned above, and roasted meat, including bear, beaver, muskrat, squirrel, and wild turkey. The corn kernels were boiled with wood ash and then washed in a basket to remove the hulls. The ash, according to one source, enhanced “the nutritional quality of the maize, increasing the amount of lysine as well as niacin that can be metabolized.”⁷² The corn was then pounded into flour using a wooden mortar and pestle. Early European observers have recorded how the Iroquois prepared the corn; Lewis Henry Morgan wrote, in 1851, that the husks were braided and the corn was hung “on the cross poles near the roof.” He also wrote that “charred and dried corn and beans were generally stored in bark barrels, and laid away in corners.”⁷³

As Long as the Sun Shall Shine

Consistent with their role as peacemakers, 21 representatives of the Iroquois Confederacy met with the Continental Congress in Philadelphia in May 1776, staying in Independence Hall for about a month. When they met with delegates there on June 11, they were assured that the “friendship between us will continue as long as the sun shall shine and the waters run.”⁷⁴ But their diplomacy was not able to preserve their traditional way of life in the face of the cataclysmic change that followed.

THE MAYA

The various Kingdoms of the Maya, which reached the height of their power between the early fourth century A.D. and the invasion by the Spanish *conquistadors* in the beginning of the fifteenth century A.D., were concentrated in a 125,000 square mile area that included Yucatan, Campeche, Tabasco, Quintana Roo, and part of Chiapas in what is now Mexico, as well as much of Guatemala.⁷⁵ This

civilization that effectively spanned between the Pacific Ocean on the west, the Gulf of Mexico to the north, and the Gulf of Honduras and the Caribbean to the east emerged relatively quickly and disappeared just as fast, in historical terms. This occurred through four distinct phases generally agreed to be the Formative Period, or Old Empire, followed by the Late Formative, Proto-Classic, and Post-Classic Periods. The earliest recorded date of this civilization is September 18, A.D. 320. There is the usual divergence of scholarly opinion about its beginnings, since it seems to spring up out of nowhere, split between those arguing for an indigenous source and those who believe in an external influence. After the Classic Period, roughly placed between A.D. 700 and 800, the decline of the civilization was rapid and the remnants of it that the *conquistadors* under Cortez encountered were not as vibrant as the culture was at its height. What caused it to rise up and become so brilliant? Where did it come from? Where did it go? Part of the mystery surrounding it has been its alphabet, which remained undeciphered until recently, as well as the fact that many of the books that the Maya wrote were burned by the Spanish. Only three of these survived and, once their writing was decoded, these have opened up a treasure trove of information about them, including the most minute details of their daily life and a complex system of ritualized behavior, based on their calendar. A central feature of this system was the idea of a cycle of creation and destruction. These cycles were long, measuring 13 *baktuns*, or a little less than 5,200 years. The Maya believed that the final cycle would be the thirteenth, which, according to one calculation, places the first of these at 3113 B.C. and means that the last “Great Cycle of the Long Count” will end on December 24, A.D. 2011.⁷⁶

A Stratified Society

Mayan society was clearly hierarchical with a theocratic hereditary elite at the top of the pyramid. This was headed by the king, *Abau*, or *balach uinic* (true man), followed by the nobles, or *almehen*, meaning “he whose descent is known on both sides.” This refers to the naming system used, which included the mother’s name first, transmitted through the female line, and the father’s second. As historian Michael Coe explains, “there is now abundant evidence that these two kind of names represented two different kinds of crosscutting and co-existing descent groups . . . the matrilineage and the patrilineage . . . they were strictly exogamous, all inheritance of property was patrilineal.”⁷⁷ This landed gentry under the *Abau* was the foundation of social power, followed by the military, the merchants, the clergy, the farmers, and the common people, or *milpas*. While their destruction of the records the Maya kept on their own culture is a disaster, the Spaniards did make helpful observations of their own about the daily life of the Maya, including descriptions of the houses of the *milpas*, which sound very similar to those found in Maya villages today. In fact, one of the most fascinating things about this culture is that the upper part of the social hierarchy, which was responsible for building the tall stepped monuments, plazas, ball courts, palaces, and administrative buildings that we have come to identify with it and which also dictated the pattern of constant warfare that is now believed to have been the major factor in its demise, seems to have vanished as quickly as it appeared. The social strata that supported it, however, as well as their way of life, houses, diet, and means of subsistence, still remain

the same. In this, it is similar to many other cultures included here such as the Khmers, the Indus River Valley and Mesopotamian civilizations, and the Egyptians during the Pharaonic Period, in which the way of life in the rural areas has remained substantially the same for millennia.

Trade

Because of the extensive coastlines that bordered their empires, as well as their ability to build seaworthy ships and their engineering skill in planning excellent roads, which they called *sakbehs* (sometimes “*sacbeab*”) or “white ways” because they were coated in white stucco, the Maya were able to trade with neighbors near and far. We often have a preconceived notion of them as being stationary, tied to the cities that they built in the middle of the rain forest, and so it may come as some surprise to imagine them as accomplished road builders and sailors. The downside of this was that their *sakbehs* also made it easier for their enemies to attack them. It is now understood that there was almost constant warfare that took place between rival city-states, which probably contributed to the ultimate collapse of the entire collective civilization.

Through their ability to trade extensively with other cultures around them, however, the Maya were able to enrich their lives and to give distinct character to their civilization through the exchange of such exotic items as cacao, copal, rubber, *balche*, salt, cotton, flint, quetzal feathers, obsidian, and jade. Of these, cacao, which was highly sought after by royalty, was so valuable that the beans were used as a means of monetary exchange, and copal, which is a resin similar to frankincense and equally rare, was used primarily for religious ceremonies. *Balche*, which is a fermented beverage similar to beer, certainly must have improved their quality of life, as did their salt, which was made from evaporated seawater and highly regarded for its quality.

The Mayan House

The Maya, like so many other ancient societies that have been included here, built large ceremonial centers, while the people who built them lived in modest and temporary shelters on their periphery. The first house that a couple built after they were married was near either one of their families’ houses, until they could manage to build a larger one elsewhere. Although there are several examples of nonrectangular plans, the typical form of the house of a common person was long and narrow, with rounded ends, technically referred to by one historian as “apsidal.”⁷⁸ It was built by firmly securing thin, flexible saplings in a stone foundation and then bending them to support a gable roof, which was covered with thatch. The spaces between the saplings was then interwoven with smaller branches and covered with adobe. The interior of the house, which has a smooth hard clay floor, was divided by a wall running across its narrow width, which separated the cooking and eating area from the sleeping quarters. Fray Diego de Landa, whose keen observations written shortly after the Spanish conquest are the source of much of our knowledge of the everyday habits of the Maya, has written that the beds in this area were also “made of small saplings laced together by withes which gave way to the movement of the body like a mattress.”⁷⁹ He observed that this framework was

covered with a flat grass or reed mat. Cotton fabric was then placed over this as a covering.

The entrance to the house was in the center of one of the long sides, and there was rarely more than one of these. There was no door, probably because the thin wattle and daub wall could not support the weight of more than a thin wooden gate, and the vibrations caused by constant opening and closing would have cracked the adobe surface near the hinges. The entrance was covered by beads or bells or strings, or by a curtain instead, giving some idea of the sense of security that the family must have felt.

Victor W. Von Hagen, who has attempted to give an insight into the daily life of the Maya in the 1960s long before it was easy or popular to do so, has made the interesting point that, since this house type has survived, relatively unchanged, for more than 2,000 years, the Maya names for several of its parts may also have remained the same over that time. This may be thought of, he says, as “linguistic paleontology.” In it, the roof purlin is called “the road of the rat,” the entrance is “the mouth of the house,” and the main roof post is “the leg of the house.”⁸⁰

The burial practices of the Maya are also similar in many ways to those of other societies discussed here in that, as Landa also records, they buried their dead under the floor of the house, designating one of the apsidal ends for that purpose. When that area was fully used, usually within 20 to 30 years’ time, a new house was built and the plot used for the previous one was designated to be a sacred space.

Houses of the Nobles

The houses of the nobles, on the other hand, were made of stone rather than wattle and daub or adobe. They were covered with stucco and painted with frescos, which were very colorful. This technique of covering stone structures with lime-based stucco gave all Mayan buildings, other than the houses of the *milpas*, a dazzling appearance that is difficult to imagine when looking at the raw stone ruins that survive today. They developed a stucco-making process, which is still prevalent, even though it is resource intensive in that no kiln is required. Wood is first stacked on end in a pile, and the limestone is placed on top of it. The trick is to use just the right amount of wood and to position it in such a way that there is a minimum amount of waste product at the end once the lime is slaked. Once the burning is complete, it is left to cool for several days, before water and a mixture of finely crushed limestone particles called *sascab* were added as temper.⁸¹ A great deal of wood was needed to burn the lime, and the Maya used stone headed axes to cut it, which gives some indication of their wood-cutting and tool-making skills and their high level of energy and strength. Since the stone walls were covered with gypsum stucco, the masonry joints were less than perfect, unlike the stonework of the Incas, which is known for its amazing precision. This was not true of the roof structure of Mayan stone buildings, however, in which an arched form, typically referred to as a corbel or a vault was used. As one expert on Mayan architecture, Tatiana Proskouriakoff, has explained, however,

the course of this new development is so sharply in contrast with the evolution of Old World style that we find it difficult to speak of Maya buildings in traditional architecture terms. The so-called “vault” of the Maya, for example, is neither a vault in the true

sense nor a true “corbel vault” as it is often called. It is a unique form of construction, taking advantage of principles of stone arrangement, while at the same time relying heavily on the strength of mortar for its support.⁸²

The end result of the use of what must be called corbel vault for want of a more accurate term, however, is that spans were severely restricted and rooms were very long and narrow. A good example is the Palace of the Governors at Uxmal, which is generally considered to be one of the most excellent monuments of this civilization. This was, more accurately, built in the *Puuc* style named after the hills nearby, in western Yucatan, in which an L-shaped stone was used to add strength to the corbelled vaults, so that it could also be used as a doorway.⁸³ The surfaces of *Puuc* architecture are also much more sculpturally ornate and deeply carved, giving it an unmistakably textured quality. The Governor’s Palace is a long narrow structure built on a high platform that originally had battered walls and a single wide staircase leading up to it in the middle. It is organized in three joined segments, with the longest in the center, flanked by two nearly square pieces at the ends. These are all unified by a richly carved, 11.5 foot high and 320 foot long frieze, which acts as a datum at the top and which also covers 75 percent of the horizontal composition of the surface elevation. The remaining 25 percent of the horizontal surface of the elevation on the bottom is plain, interrupted only by a series of small doorways, with the central entrance being square. The Palace of the Governor was commissioned by King Chaak, who was the last ruler of Uxmal before it was deserted at the beginning of the tenth century.

It is difficult to imagine how this house, or palace, might have been used since the interior spaces are so small and dark, due to the structural limitations imposed by the corbels. If this is the case in what is widely considered to be the most beautiful existing Mayan residential building, it seems to confirm the image of a society that valued a life of action, lived outdoors and organized around ceremonial public rituals and patterns, rather than one that was sedentary and fond of domestic comfort.

Africa

AL QAHIRA, EGYPT

Cairo was established by the Shiite Fatimids, who swept across North Africa and inaugurated the new city, Al Qahira (the triumphant) in A.D. 969. It was laid out in a grid plan by the Fatimid general Al-Jawhar (the Sicilian) presumably inspired by the rectilinear configurations of Roman cities he had seen while marching eastward along the Mediterranean coast. The main north-south street, replicating the Roman *Cardo Maximus*, was named after the Fatimid Caliph Al-Muizz, who built his palace on an east-west cross street near the middle, called the Qasaba or Bien Qasrean.

Islam had spread into Egypt from the Arabian Peninsula nearly three centuries earlier, in 696, and the port city of al Fustat, which had replaced the Byzantine fortress of Babylon, was prospering when the new Fatimid city was founded. The two urban areas were intended to function symbiotically, with al Fustat, which was more exposed and had far better access to trade, as the gateway to the outside world. It acted as an economic hub for the general populace, and Al Qahira, which was more protected by both its inland location and fortifications, served as a royal, judicial, and ceremonial enclave.

Al Fustat

What is now known about the physical configurations of the houses in al Fustat has only come to light relatively recently due to the fact that the area has been used as a landfill for the rapidly expanding Cairo metropolitan area as well as because the river Nile changed course. Excavations by archaeologists Ali Bahgat, Albert Gabriel, Wladyslaw Kubiak, and George Scanlon, in combination with historical accounts, increasingly provide a more vivid, if still incomplete, picture of how the general populace of various economic levels outside the princely city of Al Qahira lived. The materials used varied from mud brick to stone depending upon social level, from rich to very poor. They also varied in height for the same reason, ranging from what were described in 1191 as mud shacks to multistory apartments,



Cairo was founded in A.D. 969 by Sultan Al Muizz and was laid out by his leading general Al-Jawhar on a grid system, similar to that of the Roman cities the Fatamids had seen on their way across North Africa toward Egypt. *Source:* James Steele

clustered in neighborhoods. According to contemporary accounts, the height of the housing blocks increased to 14 stories or more in the central district, giving the city the appearance of a mountain.

Regardless of the number of stories, the houses of the lower middle class and above shared several common characteristics that are also typically found in other houses throughout the Middle East from the beginning of the agricultural revolution around 400 B.C., such as those in Ur, in the Chaldees. These common attributes were to be later refined in Cairo itself, as the political situation changed over the next four centuries to become specifically identifiable as belonging only to this city. The way that they evolved, from being generically Middle Eastern to uniquely Cairiene, provides an instructive case study in the cultural adaptation of common residential prototypes.

Common Characteristics

There are typical features that the al Fustat houses share with those in other parts of the region from earliest times. The first of these is an inner courtyard, which helped to compensate for the compressed conditions that started to exist when houses began to share perimeter walls. The courtyard was a quiet inner sanctum offering a ref-

uge from the bustle of city life as well as a temperature regulator, moderating the intense heat in the area by acting as a reservoir for cooler nighttime air and providing natural ventilation to each of the spaces around it. The courtyard also facilitated the second common feature of the Middle Eastern house, which is privacy, offering protection from prying eyes. The third feature is an offset entrance, which does not allow outsiders to see into the house when the front door is open. The fourth characteristic, which is a refinement on internal privacy, is zoning to selectively allow outsiders to enter, in a careful compartmentalization of public and private spaces. These are further divided to effectively allow the segregation of the sexes, with male visitors relegated to one reception hall and female guests to another. A fifth characteristic is the flexible nature of interior space, with each

placed in the optimum location to take advantage of the environmental benefits available at the time of day it was used. An open, south facing second floor balcony, for example, was used by the family for a late afternoon gathering, for example, because the sun angle and prevailing breeze at that time of day made it the most comfortable place to be. A sixth and final similarity relates to an extension of the internal orientation and order of the open spaces within each house out into the alleys, streets, and plazas beyond, creating a deliberate pattern of openings oriented to facilitate airflow and heat convection.

Saladin

Under the Fatimids the bivalent cities of al Fustat and Al Qahira prospered, so that, as experts Richard Ettinghausen and Oleg Grabar have described it,

The whole area to the south and southwest was transformed so that by the year 1000 Cairo, with the old city of Fustat, had become one of the largest and most cosmopolitan urban complexes of the medieval world, with its markets, mosques, streets, gardens, multi-story apartments and private houses.¹

After the Fatimids were displaced by the Ayyubids from Syria, however, under the leadership of the legendary Sultan Salih Najm al-Din Ayyub (Saladin), the urban configuration of Cairo changed dramatically. This was due to Saladin's decision to move the royal residence to the Citadel, outside the city walls, and to open up the nearly square walled enclosure to the common people. The legal changes that this precipitated, to facilitate access to new religious institutions related to the ideological difference between the Fatimids and Ayyubids, as well as trade within various quarters and the major caravan route through it along the Shariah al-Muizz Li Din from the Bab Zuwailah in the south to the Bah al Futah in the north, led to a dramatic alteration of street patterns. This change has been identified in other urban areas throughout Asia, in the Middle East, and in Europe as well during the beginning of the Middle Ages due to an expanded, market-based economy based on wider trade. It was "epitomized" as a historian of the Chinese walled city of Suzhou has noted, "by the collapse of the old system of the enclosed marketplace and walled residential wards and by their replacement with a fairly free street plan in which trade and commerce could be conducted anywhere with the city or its outlying suburbs."²

The change that occurred in Cairo, however, was profound, affecting both the street and house configurations inside the roughly one square kilometer walled enclosure. It reaffirms recent work by anthropologists and sociologists regarding the specialized refinements that can take place within a regional typology due to political, social, or religious differences. The shift that took place in Cairo, from the Fatimids, who were Shiites from North Africa, to the Ayyubids, who were Syrian Sunnis, is traceable in the influence that spatial organizations derived from the Ayyubids' Mesopotamian heartland began to have on the basic and ancient domestic features common to this area, described earlier.

The torturous street patterns and unique houses of Arabic cities such as Cairo, which fascinated the first Western travelers able to enter them in the seventeenth and eighteenth centuries, were described by Orientalist observers in purely formal

and phenomenological terms as recently as the early 1980s. This ended when pioneer researchers such as Jameel Akbar and Besim Hakim began to apply legal and religious precedents on a case-by-case basis to show that formal changes occurred primarily due to potential social or economic advantage. Although many Western writers still maintain that many spaces in the middle and upper-middle class houses of Cairene merchants in the Middle Ages are exotic, mysterious, and indecipherable, keen observers such as the late Egyptian architect Hassan Fathy have done much to explain the uses and trace the origins of spaces that have been the subject of much speculation by others.

The *Qa'a*

By far, the most remarkable transition was that of the generic reception hall for male guests, typically called a *majlis* throughout the Arab world, to the *qa'a*, which is different from anything seen previously in that region. It migrated, once perfected, to the Hijaz region of the Arabian Peninsula.

In several well-researched articles, Egyptian architect Hassan Fathy has described how the *qa'a*, which is usually easily accessible from the main entrance to effectively isolate male guests from the rest of the house, slowly evolved from its first appearance in the Ukhaider Palace in Iraq, built by a *gazi* warrior prince as a fortress palace on what was then the front line of the Islamic push northward. The Ukaider Palace is aligned on a north-south symmetrical axis, running through an open rectangular walled central court with an entrance at one end and the formal, official place and throne room at the other. The bedrooms for each of the prince's four wives were arranged along the two long east-west sides of the rectangle. They were each the same, based on an open square central courtyard, flanked by an *iwān* or covered alcove opening up to the central courtyard on both its north and south sides. Even though Iraq is relatively warm for most of the year, there is a winter season, during which late afternoons and evenings can become quite cold. Summers, by contrast, are very hot, and so these opposing sets of *iwāns* were intended to allow the occupant to take advantage of the warm sun by facing south in the winter and the cooler breezes by switching to the north facing *iwān* in the summer.³

In its transplanted, Cairene version nearly three centuries later, this square central courtyard with flanking *iwāns* was converted from a bedroom into a public social configuration with the court recessed by one step and covered with a wind tower roof, called a *shuksheika*, to cool it. The tower acted in concert with a second vertical projection, a *maalkaf*, which was oriented toward the prevailing breeze, directing it down over a fountain to cool it further and then into the *qa'a*. As this air heated, due to transpiration caused by the occupants of the space, it rose up into the *shuksheika* directly above the small central court and out, completing the cycle and providing a constant supply of cool fresh air for the space. The opposing *iwāns*, freed from seasonal occupation, were also no longer tied to orientation and so could be more flexibly located in the house plan, within the constraint of family privacy. The opposing configuration of the *iwāns* made them ideally suited to the formal requirements of social etiquette, with a guest or guests on one side and the host on the other, facing each other across the recessed central zone, which

could also be used by domestic help when serving food and drinks. The *qa'a* became an internal oasis of gentility and calm.

The *Taktaboosh*

The prevailing breeze in the medieval quarter of Cairo comes from the desert to the northwest, and at dusk and after dark this is invariably cool throughout the year. Through observation, those building houses learned that planted areas and gardens retained this cool night air blowing in from the desert on the shaded surface area of leaves, which also filtered out sand and dust and that, as the day progressed, this cool air would rise as it heated. They also observed that a paved area, when placed in tandem with this planted area, would accelerate and direct the flow of cool air sideways rather than straight up due to convection; the sun would heat the unshaded paved surface faster as it rose, especially if this portion was slightly wet, drawing the cool night air trapped in the leaves of the adjacent garden toward it. Many other cultures have made use of this simple physical principle as a cooling device, such as the *lanai* in Hawaii, but builders in medieval Cairo capitalized on it further by creating a special second-story room that bridges over an opening between the paved and planted gardens. The room and the shaded area beneath it are called a *taktaboosh*, and it was the preferred space for the family to meet for a midday meal because the cool air rushing from the garden below, on the north, through the shaded space below it toward the paved courtyard on the south, was channeled up and into it, through vents in the floor: the medieval equivalent of air conditioning. The use of materials that did not absorb heat quickly, such as stone and Isnick tiles from Turkey, in this room helped to make the *taktaboosh* comfortable at the hottest time of the day and, coincidentally, added to its elegance.⁴

The *Maqaad*

The final adaptation of the second story *maqaad*, which faced onto the paved courtyard, also relates to orientation, since this open, *iwan*-like porch was developed to take advantage of the prevailing breeze coming in from the desert in the early evening. It was a favorite meeting place for the family at that time, and the evening meal was often served here before everyone retired to their respective bedrooms on the upper floors after dark.

The evolution in Cairo of the *qa'a*, *taktaboosh*, and *maqaad*, based on preexisting regional and then specifically Mesopotamian models, demonstrates the ingenuity of local builders in adopting generic, time-tested spaces to uses more appropriate for this place. They also show that the Caiiriene family, at this economic level, was willing to be flexible in their use of these spaces, moving to them at the time of day at which the environmental purpose they were designed to benefit from was at its best. Architects specializing in sustainability and ecological sensitivity today call such movement “diurnal zoning,” meaning that the various spaces in a house or other building are designed for optimal environmental performance based on orientation and heat gain or loss at a certain time of day. The medieval builders in Cairo understood this concept very well.

CARTHAGE, TUNISIA

Carthage, which was the early rival and omnipresent scourge of ancient Rome, was originally settled by Phoenicians who established a city around the Bay of Tunis, with the earliest Punic occupation being dated to the end of the fifth century B.C. It has been difficult for archaeologists to determine both the form and the extent of this city, given the absence of defensive walls and the ferocity of Roman determination to eliminate it. The oldest settlement seems to have been clustered in an arc between the base of two dominant hills later known as Juno and Byrsa and to have spread out in a southeastern direction along the Bay.⁵

A Rational System

What can be determined about the houses in the Punic city is that a very logical system was used in their layout and construction, making them very different from those of their Roman counterparts built at the same time. There was a standard lot size and several different typologies that were used alternatively in each block. Each plot was as deep as the block was wide, and there were six equally wide plots.⁶

The Basic House Types

The typical 9 meters wide by 29.5 meters long housing unit exactly spanned between two streets. It had a narrow corridor running the entire length of the unit along one wall connected to a rectilinear courtyard in the middle. This corridor was only 90 centimeters wide, and access to it was provided by a door at each end opening onto the street. There was a wooden screen that divided it from the central courtyard for privacy. The floor of both the courtyard and corridor was *pozzolana* with a mixed aggregate of marble chips and broken pottery, giving it the appearance of *terrazzo*.⁷ There was a channel let into the floor of the corridor, running along the outer wall for sewage that directed it outside to “soakaways,” so that, in this detail at least, the houses of Punic Carthage were less hygienic than those in Rome at the same time.

At the beginning, this house, which is small, had only two rooms flanking the central courtyard. One had a portico over windows looking out to the courtyard, shading them from the direct sun coming in from above, and an entrance from the corridor, as well as a window onto the street on that side of the house. The second room on the other end was an *oecus*, which had an entrance both from the courtyard and directly to the street. The *oecus*, or living area, was the formal reception room, and its elevated status is obvious in the mosaic flooring used there. It also typically had a pair of doors on each end, and an elegant stone threshold beneath them, which is indicative of its status.

What these houses lacked in sanitation they somewhat made up for in water storage facilities, since the courtyard was used as an *impluvium*. The roof pitched inward on all sides, directing rainwater into it and then into a large circular drain that led to a deep, oblong water tank beneath the floor. This pitched roof may have projected slightly over the inward edge of both the *oecus* and its partner at the opposite end of the house, as well as the face of the side walls, and it may have been

supported by slender columns to keep each of these walls dry, forming a *peristyle*. The side walls were about 52 centimeters wide, since they were structural.⁸

Somehow, stairs also must have been included in this tight plan, due to Roman descriptions of the houses as being more than one story high when they invaded the city, but archaeological evidence of these stairways has yet to be found. The modest size of the ground floor rooms as well as the estimated capacity of the cisterns, however, imply that there must have been more than one story in these houses. There was a hierarchy of street widths, and where two of the wider streets intersect, as well as in the space between houses when they do not, there was enough room for market stalls. This raises the prospect of commercial activity along these edges and at these intersections. The excavation of the various stones needed to grind grain into flour near one of these squares lends credence to this idea.

The Punic city existed for more than 600 years before Scipio Africanus declared to the emperor and the Roman Senate that “Carthage Delenda Est” (“Carthage is destroyed”), and its ruins were plowed under with salt, following the battle of Zana in A.D. 201.

DEIR EL MEDINA AND TEL EL AMARNA, LUXOR, EGYPT

Any attempt to describe the circumstances in which the average person lived during the Pharaonic Period in ancient Egypt is complicated by both the many phases of what is one of the oldest civilizations in history and the impermanence of the materials that people other than royalty or nobles used to build their houses. Egypt is matched only by China in duration, with the Pharaonic Period beginning its early Dynastic phase about 3000 B.C. and lasting until the Ptolemaic Kingdom was brought to an end by Octavian at the battle of Actium and the death of Cleopatra on the August 12, 30 B.C. During those 2,970 years there were also three interregnums or intermediate periods. These occurred between what are now known as the Old Kingdom (2686–2125 B.C.), the Middle Kingdom (2055–1650 B.C.), the New Kingdom (1550–1069 B.C.), and the Ramessid Period (1295–1069 B.C.) when the civilization reached its height.

An Incomplete Record

Because the homes that were not part of the royal enclave were typically built of mud brick, many have not survived, leaving us with very little information about them. The scant evidence we do have comes from representations of houses on tomb paintings, as well as the remains of several villages where the artisans who painted them lived, or from those who built the new city of Tel El Amarna or the pyramid of Sesostri II, because these were in relatively remote areas that were left undisturbed. Tel El Amarna has been especially helpful, even though it was primarily a royal city, built as the new capital of King Amenhotep IV, who changed his name to Akhenaten, or “the manifestation of the sun god.”⁹ The isolated location of the city in a natural amphitheatre on the east bank of the Nile, halfway between Memphis and Thebes, was selected because it provided the ideal place

from which to observe the rising and setting of the sun, in a place that has no associations with the priestly bureaucracies that had been established around existing deities in the Egyptian pantheon, such as Amun.

Common Characteristics

By comparing all of the sources available, it has now been possible to identify several consistently occurring characteristics of the residential architecture of the average Egyptian during the most representative phases of the Pharaonic Period. It has been noted that such houses might more accurately be referred to as “Kamitic,” due to the fact that the ancient Egyptians referred to their land as *kemet*.¹⁰ This name has great significance for both their lifeway and their attitude toward their houses because *kemet*, which means “the black earth,” also implies the sharp division that exists between it and *desbre*, “the red land,” or desert alongside it, graphically symbolic of life and death. The flooding of the Nile each year was caused by the spring thaw of snow on the mountains around its source at Lake Victoria, in Tanzania. This created an annual cycle that had always been a part of Egyptian life until a series of dams were built to control it, beginning in the nineteenth century and ending with the Aswan High Dam in the mid-1960s. The inundation of the land around the Nile meant that it was enriched by the soil that the river had picked up on its long passage through Africa and carried with it in suspension, dropping it on its banks, in various widths depending on the geological formations and topography, once it receded. The inundation, which lasted for months, meant that the houses in that zone had to be abandoned each year and rebuilt when the flood was over. Mud brick was the best material to use for this because the land was replenished, and the soil that had been left behind was viscous and rich, making it perfect for molding bricks.

This dichotomy of *kemet*, or the black land of fertility and life, and *desbre*, or “the red land” and death, is central to the ancient Egyptian concept of a cycle of renewal and of life after death, finally expressed in the construction of the pyramids that were intended to preserve the body of the Pharaoh for this regeneration.

The Mud Brick House

The rectilinear mud brick house, which may be identified as being typical throughout the Pharaonic Period, represents the final stage in a long evolution of forms that mirror those in the traditional residential architecture of Africa. These can be classified as tent structures, followed by clusters of circular huts, before the development of a rectangular mud brick house with a courtyard.¹¹ In its final form, the Kamitic house had either a vaulted or flat roof, faced with a ribbed configuration of reeds on the inside. These reed mats, which are still used as floor and wall coverings in the rural houses of the *fellabin*, were also represented in stone inside the Old Kingdom funerary complex of King Djoser at Saqqara, which provides a vivid image of what they looked like. The houses also typically had angular wind catches that channeled the prevailing breeze into the interior. Kamitic houses did have secondary towers that let hot air escape. They had external stairs leading to the roof, which, on houses in which this was flat, was used as an outdoor room and a sleeping platform at night. This was especially advantageous because, even

though a thick mud brick wall prevents solar heat gain from penetrating into the house during the day, it eventually reaches a saturation point just before sunset, after which the heat stored in the wall radiates into the interior all night long. Since the nights in Egypt are fairly warm and dry for most of the year, sleeping out in the open is a pleasant option, which allows the house to be used during all of the daily and seasonal temperature cycle that it accommodated.

The use of the roof as a sleeping platform at night as well as for many other purposes during the day, when canopies were raised to protect people from the sun, made a permanent stairway to it necessary, which was located outside the house in a rear courtyard. This external stair and the courtyard it was placed in then become the final two typical features of this house type. To save material and labor, it was not built of solid mud brick all the way up, but was supported by an arch, which also allowed for a storage space beneath it. It is remarkable that this feature also survives in the mud brick houses of the *fellabin* today, and this arched opening under the stair is typically used as the place where a clay jar holding drinking water is kept in a tripod-shaped stand. As a breeze passed over the surface of the jar, which is porous enough to allow condensation to form on it, the temperature of the water in it was lowered by evaporative cooling. The courtyard was also a very versatile component of the house, providing a protected area for family use as well as playing a critically important role in keeping the house cool.

Deir El Medina

The shift from burial in singular pyramids like those on the Giza plateau to rock cut tombs like those in which Tutankamen was found spawned a new industry, requiring artisans to both carve them and paint their interiors. The Valley of the Kings and Queens near Thebes, now known as Luxor, became the preferred necropolis of royalty, who chose it in the hope that their tombs would finally escape the attention of grave robbers. It was also believed to be auspicious that a prominent mountain there had a top shaped like a pyramid, which is called “Alqurn,” or the horn, today. Rock cut tombs also required less time to build and were less expensive. Because of the numbers of burials there, requiring generations of artisans to carve them and create the exquisite wall paintings that accompanied them, it was necessary for the workers to build a permanent settlement nearby, and this evolved naturally over time within the confines of the shallow valley in which it was located.

Extreme Conditions

This community, which is now referred to as Deir El Medina, is on the way from the Nile to the Valley of the Kings and Queens, in a slight depression flanked by low hills that are 100 feet high at most. It is a desolate moonscape of barren rock and sand with very little vegetation; it is hot and dry in the summer and cooler in the winter with the frigid nights that are typical in the desert that surrounds it. The transformation of this inhospitable place into a thriving settlement that endured and grew over many generations is a testament to the human capacity for enduring hardship and providing ingenious solutions to extreme environmental conditions.



Deir El Medina ruins, Luxor, Egypt. Courtesy of Shutterstock

Unlike similar workers' compounds that have been found at Kaheen, which housed the builders of the pyramid of Sesostri II and Tel El Amarna who built the new city of *Akhetaten* for the Pharaoh Akhenaten and Nefertiti, the village of Deir El Medina was not standardized or built to a regular plan. And yet, the houses seem to have each conformed to a predictable pattern, based on the evidence that has been found, being compartmentalized into a series of consecutive spaces, or rooms, from the entrance from the street in the front to the less formal service areas at the back. Each of these, except for the courtyard, was covered and was relatively high, to allow the natural ventilation introduced in the first of these rooms to flow easily through the entire linear arrangement of spaces and then rise up and out through the courtyard in the back, which helped draw the air through. The first of these spaces, which contained a small enclosed chapel that protected an effigy of the household deity, had a floor that was several steps lower than street level, accentuating the feeling of a threshold by adding the experience of moving downward at the start. The intention of using this entry area as an intermediate, preparatory place prior to the central living space that followed it was that of an architectural equivalent of shaking the dust off one's feet, as the living area was raised up an equal number of steps. A post hole found in the middle of this nearly square central hall hints at a central column that must have seemed like a presence in the room, which was probably loti form, with capitals like closed lotus or



Deir El Medina ruins, Luxor, Egypt. Courtesy of Shutterstock

papyrus buds, like those in the rock cut tombs at Beni Hasan carved during the Middle Kingdom, about 2000 B.C. This probably supported a girder, which held joists running in the opposite direction, making the span of between 15 and 20 feet possible. Stairways found in many of these rooms have been formed, leading down to small basements carved out of the rock floor of the valley, with indications that these were covered with a trapdoor, hidden by a dais.¹² The next room was the bedroom, which was raised up one step from the living space and had a corridor running along one side of it that connected the living area to the courtyard in the back. This room, which must have been used on nights when the heat was not oppressive, had a built-in raised platform on which a cotton mattress and cover could have been placed, and it was rather low compared to the rooms that preceded it. The courtyard, which followed, had a mud brick oven and tone sink as well as a place for grinding grain into flour to make bread.¹³

While the walls of these houses were made of mud brick, they were built on stone stem walls, or foundations, since stone is plentiful in this valley and the people who lived here were certainly adapt at carving it. The facts that these stem walls are so high and the village was outside the annual inundation zone of the Nile in this area have both contributed to the preservation of the plan outlines of the houses and have made it possible to reconstruct what the village looked like.

Tel El Amarna

Known as *Akhetaten*, or the Horizon of the Aten, when Amenhotep IV ordered it built in 1348 B.C., during the latter part of the New Kingdom, Tel El Amarna is located in a natural, semicircular curve in the face of a low cliff facing the Nile,

which bends slightly at the same point creating a harbor. The site is halfway between the previous governmental centers of Memphis and Thebes, deliberately chosen as neutral territory that would be free from the influence of the priestly establishment surrounding the deity Amun and the extensive temple complex dedicated to him, now known as Karnak, in Luxor. After the death of Amenhotep IV, who took the name Akhenaten, or “the creative manifestation of the Aten,” and that of his successor, Neferneferuaten, who some believe was his wife Nefertiti, in 1336, the city was abandoned. The couple’s son Tutankamen, most famous for the astonishingly beautiful contents of his tomb discovered in 1922, returned to Theban orthodoxy, as indicated by the suffix chosen for his name, but it is suspected that he was assassinated anyway just to ensure that the Amarna heresy had ended.¹⁴

Innovative Techniques

Because of the revolutionary aspect of the theocratic apostasy that Akhenaten had initiated, his new capital city had to be built quickly and also had to embody his principles and ideals. When he took the throne, Egypt was at the height of its power and the Kingdom stretched from Nubia to Syria. Much of the center of the city was built in two years, due to the innovation of using smaller stone blocks for the public structures and royal palaces. These were about three hand lengths long, or 60 cm, making it easy for one laborer to carry them, and are now referred to as a *talatat*, which is Arabic for three, because of the manual method of measurement used.¹⁵ The organization of the city plan, like the art for which this period is famous, broke with previous conventions and was much less formal. It has been accurately described as “a cluster of small villages centered around loosely grouped houses both large and small, each with its own subsidiary buildings.”¹⁶ The central part of the city where the Royal Residence Palace and Temple were located, was bisected by the Royal Road, along which Akhenaten and Nefertiti would ride in a chariot to demonstrate solidarity with their subjects.

The palace, which was on one side of the road, was raised up so that it had an unobstructed view of the temple and the extended shoreline of the Nile beyond it. The royal couple would cross over the road on their way to the temple everyday by using a covered bridge dedicated for their use. They would frequently stop at an opening in the middle and shower money down on their subjects who were waiting below. The residence, palace, and temple were each organized around large, open courtyards, with the buildings themselves supported by many rows of columns. The Maru-Aten, dedicated to the couples’ daughter Meritaten, was located at the southern end of the Royal Road, grouped around a lake, with a pavilion near it.¹⁷

An Egalitarian Order

The openness that Akhenaten and Nefertiti encouraged in urban planning and artistic style also extended to the houses of their subjects, since the villas of the rich were interspersed with the smaller houses of the poor. The large villas typically had one large central hall with dependencies such as bedrooms and the open courtyards associated with them organized around it. This cluster was surrounded by a second rank of servants’ quarters and service functions such as the kitchen and gardens. There was a separate settlement of the workers and artisans who actually built

Akhetaten, consisting of about 70 small houses organized in a roughly square block, clearly distinguishable from houses in the rest of the city.¹⁸

GREAT ZIMBABWE

A walled city was built in Zimbabwe about A.D. 1100 and was a political economic powerhouse for the next 500 years. The stone walls that remain today testify to a high level of masonry skill, standing 37 feet high in some places, with 4 feet wide gates cut through them at strategic locations.¹⁹ The settlement, which covers an area of 1,779 acres, included three separate zones: the Hill Complex, the Great Enclosure, and the Valley Ruins. The Hill Complex, which is the oldest part of the settlement, was obviously selected for its value as a vantage point and its ability to be defended. There are houses, called *daga*, inside its 328 feet long and 148 feet wide walled enclosure that are either round or oval mud brick huts covered with thatched roofs. These vary in size and shape, creating an organic pattern in plan that covers the hilltop. The Great Enclosure, which is on the southern side of the valley that separates it from the Hill Complex, is about 650 yards away from it and is about one-quarter of its size. It has a high, roughly elliptical wall capped with open work known in Arabic as “sixes and sevens,” because the alternating V-shaped stones represent those numbers in the language. The Great Zimbabwe is known as *Imba buru*, or “house of the great women” in Karanga, which is a Shona dialect.²⁰ It has a 30 feet high, 18 feet diameter conical tower built into the wall, which one historian has taken as a symbolic portion of its purpose, which he believes to have been a royal palace, in which the grooves in the walls perhaps represented the female anatomy and the conical tower a phallus, so “the compound was used for adolescent initiation rites or for other important ceremonies” and “it may also have housed the many wives of the ruler.”²¹

Control of the Trade in Gold

Great Zimbabwe was strategically located as a control point on the main route between gold fields to the north of it and the Indian Ocean, which seems to be the source of its wealth, and as its prosperity increased there are indications that the three separate parts of the city grew also, which explains its organic form. The Valley Ruins are also evidence of this expansion, since they were the last to be built, hinting at a binuclear arrangement of a high fortress and second settlement below it at first, followed by overflow housing as the population grew.

House of Stone

Dzimbabwe, from which the name of the country where this walled city was taken after it was changed from Rhodesia after independence from the United Kingdom in 1980, means “houses of stone” in Shona.

THE NUBIAN HOUSE

Nubia is a geographic region concentrated along the Nile, divided almost evenly by the border between Upper Egypt and the Sudan so it is an ethnic rather than

a national designation. The second cataract of the river at Wadi Halfa acts as a more natural dividing line between the Egyptian and Sudanese Nubians than the border itself.

Nubian culture is very diverse. The only consistent link is the Nile, and yet the landscape around it constantly changes. In Upper Egypt, huge sand dunes come down almost to the edge of the riverbank, but near the Wadi Halfa the banks flatten out into wider areas strewn with large boulders, and acacia groves begin to soften the plains beyond. The Kanuzi Nubians, faced with the challenge of a harsh, treeless environment, and the problem of roofing over spaces without wood for beams or supporting members for centering of scaffolding, have perpetuated a building technique that has been used in Egypt since at least the thirteenth century B.C. It has been identified as having been used to build the Ramesseum, the mortuary complex of Ramses II, which is across the Nile from Luxor. This was the utilitarian storehouse part of the temple, holding the provisions for the Pharaohs' afterlife. The mud bricks used in the construction of the granaries still bear the finger marks of the masons who built them.

An Ingenious Technique

The technique used by the Kanuzi was published at the beginning of the twentieth century by several noted scholars, but was brought to public attention most dramatically by Egyptian architect Hassan Fathy, who proposed it in combination of a set of spatial typologies borrowed from the medieval houses in Cairo, described earlier here, as an inexpensive solution to the critical housing shortage facing the Egyptian peasant. In brief, this method of construction shows a great intuitive understanding of the laws of statics and resistance of materials by utilizing the compressive strength of mud brick, while avoiding tensile or bending stresses, which it cannot resist. The vaults that form the basis of the system are made in a parabolic shape that will keep the material in compression only.

Typically, the vaults begin with the erection of an end wall to the desired height of the space to be constructed. The masons, usually working in pairs, make a free-form outline of the parabolic vault in mud on the end wall as a guide. The proper shape of the curve is crucial for structural success, and learning how to lay it out without surveying tools of any kind requires long hours of practice, with skills often passed from father to son.

After this mud guideline has partially dried, the masons trim the rough edges of the parabolic arch with a sharp adze before applying the first course of mud bricks to it. The bricks used for the vault have a higher proportion of straw to mud, which makes them much lighter than those used for the walls, and each brick is scored with two finger grooves while still wet in order to give better adherence to the mud mortar.

A starter brick is laid straight up at the base of the vault line on both sides, and mud mortar is packed on it to form a wedge that is thinner at the top of the bricks and wider at the bottom. This sets the angle for each of the vault courses to follow, so that they incline toward the end wall in compression rather than remaining perpendicular to the ground, which would make them collapse. As each course of bricks is added, the masons stagger the joint lines between each row of bricks to

assist in resisting structural stresses related to bending moments and gradually continue to make the mortar thicker at the base of the arch than at the peak so that the entire assembly leans on the end wall.

This purposeful inclining of the vault as it is put into place accounts for the characteristically massive vertical end wall and sloped front edge of the vaults that are usually found in these mud brick houses. The recommended span for vaults built this way is 3 meters, and 5 meters is the maximum diameter for domes using vaults as buttressing, which limits the width of the rooms that can be built using this method. Aside from favorable aesthetic considerations, the vault also has the advantage of allowing more natural air ventilation in the higher space that it creates. If the ends of the vault are provided with open grilles, a convection cycle can be created that is difficult to achieve in the flat-roofed, wood-beamed houses farther up the Nile, keeping all the rooms of the house cool during the hottest times of the day.

Domes Are Symbolic

The use of dome forms that architect Hassan Fathy adopted for his houses has been restricted by the Nubians to buildings with religious functions, such as mosques and the tombs of saints. There are exceptions, however, where more conical shapes are used over purely utilitarian structures, but care is taken in these instances to avoid a hemispherical outline.

The religious connotations of the dome form may come from its symbolic connection with the sky vault, as indicated by the Arabic word *qubba* for dome from the Aramaic *qubtha*, the vault of heaven. The use of the dome for tombs in particular has been ascribed to the Shiite influence of the Fatimids who entered Egypt from North Africa in A.D. 969 to found Cairo.

Clearly Designated Functions

Nubian house forms were also affected by the conversion to Islam, mainly in ways related to privacy and the separation of the sexes. Archaeological excavations near the Wadi Halfa have shown that the houses of the Christian era consisted of a string of rooms grouped around a single entry space with no central open area being used. The courtyard, as a device for protecting private family areas from the view of guests, eventually appeared as a standard feature in the houses of all the Nubian groups, although both the size and the function of the rooms surrounding it vary greatly from Egypt to the Sudan. In the village of Abu al-Riche, near Aswan, for example, two rooms that are always a common denominator are the *mandara* and the *khayma*. The *mandara*, which is set aside for guests, is usually located close to the main entrance and placed in such a way that the view into the interior of the house is blocked. All windows from the room face the street only, and it is normally vaulted and spacious compared to the other spaces of the house, indicating the importance of hospitality in this society. The *khayma* is a flat-roofed loggia, covered over with palm leaves for coolness, that is located on the private side of the courtyard and used as a sitting and sleeping area for the family, especially during the summer when the temperature in Upper Egypt can reach 55 degrees Celsius.²²

In the Wadi Halfa region there may be rooms given over to guests, where a *dirwan*, or sitting room, is reserved for wedding receptions only, a *dirwan basil* is used as a social space for women, and the *mandara*, which serves the same function as in Aswan, is provided with an additional antechamber, or *dabliz*, to insulate it even further from the private family areas.

In addition to the innovative construction methods and spatial forms and organizations used by the Nubians, their method of exterior decoration in painted scribed earth is unique and shows a high level of empathy for the plastic and artistic potential of the material, using mud plaster as a protective as well as a decorative medium.

A Cultural Disaster

The construction of the Aswan High Dam, which began in 1960, led to the flooding of the majority of the Nubian homeland, obliterating most of the traditional villages where this style of architecture existed. Prior to the flooding, the Egyptian Minister of Culture Tharwat Okasha, in an enlightened gesture acknowledging the rare beauty of the work, invited a group of architects, artists, photographers, writers, poets, and musicians to visit this area to record what they saw before its destruction. Hassan Fathy was part of the group and was greatly moved by this farewell visit to the heartland of a people whose architecture had so greatly influenced his own, both technically and intellectually. As a result of the trip, he produced an extensive survey of the buildings he saw.²³

Asia and Australasia

ZHOUSHUANG, A CANAL VILLAGE IN CHINA

Zhouzhuang is located in the Taihu district of the lower Yangtze River basin in the Jiangsu Province of China. This small village is more than 1000 years old and is one of 200 similar townships located in what is known locally as “water country,” because of all the streams, ponds, lakes, and canals that crisscross the area. This region lies between the major cities of Shanghai, to the east, and Nanjing, to the northwest, and is bounded by the Yangtze River to the north. It has four distinct seasons and the climate can generally be described as temperate, although snow is typical in the winter, and summers can be very warm and humid. This has a direct bearing on the design of the houses that have evolved there over time. Because of the high water table and the proximity of the Yangtze, the soil is very fertile, so it is among the most productive agricultural regions in China, to the extent of also being referred to “*yu mi zhi xiang*,” or “the land of fish and rice.”

Ancient Heritage

Zhouzhuang was founded in A.D. 1086 by a wealthy landowner named Zhou Di, who established it as a settlement for farmers. He eventually donated his own house to the town, along with an additional 13 hectares of land that was dedicated for the construction of a temple complex for the community, which was then named in his honor. During the Song Dynasty, from A.D. 960 to 1279, this entire region thrived and Zhouzhuang was a direct beneficiary of its prosperity, becoming a major cultural and economic center. This growth was fueled by the construction of the Grand Canal from Beijing to the southeastern part of China, which made trade between the richest of the eastern regions more efficient and was far less risky than exposing trading vessels to the vicissitudes of traveling along the coast.¹ Major stretches of this Canal have now been replaced by highways and urban development or filled in for agricultural use, but Zhouzhuang is a vivid reminder of what life must have been like along its shores. Drawings and paintings of it that have

survived depict it as a liquid lifeline that fed a bustling, thriving society along its edges. These idyllic images portray a way of life that is far different from the increasingly polluted industrial wasteland that is now replacing it. Zhouzhuang is one of the last remaining remnants of a far more peaceful way of life, but is itself increasingly threatened by the drastic changes taking place around it.

The wealth and importance of this densely textured water village continued to grow when the Emperor Gaozong moved his capital from Kaifeng to Hangzhou, which is relatively close to Zhouzhuang and is famous for its beautiful central lake. Prosperity continued when a rich entrepreneur named Shen Wansan established a business there during the Yuan Dynasty (from A.D. 1271 to 1368). This mixture of wealthy inhabitants, farmers, traders, and fishermen is legible in the house types seen throughout the village, which run the gamut from palatial residential compounds to simple row houses connected by party walls along each of the twisted, narrow walkways, which are typically only wide enough for two people to pass.

An Organic Organization

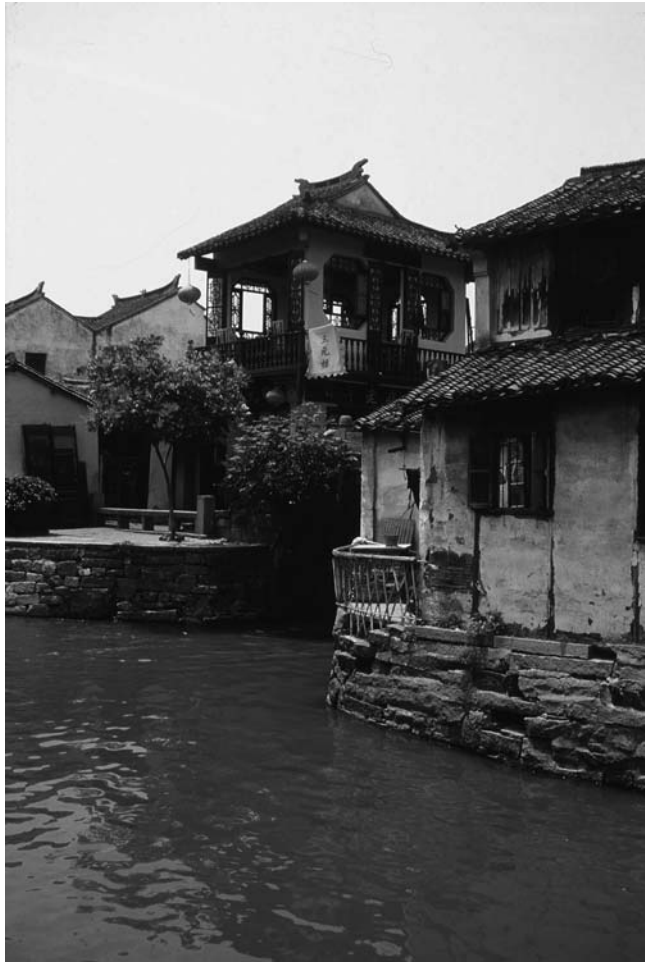
While it seems chaotic to a pedestrian who has never experienced it before, Zhouzhuang does have a roughly grid-like pattern of canals, organized around two main waterways called the *Nanshibe* and the *Beishibe*. These form the major thoroughfares for the long, slender rowboats that are the local equivalent of gondolas that move up and down them, with women, rather than men, traditionally acting as the gondoliers. There are many small bridges crossing over these two major canals and their smaller tributaries, but the most recognizable of these, due to its elegant design, is the Fu'an Bridge. It was built in 1335 and is now one of the most prominent focal points in the village. This canal system is fed by four major lakes that surround the town, and nearly one-quarter of its area is covered by water. The plan of the village is the serendipitous result of a skillful and sensitive reading of the position and flow of the original water bodies on the site and the need for an efficient movement system through them, based on the recognition that waterways would be essential to the health and growth of the village over time. Main streets, which are really little more than alleys, generally run parallel to the rivers and canals. Zhouzhuang also follows the pattern found in other traditional water villages in that its houses are designed to face the street in the front end and to open up to the water in the back. There are two main advantages to this alignment. From an economic standpoint, this made it easier to run a business at the ground floor level, since customers and clients could have access to trading houses from the street, and goods and merchandise could be delivered from the back. From an environmental point of view, the street, which was paved with flat stones, serves as a perfect convective generator, drawing the cool air from the river or canal in the back of the house through the entire length of it on all levels, as it heats up during the day and the warm air from it rises. In the winter, this cycle would reverse, bringing warmer air through the house in the other direction, because the water would act as a heat sink. In the houses of the more well to do, courtyards were added to this linear sequence to help accelerate the process, as well as to help control the public/private division that running a business on the ground level necessitated.²

A Distinct Character

Because of the humid conditions Zhouzhuang evolved in, and the modest lifestyle of most of its hard-working inhabitants, many of the houses that line the canals of the village are simple, two story timber frame structures, with whitewashed brick walls and gray tiled roofs. Although this creates a largely black and white palette, there are accents of rich colored woodwork and deep red window frames that add subtle visual cues to enliven it. Other components of the village, such as bridges, streets, river banks, wharves, and water plazas, are faced with local stone, which is plentiful. Bridges are an important feature in Zhouzhuang, connecting seven islands in 19 different locations. These not only serve as connections over waterways, but their placement also marks a historical event or a focal point in the social, economic, and artistic life of the community.

Coping with Capitalism

The quiet water town of Zhouzhuang was initially brought to public attention when Chinese painter Chen Yifei put 38 of his paintings, some of which depicted the village, on display in a gallery in New York City. This has initiated a large tourism industry in the town, which generated nearly \$40 million in 2006. While there are apparent difficulties involved in maintaining its traditional architecture and culture, Zhouzhuang has managed to make the most of this drastic change. Its mayor has worked to implement a preservation plan put forward by Tongji University in 1985, which acknowledges that changes are inevitable. Part of this plan involves the relocation of nearly half the population, along with schools and other noncommercial activities, to open space outside the village to make room for shops and restaurants. Restoration efforts have been made, but in many cases do not follow traditional construction methods, such as the substitution of concrete where stone would have originally been used. Government officials justify this by pointing out that concrete is more durable and resistant to moisture and that the craft of making bricks from the local clay has now died out.



There are six so-called “Water Villages” located within the farming region west of Shanghai. Zhouzhuang, which is one of the most accessible of these, is now flooded by tourists. *Source:* James Steele

Over time the commercial center of the town expanded westward, and it reached its peak of growth and prosperity in the eighteenth century when a population of approximately 3,000 residents was recorded. In contemporary times, the village population has varied around 4,000 in 1953 to only 1,800 in 1986. In addition to permanent residents, in 1986 nearly 3,000 transient workers commuted daily to Zhouzhuang to fish or work in one of the village's 15 factories. Also at the time of the 1986 census, the average age of a resident was 61, signifying the migration of youth to the cities. The Tongji University scheme takes these changes into consideration by proposing new teahouses, restaurants, shops, and galleries mixed in with the houses that line the pedestrian walkways that run along the canals. Since this proposal was put forward, however, the village government has started a public relations campaign to attract tourists, proclaiming Zhouzhuang to be the "number one water country village in China." It now requires visitors to buy an entrance ticket to get into the Old Town section, and in 2006, nearly two and a half million visitors patronized the nearly 500 shops and restaurants that have been added to this small area. The growth that has taken place in Zhouzhuang focuses attention on the challenge that those promoting the preservation of a rich national heritage now face in China, where urbanization has grown so quickly and people are so eager to accumulate all of the modern conveniences that were unavailable to them for so long, causing a decline in an appreciation for heritage and craftsmanship.

THE DAI AND THAI HOUSE

Background

Thailand is located in the southeastern part of Asia, bordered by China to the north, Laos to the east, Myanmar to the west, and Malaysia to the south. It is roughly 200,000 square miles in area, with a diverse topography that varies from forested mountain ranges in the north to dry plateaus and fertile river plains in the middle to tropical beach areas in the south. Since it is primarily a tropical country, it is subject to monsoon rains from May through September. Otherwise, the weather is hot and humid from March to May and cool from November through February.

The predominant religion in Thailand is Theravada Buddhism, just as it is throughout the rest of this part of Southeast Asia, with the exception of Malaysia, which is officially a Muslim nation. Theravada is also known as the "greater vehicle" because it maintains that enlightenment is not only possible for a select few, who emulate the physical deprivation practiced by the Buddha, but for anyone, with the help of a guru or *bodhisattva*. The Mahayana school or the "lesser vehicle" is far more acetic.

Thailand was previously known as Siam until 1946, when the name of the country was officially changed during the reign of King Rama IX. The Thais themselves refer to it as Prathet Thai, which means "free country."

Different Theories of Origin

There are several conflicting opinions about the origins of the Thais. One theory is that they emerged about 4,500 years ago as a nomadic tribe in the northwestern

part of the Szechwan Province of China and slowly migrated southward from there, splitting into two distinct groups. One of these settled in the north and eventually established the Lanna Kingdom, while the second moved south. The second group was conquered and subjugated by the Khmers, but eventually became independent and formed the Kingdom of Sukhothai.

Lanna

The Lanna Kingdom, which covered eight regions in northern Thailand that include Chiang Mai, Chiang Rai, Lampang, Lamphun, Nan, Phayao, Mae Hong Son, and Phrae is known for its cooler climate because of its higher elevation in the mountains that now separate it from Myanmar and Laos. Lanna, which means “a million rice fields,” was founded in A.D. 1296 by King Mengrai who captured the Mon stronghold of Haripunjaya and established his capital at Chiang Mai on the Ping Riva. Lanna culture, which had its own dialect and distinctive architectural and artistic style as well as its own legal and literary tradition, flourished for over 200 years, reaching its peak during the reign of King Tilokorai in the fifteenth century. After his death, Lanna was weakened by wars with Sukhothai to the south, as well as by internal conflict and the Burmese invasion. It was annexed to Siam in 1892.

The Lanna House

Each of these phases had an impact on the style of the Lanna house, as well as on the religious monuments with which it shares a common architectural heritage within Theravada tradition. The house, in addition, exhibits decorative elements based on animism, which predates Buddhism, especially forest and animal motifs, such as *kbrue thao*, which represents vines and *kalae*. *Kalae*, which are indigenous to Lanna houses, come from the *kbrue*, meaning “glancing crow,” presumably because of the “V” that is formed by extending the large boards of the roof about three feet above the apex of the gable, looking like a crow’s eye. A *ruen*, or *bevan kalae*, refers to several gable-roofed houses with these horn-like extensions placed together to form one residence, connected by a terrace.³ Like the Dai and the Malay houses, the Lanna house is based on a precut wooden frame on or into which the side walls are inserted, sloping outwards rather than being straight or sloping inwards, as they do in the traditional houses farther south. To keep the rooms as free of clutter as possible, a wooden bin called a *kbwan* is suspended from the rafters and is used for the storage of kitchen and other household items. The raised terrace, which connects the units together, typically has a balustrade around it with a shaft around the perimeter, called a *ron nam*, where water jars are placed.⁴ Since teak wood was abundant during the Lanna period, and is strong and resistant to infestation and moisture, it was the material of choice for house construction, as well as by the artisans who carved these images into it. But much of this has been lost.

Sukhothai

The second strand of Thais, who migrated south, confronted the Mon civilization (also called the Dvaravati), who shared common lineage with the Khmers. Dvaravati was influenced by Indian culture, at its strongest in Nakhon Fathom,

Khu Bua, Phong Tuk, and Lopburi. In 1238, two Thai governors, Khun Bang Klang, who is also known as Si Inthrahit, and Khun Pha Muang, organized a rebellion against their Khmer overlords and established the first purely Thai kingdom of Sukhothai in this area. It is remembered as a time of peace and prosperity, commemorated in a popular saying that there were then “abundant fish in the water and rice in the fields.” The borders of the Kingdom of Sukhothai eventually expanded to just below Lamphan in the north to Vientiane, in present day Laos, in the east, and into Malaysia in the south. During this period, strong diplomatic ties were established with neighboring rulers, and there was a free exchange of ideas and cultural influence, especially with the Chinese, the Khmers, and the Indians. After the death of Khun Pha Muang in 1279, King Ramkhamhaeng, the third son of Si Inthrahit, ascended to the throne. Under his rule, Sukhothai was even more closely aligned with China. He also devised a new writing system, which eventually evolved into the modern Thai alphabet.

The Dai and the Thai

There is a striking similarity between the religious structures and the traditional residences of both the Thais and the Dai, which is one of the 56 different ethnic groups in China, and still exists directly across the border in southern Yunnan Province, which seem to strongly indicate a common ancestry.

But there is also a theory, which challenges this diffusionist view, that argues for indigenous origin, based on excavations in the village of Ban Chiang in the Nong Han district of Udon Thani Province in the northeastern part of the country. Evidence of early bronze metallurgy that has been discovered there has led archaeologists to conclude that migration alone may not account for the ethnic origin of the nation.

Physical, social, and cultural similarities aside, the argument will now be put forward that the Thai traditional house is an extension of a Dai predecessor. Domestic architecture is the major focus of this book, but to the extent that religious structures have influenced house design in Thailand, it must be briefly mentioned here. The similarities between Thai and Dai religious complexes further strengthen the case for a single origin, which is relevant to a discussion of their common housing type.

The Temple as a Large House, the House as a Small Temple

Theravada Buddhism entered Thailand from China, in the sixth century A.D. As one historian describes the sequence:

The Theravada school of Buddhism . . . entered China from the south during the sixth century A.D., having traveled from India from Sri Lanka, and its trading partners in the states and kingdoms of the era in the Southeast Asian peninsula, especially in what are now Burma and Thailand, as well as into the Dai regions of Southeast China who were converted.⁵

A temple is referred to as a *wat* in Thai and is typically both a place of religious worship and a monastery for monks, which are referred to as *sangha* and are typically male. Traditional Thai temples, like those of the Dai across the Chinese

border, do not simply consist of one structure, but are a compound made up of many buildings. These include a *chedi*, *bot*, *viharn*, *sala*, *haw-trai*, and *mondrop*. The *chedi* is considered the most sacred of all of these because it contains a relic of the Buddha. It is thought to have been derived from the Indian *stupa*, which is a domical structure serving the same commemorative purpose, but in China and Japan evolved differently into the pagoda form. The *bot* (or *ubosot*) is an ordination hall, where the monks worship and meditate, separate from their living quarters. It is not open to the public and faces east. It is preferable for the *bot* to be near water if possible, because the Buddha is thought to have achieved enlightenment while facing a river. The *bot* is typically rectangular with a tall, narrow door at one end and a distinctive multilayered and gently curved roof, which is thought by some to have been derived from a similar roof form in both the Dai and Thai houses.⁶

The *viharn* is similar to the *bot* in that it is a prayer and assembly hall but differs in being open to the public. People gather here to listen to the monks chant and read from Buddhist scriptures. The exterior of the *viharn* is also similar in appearance to the *bot*. In both Thai and Dai villages, the *viharn* is given a prominent place of honor, so that it is easily recognized and dominant in the horizon. It may not always be in the center, but it is always given the most advantageous siting.

The similarities between these two cultures continue in the remaining parts of the temple compound: the *sala*, for public assemblies that do not relate to sacred ceremonies, the *haw-trai*, or library, and *mondrop*, or bell tower. They also extend to decoration, although after the Thais migrated, their temples evolved different kinds of imagery. Decoration includes wooden carvings, mother-of-pearl art glass, tile, and even paint, as well as images that include mythological serpents and monsters like the *kala*, which is a fanged creature that guards the temple compound.

The Dai and Thai Traditional House

Finally, then, to the main issue: the basic aspects of the traditional house of these two groups. The traditional Thai house was initially designed in direct response to Thailand's geographical climate conditions, and today it is respected for its architectural beauty. Records of the houses can be traced back to as early as the eighth century with its depiction on Dvaravati stone reliefs. Also known as *ruen Thai derm*, the traditional Thai house in general, like the Lanna house, is characterized as a wood dwelling raised off the ground on posts with a gabled, elegantly tapering roof. The design functions in harmony with the tropical environment, which has abundant rainfall, often leading to flooding. In addition to the Lanna in the north, there are three geographical areas in Thailand: the central, the northeast, and the south regions, each with its own subtle variations on the Thai house.

Village Types, the House in Context

Before modern times, the traditional Thai house operated as an integral part of the village community and served a way of life that has now all but vanished. One of these village types is the ribbon, which developed along rivers and roads. Growth occurred in a linear way, with houses located along the river that was essential for domestic and agricultural use, as well as for communication. Directly behind the houses and other village facilities, fruit orchards and rice fields would typically be planted.



Wat Chai Wattanaram Temple, Ayutthaya, Thailand. Courtesy of Shutterstock

Cluster-type villages developed in areas away from waterways, usually on high ground above rice fields. The villagers built their dwellings in close proximity and then spread outwards to work the fields. Water was provided by a community pond that was replenished by the rains and annual floods. The third village style was the loose village, which consisted of scattered houses on personal plots of farmland. These houses may have originally developed from rice huts, and their physical isolation prevented close-knit community growth.

While different village types arose out of varying geographical locations, types of the traditional Thai house differed according to family structure. The most basic organization occurs in the nuclear family single house, with a mother, father, and unmarried children. The *sork* is the unit of measurement used in the construction of the house, with one *sork* being the span of an adult's elbow. The sleeping room, for example, is 6–9 *sork* wide and 15–18 *sork* long, which is divided into three spans, one for an open hall and two for the bedroom. A living area is created by connecting a covered verandah, which is connected to the front of the bedroom, to the terrace. The terrace serves as an outdoor living area, as well as a space for bathing and washing.

When children get married, the nuclear family expands since Thai custom calls for a married man to live with the family of his wife. At this point the family typically built a second house next to their own, if possible, to avoid taboos relating to adapting buildings and to ensure a degree of privacy for all family members,



The Dai and Tai House. Courtesy of Frans Devriese. *Source:* Flickr

creating a clustered house. The new house was oriented with the gabled ends facing in the same direction as the old, if the site allowed, and is usually filled in on only three sides, leaving the side adjacent to the parents' terrace open.

The raised floor. One of the most prominent characteristics of the traditional Thai houses is the elevated position. They are typically raised above the ground to just above head height, and many houses will integrate varying levels determined by differing spatial functions. The highest part is the bedroom floor, which is approximately 260 cm above the ground, followed by 40 cm drops for the verandah and then the terrace. These 40 cm height changes allow for floor surfaces that act as benches. There are several reasons for the raised house design with the primary concern being floor evasion. During the rainy season, all regions of Thailand experience flooding, which can sometimes last several months. When the ground becomes inundated with water, people, animals, and equipment are able to stay dry.

In China, the raised dwelling is called the *gan lan* or “house on stilts.” It is a very old typology, having been discovered in ancient settlements along the Yangtze River basin and farther south and developed as a defense against flooding, malaria, reptiles, rats, and insects. It is obviously different from the urban *butong* house, which is on grade and consists of a series of rectilinear blocks strung around the perimeter of a site to create two, three, or more internal courtyards, which was favored by the Han Chinese. The Dai and Thai houses also differ from the Han courtyard house in being less axial, more open and overt, less private, less permanent, and nonadditive. That is, rather than adding another room onto the *butong* house to include new family members, newly married Dai and Thai sons and daughters leave and build houses of their own.⁷

Shaded ground level. Raising the house on columns provides a shaded area under it. This area is well ventilated and cooler because it is shaded, and it is a popular place for the family to sit during the day. In wealthier households, this open area between the ground and the first floor may actually provide living quarters for servants, as well as a place for the family to live during the day. There will typically be a hammock here for resting or for rocking a baby to sleep, and grandparents may sometimes take care of children here if their daughter or daughter-in-law has to go to work in the fields or elsewhere. Sometimes cottage industries, such as metalworking or basket weaving, are performed here too. In rice growing areas, the ox cart, which is an important implement that is still widely used for carrying the rice sheafs from the field to the house or the milled rice from the house to market, will be stored here, as well as other farm implements, like the sickles used to cut the rice, and sometimes the generator used to run the milling machine itself. Although automation and larger conglomerates are taking over some of the farms in Southern China and Northern Thailand, as well as in Laos, Cambodia, Vietnam, Malaysia, and Indonesia, as has already happened in Japan, most of the backbreaking work of planting, harvesting, shipping, and threshing rice is done by people working from sunrise to sunset. The water buffalo, which may seem like an anachronism to outsiders, is still a vital part of this process, and is used to walk on the sheafs of rice to separate the grains from the stem. It is also used to plow the land after each harvest, which can be three times a year if the soil is good enough and there is enough water available. Much of this replanting is still done in the ancient slash and burn way, since cultivating machinery and fertilizer are too expensive. After the rice is hand cut and the sheafs are taken to the house to be winnowed on a rattan mat spread out underneath it to catch the grains as they fall, the stubble, which can still be up to two or three feet high, is burned. When the fire stops, the field is flooded by whatever means possible, and once it is wet enough to work, it is plowed by a man walking behind one or two buffalo. Then it is flooded again and hand planted with fresh shoots of rice. The water buffalo, as well as assorted cows, pigs, and chickens are kept in stables under the house, protected from mosquitoes by net screens. Their waste is collected by hand daily in a wedge-shaped basket to be spread on the garden as fertilizer. The burned rice stubble, when plowed under, acts as fertilizer as well, as it is high in nitrogen.

So, the space under the house, which may be as little as 6 or as much as 10 feet high, depending on the module the builder has used, is an important, multipurpose area that facilitates many parts of daily life in this part of the world.

The stair. One steep stair provides access up to the main living floor of the house, and the number of steps used in Dai communities of Yunnan Province, as in northern Thailand and in the traditional Malay house, has deep symbolic significance as a protection against evil. Ghosts are considered to be unable to negotiate an odd number of stairs, as well as angled passageways.

The veranda. The stair leads to a covered porch-like balcony attached to the house and open on three sides, which in Malaysia is called the *dapur* and doubles as a reception space for visitors. Because it is still outside the main living area of the house, family privacy is preserved. This can be used for larger gatherings, such

as wedding receptions, for visitation to offer condolences or pay respects after a funeral, or for other major family events.

Living, eating, sleeping. Since the perimeter of the house is usually nearly square, or at least the raised floor is, the interior is simply partitioned into a living, dining, and kitchen space on one side and a sleeping space on the other, usually on the left side of the entry. Dai and Thai houses differ in this regard from the Malay house, in which the kitchen is usually located outside to avoid burning the house down. Yunnan Province and northern Thailand, especially in the mountains near Chiang Mai, Chiang Rai, and Mai Hong Son, also get much colder than anywhere in Malaysia, which is closer to the equator, and so the cooking hearth also serves as a source of heat, as it also does in the rural *minka* of Japan.

The spirit house. An animistic holdover in these provinces is that the spirits in the earth that are disturbed and displaced when a house is built must be appeased by the provision of another “spirit house” for them. This is usually a smaller replica of the house placed on top of a pillar somewhere in the corner of each property. These used to be much more ornate than they tend to be today, made with as much care as the house itself, rather than being mass produced in garish colors as many of them are now.

A complex set of customs and rituals apply to those living in or visiting a Thai house, developing upon an individual’s stature within the family or relationship to it. The plan configuration of the house is also a spatial manipulation of those unwritten codes. Visitors, for example, are confined to a room located closest to the house ladder or stair (*ban dai*) and the *saam*, which is that part of the connecting raised terrace that serves as an open entrance platform. This guest room, also known as “the little house,” faces south toward the entrance terrace, as the first of a series of rooms organized on a north-south axis. If conditions allow it, the kitchen or *kbrua* is an extension of the guest room, in its western end, and a small open court separates guests from the main family area, or *buean yaai*, also known as “the large house,” even though it may be the same size or even smaller than the guest house. A bathroom, or “wash place,” *haung noam*, is usually located on the western side of this small dividing courtyard, contiguous to the kitchen, on its northern end. The rectangular family area is further divided down the middle into two roughly square parts, with the eastern part occupied by the parents and the western half by the children; and each half has a door to allow separate entry if a partition is built down the middle, as it usually is. When a daughter marries, her husband moves into this western half of the family area, occupying the section along the wall, while the unmarried children sleep against the dividing partition.

Position Is Everything

In such open surroundings, privacy and decorum are assisted a great deal by the place each family ensemble occupies on the floor. In a Thai house, the father sleeps on the right side of half of “the large house,” along the east wall, related to a small head of the household. His wife sleeps closest to the middle partition, and daughters sleep to the left of her. Sons occupy the space between the female children and the married daughter until they reach puberty, after which they move into a part of the “little house” set aside for them. When the married daughter’s husband moves in, his position to her left against the wall has been identified by ethnologists

as expressing “the fact that he is an intruder into the family and isolates him from the other women, particularly unmarried daughters in the middle of the room.”⁸ This same source eloquently describes the important associations that directions have for the Thais, which also apply to the Dai, in which

the north and east are auspicious orientations, south neutral, west inauspicious. North is related to the elephant, a royal animal important in Buddhist mythology and when facing north the east is on the right—the dominant hand, and that associated with the male sex. The east-west axis also relates to the rising and setting of the sun, thus east is life giving while the west is associated with death. For this reason, people normally sleep with their heads to the east, while a corpse is laid out with its head to the west.⁹

This attention to orientation also means that the “large house” should never face west, while the washing room must always be on the western side of the house because it is impure.

HUTONG

The Chinese word *hutong* translates roughly into residential district or quarter but has come to imply a special configuration of dwelling characteristics of older, walled Chinese cities like Beijing, Nanjing, and Pingyao. To understand this house type, it is necessary to first discuss the urban context related to it, since it is so closely connected to the urban fabric.¹⁰ The *hutong* of Beijing are a representative example of the type. Beijing has been continuously inhabited in different forms since the first millennium B.C., due to its strategic location at the crossroads of several important trade routes and mountain passes. The historical city we see today was established by Genghis Khan after his imposition of a Mongolian Empire in the twelfth century. He made it the northern terminus of a grand canal that he ordered to be built, running roughly parallel to the coastline and ending in Nanjing. It is as much of an engineering marvel as the Great Wall, but not nearly as well known because much of the waterway has now disappeared under urban development. Because of this additional economic impetus, added to that of the Silk Route, which also ended there, Beijing, or Khanbaliq as it was known, prospered beyond belief.

Strict Organization

After a relatively brief hiatus during which the capital was moved to Nanjing at the beginning of the Ming Dynasty, it was relocated back to Beijing at the end of that period. The Manchus, who followed, did not change the city plan, which conformed to a gridiron pattern first established at Chang’an and institutionalized there. It refined that compartmentalized layout by stratifying social classes even more clearly in four successively exclusive zones, which were each surrounded by a wall and a moat. Moving from south to north, as these zones would be experienced by any visitor who was privileged enough to be brought into the throne room of the emperor, these are the Outer City, the Inner City, the Imperial City inside the Inner City, and finally the Forbidden City, where the emperor’s palace

was located. Beijing also differs from the strictly rectilinear pattern of Chang'an in its adaptation to a natural watercourse, which flows down from the mountains to the northwest and penetrates the wall of the Inner City at that corner. It finally ends up as an organically shaped lake that forms the western edge of the Forbidden City. In addition to its strategic location as a trading city, Beijing was also chosen because it has good *feng shui*, a Chinese concept based on geomancy that literally means “wind and water.” Although *feng shui* has now become much more obtuse, it originally referred to good orientation, and the best site for a city was considered to be below the south-facing slope of a mountain with water nearby. Rather than simply being based on aesthetically driven criteria, these factors ensured protection from cold winter winds coming down from Manchuria, to the north, and cool breezes when the direction of the flow changed during the summer, since the temperature of the air drops as it passes over water.

Feng Shui in Houses

This preference for southern orientation carried over to the houses, which are organized on a north-south axis in Beijing, aligned with the walls of each of the four districts. They are strictly organized according to socioeconomic level, but all follow a typical planning format, based on the *sibeyuan*, which is a central courtyard surrounded on each side by a single-story rectangular building, with the entrance being on the southernmost side adjacent to the street. This front door, or *chuihuamen* (“festooned gate”), was covered by a gable roof that was higher than the rest of that portion of the house, usually occupied by servants, because it was the most vulnerable. Its street side was completely windowless as were those of the houses adjoining it, creating a blank 10 to 12 feet high wall to the public. Since the streets giving access to the *hutong* had no sidewalks, they have a forbidding, unwelcoming aspect, which was intentional, since the protection of family privacy was an utmost concern.

The whole concept of public space, in fact, in Beijing and throughout China during the Manchu, Ming, and Qing Dynasties when the historical core was at its height, was quite different from that in the West at the same time. Women rarely left the home, and the custom of foot binding, which was common at the time, was partially intended to ensure that they physically could not do so. So the house was their entire world, from birth to death. The house often also served as an office or shop, so the owner himself may have only rarely ventured outside. Commercial areas and shops were located in specified areas, and servants usually did the shopping or vendors made deliveries directly to the entrance. There were specific times during the year when the emperor performed certain rituals, in which upper social echelons could participate, according to rigid etiquette. Important research has been done recently showing how closely the size of the main open spaces in the Forbidden City matches the number of people allowed to participate in these annual rituals, indicating that they are far from being random as are, for example, the size of plazas in Europe, since they have grown organically by accretion, over time.

The front door to the *sibeyuan* compound was massive and studded with huge metal rivets to emphasize its role as the first line of defense against the public invasion of family privacy. After it was opened, a visitor would be faced with the “spirit

wall” as a second line of protection, to prevent direct access or view into the interior. Its name refers to the belief that evil spirits could also enter if not impeded, but that they cannot turn corners. This wall is found in many other cultures, especially throughout the Middle East. In the medieval Cairiene house, for example, this bent entrance is called a *magaz* and serves the same purposes of preserving family security and privacy and blocking direct public view into the courtyard when the front door is opened. The front gate was also built on a raised platform to block the flow of water into the *sibeyuan*.

The buildings on the east and west of the courtyard were allocated to married sons and their families or unmarried children, while the main wing, which took pride of place along the northern edge of the courtyard and had a floor that was higher than the rest, was occupied by the parents. This hierarchical organization of both the home and the city mirrors Confucian teaching about the triangular relationship between the emperor who is at the apex and his subjects, which Confucius considered to be the same as that of the father, mother, and their family. These *butong* houses also accommodated extended family, including grandparents and grandchildren, and would have a second, third, or even fourth courtyard, if necessary to do so. These additional segments were once again subject to strict rules, according to social and economic status.

Courtyard Life

There was no kitchen component in the *sibeyuan*, and all cooking was done in the courtyard, as was the washing. There was also typically one small bathroom attached to the wall next to the servants’ quarters, accessible to the street so that it could be cleaned out daily by someone who collected “night soil,” which was then spread out on the fields to fertilize them. Daily life really took place in the courtyard, or courtyards, as well as under the extended eaves of the raised arcades that surrounded them, if weather permitted. These open spaces served as a children’s playground, conversation area, living room, kitchen, and dining room all in one, although there was typically always a study incorporated into the parents’ wing. Temperature in the various wings could be controlled by inserting or removing rice paper screens, which were inserted into masonry lattice-work grilles built into the side walls, and portable charcoal burning furnaces were brought inside in the winter time for warmth.

JOMON AND YAYOI HERITAGE IN JAPAN

Two parallel traditions with ancient roots exist in Japanese residential architecture. One contentious, but highly plausible and extremely persuasive, explanation for the reason for the difference between these traditions is that one belongs to the indigenous population of the islands and the other was introduced and nurtured by others, who displaced them. The preexisting culture is called Jomon after the cord-like patterns found on the pottery it produced.

This culture predates the Neolithic Period and sustained itself until about 300 B.C. when it was challenged by outsiders, called the Yayoi who have been described as “invaders who crossed into western Kysuhu by the straits from

Korea.”¹¹ The Yayoi were assisted in their competition with the Jomon people in being faster to adapt to working with iron, so that “with the Iron Age, the inheritors of Yayoi culture emerge into proto-history as the ‘Yamato,’ the half-legendary hero ancestors of the historic Japanese.”¹² Jomon houses were pit dwellings similar to those described as being used by the Longshan and Shang cultures. Like them, they were buried in the earth to about shoulder height to take advantage of the natural capacity of earth to balance out the temperature swings that prevail at grade. If superimposed on a map of the United States, Japan would extend along its entire eastern coast, with Hokkaido in the north corresponding to Maine and Fukuoka in the south aligned with Houston, Texas. While most of the archipelago is temperate, it does have the subarctic and tropical extremes associated with those comparisons, and even in the temperate zones summers are known to be extremely humid and winters frigid with lots of snow. Although they do mitigate temperature swings, pit dwellings, with their wood frame structures and sloping thatched roofs that extended all the way down to ground level, are especially adapted to cold climates. Because their walls and floor are literally the earth itself, they are not as exposed to wind as their ground level counterparts. The rice straw used for the heavy thatched roof is also highly insulative since the air inside the center of each piece of straw prevents the transmission of cold into the interior.



The Yayoi and Jomon traditions represent two divergent directions in the history of vernacular architecture of Japan. *Source:* James Steele

Jomon Houses

Jomon pit dwellings are concentrated in the central and eastern parts of Japan, usually grouped in clusters near a dependable water source, but sited well above the flood plain. In spite of the images of them that have usually been published, they were not always circular, although this shape must have been the easiest to build. Rectilinear and elliptical plan forms are also evident, with compactness to avoid exposure being the primary criteria. Diameters of the circular forms or the longest dimensions of the rectilinear ones do not exceed 12 to 15 feet, and depths

of the pits vary from very shallow to 3 to 4 feet deep. There was a hearth in the middle of the earthen floor, ringed by stones to provide a harder surface.¹³

One of the most visible and important structures that still exists in Japan, which allows us to understand the transition from Jomon to the Yayoi residential tradition, is the Ise Shrine, near Nagoya.

The Ise Shrine

The Ise Shrine is technically known as *Jingu*, which refers to a compound consisting of the inner shrine, or *Naiku*, and the outer shrine, or *Geku*. *Naiku* is dedicated to the sun goddess Amaterasu Omikami, who is revered as the divine source of the Japanese Imperial Family line and the deity that protects the entire nation. The outer shrine, or *Geku*, is dedicated to the deity of fertility and sustenance, *Toyuke*. Amaterasu had originally been worshipped at a residential temple near the Imperial Palace at Nara, but during the reign of Emperor Sujin this dwelling was moved to the village of Kasanui. In the following dynasty of Emperor Suinin, the responsibility for the care of this sacred residence was given to Princess Yamato-hime-no-Mikoto, who selected the present location after a long search. The style of the *Naiku* shrine is very similar to representations of houses that have been found that date from the time that the 20-year cycle of its reconstruction first started in A.D. 478.

There is significance in the location of *Naiku* and *Geku*, since Amaterasu, who is the ancestral goddess of the Imperial Family, and its Yamato tradition takes pride of place in the center of the sacred site. *Toyuke*, the goddess of food and agriculture, who represents a more ancient and indigenous deity, was displaced and relegated to an outside location.¹⁴

Before the Yayoi infiltration, each region and the families living there adopted a guardian deity of fertility, with each district using different names for the focus of their worship as well as sacred zones and ceremonies dedicated to it.

By concentrating each of these individual deities into one that was also identified with the Imperial House, the fledgling Yamato government discovered an effective political means of uniting the people behind them, using potent architectural symbolism to do so.

The house form for the deities of the sun and of abundant food or sustenance seen at Ise today represents the third phase of development of the way that Shinto has designated a site as sacred. In the earliest phase of Shinto, no buildings were used, since, in a belief system based on animism in which everything seen and known in nature is considered to have a spirit, no architecture is necessary.

In the first phase, a sanctuary rope, or *shimenawa*, was placed around an object or site to designate it as being sacred. The second phase of recognition was the construction of storage buildings that were used to protect valuable offerings that were made to the deities or precious objects used for worship. The third phase was the form seen at Ise today.

The *Naiku* Shrine

Naiku consists of four rectangular buildings located on a level clearing in a dense forest. The clearing measures 55 yards wide by 127 yards long, is oriented on a

north-south axis, and is surrounded by a high three part wooden palisade. Worshipers approach up a hill along a winding path from the south, echoing a similar orientation used in the Imperial Chinese Palace architecture. The main building, the dwelling of Amaterasu, or the *Shoden*, is located in the center of the clearing, and it, like the other buildings around it, is built of Japanese cypress, or *hinoki*, which is distinctive for its even texture, gray-green color, and fragrance. No glue or nails are used since they would defile the natural purity of the material, so that *Naiku* and *Geku* are held together simply by a series of mortise and tenon joints, which take a carpenter a long apprenticeship to master. The ancient column and beam system that is used, which has no diagonal structural members, meant that the traditional Japanese house, which evolved from this Yayoi / Yamato prototype, could have nonstructural wall partitions and wide openings. This would allow for the combination of two spaces into one or the opening of the demising wall to establish a connection between inside and outside. This system is also ideal for earthquake-prone areas like Japan because it is very flexible. The bases of the cypress columns at the *Jingu* shrines come in direct contact with the earth, with no intermediate stone footing to protect the wood from ground moisture and rotting. This is especially important with the large vertical columns placed at each end of the shrine residence, called *munamochi-bashira*, which carry the ridge girder that supports the entire gable roof. The *munamochi-bashira* are considered to be the direct natural conduit between heaven and earth through which the *kami*, or spirits, pass, which in the case of *Naiku* and *Geku* are Amaterasu and *Toyuke* both designated with the suffix “*Omikami*” or “meta-spirit.”

The roofs of the shrine are steeply sloped, rather than curved upward in the Chinese fashion, and have deep eaves, which underscore their ancient lineage. The proportions are identical, but are larger than a typical residence at the time they were initiated, using what is called the “*shinmei zukuri*” or monumental ceremonial style instead, since a superhuman scale was considered to be more appropriate for the earthly residence of these deities.¹⁵ The roofs are thatched with *kaya* grass (*Miscanthus sinensis*) and have distinctive extensions of the final gable rafters called *Chigi*. The roof is protected against the uplifting force of typhoons, which Japan is subject to, by weights called *katsuogi*, which are placed at regular intervals along the ridge girder. All of these details also appear on clay models of houses that date from the fifth century that have been uncovered near Tokyo.

Minka Heritage

Except for the obvious fact that the typical Japanese farmhouse, or *minka*, has its foundation at grade, there are many similarities between it and the Jomon pit house. The most generic of these is the thatched rice straw roof, which is steeply pitched and extends down very close to the ground. Because the plan of these farmhouses is rectangular, the gable ends of the *minka* are not protected by the thatch, but the exposed surface area of the ends is kept to a minimum. There is also a strong similarity between the hearth areas of some of the Jomon houses and the *moya* of the *minka*. In each case it is the center of the house, both literally and figuratively, because it is the only place that is warm in the winter. Although the roof structure of the pit house usually projects upward from the perimeter, four columns have been placed around the hearth as the type has evolved



Before the Yayoi culture entered Japan, the indigenous people built houses that were partially dug into the earth, which had heavily thatched roofs like the *minka* farmhouses today. Source: James Steele

to hold up the apex of the roof, with one at each corner of the fireplace. In its later stages, as one historian has observed,

The most advanced type may have looked like a small, clumsy forerunner of the traditional farmhouse. One may imagine a central area like the later *moya* room, bounded by four main posts; a rectangle of substantial beams above; and a thatched gable roof with open ends to discharge smoke.¹⁶

Minka, which vary widely from region to region, all conform to the typology of this timber-framed configuration, with the steep heavily thatched roof and central hearth that has just been described. But they are much larger than Jomon pit houses were. *Minka* typically also served as a barn as well as a house, with space allowed for the livestock at the ground floor level, and the first floor was used as a storage area for their feed and bedding. By raising the wooden floor of the area used as living space by the farmers to a foot or so above the dirt floor of the stables, it was possible to retain a certain degree of cleanliness. In addition, the body heat of the animals helped to raise the ambient temperatures of the interior during the winter. A fire was usually always kept burning during the coldest months, and even though there were openings in the gable

ends to let the smoke escape, instead of having a chimney, which was thought to allow too much cold air to infiltrate, the interior of the *minka* was always smoky. Cooking was done in a pot suspended by a chain from a beam above the fire, and its distance from the fire was adjusted by a counterweight. Bedrooms were in the several stories that were tucked under the steep eaves, with their width diminishing toward the top of the steep gable, and were accessible by ladder.

Minka farmhouses, like their pit house predecessors, were well adapted to winter weather and heavy snow, but they were dark, smoky, damp, and claustrophobic in the thick humidity of a Japanese summer. Representations of an alternative type of lighter house, with a floor raised up above ground level by columns, began to



The Jomon tradition persists in the heavy wooded and thatched roof *minka* farmhouses in Japan, and the Yayoi strain is most evident in the raised floor and light frame house most commonly associated with that country. *Source:* James Steele

appear as early as the Bronze Age in Japan. A bronze mirror from the fifth century A.D. shows elevations of four houses that look remarkably like the Ise Shrine.

In spite of its general similarity to the Jomon pit house, the *minka*, which means “houses of the people,” differs widely from region to region and family to family.¹⁷ It is clear also that the *minka* farmhouse shares the same architectural heritage as the Jingu shrines at Ise as well as the storehouses that were used in the past to keep rice dry and free from rodent and insect infestation, and are still common in a far less sophisticated form throughout Southeast Asia today. The Ise Shrines are built in almost the same way that they were 15 centuries ago, and they open a remarkable window for us into the distant past. While they honor Shinto deities rather than being the houses of mortals, they do provide a substantial clue to the way in which the transformation from the Jomon pit dwelling and its *minka* descendant to the light frame house that we now associate with Japanese traditional architecture took place.

THE KHMERS IN CAMBODIA

There is exquisite irony in the fact that some of the most powerful civilizations in history, in China, Mesopotamia, Mesoamerica, Cambodia, and Egypt, which also have the most impressive monumental remains, only survive today in the everyday habits of the common people whose architecture was the most expendable. When media tycoon Rupert Murdoch was asked the secret of his success, he said, “I keep

doing what works and I stop doing what doesn't." In considering each of these cultures, it can be seen that the monumental phase of their history, in which grandiose stone pyramids, temples, and tombs were produced, was unsustainable because of the vast extent of the resources required to perpetuate it, but social patterns honed by evolutionary effectiveness were able to survive. Cultural memory is a potent force that encompasses far more than nostalgia for the way things have been done in the past and goes to a continuing respect for what works best.

Daily Life Virtually Unchanged

In Cambodia, this is especially true. Speculation continues to swirl around the question of what happened to the people who built the beautiful temple cities around Siem Reap between A.D. 770 and 1295. But the answer is simple; their descendants are still there, living in the same way they lived when these grand cities were at their height of power, before they collapsed from the inability to meet the demands of food production and defense that a rapidly increasing population placed on them.¹⁸ In a way that is startlingly similar to other cultures, such as the Maya in particular, the houses of Khmer farmers today are virtually the same as they were 800 years ago.

Origins

The origin of the Khmer people, as well as that of their kings, is still a mystery, but mention of them begins in the records of the Chinese, with whom they traded, in the seventh century. The earliest inscription in Khmer script, which was based on Sanskrit that appeared on Angkor Borei, is dated A.D. 612.¹⁹ The Khmers are believed to have migrated south from Vat Ph'u, in Laos.²⁰ Their first kin of record was Bhavavarman, followed by Isanavarman and Jayavarman I during the seventh century, but the next King Jayavarman II, who ruled from A.D. 770 to 834, is widely regarded as the founder of the Khmer Kingdom. He declared Khmer unity and independence from the suzerainty of any other external power at Mahendra Parvata in A.D. 802.²¹ He established his capital at Lolei, several miles southeast of Siem Reap, with the Rolos group of monuments that still survive there being a visual reminder of his rule. These were augmented by Indravarman I (A.D. 877–890), who built the Preah Kan and the Bakong there.

The monuments built by Jayavarman II and Indravarman I established a tradition that was followed by subsequent rulers, described best by two historians of this period as "a pattern that was to recur often in the quest for legitimacy: a group of shrines to previous rulers and their wives, and then a pyramid representing a mountain of the gods, destined to receive the kings own relics . . . after his death."²²

The model for this divine residence, like Olympus for the Greek pantheon, was Mount Meru in Java, with the most famous architectural representation of it being the Borobudur Temple in Yogyakarta, nearby. In the case of Borobudur the way to nirvana is physically represented by three distinct levels, which are an analogy for the individual struggle for enlightenment, with the last of these, at the summit being circular, rather than rectilinear, to indicate the transition from the secular to the sacred realm.

Rather than constructing his own version of Mount Meru, King Yasovarman chose a real mountain for his capital north of Siem Reap and built Phnom Bakhang on top of it as the center of his royal city of Yasod Harapura, ruling from there from A.D. 890 to 912. As at Borobudur, roads radiate out from the cardinal points of this artificial mountain to the four corners of the Khmer Kingdom.

This begins to occur more ostensibly at Angkor Wat, which is the most famous of these monuments, built by Suryavarman II, from A.D. 1113 to 1150 and in the Bayon at the center of Angkor Thom, built by Jayavarman VII between A.D. 1181 and 1218.

Angkor Wat

Angkor Wat was a largely ceremonial city as well as a religious shrine surrounded by a wide moat. The palace of the king and various governmental structures were inside its 815 meters by 1,000 meters enclosure. This barrier had a main entrance causeway on its western side, related to the original connection of the city to the Hindu god Vishnu, the god of creation and destruction symbolized by the cosmic serpent Amanta and the bird Garuda, which was his protector. These are commemorated in a temple at the top of its central tower, which is surrounded at each cardinal point by additional towers dedicated to other deities and, by extension, the royal predecessors of Suryavarman II that are associated with them.

Hindu Influence

The complex layering of Hinduism and Buddhism, which is a consistent feature of Khmer culture, is extensively evident at Angkor Wat. Indian culture began to penetrate into Southeast Asia in the fourth century A.D., during the Gupta Dynasty.²³

Like Borobudur, Angkor Wat also rises up in three distinct increasingly smaller stages, which are each also surrounded by galleries, just as they are in Yogyakarta. The most descriptive of these are carved on the inside wall of the first gallery, mixing mythological scenes, such as the Ramayana, with those of daily life. While there are similar scenes carved on Mayan pyramids and stele, they are not nearly as informal and informative of the habits of the ordinary people of their society as these are. These carvings give us a clear idea of how the Khmers led their lives.

Khmer Houses

The Khmer Kingdom was based on agriculture, and there were strict laws that governed how people of various classes would live, what they could own and wear, and what their houses could be like.²⁴ Life in a farming village was carefully circumscribed by these laws, the unforgiving cycle of the seasons, the hot humid climate, and the relatively poor quality of the soil. The houses shown in the gallery carvings at Angkor Wat and elsewhere are very similar to those found in farming villages throughout Cambodia today. They are raised up on columns, to a level that seems to be generally higher than that of similar houses in neighboring Southeast Asian countries, such as Thailand, Laos, and Malaysia. Elevating the house on posts is primarily done to allow an air movement up, under, and through it, since the climate is hot and humid most of the year. Unlike southern Thailand and all of Malaysia, however, Cambodia does get cooler for a few months of the year,

around December and January, but when it gets hot, it is really oppressive, and the flow of cool air up through the heavy wooden floor boards, from the shaded area beneath the house, is very welcome during that time. The height of these lower supporting columns varies according to the economic circumstances of each family and is a status symbol, to some extent. Based on archaeological evidence, people were smaller at the height of the Khmer Kingdom than they are today, so a 6 feet high open area between the ground and the living floor would have been adequate, but the controlling factor, then as now, was the oxcart, which is stored there. This cart, which is primarily used for transporting rice from the field to this covered space that is also used as a threshing floor, and the oxen that pull it are possibly the most valuable possessions that farmers have, since the oxen are also used for plowing the rice fields, and they are also stabled under the house. In the Khmer bas-reliefs at Angkor Wat and the Bayon, troops are shown being transported to the front of the battle with the Khmers' arch nemesis the Chams, who occupied the area around what is now My Son in Vietnam. The carts that are depicted there are reassuringly similar to those seen in use on Cambodian farms today.

The rice sheafs are spread out on a large woven rattan mat under the house so that none of the grains are lost, and these are separated from the shaft by walking on them, or treading them lightly under foot. The same kind of rattan mat is used as a floor covering on the main floor of the house above because it is cool underfoot and light, and it lets the breeze enter unhindered. There is usually a steep, narrow stairway, sometimes a glorified ladder that provides access up into the house, with an odd number of steps used, based on the superstition that this will confound evil spirits.

The Spirit World

This belief in spirits still persists in parallel with organized religion. In a sense there was a discontinuity between the formal, abstract objective religious concepts and rituals of royalty and the highly personalized, subjective, and superstitious beliefs of the villagers who were their subjects. The Khmers, as one source describes,

came from the forest; the forest remained, never very far away, as paradigm and symbol of the dark, chaotic, and dangerous world of nature from which civilization was born. No Khmer could even be completely at ease alone in the dark forest. Practical fears of physical dangers certainly contributed to their unease, but there was more. The invisible being[s] that dwell in the wild inspire dread.²⁵

The list of these spirits is lengthy, but persists in a contemporary fascination with ghosts in the same region, the restless spirits of the departed that still haunt the places where they lived under the collective category of *nakta* or ancestors. There are also the spirits of the earth, including the *naga* serpent, which fall into either benevolent or malicious categories and which must be appropriated, especially when a new house is built. To do this, a small spirit house is usually placed near the new one, to be occupied by the earth force, which the construction has disturbed and displaced. Newborn babies are considered especially vulnerable to possession by evil spirits. In Thailand, for example, it is common for babies in rural

areas to be called something other than their given name, such as “bird” or “bee” to confuse the evil spirits and prevent them from taking the babies’ souls.

In spite of its adherence to well-established religious forms, Khmer rulers were not completely impervious to such animistic, supernatural beliefs. *Linga* shrines were usually placed at the cardinal points and center of each of their capitals, in recognition of Siva, and its earlier basis in fertility cults. These consist of a stone shaft, representing a phallus, placed vertically in the middle of a square basin, representing a womb. This basin had a trough cut into it that drained the water that was ritually poured on the *linga* and had an obvious symbolic reference to impregnation, as well as life-giving rain falling on the earth.

The Bayon

The Khmer Kingdom reached its furthest extent spreading into the Mekong Delta, Laos, and Thailand under Jayavarman VII, who ruled from 1181 to 1218, during a time in which Buddhism was dominant, and its iconography prevailed over the rival forms of Hinduism, which surfaced again soon after his reign. The Bayon, the centerpiece of his capital at Angkor Thom is evident of this dominance with its towers carved with the face of the Bodhisattva Lokeshvara, who looks north, south, east, and west on each of them, as if he is surveying the vast kingdom that Java VII ruled. But, within 200 years, Angkor was abandoned and this glorious period of Khmer civilization was over. The bas-reliefs on the Bayon walls, like those on the Galley of Angkor Wat, are all that remain to remind us of the complexity of social levels of this great civilization.

THE MALAY HOUSE

Commonly referred to as the “*rumah ibu*” or “mother house” by the Malays, the traditional residential form that is recognizable throughout the archipelago is similar in many ways to houses in Japan, Cambodia, Laos, Thailand, and Vietnam in its three part vertical division into raised, columnar base, mid-level living area and large overhanging roof. The similarities relate to the following elements.

Anthropomorphic Dimensional System

The Malay house, like those in the countries just mentioned, is based on human proportions, to an extent that is only recently becoming apparent, due to the research that has been done by Dr. Syed Iskandar and several other investigators. It has been well known for some time that these houses are laid out by master builders rather than the owners themselves, although the people in the *kampung* or village collectively participate in the actual construction. The master builder measures the primary wife of the family, since the Malay Archipelago is primarily Muslim and there may be more than one, and uses key dimensions from her, such as the length of her forearm, to develop a module. This feature, of individuality within a systematic framework, is also the essence of traditional Malay society, in which a network of cultural norms governs behavior, but in which each person is valued as an individual. Such measuring also brings to mind a tailor, who custom



Malay house. Courtesy of Shutterstock

fits a uniform to each person, taking anomalies into account, but striving for conformity nonetheless.

The builder is itinerant in that he moves from village to village as needed. He is considered to have magical powers, and the entire process of planning, preparing, and building a house is viewed as a spiritual act. The house is believed to be a living thing, as an extension of nature, since it is made of natural materials and is a manifestation of the people who inhabit it, so there is a mystical aspect to it that extends to numerology and orientation as well. This relates to the *tiang seri*, meaning central (or navel) post, which is the first structural member erected, symbolically establishing a cosmological link between heaven and earth. The word *seri*, which translates roughly as “aura,” has connotations of radiant beauty and spiritual energy, transcending the purely functional role of the column as the central structural member. This aspect of an “axis mundi” is also common to the cultures mentioned earlier. In Japan, for example, this central column is called the *daikokubashira*. In the Ise Shrine, which is an important Shinto site near Osaka and is considered to be the earthly residence of the sun goddess Amaterasu, it is also erected first, and is felt to be the conduit through which her spirit or *kami* moves from heaven to earth. In the Malay house, a coin is placed under the *tiang seri* to ensure good fortune for the inhabitants in the future.

Natural Materials

Although metal has replaced wood and thatch to some extent, especially for the roof, where corrugated tin has now been substituted for the woven mat of *atap* or mangrove leaves because it is more durable, the structural members are all wood,

precut on site to have interlocking joints that make nails unnecessary. To put this into context, it is important to remember that metal nails, which were first hand cut before being mass produced as they are now, are a relatively recent development in the long history of this indigenous residential typology, which started long before they were available. Nails were very expensive when they were hand cut, even in the Western industrializing countries where they were first produced, and so were prohibitive in undeveloped areas. Even now when they are machine made, their price is comparatively exorbitant in countries in which one bag may represent a day's wages. The use of interlocking joints, then, is not a conceit, or an issue of nationalistic pride and a desire to remain free of external influence, although this is a partial subtext in stylistic revivalism, but simply an economic necessity.

Chengal, rather than teak, is the wood of choice, because it resists rot and termites, but it is now becoming very scarce and expensive in Malaysia. In one recent instance, in the Salinger House designed by Jimmy Lim, for a site that was once part of a rubber plantation near Kuala Lumpur, the master builder had to apply to the state government in Selangor to purchase the trees he needed to build a sensitively conceived reworking of the traditional Malay prototype, created by an architect known for his originality. Because of the rarity and expense of the trees, the builder reduced the number he used to three for the entire house, which also shows how massive they are. The nature preserve from which they were culled was delivered to the site, and the builder set up his workshop near the drop-off point to avoid having to move them. He then cut them into the various framing pieces needed, wasting as little of the precious wood as possible.



The Malay house is identified by a raised floor supported by columns and a thatched roof with wide overhanging eaves. Instead of having fixed individual rooms, the Malay house has open spaces reserved for specific functions. *Source:* James Steele

Orientation

The symbolic and spiritual aspects of the construction process also pertain to orientation, going beyond purely environmental considerations of heat gain and loss, or natural ventilation, although these are also of critical importance. The east, the direction of the sunrise, is considered to be the side of life and brightness, and so it is preferred. The west, the sunset, is the side of death, darkness, and the devil. This idea is not new and is not confined to Malaysia. During the Pharaonic Age in Egypt, pyramids were oriented using the same criteria, and many indigenous cultures, including several described here, follow the same belief. If these conditions, which are primary, happen to coincide with climatic factors, so much the better, but if not, spiritual concerns take precedence. The preference of east over west also extends to the idea of a front and a back to the house, with each façade treated differently. The front, where the main entrance is located, is usually more ornately carved than the back and is more formal. By contrast, the service spaces are located at the back.

Daily Life

The front entrance, which is accessible by a narrow staircase leading up to the raised main floor, is covered by a roof to protect inhabitants and visitors from sun and rain, which are both abundant in Malaysia. The stair may be further protected by carved side panels, which allow only a minor amount of dappled light to guide people up to the front porch, or *serambi*. This space, which is covered by the roof but is open on three sides, is much more important than the prosaic designation of the front porch would indicate, being a place for social gatherings, family meetings, and relaxation, in turn. In his doctoral thesis, completed under Paul Oliver at Oxford Brooks University, Dr. Syed Iskandar has shown just how intensively the *serambi* is used and how its patterns of use have contributed to its long and narrow dimensions.²⁶

His work, as well as that of his tutor, has provided considerable insight into the ways in which behavioral patterns and social conventions contribute to house form, and Iskandar's suppositions about the *serambi* are especially compelling. He maintains that its size is determined by the dimensions of a woven palm leaf floor mat (*tikar*), based on a 405 centimeters by 405 centimeters module, and the round *dulang* or dining tray used to serve guests, who are usually confined to this space to maintain family privacy inside the house itself. The size of the floor mat allows four people to sit around the dining tray, with their backs into the corner of the *tikar*. One row of these mats is placed against the side of the house and another along the outer railing of the *serambi* with an equally wide 405 centimeters space left open through the middle as a service corridor; and this determines the width of the space. Iskandar does not speculate on the possible relationship between mat placement and the width of the house, but his illustrations indicate that the same cause and effect condition pertains to it, as well. The proportion of the rectangular *serambi* is usually 1:5.

A Floor Oriented Culture

One obvious determinant in this relationship is that traditional Malay culture is based on living on the floor, rather than having furniture, as the Chinese did. In

this way, they are similar to the Japanese, whose residential proportions are also based on a floor mat, the *tatami*, which is woven from rice straws, to a module called the *ken*, just over a meter in length. There is enormous significance to this difference related to sensory perception of the interior, the way the outside is seen from the inside and the overall worldview. Sitting and sleeping on the floor means that it must be kept very clean, so shoes are removed before entering the house. Before socks and stockings, this meant, and still means to a large extent, that bare feet came in contact with the floor boards, which are smooth, wide plank timber, providing a tactile and olfactory as well as aural and visual way of experiencing the interior. Unlike the *tatami*, which is thick and heavy, the *tikar* is rather thin and rough, but serves the same purpose of helping to keep the floor smooth and clean. It is also a sign of status, since, during large celebrations such as wedding receptions, there may be more guests than mats, and preference is given to those who are most important in deciding who may sit on them. Sitting and sleeping affects many other things as well, such as the size and location of windows. The sill height, or bottom of the window, which is usually based on someone sitting on a chair in Western cultures, must be much lower in the Malay house, if those inside are to see out. It can then vary from neck height at the very least, to allow this view, to lower, depending upon the amount of privacy desired.

Like the Japanese house, the Malay equivalent has a very flexible interior, with rooms being able to serve many functions. Once inside, past the *serambi* and into the *rumah ibu*, or mother house, which is the core, there are rarely compartmentalized divisions, in the Western sense, into living room, dining room, and so on, but rather areas that can accommodate these functions through customary use. The kitchen or *dapur*, which is usually relegated to the back of the house or even into a separate structure because of the risk of fire, is an exception to this flexibility.

Regional Differences

Within this basic framework of *serambi*, *rumah ibu*, and *dapur*, there are many clearly recognizable regional differences, primarily related to the way the house can grow to accommodate an extended family. In Malacca, for example, growth is dealt with by using a long, narrow central courtyard placed between the *rumah ibu* and an addition that is equal to it in size, to house more people, creating a symmetrical arrangement. The big advantage of the modular, prefabricated system that the core house is based on is the freedom it allows for growth and change, easily permitting the permutations seen in each region.

The Malay *Kampung*

The Malay village, known as a *kampung*, has usually begun near the source of the villagers' livelihood. *Kampungs* near the coast are supported by fishing, and inland villages are usually located near paddy fields. Governmental emphasis on modernization, urbanization, and industrial growth have sharply reduced the number of *kampungs*, and this valuable resource of tradition is now an endangered species.

Kampungs do not typically have one founder, but usually one family is dominant and the leader, or *Penghulu*, is selected from it. The *kampung* usually has a mosque (*masjid*), a village cemetery (*kubur*), the village leader's house (*Rumah Penghulu*), as well as the houses (*rumah*) of the people living in it. The *Rumah Penghulu*, in

addition to being the headman's house, also serves as a bank, since he makes small loans to the villagers, courtroom, and jail, which usually occupies the space that is open under a typical Malay house, except in this case it is surrounded by bars. The layout of the *kampung* is based on hierarchical land ownership patterns, and buying or selling a property is difficult since it requires the agreement of all other inhabitants. All decisions affecting the village are based on consensus. The population of each *kampung* grows because of marriage between members of the various families rather than settlement by newcomers.

Arrangement of Houses in the *Kampung*

The rectilinear shape of properties owned by families means that houses in a typical *kampung* are arranged in a roughly linear way, with a space between them that acts as a pedestrian "street." There are examples of random placement, but local property-ownership laws are the key determinant of spacing. The cost of living in a typical *kampung* is relatively low, since many residents own their own houses and pass them on to their children. Since the 1960s, water and electricity service has improved, which is a minor expense, and sanitation systems became the norm after legislation in Malaysia was passed to make it mandatory, which adds another.

The open layout of the houses in a Malay *kampung* makes social interaction easy. The practices of *takbir*, or visiting neighbors on festive occasions, and *gotong-royong*, or sharing work, such as the building of a new house, with others in the village are encouraged by both the placement of the houses and their form. This spirit of cooperation, which is absent in urban areas, is called "*mubibbah*," or goodwill.

In the typical *kampung*, it is not possible to be a loner, and no household exists as an isolated unit. Weddings are always communal affairs, and everyone in the village takes part in preparing to celebrate these events. A musical ensemble, usually including drums (*hadrah*), is often part of each *kampung*. One of the other major festivals celebrated in the *kampung* is *Hari Raya*, observed by Muslims on the tenth day of the last month of the Muslim calendar at the end of the *Haj*, or pilgrimage in Makkah. A sheep, cow, or goat is sacrificed to commemorate Abraham's test of faith when he was asked to sacrifice his son. Since Malays are Muslim, religious homogeneity is a major unifying factor, and so the *masjid*, or mosque, and a smaller prayer hall, *sarau*, are not only reserved for religious activities but also become social centers for the entire village. In addition to *Hari Raya*, known as *Aid il Adha* elsewhere in the Islamic world, communal dinners are held there every night during the month of Ramadan, during which Muslims must fast until sunset. Religious classes also take place there.

Subtle Boundaries

While openness is a distinct characteristic of a *kampung*, and there are no ostensible physical boundaries between the houses, there are symbolic boundaries, such as plants and trees that act as a subtle demarcation of territory. But there is no concept of a front or back yard, simply an area that each household has the responsibility to keep clean. So, while there is the general impression of a lack of barriers and openness, there is a certain degree of ambiguity between public and private territory in a *kampung* and a tension between community intimacy and personal

privacy, including a high respect for *adat*, which is an informal legal system based on the precedents of customs and traditions. People unfamiliar with this ambiguity, when studying it as outsiders, may bring their own predetermined social considerations of proper lines of demarcations to it, but understanding it requires a different and a new sensitivity to the way the inhabitants of a *kampung* interact with each other in this setting. There is an invisible but distinct overlapping of territories.

Dying Tradition

The house just described was once very prevalent, whether built individually as a small holding or as part of a *kampung*, or village, throughout Malaysia. The phenomenon of rural-urban migration, which is so prevalent throughout the developing world, is also affecting Malaysia to a large extent, with families moving off the farms to the cities. The hard labor required in single family agriculture does not appeal to the younger generation, who are attracted by the glamour and higher salaries of careers in “intelligence technology,” and large conglomerates are buying up rural real estate. *Kampungs* are being rapidly depopulated and the houses are falling into ruin. Those that remain are also being adapted, with the most typical change being the use of concrete block to fill in the open ground floor level to provide more enclosed living space. This destroys the aerodynamics of natural ventilation that helps keep the house so cool and also introduces an alien industrial material into the traditional natural construction palette, completely changing its character. Several conservation efforts have begun, aimed at preserving this vital part of Malaysian heritage, but, sadly, have mostly resulted in dismantling old houses and rebuilding them in museum compounds.

MOHENJO-DARO AND HARAPPA, PAKISTAN

Relatively recent excavations that began in the 1920s in what is now Pakistan have uncovered one of the greatest civilizations in the ancient world. Its extent and complexity now allow it to unquestionably be ranked with China, Egypt, and Mesopotamia in both venerability and importance. Because of the brevity of the period of study involved, there is still much to be learned. The writing system of this civilization, for example, has yet to be deciphered. But every indication points to a very rich and complex culture that took maximum advantage of its proximity to the Indian Ocean. Since the excavation of two major sites in the Punjab and Sindh Provinces little more than 90 years ago, more than 1,500 settlements of smaller size but with similar characteristics have been discovered in an area that is more extensive than either Egypt or Mesopotamia. This culture was strategically located between the Arabian Peninsula, the Greek Islands, and the northern coast of Africa, and the people benefited from trade with all of these areas. The Indus River civilization was a thriving, politically well-organized society that lasted for ten centuries, from 2600 B.C. until its destruction by Aryan invaders from the north. It stretched from Karachi to the Gulf of Bombay to the southeast and northeast to Lahore, following the ancient course of the Indus and Saraswati Rivers, which have changed location today.

The Indus River civilization escaped attention for so long because of its location on an alluvial floor plain, since it lacked the stone to build large monuments like the pyramids of Egypt or bitumen with which to strengthen the mud brick as the Sumerians in Mesopotamia did, which made ziggurats possible. The presence of baked brick, jewelry, and clay tablets that all required firing, however, shows that they had wood and were able to maintain the high temperatures needed to create each of these things over a long period of time, indicating that they could have built large monuments if they had wanted to. One of the main questions occupying the archaeologists who are studying this culture is why they chose not to do so.

The Mound of the Dead

The two major settlements that have been excavated and the two major cities that seem to have bracketed the region were Mohenjo-daro, or “Mound of the Dead,” near Karachi to the southeast, and Harappa, 400 miles away near the northeast. A third city, named Kalibangan, which is 100 miles south of Harappa, has also been discovered, but it is not considered to have been as important as these first two.

Mohenjo-daro and Harappa, which were roughly circular, were each about three miles in diameter and very similar in plan. Both of these cities also seem to have served as bivalent administrative rules and model settlements for each of the other settlements in the region as well.²⁷

The picture that is emerging as excavations continue and both local and international interest mounts is one of well-planned cities and a focus on the fabrication of luxury items for export, produced from materials traded from both near and far.²⁸ The fact that no temples have been found has led some to think that this was a society that was preoccupied with worldly things. Others have noted, however, that this absence does not preclude the existence of organized religion, since images that appear to be of deities have been found on the exquisite fired clay tablets that have been found. One of the most recognizable of these is a tree of life symbol as well as a figure that looks like the ubiquitous “Mother Goddess” found elsewhere about this time. There are other figures that seem to prefigure Hinduism, such as a three-faced male god that could be seen to be a prototype of Shiva, lord of the beasts and all living things, and an elephant seal reminiscent of an image of Ganesh.²⁹

The absence of monumental temples or cult centers and the lack of evidence of a priestly hierarchy may simply mean that people worshipped in their own houses, and the discovery of domestic shrines seems to support this. Based on the number of seals that show representations of animals, such as tigers, zebra, goats, rhinoceros, gazelle, bulls, and buffalo, it may have been human animistic religion, like Shinto in Japan today, which revered nature and in which people worshipped at open altars under the sky.³⁰

Intriguingly, what has been found on Mohenjo-daro instead has been a large bathhouse, as well as a high terraced citadel with thick walls faced in baked brick and a large gate. The houses in this area were clustered around interior courtyards and were at least two stories high. They are believed to have been for a rich merchant class based on the ownership seals that have been found and the presence

of storerooms for goods or merchandise. The streets in this area had a very advanced clay pipe sewage system, with drainage from the bathrooms in each of the houses, which also had rubbish slots that emptied into bins along the street, indicating organized garbage collections as well. The sewers ended in the surrounding fields to fertilize them. The less fortunate, on the other hand, lived in small two room huts clustered together near the granaries outside the walls.

Mohenjo-daro and Harappa

The peak of activity in the Indus Valley civilizations lasted for about 700 years, from 2600 to 1900 B.C., with estimates of residents ranging from 40,000 to 80,000. The discovery of stone weights based on a different size than those found in Egypt or Mesopotamia but obviously used in a local system of weights and measures, as well as the lack of weapons or a military, supports the theory of concentration on trade. As one historian has described the bounty available:

The presence of raw materials and finished goods from Afghanistan and Central Asia indicates that merchants from these areas came to the city bringing lapis lazuli, tin, gold, silver and, perhaps, fine woolen textiles (which have since vanished). Traders would have carried back to the highlands cereal grains and livestock, as well as fine cotton and possibly even silks, but these items are not well preserved.³¹

The most important aspects of the city of Harappa relative to its houses are the street layout, the drainage system, and the citadel, which seems to have served a different social stratum.

The Streets

The streets serving the residential quarter in Harappa were laid out in a gridiron pattern. Main streets were about 45 feet wide with smaller lanes at right angles to them dividing the urban fabric into blocks. Some streets have been found to have been paved with identically sized terracotta blocks placed on a base of crushed ceramic pottery.³² Different types of streets were designated to serve different functions. The north-south street, which was the widest, is believed to have served oxcart traffic based on the cart tracks etched in the paving blocks and several terracotta models of ox carts that have been found.³³ Narrower streets, running east-west between the houses, provided pedestrian and service access to them, as well as having a secondary environmental function of allowing cross ventilation to cool the entire quarter. All residential lanes were provided with clay trash bins just like those found in Mohenjo-daro. This waste was collected regularly and deposited on the fields or in trash heaps.

The streets were also laid out according to cosmic considerations, with the main street aligned with the North Star, in order to bring visible order to the plan. Unlike Egyptian cities, such as Tel El Amarna, which was established by the monotheistic Pharaoh Akhenaten as the center for worship of the sun god Aten along the Nile in the middle of Egypt, however, it does not appear that the main north-south street in Harappa terminated at an important monument, such as a palace or temple, but only served a functional rather than a ritual purpose.



Remains of house and well shaft in Mohenjo-daro. The tall cylindrical structure is not a tower but a well shaft. *Source:* Amrit MacIntyre; Flickr

Harrappa had three elevated terraces, which were each ringed with a thick brick wall, areas identified by gates. Multistoned houses fronted onto the main north-south and east-west streets, which were more than 30 feet wide and had brick dividers in the center to separate two-way traffic.

The Drainage System

In addition to the efficient arrangement provided for the removal of domestic waste, a drainage system was used throughout Harappa that is one of the most comprehensive networks found in any ancient urban settlements. A brick-lined channel was placed under every main street, which had tributary drains that emptied into it from the house on either side. This main drain and the secondary conduits had slabs that covered them, laid a few inches below street level, which were segmented so that they could be lifted up easily when it became necessary to clean the drain.

The Citadel

Like Mohenjo-daro and Kalibangan, Harappa also had a citadel, surrounded by a 40 feet high wall that fortified a 600 feet by 1,200 feet area.³⁴ There is a 20 feet high and 1,000 feet square building located to the north of this walled area, near what used to be the river, that archaeologists believe might have been a granary. It consisted of two rows of storage bins with a 23 feet wide aisle down the middle, protected from flooding by being raised up on a 4 feet high mud brick platform covered with fired face brick.³⁵ The approach to the granary connects it directly

to the river bank as is also the case at Mohenjo-daro and Kalibangan. The long galleries of storage bins also had slots at the ends to allow air to circulate into a channel beneath the floor, to prevent the grain stored in them from rotting.

Houses in Harappa

Each of these well-planned systems, for transportation, waste management, and food storage and delivery, when taken together provided a smoothly functioning network that served the residential quarters of the city. Those living there seem to have led comfortable, prosperous, and well-ordered lives, with a high level of domestic and urban sophistication. The logical layout of the streets and the waste collection and drainage system indicated a high degree of civic organization.

Houses in Mohenjo-daro

The houses in Mohenjo-daro and Harappa also run the gamut from the very modest to the very grand, and interestingly these often seem to be mixed together. They are also organized within a logical, hierarchical street system composed of wide main streets oriented toward cardinal points that service much narrower alleys or lanes that are raised up a few steps from the main roads to prevent flooding, which branch off from them and link them to the secondary streets.³⁶

One residence in Mohenjo-daro, described by an archaeologist as an “average upper class house” and named house No. 8, reveals several design strategies that are typical of many other houses in Mohenjo-daro, even though they were occupied by families of a different socioeconomic background. It is located off a main thoroughfare labeled “First Street” by investigators, with its entrance on a branch



Ruins of house at Mohenjo-daro. *Source:* Amrit MacIntyre; Flickr

pedestrian pathway designated as “High Lane.” The first thing that is obvious, upon coming into the house, is the effective use of the indirect entry that is so evident in many other urban areas throughout the West Asian region, up through the late Middle Ages. It is referred to as a *magaz* in Islamic architecture and is used to prevent direct physical or visual access into the private domestic realm, the sacrosanct domain of the family. The indirect entry at No. 8 is ingeniously arranged so that a visitor would first be confronted by a doorkeeper, who had a little alcove to sit and sleep in, before being allowed into the central court at the heart of the residence. If the person entering was a guest, he or she would then have unhindered access to guest quarters on the left side of the house behind the gatekeeper, without disturbing the permanent residents, and would also have discreet access to a bathroom and a source of water without entering the main part of the house. The owners, on the other hand, occupied the quietest and most protected part of the compound upstairs, having direct access to one of the extended legs of the L-shaped central court, which had servants’ quarters and a kitchen at ground level. The mud brick walls of the house also vary in thickness according to the need for privacy, being widest when they are adjacent, or common to, other houses, as party walls, or when it is necessary to buffer noise such as in bathrooms and the master bedroom, and thinnest when privacy and noise are less of a concern, as in the guest room. The floor of both the bathrooms and the well chamber were paved with bricks, and there was an opening through the wall separating the house from High Lane to allow waste water to escape. The house had a stairway on the north side of the courtyard, giving access to an upper level.³⁷

The whole approach to privacy and the division of areas into service and nonservice categories is very deliberate in this residence and is consistent with strategies used in other urban areas throughout this region at a later date. Service uses, such as the kitchen and servants’ quarters, are relegated to the ground floor, while the family takes pride of place in the most privileged and private position on the upper level above. The open courtyard, as the main device for temperature regulation and spatial compartmentalization, helps make this strategy of public-private segregation possible.

THE MINANGKABAU HOUSE

The Minangkabau are an ethnic group in Australasia, an ethnographically defined world that extends from Madagascar on the west to Easter Island on the east, including Southeast Asia, Micronesia, Polynesia, Peninsula Malaysia, South Vietnam, Taiwan, and New Guinea. They originated in the central part of the island of Sumatra, forming the majority of the population of *Propinsi Sumatera Barat*, or West Sumatra Province. This is one of 33 provinces that make up the Republic of Indonesia.

The traditional Minangkabau village in this part of Sumatra is made up of a number of distinctive dwellings called *rumah gadang* or great houses in addition to the mosque or *surou*, the *balai adapt*, or *balairung*, which is a village hall where the representatives of the people living there meet to discuss issues related to the village and the *rangkiang* or *lam buong*, which are rice farms. Of all of these, the



The Minangkabau house has a unique profile related to both its social function and the history of the people. The Minangkabau are a matriarchal society and have a foundation legend based on the story of a duel between buffalo. *Source: Ezrin Arbi*

rumah gadang has become most closely associated with the Minangkabau people because of its metaphorical form and the fact that the house is a direct extension of the social structure of the people.

The *Alam Minangkabau* or Minangkabau World

The Province of West Sumatra, which is the homeland of Minangkabau, has a coastal border formed by the Indian Ocean, along its western edge, and is contained, on its other three sides, by Sumatra Province on the north, Riau Province on the east, and Bengkulu Province on the south. West Sumatra Province is diagonally divided by the Bukit Barisan highlands, which span the equator. A mountain range, Bukit Barisan, which runs the length of West Sumatra, defines the territory of the Minangkabau, acting as a backdrop to the east, confining their group between it and the sea on the west. Mount Marabi is the most impressive peak along this ridge. It has three valleys that extend outward from it, called *Singgalang*, *Tandikat*, and *Sago*. These have been historically known as *Kubak nan Tigo*, or the three districts, or simply as *darek*, the interior, and are the heartland of Minangkabau culture. Mount Marabi was once an active volcano, and so the soil in the valleys is very fertile. There are also several streams that originate in the foothills, which, in combination with the quality of the soil, make this an excellent area for the

cultivation of rice. Because the altitude of the majority of the region is relatively high, except along the coastal plain, the temperature is mild. In the Agam district of West Sumatra Province, annual daytime temperatures average 69 degrees Fahrenheit or 26 degrees Celsius, in spite of the fact that it is right on the equator. It also has ample rainfall. But today, Agam is only one of eight *kabupaten* or districts in the Province of West Sumatra that are each administered by a *bupati*, or district head. The other seven are Pasaman, Padang-Pariaman, Tanah Datar, Limapuluh-Koto, Solok, Sawahlunto Sijunjung, and Pesisir Selatan. In addition, each district is subdivided into smaller units called *kecamatan*. The Minangkabau foundation legend is based on the story of their ancestors, who came across these mountains and down onto the coastal plain to settle there. They divide this territory into “the land” (*Darek*), “the coast” (*Pesisir*), and “the outer lands” beyond the mountains (*Rantars*). To the north, Bukit Tinggi, which is one of the highest peaks in the mountain range, is of special importance as a landmark for this group.

A World Apart

Because of the unique and relatively isolated geographical conditions in which their society has originated and evolved, the Minangkabau have developed an identifiably different culture, quite separate from that of the Malays of the lowlands along the east coast of Sumatra. From the seventh century until the beginning of Portuguese incursions into the Straits of Melaka, this area was a center of trade because it is on the main sea-lane connecting India and China, creating a cultural *entrepot* that fostered a strong and unified Malay civilization and identity. The Minangkabau had iron ore and gold, mined from relatively small and scattered deposits in the highlands, as well as rice to trade, but generally remained untouched by foreign influence from the Straits. Because of this relative detachment, the Minangkabau way of life has remained virtually unchanged for centuries, making the *rumah gadang* an especially valuable anthropological artifact. The Minangkabau, referred to locally simply as *Orang Minang* or *Orang Padang*, using the name of the capital of the province, are the fourth largest ethnic group in Indonesia, following the Javanese at 47 percent, the Sudanese at 15 percent, and the Madurese at 7 percent. But still, according to the 1990 census, they make up only 3 percent of the population of Indonesia.³⁸ This very small percentage is not just confined to the Minangkabau heartland, but is scattered throughout Indonesia and the remainder of the Malay Archipelago as well.

The Minangkabau House

The Minangkabau houses in Indonesia and Malaysia fall into the general category of Southeast Asian vernacular. They conform to a traditional typology, found throughout the region, with all having a similar design solution to the hot, humid climate that exists there. This solution involves the distancing and orientation of houses to allow for maximum ventilation, the raising of the main floor on columns to also encourage air flow and to keep the occupants safe from animals and reptiles, the practice of directly opposing openings to encourage airflow, and the inclusion of a broad overhanging roof for shade. The walls are also located to help direct air flow, and outside verandas and porches are used as living spaces to

free up interior space. Local materials, such as wood and palm fronds or mangrove leaves (*atap* and *nipah*), are used for structural members and roof thatching, and wood is precut in modular units before being assembled on-site, with only interlocking joints (and no metal fasteners) being used to erect it. The rules used for the orientation of the house differ with the Minangkabau, however, due to the overriding importance of group identity in their society. Minangkabau houses also are among the most symbolic of all vernacular types, representing both the mythical origins of the group in external form and the reproductive life cycle and social ordering system in the room arrangement inside.

A Matriarchal Society

Women have always played an important part in Malay society, but the Minangkabau are unusual in that even after the advent of Islam in the sixteenth century, which puts great emphasis upon male authority within the family, they have remained matrilineal. That is, lineage is traced through the women, who own all of the property and control family finances and possessions, including the inheritance of houses.

Prior to the prevalence of Islam, Malay society used customs or traditions, agreed upon by consensus, called “*adat*,” as rules of law. Once Islamic law was introduced, *adat* still remained intact, currently providing a dual set of laws. In Minangkabau society *adat* is referred to as “*perpateh*,” or matrilineal rather than the “*adat temenggong*” or patrilineal legal traditions that prevail elsewhere in other Malaysian and Indonesian family structures. The way that the dominant role of the female members of this society has contributed to the development of the *rumah gadang*, or great house, makes it an important resource for studying how social norms affect house form.

The Minangkabau Great House or *Rumah Gadang*

Minangkabau houses are long and narrow, with the main entrance on one of the long sides. The position of the entrance is specifically related to the type of *adat* practiced in the village and house, of either the autocratic (*koto piliang*) or democratic (*bodi camiago*) form, based on the way final decisions are made in each residence. In the former, the entrance is in the middle of a central axis with the house stepping up in each direction toward elevated alcoves at the end, while the entrance is asymmetrically placed, usually toward the right. If the *bodi camiago* system prevails, the floor remains flat. Wherever it is placed, the main entrance leads directly into a semipublic space called a *ruang*, which is similar to the *serambi* of the Malay house in that it is intended for the reception of visitors and guests as well as daily use by the family; but here it is more of a large hall in which social activities occur and family meals are shared. There is a room, called the *anjjuang*, which takes up one entire end of the rectangular house, that is directly accessible from the *ruang*, where the most recently married woman in the family and her husband live. This couple is then displaced by the next daughter to get married, moving clockwise to the next of a series of *billak*, or rooms arranged in a line along the long back edge of the house, shifting step by step toward the *dabu*, or kitchen at the end opposite the *anjjuang*.

The matriarch of the family occupies a space near the *pangkalan*, or central post, which holds up the main roof girder, designating her status as the head of the family. In the Malay house this central post, called the *tiang seri*, is also important, as it is the first structural member installed, accompanied by a ceremony in which a coin is placed under it for good luck. In each instance, the dimensions of the central post, which set the module for the remaining structural members that are used, are derived from the height of the woman of the house. The central post is typically near the main entrance to the Minangkabau house, putting the senior matriarch in a powerful position in relationship to all those entering, especially all of the husbands living in the *anjuang* or *billak* inside. Houses of the highest status have front entrances that face toward the Bukit Barisan, in remembrance of the ancestral migration to West Sumatra, enhancing the division of these long houses into the front, where the *ruang* and central post, or *pangkalan*, are located, and the back with its row of *billak* for older married couples. So, the plan of the house is a diagram of the reproductive cycle of each of the women who occupy it, since the most recently married daughter and her husband occupy the end apartment until they are displaced by the next daughter to wed, ending with the matriarch, in her position of authority near the center post and the front door.

This column, or *pangkalan*, is important, but each of the others, which number about 30 in an average house, are also considered to have spiritual power, revealing the role that animism still plays in what is now a mostly Muslim society. This is especially true of columns made from an entire tree trunk, and family well-being and strength are believed to be dependant upon the sensitivity of the carpenter and his skill at interpreting natural signs when selecting the trees in the forest that are used to make them.³⁹ The space between the columns running the long direction of the rectangular house is called *ruang*, and across it is referred to as *lebar*. The size of the house is designated by the number of *ruang* it has, with a larger number indicating higher social stature, since this means that the number of *billak* it can accommodate, and therefore its longevity, is greater, implying a closer connection to the original Minangkabau ancestors.⁴⁰

The *Rumah Gonjong* or “House with Horns”

While the plan of the Minangkabau house is spatially descriptive of its matrilineal organization and the reproductive life cycle of its inhabitants, its roof, which is the most distinctive feature of its external appearance, is symbolic of group identity, popularly believed to be based on a cultural legend. The roofs of the houses arch upward toward a peak at each end, which is capped with metal fittings. The legend, from which the people also take their name, is based on a battle with the Javanese, which each side eventually agreed would be settled by a contest between two water buffalos. The Javanese chose a huge buffalo to represent them, while the Minang used a young calf, which they starved before the tournament, so that it would go under its opponent looking for milk. The Minang tied a curved knife blade to its jaw to cause maximum damage and won the contest, taking their name, which means “victorious buffalo” (*menang kerbau*), from it. For this reason, the roof form of their houses represents a buffalo’s horns, although there are other opinions, such as the belief that it symbolizes the ship that originally brought them



Traditional Batak style house at Lake Toba, Sumatra, Indonesia. Courtesy of Shutterstock

to Sumatra from India.⁴¹ Trusses with struts are used to achieve the curved slope and pointed ends of the roof. Sugar palm leaves (*ijuk*), which are extremely durable and turn black with age, are used for thatch, although corrugated metal has replaced this often.

This widely accepted apocryphal story of the connection between the roof form and the victorious buffalo is complicated a bit by other variations, described by one expert as economic symbols in which:

Class status and identity are often associated with the composition of these forms with their projecting “*tanduk*” (horn) gable ends. A “proper” house will have four “*tanduk*,” symbolic of the four main clan divisions of the Minangkabau. Houses with two to four “*tanduk*” are referred to as “*gajah mangaram*” (sleeping elephant), while those with six “*tanduk*” are the “*rumah bakajangan*.” If the steeples sit in the center, not the end, like a crown, it is known as a “*rumah bas sanggul*,” or a house with a headdress.⁴²

Regardless of the mixed metaphors, the victorious buffalo story, like the legendary battle between Hector and Achilles to decide the fate of Troy, or the decision to let single combat between David and Goliath substitute for warfare between the armies of the Philistines and the Israelites, is much more compelling and memorable as a collective myth, institutionalizing the attribute of cleverness in

the face of adversity, in spite of the fact that the Javanese themselves were eventually victorious.

Marantau

While Minangkabau culture has remained concentrated in and around their highland homeland until very recently, there has also been a tradition, strengthened by *adat* or custom, for young men to migrate, in search of money or identity. This is called *marantau*, which has a meaning similar to the Australian Aborigines' use of the term "walkabout," referring to a journey of self-discovery. Changes to the boundaries of the provinces by the central government of Indonesia since independence have also reduced the size of Minangkabau territory so that today there is a Minangkabau diaspora, which like the Nubians is a sociocultural rather than a geographical group.

Disseminating a Powerful Building Tradition

The tendency to migrate has also been attributed to frustration with the restrictions of matrilineal *adat*, as well as economic necessity and sheer curiosity, but for whatever reason many Minangkabau males feel the urge to explore the "outer lands" portion of their territorial consciousness, the "*rantau*," beyond the mountains. To leave "the land" for the outside is called "*marantau*," and the person who does so is called a "*perantauan*." The Minangkabau is not the only ethnological group in which the men leave the homeland while the women, preadolescent children, and elderly stay behind. The Nubians in southern Egypt and Sudan are another notable example of several ethnic groups that do the same. But for the Nubians a temporary exile is economically necessary because their homeland, which has been redistributed since the dislocation caused by the construction of the Aswan High Dam, cannot be easily farmed and there is no other way to make a living there. Their traditional self-exile is also for a finite period, from adolescence until retirement age, with frequent visits back home for weddings, anniversaries, birthdays, and funerals. In the case of the Minangkabau, there has been a historical pattern of immigration to Malaysia, as well as of men taking their entire family with them.⁴³

Negri Sembilan

Malacca, which is directly across the Strait from Sumatra, has been a preferred destination for the *perantauan* from Sumatra. This pattern started in the fifteenth century when the Sultanate was at its most powerful and the city was a lucrative center for trade because of its strategic location as a meeting point for Europe, the Middle East, and Asia. There were two waves of Minangkabau immigration prior to the occupation of Malacca by the Portuguese in 1511, resulting in settlement along the Muar and Linggi river valleys and the replication there of the matrilineal society in Sumatra, but in this instance the economy was based on the planting, harvesting, and sale of rice.

After the fall of Malacca to a foreign power, the center of Malay power shifted to Johor. Eventually a group of nine "states" evolved in two rings around the royal capital. The first is Ulu Muar, the capital, with Jempol, Gunong Pasir, and Terachi

surrounding it in the inner ring, and Sungei Ujong, Jelebu, and Johal in the outer circle. These states occupy an area of the Malaysian Peninsula between Selangor to the north, Johor to the south, and Pahang to the east, with Remban and Sungei Ujong having direct access to the Straits of Malacca on the west.

Similarities and Differences

The houses of the *perantauan* Minangkabau in Negri Sembilan share many attributes of the original type in Sumatra, but also differ from it in significant ways, leading to much speculation about why changes have occurred. The early settlements in the Muar and Linggi river valleys generally took the form of *kampungs*, or villages, consisting of groupings of *rumah gadang*, just as in Sumatra, which are family or clan houses under matriarchal control. There are indications, however, of an attempt by some to establish independent family groups. These *kampungs* expand as populations grow, covering the slopes of the river valleys.⁴⁴

In general the Minangkabau houses in Negri Sembilan are not as elaborate as those in Sumatra and also incorporate local elements from the Malay house, which corrupts the original model. There does seem to have been an attempt to approximate the grandeur of the long *rumah gadang* as time passes and the immigrants became more established and economically stable, but the “victorious buffalo” roof form along with vestiges of matrilineal *adat* in Negri Sembilan remains the most obvious indication of a cultural link across the Malacca Straits.

SHANG HOUSES IN CHINA

The Shang Dynasty is the first recorded cohesive political structure in China, lasting more than 600 years, from 1766 until 1122 B.C. It was concentrated along the middle and lower portions of the Yellow River in what are now the regions of Hunan, Hopei, Shansi, Shensi, and Shantung, in a capital city called Changzhou (formerly known as Chang-chou).

During the Shang Dynasty, remarkable works of pottery, sculpture, and painting were produced, but most notable of all are the wide variety of bronze objects that have been discovered from this period. These include bronze vessels for both religious and domestic use and weapons, many of which have inscriptions that identify their purpose. Bronze was commonly used to decorate tombs and to provide a covering for the stone substructures of public and private buildings.

The Record

The Shang Dynasty is the second of the three critically formative periods in Chinese history including the Hsia that preceded it and the Chou that followed. The Shang Dynasty lasted 644 years, from 1766 to 1122 B.C. But, in spite of its duration, documentation of the Shang Period has been scarce. It has primarily been limited to bronze ritual vessels that run the gamut in scale from huge to small personal items and bones that were inscribed with texts of various lengths that predicted the future and so are called “oracle” bones. These bones mostly include the shoulder blades of cattle and turtle shells, and have helped provide insights into Shang social customs, with 14 rulers listed prior to its official royal line and 30 kings

who followed once it was established. The capital was moved several times before it was firmly established in Changzhou.

Ritual Bronzes

Inscriptions, ranging from a single word to 497 characters, have been found on only a portion of the bronze vessels and objects that have been uncovered so far. These have been categorized as those with signs and those with cohesive texts or statements. The signs often identify either a family or clan or simply the social rank of the person for whom the vessel was made. The bronzes with longer texts often describe the circumstances surrounding the making of the vessel, the king to whom it was given as a gift, the cost of producing or acquiring it, or a battle or a royal journey. These inscriptions are valuable as literary texts because of the limited amount of other historical data available for this period.

Bronze casting at the scale of these vessels was difficult, showing a high level of skill and organization. Bronze making was a major occupation and an identifying feature of the Shang culture. The huge quantity of ore that was smelted to meet the demand for bronze objects is phenomenal. More than 400 bronze objects were found in one Shang tomb that was excavated in 1976, that of a high ranking member of the royal family. About half of these were vessels used in religious rituals, the largest of which were a pair of square cauldrons weighing about 250 pounds each. The copper and tin for these bronzes was mined in northern China, about 400 kilometers away from the capital, which would have involved a month-long round trip journey to procure it.

Oracle Bones

The oracle bones that were used for divination were prepared by first cleaning and polishing them to create a smooth surface. They were then heated on the hollow or concave side to cause cracking on the reverse, upper surface. The pattern of the cracks was then interpreted in response to a question put to the oracle, and the prediction was written on the bone or shell. Turtle shells were obviously a popular item in this ritual, and mostly belong to a species found only in the Yangtze Valley, south of Anyang. The inscriptions on them often state who donated them. Almost all inquiries were requested by royal clients, since the inscriptions also usually mention the person in whose name the inquiry was made, the name of the oracle, and the prophecy. Divination seems to have played a major role in the decisions taken by the court. Inscriptions have been found that refer to sacrificial rituals, military campaigns, hunting expeditions, general predictions about the future, weather, harvests, illness, the interpretation of dreams, the extent of life, the time of death, and the best time to build a temple or a palace.

The Great City of Shang and Its Houses

In the oracle bone texts, the capital was always referred to as the “Great City of Shang.” There is evidence of a moderate settlement at Changzhou in the Predynastic Period, but it was not until this city was transformed into a royal capital that a consistent house typology began to emerge with two distinct types. The first of these is a large house, which was perhaps a palace; it was based on a wooden frame

structure, with mud bricks used to fill in the spaces between the columns. The discovery of the foundations of these large houses has been one of the most exciting archaeological events in the study of the dynastic phase of the Shang Period.

Changzhou

The Shang capital of Changzhou must have been very impressive, with a wide variety of large ancestral temples and palaces, as well as houses for those of various socioeconomic levels divided into different districts, with the most important of these clad in shiny bronze, glinting in the sun. Changzhou was basically rectangular, surrounded by a high wall. The city occupied an area of 3.2 square kilometers. The only part of the wall that still survives today is 9.1 meters tall and 3.6 meters wide, and its inner structure makes it obvious that it was built in two stages, perhaps having been mended after an attack. Chinese historians estimate that the construction of the wall, which is made of *terre pisé*, or compressed mud brick, took about 18 years, involving approximately 10,000 laborers to dig, transport, and compress the earth that was required to make it.

It is difficult to fully understand the exact layout of Changzhou, due to its great age and the fact that many of its houses, which were also made of mud brick, have not survived. But, archaeologists believe that the residential districts surrounded a central administrative and ceremonial center. Excavations that have gone on since the mid-1970s, which have been underway in the northeastern corner of the city near the wall, have uncovered a long ditch filled with more than 100 human skulls, which were sawn in half. Human and animal bones have also been found under similar circumstances in other parts of the city, leaving archaeologists to speculate about their use. They now believe these are the remains of slain enemies, ceremonial burials, or bone used for bone workshops, where fragments are known to have been inlaid into pottery and weapons.

A Uniform City Plan

Enough of Changzhou remains to determine that the layout of the city conforms to others built in the Hsia and Chou Dynasties, indicating that even at such an early stage, a series of urban planning principles had been adopted.⁴⁵ These are known to have been codified by the time of the construction of Chang'an, for which an actual plan, which was carved in stone, exists. These principles, which conform to the concept of *feng shui* (literally “wind and water”), begin with choosing a site on higher ground, preferably with mountains on its northern side to block cold winter winds and water to the south, with land at the confluence of two rivers being highly preferable. The presence of a river was important not just as a source of water but also as an additional line of defense against attack and a means of transporting goods.

These conditions existed at Changzhou, which had the Chin-Shui River running along its northern edge and the Hsiung-Erh River on the south. The excavation site today makes it appear as if the city and the land outside the walls around it were on the same level, but thick layers of silt have been deposited over the entire area that have created this uniformly high plateau. When it was occupied, during the Shang Dynasty, the city was much higher than the river valleys around it, and the

walls were built to take maximum advantage of the change in topography for defensive reasons.

There is sufficient evidence available to conclude that Changzhou contained a highly stratified class hierarchy, beginning with the royal family, moving downward through nobles, officials, warriors, merchants, commoners, and slaves. These were each allocated a separate district in the city, based on the location of palaces and temples, commercial areas and shops, and the size, type, and material of the various dwellings, all linked by a well-designed drainage system that was used to deliver water and remove sewage.

House Types in Changzhou

The foundations of houses, other than palaces, are either square or rectangular. Those with square foundations have mostly been found in a working class neighborhood, now referred to as Ming-kong-lu, near an ancient kiln site, where bricks were made and pottery was fired. In these homes, a roughly square, shallow depression was dug first, measuring 2.5 meters on a side, and a wooden floor was suspended above it to keep it dry. Mud brick walls, about 1.2 meters high, were then erected along the perimeter, creating a foundation known as *hang-tú*, or rammed earth, which is a distinctive feature of Shang houses. Windows and a door were usually concentrated on the south-facing wall for maximum solar heat during the winter, and although the roofs, which were made with wooden beams and joists, have disintegrated, boulders or bronze discs have been formed that were placed at the bottom of columns to protect them from rotting. These columns supported an intermediate thatched roof that served as a portico around the entire house to prevent the high summer sun from overheating the interior during that season. A fireplace, consisting of a hole in the floor and a chimney built into the wall was typically built on the solid northern side of the house. This kind of foundation seems to have predated the second rectangular type. This long and narrow configuration, which appeared toward the middle of the Shang Dynasty, supported several levels above it, based on the holes for columns that have been found. These houses may have been up to four or five stories high, judging from the diameter of these holes and the weight that columns of this size could have supported. A similar kind of floor was used at ground level, but it appears that it was typically paved with glazed tile. The columns were set upon stones or pottery fragments to keep them from rotting. Partitions were built in the middle of the rectangular plan to divide it into two square spaces.

Mysterious Underground Chambers

In addition to the palaces, temples, workshops, and houses that have been excavated, several underground pits have been discovered that have yet to be satisfactorily explained. One theory is that these rectangular or round pits were used for storage, or as granaries, and that the wealth of the royal houses was kept in them. Several hundred bronze casting molds, as well as jade and stone implements, hundreds of knives, pieces of bone, and many arrowheads, have complicated the problem of identification. These have led some archaeologists to believe that they were also bronze casting workshops, while bone fragments with copper green stains on

them or fireplaces and stoves found in others have confounded this theory. Other archaeologists think that a number of these pits were for ceremonial or ritual burials due to the discovery of human and animal remains in them. The sequence of layers also suggest that a number of sacrificial animals were slaughtered and put on top of the human burials, which could have been those of victims, because a wooden floor was built on top, indicating the possibility of the consecration of a foundation.⁴⁶

In one series of underground pits found near the entrance to one house, a human skeleton was found in a kneeling position, with a bronze dagger, or *ko*, nearby. In another, a skeleton was found with a sword and shield. Pits inside the door also contained human skeletons, with two in one pit and three in another, all lying face down with their heads pointing toward the center of the room. These discoveries strengthen the possibility of a tradition of ritual sacrifice, as an act of consecration during the construction of a house, or palace for an important person, concentrating on the entrance, perhaps as a gesture of protection or of the provision of spiritual guardianship.

In one case, at a house large enough to have been a palace, the skeletons of more than a hundred people were found, along with five chariots, all buried immediately in front of the entrance, contributing to the aura of mystery surrounding these houses.

House Construction as a Spiritual Act

These discoveries suggest a society that practiced both human and animal sacrifice and also believed in the survival of the soul after death, as well as attribute a religious significance to domestic architecture. There are also cemeteries that have been uncovered near Changzhou, outside the walls, where hundreds of similar pits have been found, with the type of burial demonstrating the social status of the deceased. This indicates a value system in which wealth was highly regarded. Extensive grave goods found in these tombs include bronze vessels, weapons, and jewelry. These tombs were built in the same way as the pit houses inside the city, with the addition of a wooden chamber that protected a lacquer coffin placed inside it. This confirms a similar practice seen elsewhere in other early civilizations, in which a tomb is made to resemble the house that the deceased occupied in life, to ensure continued comfort in the afterlife. The coffins in this district held the remains of prominent citizens, with members of their household buried nearby.

Many of these tombs have been plundered, but the few articles that have been recovered are astonishing in both their workmanship and scale, including huge bronze caldrons, drinking vessels, bronze figurines of cows and deer, helmets, swords, spears, and daggers. Many of these carry identical family or lineage emblems in individual areas, indicating designated burial grounds for certain families.

The alluvial plain, on which the capital city of the Shang Dynasty was located, between the T'ai-hang Mountains to the west and the Yellow River to the east, was warmer, wetter, and more fertile than it is today. Evidence of about 30 different species of mammals have been found in the area, including water buffalo, boar, deer, sheep, cattle, and pigs, giving us a clear picture of what the Shang diet during the Dynastic Period must have been like. In addition, there were six kinds of fish in

the river, and chicken, pheasant, and peacock bones have also been discovered. The oracle bones also refer to rice, wheat, and millet, and they describe wildlife that resembles rhinoceros, elephants, and tigers, which all indicate a much warmer and more heavily forested environment. The Shang also domesticated horses, dogs, cattle, sheep, pigs, and chickens, which were used in ritual sacrifices as well as for food. One oracle had recorded that 1,000 cattle were used in one sacrifice and 500 in another.⁴⁷ Horses imported from the north seem to have been highly valued and were exclusively used for riding or pulling chariots. Cowrie shells have also been found and have been identified as having been used as a means of exchange since they are often referred to on oracle bones as being “precious.” Strings of cowrie shells were given as gifts, and a strand of five or ten was a basic monetary unit.

Gaps in the Record

Changzhou was burned to the ground in a massive, concluding conflagration.⁴⁸ The basin has been farmed for the thousand of years since, and the Shang tombs have been repeatedly vandalized. The record that remains in archaeological excavations of house foundations, bronze vessels, and oracle bones paints a tantalizing but far from complete picture of this highly sophisticated and complex civilization that played such a formative role in Chinese history.⁴⁹

Europe and the Western Mediterranean

ANGLO-SAXON AND NORMAN HOUSES IN BRITAIN

It is dangerous to generalize about the domestic situation of people during the Middle Ages because the time between the fall of the Roman Empire and the beginning of the Renaissance, covering a period of nearly 700 years, was one of great change, and conditions varied greatly from region to region. It is usually divided into the Dark Ages, Early Middle Ages, and High Middle Ages to reflect the change in security, personal freedom, and mercantile activity that occurred. There are some indisputable common denominators that can be identified and will be discussed at the end of this overview, which will focus on Britain.

The End of Roman Power

Because of the growing threat to Rome from Germanic tribes by the middle of the fourth century, combined with the decision of the Emperor Constantine to move the capital of the Empire to the east for more security, it became increasingly difficult to support a presence in Britain, and there is evidence of a shortage of financial resources to continue to maintain an army there by this time.¹ Roman legions began to leave; there is a record of the departure of a large group under the leadership of Magnus Maximus in A.D. 383.² A group of local leaders took control in A.D. 410, but were immediately faced with incursions by Picts and Scots from the north. They asked for Roman help in repelling them. Troops returned several times to do so, but by the middle of the fifth century further requests went unanswered since the Romans had problems of their own in defending their homeland. The Britons then began to use Anglo-Saxon mercenaries to repel the invaders. Although the exact date is contested, but usually given as 450, Saxon leaders Hengest and Horsa, who were famously invited by a Briton named Vortigern,

arrived on the east coast with three ships full of warriors. They were followed by many reinforcements, and as they became bolder, they mutinied and demanded more pay and power. Following their defeat by a local force led by Ambrosius Aurelianus at Mount Baden in A.D. 500, they left for home.

Anglo-Saxon Britain

The respite was only temporary, however, and the Anglo-Saxons, joined by the Jutes, sensed opportunity in the power vacuum that existed following the Roman departure. They began to invade again, slowly beginning to occupy Britain, moving from east to west. This occupation was not as immediate as it is usually thought to have been, however, and for some time there were two Britains: the Anglo-Saxon east and the non-Anglo-Saxon west.

As is so often the case in many of the other societies discussed here, the houses of the average Anglo-Saxon villages were made of perishable materials, so that little evidence of them still remains and any attempt to reconstruct what they were like would be highly speculative. Evidence that has been found outside of Britain, however, allows some insights into what village life might have been like. Also, as is usually seen elsewhere, there was a clear division between classes, with those involved in fighting having the upper hand.

In 1936, archaeologist Brian Hope-Taylor excavated the so-called “Palace of the Kings of North Umbria” at Yeavinger, associated with Anglo-Saxon leaders Aethelfrith (593–617), Edwin (617–633), and Oswald (635–644). The palace consisted of seven main structures, including four halls that were each 100 feet long, two of which had a porch at each end. These had smaller halls for retainers nearby and one temple. The royal halls typically have a double square plan, that is, the length is twice the width; and their walls were made of squared off, mortised planks of uniform thickness aligned vertically, with every second plank sunk into the foundation for rigidity, which is a structural system unparalleled in Europe at this time. External buttress posts supported the halls against wind, which can reach gale strength in Britain. The roof was a gable with a hip at one end and a plain façade on the other. There were opposing doorways on the long sides and colonnades running parallel to these, to shorten the span of the roof timbers. This created a spatial arrangement analogous to a nave and side aisles in a Gothic church, at a much smaller scale.

The Long Hall of Alfred

In 1961 a similarly ascribed “Palace of the Kings” was excavated in Somerset, including the ninth-century Long Hall of Alfred, which had a similar post and trench system of construction. The hall, which was 80 feet long and 18 feet wide, was boat shaped, however, being wider in the middle than at the ends, with an interior row of columns on each side that sloped inward to support an upper floor, which is similar to a house type found in Viking strongholds. Archaeologists speculate that the curve was intended to accommodate a hearth at the middle of the bulge, to allow more space around it, as well as to give the hall more resistance to the wind. These discoveries compare favorably to houses found in a reasonably well-preserved Saxon village in Warendorf, Germany, dated from A.D. 650 to

800, which had 11 such long houses amidst the 75 houses in the village, as well as with stone Norse houses in Iceland, and the Orkney and Shetland Islands.

The Typical Anglo-Saxon House

So, from these findings, it seems that the typical Anglo-Saxon hall during this time, at least the halls used by leaders and nobles, was a long rectangular wooden building, with wood plank walls and buttress poles, sometimes curved, and was multistoried. As time went on, the entrance moved from the center of the long walls to the end, with the “high table,” for ceremonial dinners, located at the opposite end, presumably for protection.³ Otherwise, more modest houses had walls made of wattle and daub, which is clay, chopped straw or cow hair, and cow dung imbedded into a woven wooden surface supported by vertical or diagonal cross bracing.

Norman Houses in Britain

Following the Norman conquest in A.D. 1066, house styles and construction methods changed, with the emphasis on stone rather than wood, and adapted to local building traditions and climactic variations, making them slightly different from houses of the same period in France. Because of the Hundred Years’ War with the English, which really occurred in two phases from A.D. 1337 to 1360, and then from A.D. 1369 to 1453, there are few early medieval manor houses in France, and the preference, for security reasons, seemed to have focused on town-houses instead.⁴ In Britain, however, the manor house evolved in a more measured way, in a more secure framework, with a recognizable set of fixed elements, which are the hall, the solar, the kitchen, the buttery, and the garderobe.

The Hall

The first halls were the chief room of the house and mark the beginning of the evolution of the manor house. They were built of wood, which was a holdover from the Anglo-Saxon period, in which wood was used for houses and stone for churches. Wood construction was so prevalent in this early period that the word for “to build” in Old English was “timbran.”⁵ A period of civil unrest under Henry II (A.D. 1154–1189) led to the hall being moved up to the first floor, with a vaulted stone base on the ground level for defense. Slowly appendages, such as the pantry, buttery, and kitchen were attached, although these were in separate buildings. The first Norman halls, like their Anglo-Saxon predecessors, were also aisled, with a row of columns running parallel to each of their two long sides, to reduce the depth of the roof trusses and to add stability. By the end of the twelfth century, separated apartments for family members and close retainers were also connected to the hall, under a single roof.⁶ Most surviving first floor halls are in stone, and composite examples of a stone base and timber first floor have perished, since they rotted, burned, or could be replaced more easily. This has much to do with the materials available in various regions, since stone was more prevalent in the southeast, and timber was more plentiful and less expensive in the west. The earliest halls resembled barns, having a central high space running the entire length and side aisles, separated by columns. Of the few wooden halls that survive of those in which the ground floor was in wood, the most notable examples in Britain are

from the eleventh and twelfth centuries. One is in Cheddar, built in A.D. 1000 in Somerset, which is the largest of these at 60 feet by 100 feet, and it is magnificent. Rubble footings were usually used, on which the timber-framed walls rested, which performed well in the freeze–thaw cycle of winter and spring. A huge hall at Westminster, built in 1097, is 67.5 feet wide by 239.5 feet long and still has hints of brilliant colors used inside, with traces of red and blue separated by black lines. Columns were usually circular, rather than square or rectangular.

The buttery, which was for drinks, and the pantry, for bread, usually flanked a passageway leading to the kitchen, which was relegated to one end of the house, because of the risk of fire. As conditions became more secure, the hall moved down to the ground floor, having a high roof to prevent the buildup of smoke from the central hearth. The hall became, as one historian described it,

the social center of the estate. It was the assembly place for tenants, for legal and administrative purposes, as well as the main living room for the lord's family and personal staff, where most of them dined and, at first, some of them slept.⁷

After this, during the fourteenth century, the aisled hall died out because of innovations in structure, such as the hammer beam ceiling.

The Solar, or Great Chamber

In the early history of the hall, individual bedrooms were a rarity for the staff. Servants slept in the hall and the personal servants of the family slept in the lord and lady's bedroom for protection. This bedroom was called the *solar*, meaning a room above ground level, but is sometimes referred to as the "great chamber." It was originally over the kitchen, buttery, pantry service wing, and was used as a bedroom and sitting room by the owner and his family. From the eleventh century onward, it was heated by wall fireplaces. Its location allowed the owner to discretely retire from dinner, which was usually a busy affair, including retainers, and to go up a stairway at the end of the house without walking the entire length of the hall. A landing on this outside stair, called an *oriolum*, due to its similarity to an earlike appendage, slowly evolved into the oriel window, after it was enclosed. It was originally a covered porch at the middle or top of the stairway leading from the hall to the solar, but now means a "projecting window recess."⁸

These basic components then, of the ground floor hall, service wing, solar, or great chamber on the first floor, as well as garderobe, or bathroom and covered entry, usually located off-center of the rectangular hall, near the end of the long front wall, eventually became the essential elements of the typical Norman house.⁹

Peasant houses, on the other hand, had a simple rectangular plan, consisting of a "long house" with a living room at one end and a kitchen at the other, and separate outbuildings for the animals. These appear to have been rebuilt after each generation when a son took over a small holding from his father. There is one example in Yorkshire that was rebuilt nine times in the course of 325 years, from the late twelfth century until early in 1500, in which the plan stayed essentially the same.

While it describes a house in Flanders, and not in Britain, one classic passage by a contemporary writer named Lambert in 1117 paints a graphic verbal picture of a three-story wooden house by Arnold, lord of Ardes, near his castle.



Dogan Houses The Dogan people of Mali build their houses of mud brick and use thatch for the roofs. Because each individual or family has a freestanding house and they are typically clustered close together, their settlements have a distinctly vertical, uniform appearance. *Source:* James Steele



Chaco Canyon The Anasazi terrace houses at Chaco Canyon represent an intelligent adaptation to a local climate which is extremely hot and dry during the day for most of the year and cold at night. There is also very little wood available for structural use. The builders of these communal houses used local stone and mud brick, long with pimon logs covered by reed mats and a compressed clay covering to great effect here. These allowed them to cluster their houses together to provide a buffer against the heat. The mud brick and stone also kept the inside cool during the day, but buy the early evening, it would have penetrated through the walls, making the inside very hot. The terraces provided a cool place to sleep at night as well as being a social space during the day. Courtesy of Ken Breisch



Machu Picchu The Spanish incursion into Peru and the destruction of the Inca Empire there forced a group believed to have been dedicated to the preservation of the legacy of the imperial line to flee into the mountains high above the Urubamba river valley. They built a village there that remained undiscovered until the early 1920s when Hiram Bingham who was the inspiration for the Hollywood action hero Indiana Jones, uncovered it again. He found individual houses placed on carefully contrasted terraces that allowed the inhabitants to grow food to support their small community. The houses were built of local stones that were put up in battered walls without mortar and the joints are so tight that it is difficult to even get the blade of a knife between them. The community seems to have been divided between secular and sacred zones. The dwellings in the more exclusive area have niches in them that are believed to have held large jars that contained the mummified remains of Inca Emperors, which the sect brought with them. One large vertical rock on the mountaintop has evocatively, but quite appropriately named The Hitching Post of the Sun. Courtesy of Hugo Cavallo



The Nubian House The Nubian people occupy an area that now straddles the border between Sudan and Upper Egypt, near Sudan. They played a significant part in the Pharaonic portion of the history of Egypt because they posed a constant threat to the autonomy of their powerful Northern neighbors, on the one hand and offered them precious goods that they could trade for, on the other. Recent archaeological discoveries, such as the massive Pharaonic fortress of Buken which was built beside the Nile to prevent Nubian invasion, testify to the respect and fear that the ancient Egyptians had for their erstwhile trading partners. Eventually the Nubians did manage to control Egypt for a brief time, famously putting warlike Pharaohs such as Taharqa on the throne. Nubian houses then, like those today were made entirely of mud brick because there is very little wood in the region, in which the desert comes almost to the age of the Nile. The people today are also too poor to be able to afford other imported materials, such as steel, to use as scaffolding, or centering, or the concrete it might support. So, they devised an ingenious system of construction that begins with a straightforward vertical wall at the far end of the house, using mud bricks and Nile clay as mortar. Masons then mark a parabolic, catenary arch on this wall with the same clay, before layering more bricks that are cut to an angle with an edge. The base line of these vaulted courses is kept wider than the crown at the top, so that each course will remain in compression leaning against the back wall, until they can be safely straightened out. This restricts the width of the house, or the parallel rooms in it, to about ten to fifteen feet. The mud walls create an effective thermal buffer against the extreme heat of the region and orienting the vaults to align with the prevailing breeze from the river ensures constant ventilation. *Source: James Steele*



The Jomon House The prehistoric period of Japanese history is named Jomon by archaeologists because of the characteristic way that the people decorated their clay vessels. They wrapped them with twine or cord while they were still wet, and then removed the wrapping before they were fired, to leave deeply etched, serrated lines on the vessels. The houses that they built, which have been reconstructed as an outdoor exhibition at a Museum near Yokohama, were a very practical response to the distinctly seasonal climate of Japan, which generally has very cold, snowy winters and hot, humid summers, with a great deal of rain as well. The Jomon people started house construction by digging a round, uniformly deep pit in the ground, about three to six feet below grade. Wood is relatively plentiful in the island nation, and so they then inserted poles into holes that were equally spaced around the perimeter of the pit, leaning inward, like a teepee. The difference between the form of the Jomon house and that of the Native American Plains tribes, however, beside the pit which fixed them to one spot, is that the pre-historic Japanese house used two parallel horizontal ridge beams, about ten feet above grade, supported by an additional two pairs of vertical columns in the center of the house, penetrating the pit floor, which the angled row of perimeter poles rest on. A final horizontal ridge beam, at the top of the house, then made it possible for the prehistoric builders to make a second smaller pent roof, above the lower angled one that let a bit of light into the house at the gable ends and also let the heat and smoke from the cooking fire, which also provided the only source of warmth in the winter, escape. Jomon houses were roofed with straw thatch, as precursors of the later Minka farmhouse. *Source: James Steele*



Malay House The Malays are a uniformly identifiable race that has historically occupied territory far beyond the confines of the Malay Peninsula. They are Muslim, and were believed to have been converted as Islam spread eastward from Arabia, by both military and mercantile means. Their traditional house type conforms to what anthropologists have labeled an Australnesia configuration, which includes a premeasured, precut wooden frame, joined by wooden pins that allows the house to be made of a raised floor deck, and a steeply pitched roof with wide eaves overhangs that keeps the windows and the interior, in shade. A master carpenter begins the construction process by measuring the distance from the tip of the housewife's index finger to the elbow of her right arm, which becomes the basic dimension used, in either multiples or divisions for all the structural members used. The carpenters prefer a hard wood like ironwood, or chengal, or teak, but each of these are now protected and when quantities are released for use, are extremely expensive. They are best in the hot, humid climate of this region, however, because they resist rot and infestation by insects, such as termites. After the measurement module is established, the trees are sawn into all of the predetermined pieces necessary. These are then brought to the home site and erected, starting with the *tiangseri*, which is the main column that supports all of the other structural members of the house. Before the *tiangseri* is erected, a religious ceremony is held, and a coin is placed beneath its base, for good fortune. Rather than being divided into rooms, the Malay house has flexible, but clearly designated areas, corresponding to public and private uses. Guests are typically received on a spacious front porch and the kitchen is detached, at the back. *Source: James Steele*



The Minangkabau House The Minangkabau ancestral homeland is located in Sumatra, which is one of the largest islands of the Indonesian archipelago, directly across the Straits of Malaka from peninsular Malaysia. The homes of the people there are very distinctive for several fascinating reasons. The first is that the Minangkabau are a matrilineal rather than patriarchal society. The second reason is that the double peaked shape of the roofs of the houses in this region commemorates a famous foundation legend of the people in it, as does their name. When a Minangkabau woman marries, she and her husband move into her house and occupy a place of honor, to the left of the front door. If the family has more than one daughter the older ones marry first, and as the process continues, the next newly married daughter then replaces the last in the living space near the door of the long narrow house. The living area of the matriarch is to the right of the entrance, so that she can control who comes in and out, and watch over and guide the new arrivals. Each daughter's family is displaced in this way, as they move clockwise around the perimeter of the longhouse, so that the oldest replaces the matriarch when she dies. The foundation myth relates to a David and Goliath like story of a war between the Minangkabau who have gold mines in their region and the covetous Javanese, who wanted them. To settle the dispute the Minangkabau suggested a fight between prize water buffalo chosen by each side. The Javanese chose their biggest, fiercest specimen, but the Minangkabau chose a suckling calf which they starved and attached a curved knife to its nose. When the two were let loose the calf went for the soft underbelly of the bull, looking for milk, and stabbed it to death. The name Minangkabau means "victorious buffalo," and the peaks at each end of their long houses remind these people of that battle. Courtesy of Ezrin Arbi



The Yemeni House Traditional houses in Yemen are built as towers, in either stone or mud brick, depending on their location and the availability of each material. This vertical form reflects the social stratification in this culture, in which the privacy of the family, and especially the women in that group, is sacrosanct. To ensure this, all of the day-to-day service functions of each household, such as food deliveries, parking and storage, take place on ground level. The next level, above that is reserved for the majlis, which used for entertaining male guests. The women of the family do not mix with these visitors, remaining unseen behind closed doors, where food preparation also takes place. Food for guests is pushed through an opening in the wall between the kitchen and the all male majlis, to prevent interaction with women. There is sometimes an equivalent, totally separate entertaining area for women as well at this level. Family activities take place on the levels above the second floor, but these spaces, too, are often segregated by gender. Bedrooms are at the top of the tower-like house, with those of the father and mother at the highest level. The vertical form of the house also induces natural ventilation as air flows up through the stairway by stack effect. The thick masonry walls kept the intense heat of the region at bay, and the white paint around the windows helps to reduce glare. © Curt Carnemark/World Bank Archives

He describes a richly textured domestic situation, in which the ground floor was given over to granaries and storage rooms where large wooden boxes, cases of wine, and large implements such as corn grinders were kept. The first floor contained “the dwelling and common living rooms of the residents in which were the boarders, the rooms of the bakers and butlers, and the great chamber in which the lord and his wife slept.”¹⁰ The support staff of maids as well as the younger children occupied rooms around the great chamber, and there was also a “private room” nearby, “where at early dawn or in the evening, or during sickness or at a time of bloodletting or for warming the maids or weaned children, they used to have a fire.”¹¹ The upper story was occupied by older, postpubescent children in a series of “garret rooms,” in which were, according to Arnold, “on one side the sons (when they wished it), on the other side, the daughters (because they were obliged) of the lord of the house used to sleep.”¹² The watchman and family bodyguards also lived on the upper level.

THE *DOMUS AUREA*, ROME

The *Domus Aurea*, or Golden House of the Roman Emperor Nero (Nero Claudius Caesar Drusus Germanicus), was built between A.D. 63 and 68. Nero took advantage of a fire that had ravaged Rome, which some historians believe he started to distract attention from his excesses, as well as to push through a grandiose rebuilding scheme for the city and his own palace. The great fire, which started on July 18 in A.D. 64, ravaged 75 percent of the city, so that only 4 of its 14 districts survived unscathed. The damage to the Palatine Hill and the Forum was especially severe. Nero saw this as an opportunity to seize three of the Seven Hills of Rome, the Palatine, Caelian, and Esquiline promontories, along with part of the Forum, altogether encompassing a total area of about 200 acres, for his own urban estate, displacing hundreds of thousands of people who had lost their homes in the fire in the process. Understandably, this caused a great deal of public resentment. It was intended by the emperor and his architects, Severus and Celer, to be far more than a royal residence, however, and their plans included nothing less than the conversion of the depression between the intersection of the Palatine, Esquiline, and Caelian hills into a forested valley and lake, with a green border separating all of them from the rest of the city, with Nero’s house strategically placed in the midst of it. This rural villa in the middle of Rome was about twice the size of the Vatican City today, which is technically a separate state, like the District of Columbia. The site, which was shaped roughly like a triangle with its point facing south, was bounded by the Circus Maximus and Porta Capena on the left diagonal to the southwest, and the fourth century B.C. walls running along the right diagonal to the southeast, with the line of the current Via Cavour and Via Lanza, which closed off the triangle, along its northern edge.¹³

Bringing the Countryside to the City

The *Domus*, which was located in the upper right, or northeastern, quadrant of this huge site, was positioned on a hillside to take maximum advantage of the panoramic view across the lake and valley below and then over the treetops of the



Near the *Domus Aurea*. Courtesy of Braham Ketcham. Source: Flickr

encircling forest to the new marble skyline of the city beyond. The artificial lake, which was the introductory public announcement of the presence of the *Domus*, above it, occupied the area where the Coliseum now stands. An arcade, which wended its way up the slopes of the three hills to the royal residence, with temples located along the way, was announced by a 150 feet high statue of Nero, dressed, or more accurately undressed, to resemble the sun god Helios, complete with radiating crown. As the contemporary historian Suetonius described the scene: “There was a lake like a sea, surrounded by buildings to represent cities, beside tracts of country, varied and plowed fields, vineyards, pastures and woods with a great number of wild and domestic animals.”¹⁴

The plan of the residence is usually published out of context, which makes it look confusing and awkward, unless this stunning topographical setting is also taken into account. It is essentially a 450 yard long ranking of 250 rooms facing in one direction to take full advantage of the southern exposure and the view. The rooms, which are organized in *enfilade*, or series, are organized behind an arcaded cryptoportico that switches from a row of columns to a perforated wall in some places, depending on the amount of privacy desired. This provides shade and protects from glare those who are looking out at the fields, trees, and lake in the distance. The portico also provided a foreground, or frame, to the distant view and acted as a transition between the human environment and the natural worlds similar to the function of the *engawa* of the Japanese house.

Nero's desire to create a rural retreat in the middle of Rome may have come partly from his childhood, which was spent in the countryside. Because of vicious internal strife at court, his mother sent him away to live with distant relatives when he was very young, and he was raised on a farm, before returning to court as the adopted son of the Emperor Claudius, whom Agrippina had married. In their lust for power they assassinated both Claudius and his legitimate son Britannicus so that Nero could become emperor.

The Peristyle and Portico Tradition

However grand, the *Domus Aurea* still conforms to the peristyle and portico tradition used in rural Roman estates since the Republican Period, and so, in spite of the fact that it hardly represents the residential architecture of the status quo, it does offer many insights into the way in which these forms evolved and how they were being dramatically transformed at this stage of Imperial history. The *Domus Aurea* is a creative watershed, after which there was a reflexive return to more pragmatic planning, in keeping with the conservative policies of Nero's immediate successors. There was great dissatisfaction with the house even as it was being built because of its scale, level of ostentation, and the large number of poor that were displaced to make it possible. Half humorous, half sarcastic "warnings" by Suetonius at the time said that, "All Rome is transformed to a villa," and urged his contemporaries to flee before they were engulfed by it.¹⁵

Power to the People

The bulk of the construction of the *Domus Aurea* was completed over a four-year period, but there are records of parts of it continuing to be built after Nero's death. It only survived, however, for another 40 years before being either demolished or subsumed into public works projects intended to defray discontent with economic disparities of the kind that Nero's lifestyle made all too evident. Vespasian filled in the lake and built his amphitheatre, the Coliseum, over it, temporarily using the vestibule of the *Domus Aurea* to store some of the mechanisms used to raise and lower equipment to and from the wooden floor of the arena. For a time, the statue of Nero that had marked the entrance to the *Domus* stood near the exterior wall of the Coliseum. The main palace is now covered by the Thermae of Trajan, and the public baths of Titus were built on that part of the Esquiline Hill from which the majority of the evictions had taken place that had helped to turn public sentiment against the project in the first place. To these were also added the Temple of Venus and Rome and the Flavian Temple of Peace at the northern edge of the *Domus* with a library in which some of the artwork that Nero had assembled were put on public display. The private paradise of a luxury-loving emperor was eventually transformed, in the words of a historian who is especially knowledgeable about this period, into a "pleasure ground of the masses."¹⁶

A Lasting Contribution

Since the *Domus Aurea* only existed for such a short time, was so controversial when it was built, and was such a luxurious anomaly, why discuss it here? Several reasons among the many that come to mind should be mentioned. First, it is perhaps the best example among several contenders of a growing confidence in a

Roman, rather than a purely Greek or Hellenistic, identity in residential design, albeit at an elevated social level. As a *parvenu* on the stage of the ancient world in the Republican Period, Rome relatively suddenly was able to exercise the enormous power it both had wrested from others and, in the case of the Attalid Empire, had thrust upon it. It appropriated the symbolic authority it needed to convey its hard-won position from predecessors who had previously held a similar position, such as the Athenian Empire under Pericles and the Hellenistic syncretism initiated by Alexander the Great and perpetuated by his successors, of which Attalus, who founded his own empire at Pergamon, was one. Alexander's adventure began and ended in Persia, in an unprecedented attempt to convert that unbelievably vast part of the world he had conquered to the Hellenic values and traditions that his tutor, Aristotle, had instilled in him when he was a child. His last wife, Roxanne, was Persian, and he encouraged his men to follow his lead, which they did in mass marriages to Persian brides in Persopolis, before he died there. He and the Hellenistic Age that he introduced became so identified with that culture in the Roman consciousness that the luxurious residential tradition that may be traced back to it was disparagingly referred to by them as being "Persian."¹⁷

But, the adaptations made by the Romans were far more hedonistic than their Greek or Hellenistic predecessors ever dreamed of. The *Domus Aurea* is certainly an unrepressed example of that, as a declaration of independence from a reliance on past styles to convey authority and taste and a new trust in Roman identity alone. The stiff and formally predictable palace of Augustus, which preceded Nero's *Domus* and became the model of decorum for the more conservative emperors who immediately succeeded him, serves as a useful point of comparison. While the *Domus Aurea* is also based on axial symmetry, this only occurs in its individual parts, which are placed within a relatively asymmetrical whole. This gives Nero's Golden House a far more lively and less predictable plan, to say the least.

The *Domus* has been only partially excavated, and further archaeological work has been difficult because it has been fused in some places to the foundations of the buildings that were subsequently built on the site by Nero's contemptuous successors. The part of the plan that is clear, in what appears to be a peristyled courtyard configuration with an elongated rectilinear form, is the sequence of rooms along the northern edge of the court. These are organized in a rank on either side of an octagonally shaped entertainment center and dining room next to a *nymphaeum*, or water garden, which faces into the court, placed off axis to the east. The Romans loved fountains, but the *nymphaeum* was something more, creating nature in microcosm in a series of controlled waterfalls with a rushing sound that must have filled the courtyard and reached into every room that opened onto it. This northeastern edge of what might have been a long and narrow peristyled court terminates in the most important and memorable cluster of spaces that have been discovered in the house so far, called the "Octagon," because of the structural configuration of its central reception space. A constellation of rooms fan out from this central domed entrance, organized symmetrically around the north-south axis that runs through it. Visualizing what they must have looked like and how they might have been used is important because it gives us a keen insight into the worldview of the most powerful man in the Roman Empire at that time and the level of

luxury he demanded. This was not just luxury at a material level, of marble, gilt, and jewels or other expensive finishes, but at the conceptual level as well, beyond the gold plating that gave the villa its name.

The Dome Replicates the Sky Vault

The dome covering Nero's dining room was supported by the octagonal configuration of piers that surround the reception hall. It was not just a hemispherical roof, but had an *oculus*, or circular opening, at its apex as a premonition in miniature of Hadrian's famous Pantheon, which followed it. Like the Pantheon, this *oculus* let the sun and moon shine in and the rain pour in as well. A contemporary description of a similar kind of domed space in Varro's villa at Casino gives us an idea of what this one might have been like. Varro's dome had a mechanism attached to the curved inner surface to imitate the astronomical movements of the sky vault it imitated, so that it could also be used to tell time. There was also a compass shown on the inside of the dome.

A wall painting of the ceiling plan of the *oculus* found in the *Domus* indicates that the inner surface of the dome was a *trompe l'oeil* of the sky with Helios and his entourage in the midst of the clouds above. This painting is not only a reminder that every surface in the house was probably painted, but more importantly that the Roman consciousness of three-dimensional space and how to structurally manipulate it was so well developed at this time that a ceiling plan, which is a scaled diagram of the ceiling as it looks when lying on the floor below it, would be considered to be a perfectly natural pattern to replicate on the wall of a residence and be recognized as being the spatial configuration of the Octagon of the *Domus Aurea* as well.

The Romans adopted the Greeks' habit of eating in a reclining position, possibly because they thought it was more civilized and better for the digestion, so that sitting at a table was considered to be plebian. This made it difficult for more than three people to eat together since the wealthy also had servants who had to have access to a table that the recumbent trio would share. The perfect solution was the *triclinium*, which was a U-shaped arrangement of couches, with a table in the middle and access for service at the open fourth side. The Octagon has four sets of *triclinia*, with two on opposite sides of the entry axis, near the peristyle and the door, and two splayed out like ears, on the upper sides of the domed Octagon, which were more private. These are separated by a fountain that cascaded down a stairway, placed directly on axis with the front door. This entire ensemble, of domed central space and surrounding sets of *triclinia* culminating in a stepped cascade that took pride of place at the most visible part of the composition, was flanked by a symmetrical pair of apsidal halls, presumably each used for the display of a sculpture.¹⁸

A Royal Dinner Party

With the location and function of each of these spaces in mind, then, it is possible to conjure up what a dinner party with Nero in the Octagon might have been like. The approach to the reception room would have begun near the lake with guests being led through the cryptoporticoes lined with temples, by the emperor's bodyguard, ending at the top of a hill. It would probably have then proceeded

along the courtyard through the colonnade of the peristyle, past the *nymphaeum*, from the west. Guests would have passed a series of long narrow and extremely high vaulted rooms, open to the arcade in which they were walking, which were either shrines or exhibition niches, for sculpture. To give some idea of the scale of these vaulted spaces, the famous sculptures called the *Laocoon*, which was discovered during the Renaissance and had such a profound influence on Michelangelo and others at that time, was exhibited in one of them. Guests then passed to the large vaulted water garden that dominated the entire residential composition and served to announce the Octagon in the middle of the courtyard. They would then turn left, through a doorway in a massive, brick clad concrete wall into the central domed space, just after a brief glimpse of a major sculpture in the apsidal hall near the front door. As the host, Nero would have then taken his place in the middle of the Octagon, under the golden dome, as the living representative of Helios. The floor, which was wooden under the dome, was turned by a gear driven by the waterfall cascading down a passage opposite from the entrance and under the floor to move it. Panels would have opened above him to shower flower petals down on him, and perfume would have misted down on the assembled guests from pipes on the wall. Braziers would have provided light, and moonlight would have been streaming through the *oculus*; there would have been music, perhaps some of it even provided by him, since he played the lyre. Many servants would have been moving about with trays of food, served to those at each of the *triclinia*. Nero may have been a megalomaniac, but he may have been right in saying, when he was forced to commit suicide because of his misrule, that “what an artist dies with me.”

GREEK HOUSES IN THE CITIES OF ASIA MINOR

If they are given any credence at all in histories of ancient Greece, the cities in Asia Minor are usually relegated to a secondary position of influence and treated as the grateful beneficiary of the unparalleled cultural strides made on the mainland in Attica. The truth is quite the opposite, as many of the intellectual and philosophical innovations that made this progress possible are known to have originated in Asia Minor, and then to have moved West. The litany of these influences, while not widely known, is extensive and has been recited in several other sources. The important point to reiterate, however, is that these innovations were not of a superficial nature, but penetrate to the very heart of the Hellenic ethos.

Ionia

Ionia, which was the central region of the Aegean coastline of Asia Minor that separated Aeolia on the north from Caria on the south, originally took its name from a quasi-mythical patriarch named Ion. While he is conventionally listed as having been the son of an early Athenian king named Xuthus and Queen Creusa, and of having led a colonization effort from Athens to Asia Minor in the wake of the Dorian invasions of 1120 B.C., there are less well-known and extremely tantalizing variations of this foundation myth. While most sources agree about the four Ionian tribes that grew out of the four sons of Ion, named Geleontes, Argadeis,

Aigikareis, and Hopletes, another less well-known genealogy places the origin of Ion much further to the east. In the biblical “Tale of Nations” in *Genesis*, it states that:

This is the account of Shem, Ham, Japeth, Noah’s sons, who themselves had sons after the flood. The sons of Japeth (were) Gomer, Magog, Madai, Javan, Tubal, Meshech and Tiras . . . The sons of Javan (were) Elishah, Tarshish, Kittim, and Dodanim. From these, the maritime peoples spread out into their territories by their clans within their nations, each with their own language.

In his overview of the Asiatic elements in Greek civilization, Sir William Ramsay has raised the point that the Greek version of Javan is Ion, and it is also interesting to note that the area strongly indicated by tradition as the starting point for Noah’s flock is Mount Ararat in eastern Anatolia. Whatever the true origin of Ion was, the region of Ionia in Asia Minor is most likely to have been the birthplace of the poet Homer, whose *Iliad* and *Odyssey* both had an incalculable impact upon Hellenic religion, mythology, and social values.¹⁹

While several Ionian cities have laid claim to this honor, the island of Chios, which is about five miles from the Turkish coastline, is widely acknowledged to have been his home, as well as the location of a group of his disciples called the Homeridae, who perpetuated his poems through recitation until they were finally codified around 750 B.C. While the dramatic events that Homer speaks about were probably derived from a cataclysm that took place at Troy around 1195 B.C., those that feel that he alone composed *The Iliad* also believe that he did so about 1000 B.C. Once called “the Bible of Hellenism,” *The Iliad* was such an essential part of early Greek education that it was memorized verbatim and recited aloud in much the same way that Koranic verses are recited in Islamic schools today. As in the current example recited, such readings were not only intended to teach the basic skills of spelling and reading but were also considered to be an effective way of inculcating the basic values that are contained in the verse. In the case of *The Iliad*, those values revolved around the importance of personal courage, valor, and honor and were presented in such a way as to stress continually the degree of human frailty in comparison to the immortality of the gods.

A Pantheon of Individuals

Homer, as well as Hesiod, personified vividly each deity in the Greek pantheon in such a way that their highly individualized characteristics could be understood by the common man and easily linked with the natural phenomenon they were meant to embody. As historian Michael Grant has so aptly described this important identification: “Homer and Hesiod were credited, more plausibly, with the remarkable achievement of standardizing and welding together the Olympic gods for Greece [and] Homer in particular makes of them . . . a collection of perilously powerful divinities full of vices and foibles.”²⁰ Many of the deities in that pantheon originally sprang from Eastern cults. Dionysus, for example, who may have been so instrumental in the rites behind the formation of Greek drama, is known to have had his origins in the worship of Diouns, who was the Phrygian god of vegetation. Other obvious examples are the Greek goddess Artemis, who was derived from the

ancient Anatolian mother goddess Kybele, or Cybele, as well as Zeus, who bore a strong resemblance to Kronos, who was the Hittite god of heaven. This later comparison even extends to the wives of these “fathers of the gods,” who were called Hera and Hapat, respectively. Such similarities can be noted for virtually every member of the Olympian pantheon, indicating the degree to which Homer did indeed manage to Hellenise many diverse religious conventions into a single tradition. As Sir William Ramsey has said: “One remarkable fact strikes every observer, and that is that the personal names in old Greek mythology are rarely Greek.”²¹

With Alexander, and his love of Homer’s *Iliad*, then, the influence of Ionia comes around full circle in that a Macedonian who was more Greek than the Greeks was able to bring Hellenism back to the region where its highest ideals had been formulated in the first place. The generating influence of Ionia in this circle does not stop there, however, but may be said to extend even further to the first Persian incursions into the Aegean area of Asia Minor. Their rule of this area, which followed the capture and sack of Sardis in 546 B.C. and their eventual conquest of each of the Ionian cities in their turn, was not particularly harsh and was administered at a distance through a system of local satraps or governors. Yet, even this intrusion was unacceptable and in 499 B.C. the Ionians and particularly Aristagoras of Miletus instigated a revolt to throw the Persians out. Efforts to find allies in this revolt on the mainland were not as successful as originally expected, but Athens did send 20 ships and Eretria sent 5. In a naval battle off the island of Lade, which has long since been fused by a field of silt to the place where Miletus once proudly stood overlooking its harbor, the Persians shattered the badly organized confederation, and the ensuing destruction of Miletus thus became a foregone conclusion. After this battle in 494 B.C., the Persians went on to try to punish those who had assisted the Ionians in their revolt, leading to the famous battle of Marathon in 490. This was followed ten years later by a major Persian expedition that led to the capitulation of Athens and the burning of the Parthenon, which incensed Greeks everywhere. The ensuing formation of the Delian League, with Athens at its head, and the eventual restoration of that city, which led to the Persian defeat at Eurymedon in 467, was not sufficient to erase that blasphemy. In a very real sense, the Hellenic crusade called for by Isocrates was a direct result of the painful memory of that invasion, even though nearly a century and a half had passed between the desecration of the Acropolis and Alexander’s crossing of the Dardanelles to free Asia Minor from Persian rule.

Institutions Common to All Cities

The major buildings typically found in all of the Hellenistic cities of Asia Minor at this time, such as the *bouleuterion*, gymnasium, and theatre, are strategically placed to punctuate the path of movement from harbor to agora, acting as landmarks with the linked spaces that they individually dominate.

Priene

Priene, which is most memorable for the strict imposition of a Hippodamian grid upon a dramatic cliffside site, did not have a symbiotic relationship with its



Ephesus, Turkey, Asia. Courtesy of Shutterstock

harbor, which was called Naulochos, as many other Greek cities did, but did rely upon it as a lifeline nonetheless. Because of its relatively inaccessible location, much of Priene's formidable circuit wall, as well as many of its public buildings and houses, have remained basically intact and still present a vivid image of the city, as it must have been in the Hellenistic period. The fine state of preservation of many buildings such as the bouleuterion to the north of the central agora and the theatre have greatly improved our understanding of the function of such buildings. Like Miletus, Priene is a masterpiece of open public spaces that are effectively separated from the private residential areas and is very instructive of the ways in which a regular grid can become a liberating rather than a restrictive device in urban planning.

In the private realm, the courtyard houses that have survived in the western part of the city are also in a good state of preservation, and rival those in Delos in their ability to recall the everyday life of the people who once lived there. Besides providing a clear example of what urban planner Jacqueline Trywhitt once called the "human-scale intermediary" in urban planning, in which there is a logical graduation of open spaces from public agora to private residential courtyard in the city, both the variety of scale and degree of finish in these homes show how far contemporary expectations of what can be achieved in average domestic surroundings have deteriorated.

House 22 on Theatre Street

Priene is a model of rational Hippodamian planning in that all of the blocks were identical in dimension and each had four houses, divided by party walls. One of these, designated as House 22 by archaeologists, is still in relatively good condition and gives a clear idea what life in Priene, at its height of prestige, must have been like. It is located to the west of the theatre, on the north side of the street that leads to that institution and now takes its name from it. It exemplifies the Greek respect for outward modesty, being plain in front, with only a single door in an otherwise unassuming wall facing the street. Upon entering there is a covered colonnaded walkway that leads to the open central courtyard, and this has all the major rooms of the house, such as the dining room, grouped around it, with the most prominent of these, of unknown use, being on the north. This space looks like a temple, with Doric forecourt, pediment, and gabled roof. It is believed to have been the living area, or *oecus*, with the dining room or *andron* to its left. Bedrooms were on the second level, also overlooking the court.²²

Delos

It is a bit of a stretch to say that Delos is in Ionia, because this 5 kilometer long, 1.3 kilometer wide island is claimed by the Cyclades in the middle of the Aegean. But it played a key role in the history of Ionia because it was the headquarters and central bank of the Delian Confederacy. Pericles had established this institution as a means of defense against the Persian Empire, and its members decided that the tiny island of Delos was neutral enough to suit each of them.

Delos is also important in Greek mythology as the birthplace of the twin deities Apollo and Artemis, fathered by Zeus and borne by Leto, who took refuge there from the vengeful jealousy of Hera. A settlement is recorded on Delos as early as the third millennium B.C., on the Kynthos Hill, and another was established in the Sacred Precinct by the seventh century B.C. This was just before the island came under the influence of Naxos, and its subsequent sacralization by King Peisistratos in the sixth century B.C., involving the relocation of all tombs on Delos to the neighboring island of Rhoneia.

Its status as a sacred precinct continued to grow, attracting pilgrims from all over the Hellenic world. The main harbor was located on the western edge of the island and a sacred way led from it to the Sanctuary of Apollo. There was an impressive line of temples, high altars, and civic buildings lined up along the waterfront that must have made an arrival at the Delos harbor quite spectacular. There were eventually four temples dedicated to Apollo in this grouping, the latest of which is also known as the Temple of the Athenians. The treasury, where the combined contributions of each of the members of the Delian Confederacy were kept, was located at the northern end of the island near an Ionic temple dedicated to Artemis. Further north still is the Sacred Lake, the Terrace of the Lions, the Letoon, the Agora of the Italians, the Stadium, and the Gymnasium, near to a narrow channel that separates Delos from Rhoneia.

During the Hellenistic period, Delos benefited from the attention of several rulers who tried to outdo each other in their contributions to the sanctuaries there. Control of the island passed to the Romans, but they gave control back to Athens

in 166 B.C., leading to its designation as a free port. Wealth followed and by the middle of the second century B.C., a number of elegant houses were built by those who benefited from commercial gain, on the northern end of the island.²³

The Houses of Delos

The polyglot culture created by the transformation of Delos to a free port resulted in the polarized residential districts as well as the public facilities on the island into separate ethnic enclaves. The houses on the northern slopes differ widely depending on the financial status of the owner, but almost all of them have at least one, if not two or more, central courtyards.²⁴ This basic Greek typology, which may be found throughout the Hellenic world as early as the fifth century, was most notably augmented by Hellenistic and Roman influence by the addition of mosaics, which are still in place in many of these houses. They differ from their Roman counterparts in being made of finely cut pieces of stone and are more expressive. They usually cover the entire courtyard, which was placed a few steps lower than the peristyle that surrounded it to prevent the rainwater that fell into the court from flooding the rest of the house. The dining room and other domestic spaces such as bedrooms were typically arranged around the sides of the peristyle, opening up to the court.

The House of the Masks, which dates from the time of the Athenian conversion of the island to a free port, has a long offset entrance leading into a large walled-in forecourt, which then opens into the central court itself. There is a more direct, but less obvious, second entrance into this court, probably used by the family as a less formal and circuitous way of coming into the house. As elsewhere, a peristyle encloses this court, and the other rooms, now designated the Room of the Masks, because of the theme of the floor mosaic, the Room with Amphora Mosaics, and the Room with the Mosaic of Dionysos Riding a Panther, all face onto the northern end of this peristyle and the court beyond.²⁵

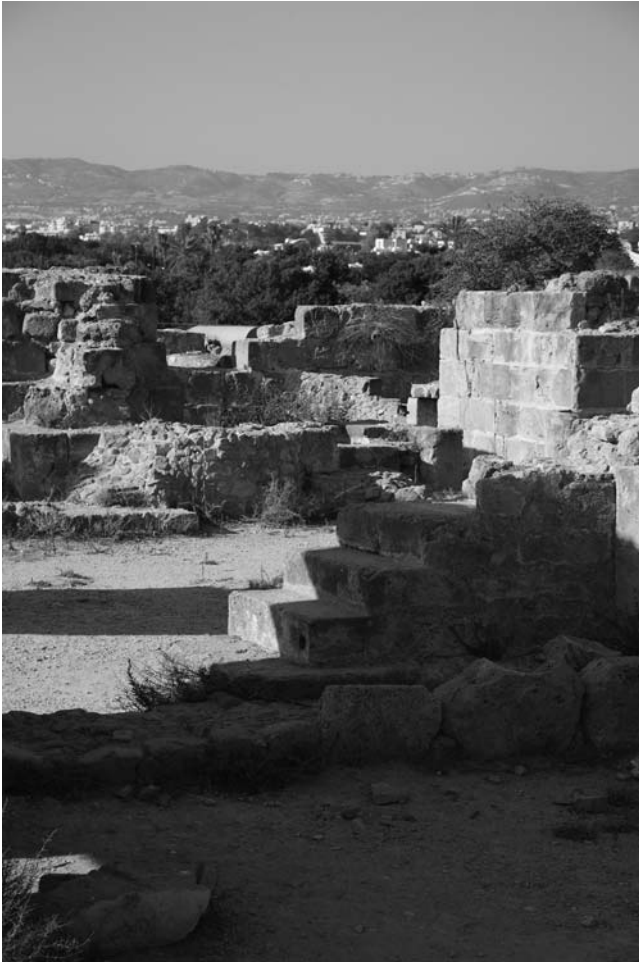
The lifestyle that these houses supported was short-lived, however, because the island was invaded and destroyed by Mithradates in 88 B.C. The substantial insights into that brief time of luxury, provided mostly by the mosaics that still survive, indicate a period of sophistication and grace.

KHIROKITIA, CYPRUS

Khirokitia is a Neolithic settlement located on the slope of a hill overlooking the Maroniou River valley about 10 miles from the southern coast of Cyprus. It was surrounded by a massive 10 feet high stone wall that was just slightly less thick than it was high. There was controlled access into the settlement through a limited number of gates, underscoring its role as both a fortress and an inhabited village, as well as the degree of insecurity that those who lived there must have felt during that uncertain time.

A Mysterious Gap

It is curious that, while other areas of Greece to the north and east of Cyprus have evidence of Paleolithic and Mesolithic culture, no trace of these historical



Paphos historic site in Cyprus. Courtesy of Shutterstock

periods has yet to be found on Cyprus. Some have attributed this to the relative isolation of the island, which may have deterred the growth of pre-Neolithic cultures there. The sea is known to have always been a challenge to the migration of people during the Prehistoric Period because they lacked the skills necessary to build sailing vessels big enough to navigate open waters. There is evidence of oceangoing vessels from this early period, to be sure, but nothing of the kind has yet to be found on Cyprus. The Neolithic Period there actually occurred in several stages, divided into Neolithic I, without pottery, and Neolithic II, after it appeared. The earliest evidence of pottery at Khirokitia occurred in 4000 B.C., but carbon 14 tests have shown that there was human activity on the site, before pottery was used there, as early as 5800 B.C. Since archaeologists estimate that the end of the first Neolithic Period occurred around 5000 B.C., there is a hiatus of about 1,500 years that has yet to be satisfactorily explained. No substantial evidence to solve the mystery has yet been found at Khirokitia, but at Troulli, on the northern coast of the island, pottery from an intermediate Neolithic Period has been found. There has been speculation that the island was

abandoned at about 5000 B.C., and then reoccupied by new settlers about 3500, but this has yet to be substantiated.

Khirokitia is one of the most important archaeological discoveries in its region and one of the best preserved Neolithic settlements in the world. It was first excavated by Porphyrios Dikaos of the Cyprus Department of Antiquities in 1934, who has said that it is “by far the most representative example yet found of the architecture, art and social structure of Neolithic Greece.” Although only a small portion of the settlement has yet to be excavated, a magnetometric survey of the area has shown that a majority of the hill was occupied.

Hunter-Gatherers and Farmers

Studies of the skeletons found there, and especially craniological analysis, have not conclusively determined where the settlers of Khirokitia actually came

from, with theories running the gamut from a distinct group not related to any neighboring region, possibly from the Balkans, Thessaly, Macedonia, or Cilicia, to indigenous builders. It is certain, however, that these first inhabitants were both hunter-gatherers and farmers, fitting neatly into that transitional period between a purely nomadic existence and the stationary agricultural phase that followed it, when urban settlements were firmly established. These early Neolithic settlers were attracted to this site because it was elevated and so could easily be protected and was free from floods. It was also close to the Maroniou River, which has a fertile valley and perennial springs. These provided a continuous source of food and water for the settlement. Also, since the sea is only four miles away, to the south, it was easily accessible by traveling through the valley, so the villagers could fish from the shore or organize tentative expeditions in small boats.

Circular Houses

The houses that have been excavated in Khirokitia thus far indicate a high level of construction skill and lifestyle. The bed of the Maroniou River is dry for part of the year, and stones provided the material with which to build the foundations of the houses as well as to make tools, such as hammers and axes. The houses that have been found are all circular in plan with stone and rubble walls built up to a height of about 3 feet. Archaeologists believe that these foundations were capped with superstructures of mud brick or earth tamped down into a wooden form, now referred to as *terre pisé*.

These structures, known as *tholoi*, had either domed or conical roofs, which were additionally supported by a wooden or stone column in the center of the house. Subsequently, during the Bronze Age, elegant *tholoi* reappear in Mycenae and elsewhere throughout the Argolid, made completely of cut stone and referred to as dressed ashlar, without supporting columns in the center. This is because, by this time, builders had mastered the technique of corbelling, which involves stepping each flat stone incrementally and progressively inward as the circular wall is built, in a gradual curve, until the space is covered.

The house form found at Khirokitia has also been used in much earlier prototypes, such as in the Natufian culture in the Levant, and it persisted on Cyprus, even as other societies around it began to adopt rectangular plans for theirs. There was usually an opening at the apex of the roof for the smoke from the hearth in the center of the room below to escape. There were also built-in stone benches around the perimeter that served as tables or beds. The floor was of tamped down earth. Sometimes, in addition to the central column, there were two others made of stone that supported a second, attic story used for additional sleeping quarters or for storage, accessible by a wooden ladder.

A House with Many Rooms

Archaeologists originally assumed that each *tholos* represented an independent house, but renewed excavations have indicated that one residence may have combined several of them, with each one used for a different purpose. There is also one *tholos* that is bigger than the others, which may have been set aside for the leader of the community, or it may have been used for the production of goods of some kind, since nearly two-thirds of its perimeter was covered by a roof, as if

shops were located inside.²⁶ The passageway covered the east, west, and north sides of this larger *tholos*, and there was an opening on the south for ventilation in the summer and the lower winter sun.

All of these *tholoi* show considerable skill in construction, but the overall planning of the village does not, since the houses seem to be built randomly, occupying every available space in an organic arrangement. The *tholoi* are so close together that there is only room for narrow pedestrian passageways between them, which wind through the entire village. There is evidence that there was one main road, which crossed through the settlement at an oblique angle from a bend in the river to the south, leading up to the top of the hill. It seems to have been the major access to the water supply, and so was the lifeline of the settlement. As houses were added along its edge, the surface of the road was raised, until today its embankments look like a wall, because some of these houses have disappeared. Since the village was also surrounded by a wall, archaeologists have found it difficult to determine just where the main street ends and the wall begins. But, they are sure that the wall turned to form the western limit of the village. There were no houses built beyond this point during the primary period of occupation, although some did appear to be added much later, as population increased, and a second defensive wall was added to incorporate and protect them. Based on the number of houses uncovered and the most recent assessment of room functions, it is estimated that at its peak Khirakitia only had a population of about 600. But, it should be mentioned that the Bronze Age cities of Homer's *Iliad*, such as Troy, Mycenae, Tiryns, and Gla, which had such an enormous historical impact on the Hellenic imagination and value system after the Dark Ages ended after their fall, nearly 500 years later, were also relatively small in scale and population.

Based on skeletal evidence, the inhabitants were fairly diminutive, with an average height of 1.61 meters for men and 1.51 meters for women. Infant mortality was high, although the life expectancy in the village was about ten years longer than that of its Neolithic neighbors averaging in the mid thirties. As in Çatal Hüyük, the dead were buried under the floor of the house, but rather than an inhumation burial, in which the body was left outside, exposed to the elements until the bones were stripped clean and then wrapped in cloth for burial inside, the dead in Khirakitia were placed in a fetal position, directly under the surface of the floor, buried with implements, such as stone bowls that were ceremoniously broken as part of the funeral rite. Cornelian bead necklaces have also typically been found on the skeletons of the women. Sometimes huge stone slabs were placed flat over the graves. Flint sickle blades have also been found inside the houses, confirming that this was mainly a farming community, but the presence of flint arrowheads, and the skeletal remains of deer indicate that hunting was still practiced. Other bones, of sheep, goats, and pigs, suggest that these animals may have been domesticated at this early date. They also indicate a very varied diet, since the seeds of figs, olives, and prunes have also been found, as well as pistachio shells.

Fine Implements

A more detailed idea of the daily life of the people in this village may also be conveyed by a description of the bowls they used for cooking and eating. These were

made of andesite, a stone they collected from the riverbed, rubbed thin against another stone into perfect shapes with nearly translucent sides, with patterns engraved on the sides. Some had spouts but most did not. Some of these vessels are made of a black stone that does not exist on the island and so must have been imported or traded from somewhere else, perhaps Anatolia or Northern Syria where vessels made from this material have also been found. Spindle whorls and needles found in the houses also indicate that the people of this village wove their own textiles.

KNOSSOS, CRETE

The first advanced civilization in the Aegean basin developed on Crete in the early part of the Bronze Age and lasted until it was weakened by the eruption of a volcano on the island of Thera in 1450 B.C. This destroyed much evidence of it, except for the city of Knossos, which was destroyed much later, around 1375 B.C., possibly due to a Mycenaean invasion from mainland Greece. There is ample, irrefutable evidence of the cataclysmic destruction of Thera, now Santorini, by a volcano, since half the island, which now appears as a semicircular bay, is missing. Studies of the ash caused by the volcano on the sea bottom and on Crete have confirmed that it reached the island, and some geologists have speculated that it may have traveled as far as Egypt. There were 30,000 people on Thera at the time of the eruption, but the lack of any human remains as well as the presence of frescos depicting an evacuation by long boats indicate that they may have all had time to escape. An earthquake accompanied the eruption, which may have caused a tsunami that compromised the Minoan ability to defend themselves against a Mycenaean invasion.

An Elegant Culture

The culture that this volcanic eruption brought to the verge of extinction was highly refined and developed. It was fostered by the cultivation of grapes and olives, which also yielded wine and olive oil. This gave it an advantage over northern Greece, which was restricted to growing wheat and barley. This allowed the economy and the standard of living in this part of the Aegean to grow more quickly. Archaeologists have divided the Bronze Age, which began in 3000 B.C. and ended in 1100 B.C., into early, middle, and late periods in this region, with several subheadings in each period. On Crete, in a much simplified chronology, this translates into Early Minoan I, II, and III, from 3000 to 2000 B.C., Middle Minoan IA, IB, II, and IIIA and IIIB from 2000 to 1600 B.C., and Late Minoan IA, IB, II, IIIA, IIIB, and IIIC from 1600 to 100 B.C. The description of Minoan architecture that follows focuses mainly on the period from 1600 to 1500 B.C.

The ruins visible in Knossos today represent different historical periods. The first of them is a part of the city that was built in the Middle Minoan IA period, but was burned down around 1700 B.C. The palace was then rebuilt on a much larger scale and was remodeled and enlarged over a period of 300 years, until much of the building erected during this phase was once again destroyed by a large



Knossos ruins. Courtesy of Shutterstock

earthquake. The palace was reconstructed again, when the Minoan culture was at its height, and finally destroyed.

Inspired by the Myth of the Minotaur

The discovery of Knossos is one of the greatest, and now most controversial, archaeological adventures in modern history. The story behind it reads like a detective thriller, including clandestine meetings in smoke-filled bars, the transfer of top secret information, and a high stakes gamble with a small fortune in the balance. Sir Arthur Evans began working on Knossos in 1900, when he was 49 years old. It was his first archaeological project. Before he became involved, however, a Cretan merchant named Minos Kalokairinos had made trial excavations on the site, digging 12 trenches that revealed parts of the palace only six feet below the surface. The pottery that he unearthed caused a great deal of excitement on Crete, to the extent that the Parliament passed a resolution forbidding him to dig any further in fear that the Ottoman government that then controlled the area would take over the project and remove all the finds to the Imperial Museum in Istanbul.

Evans learned of Kalokairinos's finds and, after meeting with him, went to examine the collection of pottery and shards taken from the trenches. This prompted him to decide to excavate the site himself, buying as much of it as possible. This involved obtaining permission from Istanbul and transferring about a million dollars of Evans's personal fortune to finalize the purchase. It was not long after he began excavation that Evans concluded that this city was built by a people of great originality, vigor, and aesthetic achievement. They had sustained their culture there for more than 1,000 years and had disappeared without a trace. They were extraordinarily gifted builders and fresco painters with an obvious love of luxury and life. Knossos appeared to him to be the epicenter of a *thalassocracy*, a maritime civilization like Athens and Britain after it, that reached and maintained ascendancy through a powerful navy and the domination of the sea. Subsequent evidence of their trade as far afield as Egypt and Western Asia supports this view, as well as



Early Minoan house at Knossos. Courtesy of Shutterstock

the Minoans' high level of sophistication. They were an elegant and not particularly warlike people who were totally unlike the Mycenaeans, who competed with them for economic markets around the Aegean and Mediterranean Seas, as well as the Assyrians, Hittites, and Egyptians at that time. There were no battle frescos or overtly aggressive scenes of self-aggrandizement in their art, just images of a joyously happy fashion-conscious people who obviously loved life.

The palace that Evans continued to excavate was, in its prime, the center of an extraordinary culture. It was not only a royal residence, and home to the extensive retinue that the royal family required, but also a religious and administrative center. It did not resemble any other residences of similar function built during the same historical period elsewhere and so could not be easily defined. Stone, wood, and gypsum were the main materials used to build it, and at its furthest extent it was five stories high in some parts.

The palace was supported by wooden columns, which are unusual in that they taper outward from bottom to top, rather than the other way around, as classical Greek columns do. Their wide capitals made it possible to use wider spans, which reduced the numbers of wooden beams necessary to support the roof. Few of these columns remained when Evans excavated the site, so he and his team recreated them from wall paintings and from their own imaginations.

The Labyrinth of the Minotaur

During his excavation of the palace, including a *megaron* with a throne still in place against one of its walls, and frescos showing acrobats vaulting over the back of a charging bull and a double headed axe or *labrys*, which was the royal symbol,

Evans also uncovered a large compartmentalized chamber beneath it. He concluded that he had found the mythological labyrinth supposedly built by King Minos to imprison the Minotaur. Lacking any evidence at the time to help him determine what this culture had called itself, he decided to call it Minoan. The legend of King Minos and the Minotaur, which inspired his choice of a name for this culture, focuses on Minos who was a son of Zeus. Zeus saw Europa, the daughter of the Phoenician king Agenor, picking flowers with her friends near the seashore. He fell in love with her at first sight, but thought he would not be attractive to her, and so he changed himself into a bull and cavorted around her, tempting her to ride him. When she did, he swam off to Crete with her on his back. Three sons, named Minos, Rhadamanthys, and Sarpedon were born to them there. Minos later ruled Crete using laws given to him every nine years by his father, Zeus. Minos married Pasiphaë, and they had four sons and four daughters, living in the royal palace at Knossos. The legend goes on to say that Minos, in his desire to make a sacrifice to Poseidon, prayed that the god of the sea would send him a suitable offering. Poseidon sent Minos a beautiful white bull, but Minos decided to keep it and sacrificed another instead. As a punishment, Poseidon made Pasiphaë lust after the bull that he had sent to Minos, and the Minotaur, who had a man's body and a bull's head, was the result. Minos imprisoned it in a labyrinth below the palace that his architect Daidalos designed for it.²⁷

Evans subsequently presented his theories about Minoan culture in a series of four books entitled *The Palace of Minos*, which were released between 1921 and 1936. He also wrote two books dealing with the artifacts and inscriptions, which at the time of his excavations could not be translated. These included tablets carved with a primitive form of Greek, which Evans called Linear B and which were deciphered 52 years after Evans's excavation by architect Michael Ventris, who had a passion for linguistics. There was no mention on any of the inscriptions of the name the Minoans had used to refer to themselves, but translations of an Egyptian stele refer to them as *Kiftiu*.

Evans's theories about Knossos went unchallenged for nearly 50 years, while he was the only excavator there. But after he left, others began to contest his theories and his methods, putting forward alternative views about the way the rooms in the palace had been used and about the fate of the Minoans themselves. An alternative view, that Mycenaeans who had conquered the Minoans, rather than the Minoans themselves, had been living there when it was finally destroyed, was supported by Ventris's translations.

A Palace Culture

In addition to Knossos, there were five other centers of power on Crete at this time, at Mallia, Phaistos, Hagia Triada, Keos, and Gournia. It appears that they did not fight among themselves and that Knossos possibly ruled the rest as a political and religious capital by mutual consent. The palace of Knossos, then, was the hub of a powerful kingdom, with a reach that extended over the entire region, the focal point of a highly centralized religiously based bureaucracy. The rectangular court can immediately be recognized as a unifying feature in the balance of each of the six main cities on Crete, and each has similar proportions. The courtyard

of the Place at Mallia, for example, measures 165 feet by 72.5 feet compared to that at Knossos, which is 165 feet by 82.5 feet. The general rule is that each of these courts is roughly twice as long in the north-south direction as they are on the east-west axis to provide shade during the summer and to capture the lower winter sun in the winter for more warmth.

The palace of Knossos is divided into eastern and western wings. The west wing was higher, since it was located on a hillside and had fewer levels than the east wing, which terraced down a slope into a valley. The so-called “Royal Villa,” which is located at some distance from the main palace complex, to the north-south, faces east, with a view over the valley toward the Kairatos River. It is two stories high, with access by a stairway connected to a light well in the southwest corner. It has a main hall with a throne located behind a balustrade on the ground floor, with a crypt, thought to have been used for religious sacrifices, next to it. The arrangement of the columned portico leading into the royal hall, as well as the use of a court or well to light the stair and lower levels, and the thick masonry construction are typical of the architecture found in the main palace. The walls are faced with white gypsum, and the floors are paved with stone slabs coated in the same way.

The Theatre and the Lustral Bath

The entrance to the Royal Villa is axial, which is one of the few instances of a straightforward entry in Knossos. The Minoans seem to have been fond of asymmetrical, indirect entrances and room arrangements that created right angles.

The main entrance to the palace, into the southern end of this rectangular plaza, is a perfect example of that, bending through opposing L-shaped turns before allowing access to a *propylaeum* and a stair that leads up and into this grand open space. At ground level, the palace is clearly zoned into formal and ceremonial spaces in the southeastern quadrant, with craft workshops and related storage relegated to the northeast quarter and “magazines” for the storage of wine olives and olive oil aligned in sequence along the entire western edge of the sloping hill that the palace stood on. Artists and workmen occupied the northeast section of the palace and specific jobs were carried out in each section. For example, olives were pressed in one room, and oil flowed away through a type of drain to a spout in a wall about 50 feet away. In other rooms, pots were made and painted, stone vases were carved, metal art was molded, sculptures were chiseled, and other types of artistic activities were carried out. The walls at this ground level are all massive to support the weight of the floors above and to keep these spaces, which are used as storage areas for perishables in some cases, as cool as possible.

Lustral Basins

An “Initiatory Area,” or lustral basin, intended for ritual cleansing, is located near the northwest entrance to the palace complex and is the largest of several such basins found throughout it. It is reminiscent of a similar bathing tank found in Mohenjo-daro, also described in this volume, and Evans believed these were used for more than just communal bathing. He named the northwest lustral basin in the belief that it provided a place for those entering the city to perform an ablution before doing so. A theatre or public viewing area is located nearby, just outside the

palace precinct, which is also thought to have served a ritual purpose, such as a dancing area, or may also have been a place to carry out legal sentences.

A long straight corridor, which runs directly from the *propylaeum* at the south, to the Initiatory Area near the entrance to the central plaza on the north, effectively separates the magazines from a series of shrine rooms and a throne suite, facing directly into the court.

The Royal Apartments

The royal apartments, which are concentrated along the eastern edge of the central courtyard on the upper levels, progressively overhang the rooms on the levels below to shade them. A grand staircase at the middle of the courtyard on this side provided the main means of access to these floors, and the bearing walls become increasingly thinner on the higher levels, according to reduced structural requirements. The columns used here, as throughout the palace and the rest of the city, are unique to Minoan civilization. Rather than being thicker at the bottom and tapering upward toward the capital, the Minoan column is counterintuitive and does just the opposite. This may have something to do with providing more space in a room at floor level, or is a result of using an actual tree trunk as the column shaft, which would have been prevented from sprouting any new branches by turning it upside down.²⁸ Whatever the reason, the tapering column profile, with its slim base and bulbous capital, has become a memorable architectural symbol of Minoan culture. It is certainly no coincidence that a single column of this distinctive profile appears between a pair of rampant lions as a symbol of Mycenaean power on the outside façade of the Lion Gate, which was the main entrance into Mycenae, as a clear example of the appropriation of power by one culture from another through the deliberate borrowing of a potent icon.

The Queen's Megaron or Hall

One of the most elegant of the residential apartments in the Palace of Knossos, as well as arguably being among the most representative of the Minoan style itself, is the Queen's Megaron or Hall. Located next to the throne room, the wall above the entry and the ceiling are a riot of colors that reflect an island culture that thrived because of maritime trade. It is predominantly covered by frescos rendered in aquatic blue. The lone narrow panel above the door that connects the apartment through a right angled corridor to the Hall of the Double Axes next to it is dominated by a playful dolphin motif, separated from the doors below by a horizontal band of blue rosettes that continues in vertical stripes of the same broad width, down each door jamb to the floor. The ceiling, on the other hand, is covered by a repetitive pattern of interlocking spirals that recall the waves of the ocean in the same way that the volutes of an Ionic capital on a column of that order do. The spirals are white on an azure field that is slightly darker than the shade of blue used on either the dolphins or the rosettes, giving it more intensity and drawing the line of sight upward.

By contrast, the other three sides of the 14 feet by 20 feet (4.3 meters by 6.1 meters) room are syncopated by a series of long narrow piers that terminate on top of a ledge on each side. This could have been used as a built-in seat, since

it is about 4 feet wide and 3 feet high, projecting past the edge of the piers by about 9 inches. The piers and the frame around them are dark beige, and the panels that result from the depth of the jambs of the openings that they make possible were also used to place frescos in them, which depict a series of dancing women.

The height of these built-in seats and the frescos of women, as well as the proximity of the apartment to the King's Megaron, suggested to Arthur Evans that it was meant for a queen. That interpretation has since been questioned, but the guides that lead visitors through the apartment today are certainly convinced, avidly describing the Queen's Bathroom, on the west side of this hall, which still has a clay bathtub inside it reconstructed from pieces found near the doorway, as well as the Queen's Dressing Room, connected by corridor to it, and the Queen's Privy, which was separate from the room where the bathtub was found.

Natural Light

One of the most striking things about this apartment, irregardless of its occupant, is the use of layering, created by two light wells, on the east and south edges of the rectangular hall. A 5 feet wide antechamber, between the pillars or piers on top of the benches that flank the room and the light well on that side, accentuates this feeling of layering even more.

Environmental Awareness

The Queen's Megaron shows just how well the Minoans adapted to their environment. The room is exceptionally well proportioned, with a fine sense of human scale. Structural elements such as columns and bearing walls are substantial without being massive. They are appropriately sized for their engineering requirements, use, and aesthetic pleasure. Openings are deep to avoid glare and provide shade. Wooden shutters were used that were as wide as the square columns they were attached to were deep. They pocketed into these columns unobtrusively when open, and were closed to block out the hot sun or cold air. So they controlled natural ventilation and room temperature. Floors were tiled for additional coolness in the summer.

The orientation of the palace shows that the Minoans had a keen awareness of their microclimate. Summers in Crete are intensely hot and dry and winters are cold and wet, so the use of open internal courtyards makes a lot of sense. If oriented and configured correctly, a courtyard can mitigate extreme temperatures dramatically, allowing cooler night air to be trapped there and then slowly released by convection during the day in the summer, and allowing the warmth of the sun to be absorbed and reflected during the winter.

An Integral Organism

The most remarkable thing about the Palace of Knossos from an environmental point of view is that it was conceived as and operated like an interrelated organism, so that each part played a role in allowing the entire entity to function well in a place known for climatic extremes. The overall orientation of the central plaza, the planimetric layering of functions in the clusters of functions that flank it on its east and west sides, the overhanging of the floors as they rise, the thermal mass and performance of the materials, and the smaller courtyard or light wells that

penetrate through the spaces at regular intervals make the Palace of Knossos a model of ecological sensibility.

MYCENAE AND TROY

The history and the destiny of Mycenae and Troy are so inextricably connected that it seems appropriate to discuss them together even though they were located at opposite ends of the ancient world when their power was at its height. Troy, which has captured the popular imagination because of the *Iliad* and the *Odyssey* by the Greek poet Homer, is called Hisarlik today, near Canakalle, in Turkey. Courageously deciding to contradict conventional opinion in the mid-nineteenth century and to treat Homer's poems as history rather than myth, amateur archaeologist Heinrich Schliemann excavated it first, from 1870 to 1890, removing more than 50 feet of earth and debris from the top of the mound that existed there in the process. He was followed by Wilhelm Dörpfeld in 1893–1894 and Carl Blegen from 1932 to 1938. Their work, as well as many subsequent excavations, has confirmed that there was not just one but several Troys distributed among many levels of occupation that begin with Troy I before the beginning of the Bronze Age and end with Troy IX near the end of the Roman Empire. The Troy of Homer, which is near the middle, is Troy VI, and it was destroyed around 1250 B.C. near the end of the Bronze Age.

A Memorable Epic or a Historical Document?

If it ever happened at all as Homer describes, the *Iliad* deals with one episode covering several weeks in the tenth year of the Trojan War, and to understand it, it is necessary to understand the main characters on each side. Agamemnon, the Achaean King, was the most powerful ruler of his time in the Aegean region. He was King of Mycenae and in control of all of Argos. His predecessors are believed to have come from Lydia, in Asia Minor, and to have married into the Perseid Dynasty of Mycenae. Agamemnon married Clytemnestra, the daughter of Tyndareus of Sparta and the sister of Helen, whose abduction, according to Homer, was the cause of the war. Helen, who was married to Menelaos of Sparta, was Agamemnon's sister-in-law. Troy at this time was ruled by Priam, who had two potential successors: his eldest son Hector and his son Paris, or Alexander, who was next in line for the throne. Hector and Paris were sent on a diplomatic mission to Sparta, during which Paris fell in love with Helen. Whether he abducted her or she left with him willingly on board ship back to Troy is open to conjecture, but the result was the same: Menelaos felt honor bound to avenge the act and called on Agamemnon for help. Agamemnon organized an army from all over the Argolid, which met in ships at the port of Aulis. According to Homer, 164 towns and cities sent representatives, with the bulk being from Mycenae, Sparta, Tiryns, and Pylos. In an act that would prove fatal to him later, Agamemnon sacrificed his daughter Iphigenia at Aulis to end a period of calm, which was delaying the sailing of the fleet to Troy.

After nearly ten years of a stalemate, the combatants agreed that the outcome of the war would be decided by a single combat between warriors from each side. Hector was selected to represent the Trojans and Achilles the Greeks. The passage

in which Homer describes how Achilles, “like an implacable god of war,” killed Hector and won the war for the Greeks is one of the most eloquent parts of the *Iliad*. The Greek victory was overturned, however, when Paris avenged his brother’s death by shooting Achilles in his heel as he was dragging Hector behind his chariot around the wall of the city. His heel was vulnerable because it was missed in a spell of invincibility cast over him at his birth.

The Houses of Troy

Homer’s epic poem, which was transmitted orally for generations before being transcribed, evokes a grand, gleaming city, towering above the plain and beach where the Greek ships were moored below. Real archaeological evidence, however, suggests much more modest circumstances, in which the Troy of Priam was little more than a citadel at best, with walls surrounding the royal palace and a few other buildings crammed in behind the broadly U-shaped wall around it. Excavations of earlier levels, down to what is called the “first settlement,” have yielded important evidence about the beginning of a house type that eventually evolved into the Bronze Age Mycenaean *megaron*, or palace. This then evolved into the classical Greek temples nearly 2,500 years later.²⁹ One of the earliest houses excavated at Hisarlik has all of the characteristics of the Bronze Age palaces. It is rectangular, being nearly twice as long as it is wide, with a centrally placed door in the short wall at the front and a solid opposing wall in the back. The long sidewalls extend past the front entrance wall, creating a foreporch, and carried the flat roof to create a nearly square shaded alcove. There was a fire pit in the middle of the large interior space, and platforms were built into the sidewalls. A small oven was also built into the back wall, with a drain, which also served as a toilet nearby. Animal bones and refuse, mixed in with the clay flooring, suggests that rather than regularly removing these from the house, they were simply thrown on the floor and allowed to accumulate, until they were eventually covered over with a fresh layer of clay.

This prototype of a long, narrow house with projecting sidewalls that create a front porch, all built to a 3:1 proportion and covered with a flat roof, evolves, in Troy IIc, into one with walls projecting from the back to create another back porch that was not as deep. Since there was no door in the back wall to give access to it, it is assumed that it was intended to protect the walls, which were made of mud brick, from the rain.³⁰

This discovery is exciting for architectural historians, because it seems to be the predecessor of the Greek temple form, with a long narrow *cella*, porches on either end, in *antis*; even though a direct connection is impossible to prove. The striking similarity between these houses and temples in the Classical Age, as well as between other elements such as the *propylae*, or entrance gate into the city, or the colonnades surrounding the palace forecourts are clear testimony, however, to the power of cultural memory. It confirms the compelling force of tradition, which prompts the continuous retention of typologies that work, over a long period of time. The residential adaptations that evolved in Troy, beginning with the earliest Neolithic shelters to what may have been Priam’s palace at Troy VI, are also found in Mycenae, Tiryns, Pylos, Gla, and other Bronze Age cities in the Argolid. Since these reappear again after a 400 year hiatus as the first prototypical temple, they are proof of the durability of memory.

Dispersion

While the history of Trojan settlements continues on past Troy VI, as well as through Hellenistic and Roman occupation, Homeric tradition holds that Priam's city was burned, the walls were razed, the entire male population massacred, and the women taken as slaves to Greece, as commemorated in Aeschylus's play, *The Trojan Women*. The historian Thucydides said that this marked the beginning of the end of the Age of Heroes because, according to Homer, Agamemnon was assassinated by his wife Clytemnestra in his bath soon after his return to Mycenae as retribution for his sacrifice of their daughter Iphigenia. Soon afterward all of the other cities in the Mycenaean league fell due to unconfirmed circumstances, and the migration of the Dorians from the north marked the end of Agamemnon's empire.

An Amateur Archaeologist and Treasure Hunter

Heinrich Schliemann made his fortune during the Gold Rush in California and Alaska in the mid-1800s, and was also an amateur archaeologist. During his excavations of Troy in 1873, he uncovered a golden cask containing a necklace and earrings, which he dramatically characterized to the assembled members of the press as "the Jewels of Helen," underscoring his real agenda in undertaking these disastrously destructive excavations.

Mycenae

Schliemann's spectacular, if not disastrous, activities at Troy encouraged him to press on to find the palace city of Agamemnon as well, undoubtedly also tempted by the prospect of more gold and notoriety. He went to Mycenae and started digging there in 1876. By cross referencing Homer with passages about the city written by the Roman historian Pausanias, Schliemann focused his attention on a grave circle inside the citadel, which he felt must be the resting place of Agamemnon and the other heroes of the Trojan War. He dug a trench inside the Lion Gate through

the 90 feet diameter grave circle and found 19 male skeletons covered in gold. Their faces were protected by realistically rendered gold masks, and there were gold breastplates with sunbursts on their chests, with numerous gold swords and daggers scattered around them. With characteristic hyperbole, already well rehearsed with the discovery of gold jewelry at Troy, Schliemann announced the discovery by saying, "I have gazed upon the face of Agamemnon." But such an identification was impossible to confirm, and radiocarbon dates, taken since, do not match those of the Trojan War. Schliemann then went on to Tiryns, about nine miles north of Mycenae, built on



A model of the ancient city of Mycenae. Courtesy of Thomas Anthony Schuman Jr. Source: Flickr

a rocky promontory miles away from the sea, from which Homer said that 80 ships joined the fleet headed to Troy. Schliemann was the first to dig at Tiryns, and once again his crudely excavated shafts and trenches did a great deal of damage. Carl Blegen, who was also involved with the dig at Troy, followed him here and is widely credited with salvaging most of the site.

Palace Culture

Tiryns, like Mycenae, is a good example of what is newly referred to as “palace culture,” since the entire city, if it may be called that due to its modest size, revolves around the royal *megaron* in its midst.

Once again, as is so often the case in many other societies discussed here, there is a marked difference between the houses of the upper and lower classes in the Mycenae Royal City. The designation “palace culture,” which relates to this period, marks it because of the development of the *megaron*, but royal subjects lived here as well.

Mycenae, like Tiryns and Pylos, was a citadel, ringed with massive walls with little room inside it for residential construction. In fact, the grave circle that Schliemann excavated had once been outside these walls, which were eventually enlarged to enclose it. The palace, which was the focal point of the city plan, was a rectilinear building facing a forecourt, with a tapered columned porch serving as an entrance.

This porch, which was open in front but closed on its other three sides and roofed over, was paved with gypsum. It led to a thin vestibule as wide as the porch in front of it and the *megaron* behind, from which subjects and visitors entered into the king’s throne room, or the *megaron* itself. This was nearly square, with a circular hearth in the middle, flanked at each quadrant by four columns that held up a skylight or chimney above it. The king’s throne was placed against one wall. The floor was tiled with large square glazed tiles that were astonishingly polychromed in bright colors. The walls were covered with equally colorful frescos, and the timber frame was accentuated. The ceiling was also painted in brightly colored patterns. At Mycenae, the *megaron* measured 13 meters by 12 meters, or about 40 feet in each direction.³¹

The *megarons* at both Tiryns and Pylos are similar to that of Mycenae, although each varies from it in interesting ways. At Tiryns, the citadel is most cramped, having been built on top of a rock outcropping that covers only four acres, divided into three different levels. The *megaron* occupies the uppermost of these terraces and is slightly larger than that of Mycenae, being 13.34 meters by 13.64 meters, or 43.75 feet by 45.75 feet.³² At Pylos, the main room is more rectangular, being 12.90 meters or 42 feet long and 11.20 meters or 37 feet wide. The four columns equidistantly placed around the circular hearth support an elegant balcony in this case, which overlooks the fireplace, and then a raised portion of the roof above that, which acts as a chimney and source of light and ventilation. There were chambers for the royal couple and presumably also for a select group of their retainers at this upper level. According to Homer, guests slept on beds put out for them on the porch or in the central courtyard and servants stayed in rooms surrounding it. The royal sons and daughters had rooms opposite these, built especially for them, in polished wood and smooth plaster. These smooth white walls were decorated

with frescos, and the timber was left natural. The floors were either of smooth tamped clay or gypsum, also decorated with a painted abstract pattern or scene. Because of the scarcity and high cost of wood, which was necessary to make a lintel or crossbeam at the top of a window in a mud brick or stone bearing wall, windows were small. Mycenaean palace compounds, like the Minoan cities they were informed by, had drainage and sewage systems, and bathrooms had fired clay bathtubs. During winters that could be very cold and wet, heat was provided by charcoal braziers.³³

The poor, on the other hand, lived in mud brick or wattle and daub, single or double room huts with flat roofs and clay floors in a way that may be seen to be typical in many other cultures throughout the world at this time, as discussed elsewhere.

HOUSES OF THE ROMAN REPUBLIC AND EMPIRE

The Romans began as a disparate group of tribes in the *Latium Campana*, south of the Alps in Italy. These tribes, concentrated just south of the Tiber River, began to coalesce as a challenge to Etruscan domination of the area, then known as Etruria, between the eighth and sixth centuries B.C. The Etruscans remain something of a historical mystery, having unknown origins. What little we do know of them comes from several massive fortifications, such as the main gate to the city of Perugia, that still survive and their tombs, which were a mirror of their houses and which have disappeared.

Appropriation of Forms during the Early Republic

As the Romans gained strength, they began to chafe against the rule of the Etruscan Tarquin kings and overthrew them in 509 B.C., taking control of their center of power from the Po River Valley to the Campagna region. The new Republic then set about making alliances with surrounding territories, or taking them over by force, until it controlled the entire region 225 years later. This then brought them into direct competition with Carthage, which was a city established by the Phoenicians on the coast of what is now Tunisia. In a famously daring raid, a Carthaginian general, Hannibal, did what was then thought to be impossible by leading an army, including attack elephants, across the Alps and up to the walls of Rome. This was followed by a protracted conflict known as the Punic Wars, between 264 and 146 B.C. It was finally won by the Roman general Scipio, who was given the honorary title Africanus because of his victory, and Carthage was leveled and turned into a Roman province. Rome then had unchallenged control of the Mediterranean, which they referred to as "*Mare Nostrum*," or "our sea."

Their next fields of conquest were the Hellenistic kingdoms established by generals in Alexander's army after his death, funded with the spoils of the wars they had fought with him. These were in the Greek and Macedonian heartland, where Alexander's kingdom had begun, the Attalid kingdom based in Pergamon founded by Lysimachus, the Seleucid kingdom in what was once Mesopotamia, and the Ptolemaic kingdom in Egypt. By 100 B.C. the Romans had taken Greece and Macedonia, and by a stroke of luck also received an offer from the last of the Attalid



Villa Adriana, Tivoli, near Rome. Courtesy of Shutterstock

kings, who was exhausted by incessant struggles with neighboring Gallic tribes, to take over the Attalid Empire. By 44 B.C., Julius Caesar had subdued Gaul itself and Rome was poised to cross the channel into Britain.

As Roman power grew, its need for an architectural image to lend legitimacy to it did also, and they borrowed heavily from the Etruscans, as well as the Greeks, to do so. This assimilation was complicated by the fact that the Etruscans were also influenced by the Greeks, due to their proximity to them and the trade they carried out with them. The Greeks, because of being intrepid sailors, had called on Etruscan ports and had also started to establish colonies on nearby Sicily by the mid-700s B.C. The Etruscans were strategically positioned on the threshold of the Tyrrhenian and Mediterranean Seas, and absorbed all of the cultural crosscurrents around them, from North Africa, Egypt, Phoenicia, and Turkey as well.

One clear example of the way in which the Romans borrowed from the Etruscans was the temple on the Capitoline Hill, which the Roman architect Vitruvius has described. Rather than being three dimensional as Classical Greek temples were, in the sense that they were designed as objects in space that were intended to be seen from any point around them, this Etruscan temple was one directional. It had a large, open entrance portico or porch in the front covered by a roof supported by two rows of columns of what Vitruvius called the *tuscan* (for Etruscan) order, with plain sides and back. Three rectangular chambers or shrines, each

similar to a Greek *cella*, were lined up in parallel sequence inside the temple and were dedicated to three different deities. A second temple, which the Romans later built to replace this Etruscan original on the Capitolium, was clearly based on the earlier building. Bronze plaques recording the history of the Roman Republic and later the Empire were kept in the Capitolium, and it was here that conquering generals, on their return to Rome, would end their triumphal marches through the city, to receive a hero's welcome from the emperor himself.

Appropriation Expands to Houses

Such appropriation of architectural forms from a political power structure, or structures that a usurper had replaced, was not unique to the Romans, of course, but an additional nuance here allows us, through analogy, to gain some insight into what Etruscan houses must have been like as well, although the main focus here is the Roman house.

The Romans, like the Etruscans, organized their cities on a gridiron plan, with a main north-south street or *cardo maximus* and an east-west street *decumanus* running through the middle. This rational organizational technique was also a highly effective way of occupying recently conquered territory and fortified military camps, which slowly evolved into cities. The Romans also adopted the *atrium* house from the Etruscans and Greeks, surrounding an open inner courtyard, or *atrium*, which usually had a water feature such as a fountain or pool inside. The *atrium* house was particularly well suited to both the gridiron plan and the climate in the majority of the regions around the Mediterranean basin into which Roman authority began to extend, as well as the basic desire for privacy of the typical family during the Republic. The house was turned inside, with solid walls to the street, in much the same way that those in a Chinese *hutong* are, and so could be conjoined more easily. The courtyard is also an effective architectural device that can be used to mitigate against heat by convection, since it captures cool evening and night air that drops into it and is trapped in the surface area of the grass and leaves of the trees, and then rises up as the sun heats up the space during the day, keeping the rooms that open onto it cool the entire time.

This cooling, convective cycle was enhanced by the use of two courtyards in tandem because if one was left unplanted and the other was green, the unplanted courtyard would heat up faster and as the hot air rose, it would pull cooler air in from the planted courtyard next to it. The typical Roman house during the Republican period, following Etruscan and Greek models, used this principle to perfection, with an *atrium* block at the front near the entrance and the street, if that were the case, and another with a peristyle and a garden in the back, separated by the *tablinum*, which served as a combination of reception space in which to meet guests or clients, record room, and the place to honor family ancestors with statuary. While the forward *atrium* was public and also included spaces for guests to sleep, the peristyle was private, reserved for family and special guests. It was also where the *triclinium*, or dining room, *portico*, or colonnaded, roofed porch that served as a living area, and bedrooms were located. In some cases, the entrance, or *fauces* was preceded by another small courtyard called a *vestibulum*, similar to a similar kind of space also seen in the Bronze Age *megaron*, mentioned earlier in the discussion about Mycenae.

A Pragmatic People Seduced by Extravagance

As time progressed and the Republic evolved into an empire, Roman houses and their decoration became much more lavish. One of the words most frequently used in reference to the Romans is “pragmatic,” and no matter how rich and powerful the society became, this trait remained a central characteristic of its architecture. The Greeks, for example, insisted on the use of a post and lintel, or column and beam, system for their sacred buildings because the straight horizontal lines of the architrave and the cornice directed the eye to the sky rather than to the earth, which they consider to be the base. The Romans, on the other hand, preferred the arch because the scale of buildings that were possible with the post and lintel system was limited, due to the restriction on the size of a span. The Romans were partial to grandiose scale, perhaps again as a clear declaration of legitimacy and masonry construction, and using the arch allowed them to achieve it. Refined sensibilities, about the visual connection it made to the ground and the implication this had of a symbolic connection to the profane world, were not a concern. They were also inveterate merchants, seeing no conflict in having commercial areas mixed with sacred zones. One of the most architecturally engaging mercantile complexes in ancient Rome, known today as Trajan’s Market, was located directly behind the Forum, taking advantage of a captive audience coming out of the religious precinct. The market is a brilliant example of commercial planning, stepping up the hill behind the Forum in a series of gradually receding terraces that led people effortlessly up to the Via Biberatica at the summit, which is enclosed in a large roofed structure with several stories of shops on either side. It is easy to imagine this entire ensemble of fan-shaped terraces cut into the hillside and internal street above it with balconied shops on several levels under an all-encompassing roof, teeming with people moving up and down the stairs to and from the Forum below. Such structures were made possible by the arch, which allowed Roman engineers the freedom to build on any terrain. The Greeks used natural slopes to build their theatres, finding a gentle gradient to use as a foundation for the stepped seating placed in an arch around the stage. The Romans, on the other hand, excavated sloping ground at will, and built an arched substructure on foundations built on the level plane they created. They were also the first to develop a simple kind of concrete, using *pozzolana*, sand, aggregate, and water, which was then faced with brick, as it was at Nero’s *Domus Aurea*, or stone, but rarely left exposed.

Insulae

With the arch and the increasing facility in the use of poured-in-place concrete, the Romans were able to develop multistory housing blocks, called “insulae,” or islands, because they seemed to be like self-sufficient units within the urban fabric. They contained shops, or *tabernae*, at street level that provided food and drink to the residents and had running water and sewage systems as well. By the Imperial Period there were many of these, to the extent that they were the prevalent housing type from A.D. 200 onward.³⁴

Surviving examples of *insulae* in the well-preserved city of Ostia, which served as a port for Rome, as well as in Pompeii and Herculaneum, give us a good idea of exactly what life was like in these ancient apartment buildings. For a start, the *tabernae* that served as their foundation at street level were completely open to the



Close view of Herculaneum excavations, Naples, Italy. Courtesy of Shutterstock

street and could be closed at night with large wooden panels that could be fixed in place. These shops, as well as selling goods directly to the public, also housed cottage industries that produced things for sale elsewhere, and so were a valuable economic resource to both the burgeoning Republic and the empire that grew from it. The floor of these shops was usually raised a step or two above the street to avoid flooding, and there was sometimes a built-in counter facing the sidewalk. In contrast to the Greek *ergasteria*, which were concentrated in or near an *agora*, Roman *tabernae* also flanked roads that were ubiquitous arteries, linking the far-flung parts of their empire, as is visible in distant corners of it, such as Jerash, or Gerasa, in Jordan today.⁵⁵

Houses of the Roman Empire

After a resounding naval victory at Actium in 33 B.C. over the allied forces of Mark Antony and Cleopatra, who was the last Ptolemaic ruler of Egypt, no further obstacles stood between Octavian and complete control of the Roman Republic. The Senate proclaimed him Augustus, the first Roman emperor, in 27 B.C., inaugurating a Julio-Claudian dynasty. It continued after he died in A.D. 14 and included Tiberius (A.D. 14 to 37), Caligula (A.D. 37 to 41), Claudius (A.D. 44 to 54), and Claudius's adopted son, Nero (A.D. 54 to 68).

Some historians argue that the legal, economic, and military structure of the Empire already existed long before this proclamation was made, but the judicious rule of Augustus helped solidify its structure to the point that a *Pax Romana* was established that lasted for nearly 200 years, until the dissolute rule of Marcus Aurelius's son Commodus (180–192). This period of Roman peace, admittedly sustained by Roman law and military might, meant that agricultural estates could be expanded and towns and cities could prosper. They did so throughout a vast empire that included what is now roughly half of Britain, most of Continental Europe, all of north Africa, and the Middle East. Houses at each level of the social spectrum continued to evolve naturally during this period, with slight regional accommodations to microclimate and local culture taking place.

Interchangeable Parts in a Grid

One of the advantages of the gridiron plan of the typical Roman city, which was first established as a *castrum* or military camp and then slowly built up as the territory it controlled became more secure, was that the full range of public institutions could be placed into it as the city grew. These included the forum, or commercial area, the basilica, or law court, the theatre, the public bath house, the temple, and others. These then became an indispensable part of the establishment of Roman identity in the far-flung corners of a burgeoning Empire and could be inserted at will into this rectilinear framework as it grew, like a game piece on a chess board. A quick retrospective overview of one of these cities in Algeria, called Timgad, which was founded by the Emperor Trajan in A.D. 100 for retired legionnaires, shows that these institutions were not always located in a carefully prescribed way within a regular orthogonal grid. This delightful capacity to achieve freedom within a systematic urban plan reveals a great deal about the Roman approach to domestic planning as well. This same principle of individual expression within a system of conventional typologies is also recognizable in the houses of each of the various social levels.

Roman Identity in Spite of Regional Differences

This combination of an orthogonal city plan and easily recognizable and replicable institutions meant that Roman citizens living on the periphery of the Empire near Hadrian's Wall in the middle north of Britain, on the edge of the desert on Algeria, or in Gerash in Jordan could feel just as much a part of it as someone living a block away from the Tiber River. They were each protected by the same laws and could each enjoy the same amenities of the social life of the Forum and public bath, see the latest play from Rome in the theatre, or enjoy wine, olive oil, and bread with roasted meat or fish grilled at a local *tabernae*. The Romans were accurately aware of space and its demarcation and direction, even having a god named Terminus that symbolized beginnings, endings, and the difference between them. The cardinal points at the middle of each side of the city were prominently marked with gates, and one of these, which was typically the one marking the direction to Rome, was a psychological as well as a physical connection to the capital to which they paid allegiance. The construction of Roman roads was excellent, to the extent that many of them, in these isolated, undeveloped areas, still exist today. They were dug deeper than the frost line to avoid upheaval in the freeze-thaw cycle, layered with

increasingly smaller rocks as the level neared the surface, and then finally topped with finely chiseled flat slabs and raised curb stones on each side. The phrase “all roads lead to Rome” was more than a casual analogy to a citizen who lived thousands of miles away from Latium, since they all really did lead there, and everyone knew that once they started out on one they would eventually end up in the capital and be relatively safe, well housed, and well fed along the way.

Estates

The estates of landholders at the upper end of the economic scale continued to become more luxurious and refined, reflecting a life of greater leisure. No matter how much wealth they accumulated, however, there remained nostalgia for the simple agricultural beginning of the Republic and the closeness to nature that such a life entailed. This is obvious in the bucolic subjects chosen for the wall paintings that have been found in the villas that have survived, in which no wall, except for those in rooms for the most mundane purpose, was left undecorated. These pastoral scenes, which became more skillfully executed over time, were an obvious debt to set design and the screens used as backdrops for theatrical productions. They demonstrate the same growing awareness of spatial perception that is evident in the rooms of the villas as well, and the increasing willingness to experiment rather than to be totally dependent upon Greek and Hellenistic precedents.

Frozen in Time

Much of what we know of this art form, as well as of mosaics, which were also extensively used in the homes of the wealthy, comes from villas that were preserved in Pompeii by the pumice that fell on it during a deadly eruption of Mount Vesuvius in A.D. 79. Unlike cities like Timgad, which evolved out of a *castrum* built on a relatively flat and unrestricted site, the north-south *cardo maximus* and east-west *decumanus* of Pompeii intersect at much less than the usual 90 degree angle to conform to irregular topography, with the *decumanus* being about 30 degrees south of west. In the Pompeii city plan, the forum, theatre, gymnasium, basilica, temple precinct, and baths are all clustered together very close to the main Stabian Gate. Many of the most elegant houses that have been extracted from the 10 feet deep layer of ash that hardened around them are at the opposite end of the city, north of the *decumanus* near the Vesuvian Gate that provided entry into Pompeii through the wall at that edge.

Without knowing their original names, unless they have found inscriptions to identify them, archaeologists have designated these villas by a distinguishing feature or theme, or even an event related to their discovery. These include the House of the Vettii, House of Pansa, House of the Silver Wedding, and the Villa of the Mysteries, which is some distance outside the perimeter wall, on the road leading out of the Herculaneum Gate in the northwest corner of the city. The House of the Silver Wedding, for example, which was excavated in 1893, was named for the silver wedding anniversary of the king and queen of Italy at the time, who supported the dig. This villa, as well the House of the Vettii are each stunning examples of the use of an *impluvium* over the *atrium*, as well as the use of a *tablinum* to connect this more public forward courtyard to the peristyle garden in the back.



A residence of Pontius Pilate, the procurator of Judea. Courtesy of Shutterstock

The *impluvium* is an angled roof over the open corridor that ran around all four sides of the *atrium*, sloping down to the inner edge to direct rainwater into a pool in the center of the court with no gutter to stop it. It is easy to imagine what the *atrium* must have been like during a storm, with rain cascading down like a waterfall all around it into the open cistern, which served a practical as well as an aesthetic purpose below.

The Villa of the Mysteries, built in 50 B.C., is what some believe to be a center for the imitation rites into the cult of Bacchus. It has elegant and highly erotic wall paintings that have a compelling, personalized, dramatic, and sequential documentary quality to them. These include a flagellation scene showing an innocent young woman with back exposed, being whipped while draped over the knees of a wild-eyed seated matriarch who is obviously in charge of the ceremony.

Such paintings are a vivid reminder that the Romans grew even more pantheistic as the empire grew, adopting the religious traditions of the various cultures they encountered as they conquered new territories. In one of the houses in Pompeii that could be positively identified by inscription as having belonged to Publius Fannius Synistor built in late A.D. 1005, and now reconstructed in the Metropolitan Museum of Art in New York, there is such a mosaic in the middle of the bedroom floor. It represents a priest offering a snake to Isis, who was revered in Egypt as the wife of the god Osiris and credited with magical powers because of her mythical ability to bring him back to life after he was murdered by his jealous brother, Seth. Her cult spread rapidly during the Hellenistic Age because of the wider worldview that prevailed at that time and the interaction between the leaders of each of the major kingdoms that



Ruins of Pompeii, Italy. Courtesy of Shutterstock

arose out of the ranks of Alexander's army after his death. One of the largest temples dedicated to Isis, in fact, spans a river at the bottom of the mountain-side city of Pergamon, built on a successive series of terraces above it.

Mosaics

The art of floor mosaics also became progressively more sophisticated during the Imperial Period. While they, like wall paintings, had consistently been a feature of the houses of the middle and upper classes, there was a consistent refinement that took place in the skill level of the artists who prepared the panels, or *emblemata*, of these carpets of stone, which were very often composed in wooden frames in their workshops and transported to the house in which they were to be installed, which may have been some distance away. The *Tesserae* or small cubes of marble or other stones that the artists used during the Classical Greek and Hellenistic periods, gave way to subtle shades of glass that gave the images more depth and iridescence. Other than Pompeii and Herculaneum, which suffered a similar volcanic fate, many of the other best examples of mosaic art exist on the island of Delos and in the Bardo Museum in Tunis.

Cathage

There is more than a hint of tragedy in the fact that Cathage, which is described in more detail elsewhere and which had been the nemesis of the Republic in its

earliest phase, became a rural paradise for rich Roman landowners who settled there after it had been subjugated. Many of the mosaics uncovered there give wonderful insights into their lifestyle on their *latifundia* or huge estates, and the workshops that produced them were the best in the Empire.

The combination of wall paintings and floor mosaics, which increasingly came to imitate the painterly techniques used on the walls, gave each room in these villas a visual, textural richness that expanded the space of even the most generous of them. When combined with access to a garden, or at least a view of one, the effect must have been overwhelmingly luxurious.

Roman Gardens

The influence of Hellenistic worldliness and hedonism, which had not yet been able to soften the stern austerity of the agriculturally based early Roman Republic, began to make inroads after the second century B.C. This was especially true of garden design, which was an integral part of any Roman house with access to water and an open space at ground floor level, being considered to be essential to domestic tranquility. Alexander had, after all, ruled from Persepolis and breached the walls of Babylon, with its fabled Hanging Gardens, and his tutor Aristotle had written one of the most complete studies of biology of its time, so there was a heightened awareness of new exotic plant types that Alexander's explorations had brought to light. The Hellenistic fondness for *nymphaea*, styled to look like caves or grottos with fountains imitating waterfalls gushing out of them, was transformed by the Romans to a source of water for an entire city. The *nymphaeum* was also reduced in scale for use in villas and was frequently used as a backdrop for the exhibition of sculpture. Expanding on the Hellenistic taste for *folies*, or mock ruins reduced in scale in gardens dedicated to the Muses, the Romans added *topia*, or artificial elements that would contribute to the image of a bucolic setting. They also continued to blur the line between architecture and nature, using scenography and forced perspective to make distant scenery seem to be connected to the house. This attempt to connect with the natural world increasingly became a defining feature of the Roman villa in the Imperial Age, to the extent that Renaissance architects and landscape architects fastened upon it as a way of establishing a historical relationship with their cultural roots.

In addition to providing a wealth of information about the architectural features that were typical of Roman villas, the houses in Pompeii have also been helpful in providing insights into what the gardens were like. They typically have one or the other of the most popular types of landscaped settings: the courtyard garden or the colonnaded peristyle. A large villa sometimes had both features, which can be seen in later Renaissance Roman villas as well. Key to later Roman villas was the idea of linking the house and garden with axial symmetry. This allowed a clear sight line from the entrance through the atrium and the *tablinum* to the peristyle garden at the back of the house. The perspective effect that this caused, of limitless green space inside the house, was frequently enhanced by *trompe l'oeil* effects in the wall paintings. In houses on larger properties this axuality was prolonged by the addition of a third and final garden, called a *xystus*, that was also surrounded by a *portico*. It typically had a thin pool of water down the middle that stretched from one end to the other in the same way that Islamic gardens in Spain and Mughal

gardens in India did, seven centuries or more later. According to Pliny's *Natural History*, and the evidence provided by wall paintings and in mosaics, these gardens were planted with fruit-bearing species, creating small orchards of apple, cherry, peach, pear, quince, and pomegranate trees, as well as cypress, bay, poplar, and evergreens around the house. The Romans were fond of *espalier* and topiary techniques, and also flower gardens full of roses, lilies, violets, iris, narcissus, daffodils, marigolds, and lavender, with myrtle, boxwood, and laurel used for borders.

The Romans considered the ideal setting for dining to be in fresh air in the midst of a natural paradise, under a vine-covered pergola, with the sound of water in the background and a beautiful distant view. If this was not possible, nature was replicated at a smaller scale within the space available, as a garden.

SKARA BRAE, SCOTLAND

Skara Brae is a well-preserved Neolithic village on the western edge of the Orkney Islands, between Scotland and Norway. It is built of dry stone walls, and houses had turf roofs held up by whale bone, which have long since disappeared. This area is virtually treeless, and so this kind of construction was a logical option. The houses were clustered together as if sheltering from the cold harsh winds coming in off the ocean, due to their exposed position on the western shoreline.

When this village was occupied between 3100 and 2500 B.C., it was a bit further inland, since the position of the shoreline of the Bay of Skail has changed, but it was still a chilly forbidding spot for most of the year. This was a farming community, with cattle, sheep, and pigs, as well as wheat and barley, imported to the island from the Scottish mainland by raft about 3800 B.C.³⁶

The Comforts of Home

In spite of adverse environmental conditions, the relatively long duration of habitation at the site, which went through several phases of expansion, is confirmation of the cleverness and adaptability of the residents, who made the best of the resources they had. The different dates of the nearly ten houses that make up the compound suggest that it was almost entirely replaced about 300 years after the first houses were built there. The plans of the houses are very similar, with built-in stone furniture being a common characteristic. The fireplace, which was an essential feature for survival here, was located in the center of the house, in a rectangular depression in the earth surrounded by a low stone wall. There was a hole in the roof directly above it that let the smoke escape. Since there was no wood in this region, archaeologists believe that the villagers burned turf, animal dung, driftwood, and even dried seaweed to keep warm.³⁷ The clustering together of the houses, the tactic of partially burying them in and behind the sand dunes, and the thickness of the stone walls also helped to conserve warmth.

One of the most prominent pieces of built-in furniture, which was typically placed across from the entrance, was what is commonly referred to as a "dresser" in contemporary descriptions, using a modern frame of reference. This is because this object, which extends about 3 feet out from the wall, has uprights that support two horizontal stone slabs that form shelves. This is generally believed to have



Visitors look at the 5,000-year-old remains of Skara Brae village in the Scottish Orkney islands. Source: AP / Wide World Photos

been used for storage of clothing or utensils, but its location, on axis with the entrance, suggests a more important function, such as a place where special objects were kept, like the *tokonoma* of a Japanese house. It might have been an altar that honored the family deity, like that of a Roman house.³⁸ A large stone placed between this dresser and the fireplace may have been used as a seat.

In addition, beds were attached to the exterior walls, made from a large slab supported by low walls on three sides. These had a recess nearby cut into the exterior wall, where personal objects may have been stored. Tall stones, located at the outer corners may have been used as bedposts from which a curtain of some kind was hung, probably for warmth and privacy. The hardness of the stone slab was offset by animal skins or mattresses stuffed with straw. Finally, there were also stone boxes sunk into the house floor and sealed with clay that were used either to store fresh water or live fish, to keep them fresh until they were to be cooked, or to soften limpets, which were used as fish bait.³⁹ In some houses there are small enclosures, made out of stone slabs used as walls, which have rudimentary drains in the floor that archaeologists assume were used as indoor toilets. Other similar enclosures without drains may have been used for storage. The main door was a stone slab secured with a cross bar that fit into a slot in the outer wall. The passage to the outside, which led past all of the other houses, was very small and dark and was served by another stone door, which was also secured by a crossbar. One unit, now designated as House 8, seems to have been used for some other purpose, based on the

fact that there is no built-in furniture of the kind found inside other houses. Remnants of burnt flaked stone suggest that tools were made here. In a scenario reminiscent of Çatal Hüyük in Anatolia, which is older but also Neolithic, a cow's skull was found in House 7 along with the remains of two people who were buried beneath the floor, which is the only place this occurs in this settlement.⁴⁰

Placing the house below grade, along with the use of a sod roof, meant that there were no windows, and this, along with the smoke from the fireplace, must have meant that the interiors were dark and murky. Grinders in the houses indicate that grain was ground into flour there, so that life here, for much of the year, was lived indoors. Because of the fact that the houses were rather small and connected by covered stone corridors that ran between them, there seems to have been no alternative but to be friendly with your neighbors at Skara Brae, and there is no evident difference in social level.⁴¹

Short Lifespan

In spite of the facts that these houses provided their inhabitants with the essential elements necessary for survival and that food, such as fish, meat, and grain, seem to have been abundant, life expectancy was short. The social equality that seems to have prevailed at Skara Brae, and is consistent with tombs there, is at odds with other monuments in the area, such as Maes Howe, the Ring of Brodgar, and the Stones of Stenness, which all required extensive hours of labor to build and suggest a hierarchical level of organization to realize.⁴² As in other such cases, at Stonehenge, Silbury Hill, and Avebury, concurrent with the theme of common dedication to the public good at the expense of personal comfort, people spent a great deal of their short lives contributing their time to the construction of these monuments, either willingly or by coercion, in addition to the hours needed for planting, harvesting, and animal husbandry. Life expectancy was little more than 30 years, and 50 percent died in their teens.

Skara Brae is exciting because it is one of the few surviving examples of a Neolithic settlement, in the same category as Çatal Hüyük in Anatolia, Khirokitia in Cyprus, and Jericho in Israel as rare evidence of how people lived at the fragile transition point in human history from a nomadic, hunting, and gathering existence to a more settled agriculturally based lifestyle. The impact that this crucial transition had is clear at Skara Brae, where human ingenuity prevailed over the elements, but just barely.

STONEHENGE, WOODHENGE, AND DURRINGTON WALLS

In late Neolithic times, a characteristic type of monument was built in large numbers in the British Isles and Brittany, in which stones were placed upright outside a circular ditch. These are called henges and are most frequently found in southeast or central England. Some of these are not entirely circular, but elliptical, with perimeters laid out as arcs of circles. This indicates advanced geometric and planning skills and knowledge of field measurements. In the henge monuments, a

conspicuous feature on the horizon was used to help mark the points at which the sun and the moon rose and set, particularly at their furthest points in the summer and winter solstices, equinoxes, and eclipses. The line from the stone to the horizon gave the alignment. The first light of the sun was recorded each day with a peg in the ground, and this was done over a period of years before stone markers were erected. While the stars stay in relatively the same position, the sun and the moon change, and by marking this change, a calendar was established. The sun is important in a calendar for accuracy, but the moon is more complicated and is related to the prediction of eclipses. The tilt of the earth's axis causes deviation in the rising and setting positions of the sun each year, to either the east or the west, but by pinpointing the day when the sunset occurred at its furthest point at mid-summer or midwinter, the length of the year could be established. At the equinoxes at the latitude where most of the henges in England occur, which are on March 21 and September 21, the sun rises exactly in the east and sets in the west, and days begin to lengthen or shorten dramatically. At the solstices, the sun is rising and setting at the extreme northerly and southerly positions on June 21 and December 21, respectively.

Stonehenge

Possibly the best known stone circle is on the Salisbury Plain near the River Avon, called Stonehenge, although it is technically not a henge because the ditch is on the outside of the circle. This henge was built in three stages. The first stage began about 1900 B.C. when a 105 meter diameter ditch was built with an entrance facing due northeast. Two massive stones were put up to flank the entrance, and a 5 meter high sighting or heel stone was put up outside the entrance. Fifty-six pits, called Aubrey holes after the amateur archaeologist who first discovered them, were dug in the chalk and then filled in after they were used for cremation burials, although new evidence indicates that they had tall poles in them first. The distance between the holes is 4.9 meters. When seen from the center of the circle, a vertical marker called the "heel" stone marks the place on the horizon where the mid-summer sun rose in 1900 B.C., and would seem to have stood on its tip. In stage II, 82 grey-blue dolerite stones, or "bluestones," which were quarried in South Wales, were dragged and shipped the 300 kilometers to Wiltshire and put up in a double ring of 38 pairs each, with 6 extras stones used to build an entrance on the northeast side. An avenue was built from the river Avon to the site to move the stones.

In its final form, Stonehenge consisted of an outer circle of sarsen (sandstone) uprights that replaced the bluestones, for some unknown reason, and an inner horseshoe-shaped part. The outer circle had 30 uprights with continuous lintels. The inner horseshoe had five freestanding archways of three stones each, called trilithons. All stones had interlocking sockets and were curved to match the circle. This last stage took place just before the Mycenaean period in Greece, in the middle of the second millennium. This, however, is only one of nearly 100 henges scattered over Britain and Ireland. The change from bluestones to sarsens is a mystery, but evidence indicates that new leaders arose and called for a new design, which involved moving 80 sarsen blocks weighing five tons each from the site 25 miles away. To give some idea of the difficulty of this, one stone alone would



Stonehenge. Courtesy of Shutterstock

have required the backbreaking labor of over 80 people for seven weeks to drag it by rope and log rollers to the site. The lintels were raised on a timber crib that was moved upwards by levers. In all, 30,000,000 hours of labor were estimated to have been spent on the sarsen monument alone, indicating a highly organized and, some believe, sharply divided society.

In timing then, this final stage III occurred between 1900 and 1600 B.C., which is 1,000 years after the Great Pyramid of Giza. The Bronze Age began in Britain in 1700 B.C., and the people who built the final stage, referred to as the Wessex people, were commercially minded, trading with Egypt, Mycenae, and Phoenicia, unlike the people who built stage I. The total time of all three stages of construction was 300 years.

The People behind the Monument and Its Purpose

Why was Stonehenge built? Who built it, and why? These questions have haunted professional archaeologists and the public alike since the monument first came to popular attention in the eighteenth century. Theories about why it was built have evolved rapidly during the past four decades, beginning with what may be termed the Stonehenge as astronomical computer model, best represented by Gerald Hawkins. Hawkins, who has written *Stonehenge Decoded*, asked five important questions after seeing Stonehenge for the first time. First, why was the heel stone alignment with the midsummer sunrise so important? Second, why were the trilithon archways so narrow, the view through them restricted to such a narrow angle, and the grouping arranged in a horseshoe? Third, was there a

connection between the trilithon horseshoe and the sarsen ring, which restricted this view even more? Fourth, why did the height of the outer circle seem to be specifically chosen to allow a sight line to the horizon? And finally, why do the station stones form a rectangle that is specifically aligned? To answer these questions, he programmed a computer with 120 pairs of points around the circle and calculated the compass azimuth and direction that each line established. He approached the problem like an astronomer, with the idea that if the stars and planets are considered to be laying in a hollow sphere, like a planetarium above the earth, the circles on that sphere correspond to the latitude circles on the earth and can be tracked as declinations. In other words, he told the computer to stand at each selected point inside the Stonehenge circle, look across the other points into the sky, and record which declination it saw.

Hawkins found there were 27,060 possible alignments between 165 possible positions. After making some admittedly subjective value judgments, he selected 120 positions. This was the early period of computer use, and checking just one pair of positions by hand took Hawkins four hours. He tried the positions of the stars in 1750 B.C., and the computer found no match. He then tried the positions of the sun and moon and found many coincidences, with astonishing accuracy. He thought that what the builders did was to align the circle, horseshoe, and rectangle so that between all of them, when paired, 16 alignments could be used to sight the 12 unique points of the sun and the moon. This shows great economy of design in that one position can be used for more than one alignment. As Hawkins describes his impression of the purpose of Stonehenge:

This provided a calendar for planting crops, maintained priestly power, and served as a kind of intellectual game. According to the laws of probability, there is less than one chance in ten million that these alignments could have happened by accident.

Hawkins then looked at eclipses, especially the most spectacular show of a solar or lunar eclipse over the heel stone. “If the sun were considered a god, or the moon a goddess, this society would have been terrified to see them swallowed up. The Aubrey holes served as a computer for this and a stone was moved around them.”⁴³

The Latest Theory

Current interest in the pervasive influence of fertility cults during the Neolithic period, which characterizes each of the cultures included here, has redirected theories about the purpose of Stonehenge and similar mysterious monuments of its period in Britain, such as Avebury and Silbury Hill, into less abstract and more erogenous territory. Rather than being an astronomical calculator, these new theorists submit, Stonehenge was symbolic of the union between the earth and the sky. In this more subjective scenario, the horseshoe in the middle of Stonehenge represents or symbolizes a womb, and the shadow cast on each solstice is the cosmic phallus impregnating the earth, represented in its circle of stones yet again. In this line of thinking, the alignments mentioned by Hawkins are taken for granted, but are a secondary condition of the use of the monument.

Where the People Came From

The stone construction on Salisbury Plain represents an enormous expenditure of human labor, requiring a high level of organizational skill and resources. Who were the people who achieved this? Where did they come from? Archaeologists differ on their origins, almost equally split between what may be characterized as Diffusionists and Non-Diffusionists. The Diffusionists propose that early monuments were begun by indigenous people who were agrarian, but that this local culture was then dominated, and some believe subjugated, by outsiders. One prominent theory is that these invaders came from Malta, in the Eastern Mediterranean, which has well-preserved evidence of a highly advanced Neolithic culture with some of the earliest freestanding roofed structures in the world located there. More than 30 temples have been uncovered on Malta, built of huge rectilinear stones, with trilithon doorways of the same type used at Stonehenge. The plans of these temples are usually U-shaped, and the walls are typically cobbled. Coral limestone is plentiful in Malta and was typically used, because it is easily worked, splits into flat slabs, and can then be cut and polished quickly. Temple building appeared rather suddenly on Malta, around 400 years before the unification of Egypt by Menes in 3100 B.C.

The Diffusionists also point to the appearance of similar kinds of structures in other areas, such as *menhirs*, which are a single standing stone, and *dolmens*, which are freestanding megalithic chambers covered by a roof or capstone. They also point to the presence of passage graves, which were built of dry stone walls or megaliths, or both, ending in a round burial chamber. There are many passage graves, concentrated in certain areas in Brittany, dating from between 4600 and 4000 B.C., with some of these extending up to 85 feet long. Some have side chambers, while others turn at a right angle.

A Communal Society

In England itself, the distribution of collective graves is also substantial, as it is in Scotland where there is also a heavy concentration of them. In England, inhumation burial of kin described here in the discussion about Çatal Hüyük in Anatolia was also common, in which bodies were exposed to the elements and scavengers until they decomposed, and the bones were then stacked in a mass grave. Passage graves have been found at Maes Howe in Orkney that are just as sophisticated as those in Malta, made of easily worked sandstone. Some of these are more than 100 feet in diameter. At Quanterness, there is a collective passage grave that was built in the form of a wheel, with six chambers radiating out like spokes from a round central hall. Each of these chambers is roofed over with a triangular roof of a kind similar to that used by the Maya 300 years later, as an example of an independent invention of the same construction technique used to solve a similar problem. At both Maes Howe and Quanterness the high standard of construction indicates the possibility of professional, and perhaps even an itinerant class of, builders, as well as an accumulation of construction knowledge over time that concentrated on leveling, fitting, and joining huge stones. It also implies a professional priesthood that directed and financed construction by means that are still not clear. Understanding a bit about this piece of the puzzle of what the people who lived

near Stonehenge were like is essential to an appreciation of them, as is an awareness of the second piece called Woodhenge.

Woodhenge

Knowledge about the human context surrounding Stonehenge has expanded rapidly in recent years due to a startling discovery made by a pilot in 1925. Just before Christmas that year, Gilbert Insall, who was a World War I veteran, flew over Stonehenge in a single seater Sopwith Snipe, following the River Avon at an altitude of 2,000 feet. From the open cockpit he saw a large circle that he later described as having “several rings of white spots in the center.”⁴⁴ He returned later to photograph the site from the air, confirming the presence of concentric rings of white dots. He looked the site up in the *Wiltshire Archaeological Magazine* and saw that it was listed as a circular burial mound. He showed his photographs to a friend, Maud Cunnington, who, along with her husband, Benjamin, and nephew Robert, did an accurate survey over the next three years. In 1928, they excavated on the site and found something as significant and impressive in its own way as Stonehenge itself.

There had apparently been a single building on this site, held up by six concentric rings of wooden columns, surrounded by a 5 meters wide, 2 meters deep ditch. The 168 columns were each nothing less than the trunk of an oak tree weighing about 5.5 tons, making them 75 percent of the weight of the sarsens at Stonehenge. After the columns were erected, they were backfilled with chalk, which was what made them visible from the air after they disintegrated.⁴⁵ Speculation about the possible use of this building has continued unabated since, fueled by similarities between this new find, which has been labeled “Woodhenge” and “Stonehenge,” nearby. These similarities include the fact that the long axes of the four minor rings at Woodhenge, which are really more elliptical than circular, are similar to that of the horseshoe configuration at Stonehenge in that each are consistent with the



Woodhenge. © Macduff Everton / CORBIS

alignment of the midsummer solstice.⁴⁶ Each used lintels, one of stone and one of wood.

A Social Space or a Commune?

In 1940, archaeologist Stuart Piggott theorized that this one enormous thatched-roofed building had an open central court. A similar structure, now called the “Sanctuary,” was later uncovered near Avebury in 1930, discovered by Maud Cunnington. In this instance there are six concentric circles of wooden columns combined with two stone circles. In each case, Piggott surmised that those structures were a communal adjunct to the circles that were near to them. The discovery of what appear to be communal buildings near the sacred circles of Stonehenge and Avebury evokes the image of a tightly knit society that lived, socialized, and celebrated in one place and then worshipped in another. But, the prospect of communal living was short-lived because of yet another startling discovery following Woodhenge and the Sanctuary.

Durrington Walls

In 1966 a plan by the Wiltshire County Council Roads Committee to build a highway through a prehistoric site known as Durrington, or Long, Walls prompted an investigation of the site by archaeologist Geoff Wainwright. The Ministry of Transport delayed construction until September 1967 to allow archaeological work. The site is about 500 feet, or 150 yards, north of Woodhenge, just west of a significant bend in the River Avon at that point. What Wainwright found was two circular structures, which in their first phase were constructed with five rings of slight, but often quite deeply set, poles, or columns. These were subsequently replaced by six additional rings, the widest of which was nearly 40 meters across, in which the largest posts were more than 1 meter thick.

Wainwright, along with archaeologist Chris Musson, imagined this as being one large rotunda, which also had a open central court, similar to the theory that Piggott had proposed about Woodhenge and the Sanctuary. Similar compounds have subsequently been found at Mount Pleasant, Arminghall, and Belfarg, near Fife, Scotland, and now there are believed to be more than 40 such timber circles in Britain. While the thought that they may have been communal domestic enclosures has yet to be conclusively disproved, archaeologists are now increasingly dubious of a residential use for these megadendritic structures.⁴⁷

Where did People Live?

As of January 2006, we finally have confirmed evidence of what the houses of those living at Durrington Walls, the builders of Stonehenge, might have looked like. New excavations have uncovered the village that archaeologists believe housed these workers.⁴⁸ This is the largest Neolithic village yet uncovered in Britain. Eight houses in this village were uncovered in September 2006, and a new survey indicates that there were many more on this site. They are all just slightly rectangular, with the average size being 15 feet on a side, or 225 square feet. The sides were wattle and daub, or sticks woven together and filled with a paste made with crushed chalk, which is prevalent just below the thin layer of topsoil on the site. Each house

had a tamped hard clay floor and a central fireplace. The middens in some of the houses were neater than others, in which broken pottery and animal bones were found strewn all over the floor, leading to speculation that religious leaders as well as builders may have temporarily occupied the structures.

Postholes as well as slots in the clay floor seem to indicate that there was also built-in furniture in the house. There are examples of built-in furniture in other Neolithic settlements in the British Isles, such as Skara Brae, discussed elsewhere, in which stone slabs are stacked between stone uprights to create cabinets in the houses, presumably used for storing clothing.

The houses that are now being excavated at Durrington Walls have been dated to between 2600 B.C. and 2500 B.C., which is exactly contemporary with the radiocarbon dates that have been established for Stonehenge 10 years ago. Some of the dwellings were set apart by having their own individual ditch and wooden palisade around them, and there are preliminary indications that there are several more of these, confounding speculation of who may have used them and for what purpose. A road that was paved with flint once led directly from this village to the River Avon nearby. And it, like the avenue leading up to Stonehenge, is aligned to the summer solstice. The avenue, however, aligns with the sunrise, while the Durrington Walls road lines up with the solstice sunset, to “midsummer night’s eve.”

The evidence of feasts held in some of the houses, combined with the possibility of Woodhenge being used as a social hall connected to the religious precinct of Stonehenge, presents the image of a hedonistic people celebrating life while honoring and respecting death. Dr. Parker Pearson, of the University of Sheffield, who is leading this most recent excavation, speculates that Stonehenge, because it was made of more durable material, was intended to be “a memorial and final resting place for the dead,” while the wooden architecture of Woodhenge and Durrington Walls, “symbolized the transience of life,” so that people from all over the region went there “to celebrate life and deposit the dead in the river for transport to the afterlife.”⁴⁹

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East and Southeast Asia

THE FAIRY CHIMNEYS OF CAPPADOCIA

Cappadocia is in the center of Anatolia, in Turkey, near the city of Kayseri, which was once called Caesarea. The natural environment is harsh in this remote area, particularly near the volcano Erciyes Dağı, south of Kayseri, which has created a moonscape of tufa. This has eroded into peaks and valleys over time, depending upon its density. The softer varieties of rock vary in color from bleached white and shades of grey to light red, and they change in hue according to the light. The eroded rock has become sand and gravel as the floor for the crevasses and valleys between the pinnacles, so that this along with an arid climate does not allow the landscape to support much vegetation in most areas. In spring, after the snow melts, springs run through these valleys or gaps between the conical outcroppings, which fall into underground channels and caverns.¹ This region was vulnerable to political and military vicissitudes in the past, beginning with the relative security of Roman control, followed by Arab invasions in the seventh century, then received Byzantine protection, disrupted by Turkish invasion in the ninth century followed by the Seljuk Turks in the eleventh century, who conquered Kayseri.

Houses, Carved out of Stone

The visual confusion caused by the similarity of the pinnacles and the relative softness of the tufa that made it possible to burrow into them made this a great place to hide while opposing armies fought it out down below or, occasionally, up above. All that was required to live here was having enough energy to carve a house out of the inside of one or more of the tufa towers, which seemed to be the preferred place of residence for those who did so, while the subterranean caverns were relegated to storage. The other advantages to living in these conical rocks was that, in addition to being a lifesaving place to hide, they were also environmentally responsive, being cool during the hot summers in the high desert and warm in the winters.²

Cappadocia is a portion of the Hittite heartland lying to the south of Hattusas and Yazilikaya, and the cylinder seals found throughout the area prove it was heavily populated by them. Called Katpatuka by the Assyrians, which changed to Cappadocia by the time of the historian Herodotus, this province occupies a very large section of central Anatolia, from the flats of Lake Tuzgölü in the west, past Malatya in the east, and from Yozgat and Sivas in the north to Niğde in the south. Geothermal activity from both Mount Argaeus, now Erciyes Dağı, near Kayseri, and Hasan Dağı near Aksaray, first covered this entire area with a deep layer of volcanic dust millions of years ago. This was then followed by a top coating of lava that cooled into harder rock. Slow erosion at weak points in the rock mantle has led to valleys of varying width having been cut into the tufa or softer solidified ash. This has created the characteristic moonscape here, which is called *peribacalari* or “fairy chimneys” locally. The high potassium level of the tufa in combination with rainwater has ironically made parts of this wasteland a fertile area for growing fruit, especially grapes, apples, pears, plums, and apricots, and making parts of Cappadocia some of the best wine-producing areas in Turkey. Oxidation of the minerals in the tufa also creates an ever-changing spectrum of colors in each area, from the reds of Ürgüp to the pale blues of İhara and the rich creams of Göreme.

Kayseri, or ancient Caesarea, which was the nearest city to the majority of these valleys in classical times, was an important Christian outpost in Central Anatolia because of its position on the trade routes from the south and the east. The commercial activity here attracted Greeks, who were in turn supplanted by Arabs during the Islamic invasion in the seventh century. Armenians fleeing the Seljuk move from the east added another ethnic layer in the eleventh century followed by Turks, Mongols, and then Turks again who finally established control over the city in the mid-fourteenth century, never to lose it again. The final upheavals in Caesarea were devastating for the Christian community there, and an exodus, similar to that caused by the Latin occupation of Constantinople, began as people fled east into these barren valleys for protection.

Many saw isolation here as the only safe alternative in an uncertain time when solitary *akritoi*, who were the Byzantine equivalent of Turkish ghazi warrior knights, were the only law in this frontier region. A monastic movement begun by Saint Basil of Caesarea in the fourth century gradually started to increase by the seventh century and became a flood 300 years later. In contrast to the strictly separated coenobitical units seen in the southeast and elsewhere, the monastic communities set up in Cappadocia centered around the Lavra system, which originated in Palestine and did not require constant, self-sufficient separation from society, but allowed mixing with the secular world. For this reason, the monasteries of Cappadocia usually existed side by side with nearby villages, and were much smaller than those seen at Alahan, Anavarza, Sion, and Sumela because they had no sleeping facilities. The small scale of each unit was also in keeping with Saint Basil's original belief that a good monastery should have no more than 20 monks. As Spiro Kostof has said,

despite the lack of large corporate organization, or is it really because of it, monasteries were central to the life of the secular society. In an area where isolation from the influence of the capital was acute and danger from the outside a constant threat, the

villages and small towns looked to the monk, imitator of Christ and the embodiment in theory at least of selflessness, for pre-eminent leadership in all aspects of their difficult existence.

A Monastic Haven

The four main areas of monastic activity that have been studied in Cappadocia to date are Göreme, Soğanlı Dere, Açık Saray, and Ihlahan or Peristrema. Göreme and the network of valleys near Ortahisar, Üçhisar, and Zilve were the centers of Christian activity here, containing hundreds of small churches in between. Many of these, such as the Apply Church (Elmalı Kil) and the Dark Church (Karanlık), are decorated with beautiful frescos, made from the vivid colors of the local pigments. Soğanlı Dere, like Ihlahan, is in a deep gorge, but differs in that it is surrounded by a natural wall of tufa and has a wider valley floor and sides that are not as steep as Peristrema. Because it is far from the main center of tourist activity at Göreme, Soğanlı Dere is still relatively pristine and undiscovered, making it far less commercialized. Of the more than 50 churches here, one of the most intriguing is the Yılanikilise or Snake Church, named from frescos in the interior showing women, supposedly representing the progeny of Eve, wearing real boas instead of feather ones. While their faces have been chipped away, the bodies and the snakes remain. Soğanlı Dere is also close to the underground troglodyte cities of Derinkuyu, which means “deep well,” and it held more than 20,000 people at one time and was connected to its sister city Kaymaklı with a tunnel that was over 9 kilometers long. These underground cities offered nearly complete safety and comfort to all those living there, and they were virtually undetectable. Smoke from cooking fires as well as openings for ventilation were carefully hidden, and if an invader did happen to stumble upon one of the openings to the tunnels, it was sealed by a massive stone disk that rolled in grooves cut into the rock. Both cities have been empty since 1965 when the Turkish government opened them as museums.

Açık Saray, which is the third monastic center in Cappadocia, was not as extensive as the others, with its main claim to fame being a rock-cut church that is not made out of tufa, meaning that its intricate designs were even more difficult to execute. The Ihlahan Gorge, once known as Peristrema, is the fourth and last of this group and is located about 70 kilometers west of Soğanlı Dere close to Hasan Dağı. Created by the Melendis River, this valley stretches from just below Selime on the north through Yaprakhisar and Belisirma to Ihlara on the south, covering nearly 6 kilometers in its course. While not long ago this was totally uncharted territory, the churches in this valley are today dutifully marked with signs that call out strange names such as the Church of the Black Collar, the Fragrant Church, or the Church of the Crooked Stone. Yet, the atmosphere here is still primitive compared to other parts of Cappadocia, and the long walk along the river still has a feeling of high adventure.

Troglodytes

But churches and monasteries aside, the majority of the inhabitants of the fairy chimneys were people who were trying to escape persecution and death at the hands of one enemy or another. There is evidence that there were many of them,

to the extent that entire cities that were carved into the tufa have been uncovered.³ These were warrens of carved spaces connected by steps, often with only one entrance linking them to the outside world, closed off with a circular millstone that could be rolled into a groove cut into the opposing wall. In 1965, three separate, intact settlements were uncovered here covering an area of 6 square kilometers inside the rock, accessed through a single entrance.⁴ Leo the Deacon, who was a historian in the tenth century, quoted Nikephoros Phokas, who was later to become a Byzantine emperor, as saying that the people living in these rock-cut houses were called “troglodytes.”⁵ This conjures up an image of gnarled gnomes living in dark holes underground who only poked their heads out now and then when they wanted to do evil. But this image is far from the truth, given the evidence provided by the interior of the houses. Life was not as easy in these houses as it was elsewhere, but there were considerable creature comforts. Many occupants had fireplaces, with hidden channels used to hide the smoke as much as possible. Several houses also had more than one level, reached by staircases cut into the solid stone. Carpets on the floor and mattresses and blankets on the shelves that served as beds would have done much to soften and add color to the hard rock surfaces. The underground caverns served as pens for sheep and goats that were a constant source of meat, milk, cheese, and wool. The rock itself helped to mitigate temperature extremes. The only negative that could not be offset, other than the constant fear of being discovered, was the lack of natural light.

ÇATAL HÜYÜK

In the early 1960s, archaeologist James Mellaart defied the conventional belief that no significant settlement had ever occurred on the Anatolian plateau by excavating a town there that dated from 6500 to 5300 B.C. The site is called Çatal Hüyük or “forked mound” because of the shape of the tell, or earth mound, that covered the houses. The settlement, which is located on a wide expanse of fertile land southeast of Konya, Turkey, covers about 25 acres and is about three times the size of Homeric Troy, near Canakalle, to the west. The houses that Mellaart found were all made of sun-dried mud brick in a wood frame, joined together with common walls, and entered through openings on the roofs, which were flat. Several clusters of houses shared a communal courtyard, which appears to have served as a shrine, since each of these was decorated with the skulls and horns of cows, either real or cast in plaster. Wall paintings, similar to those found in Lascaux caves in France, indicate that the people who worshipped there may also have believed in sympathetic magic, or the idea that by painting the image of an animal that they wanted to kill in a hunt ensured their success in doing so.

The difference between the people who painted the murals in Lascaux caves and those at Çatal Hüyük, however, is that the occupants of the honeycomb cluster of houses on the Anatolian plateau were at a transitional point between the hunter-gatherers of the Paleolithic Period and farmers who were trying to adapt themselves to a settled, agriculturally based life in which hunting and gathering were still practiced but were not the only means of subsistence. The murals as well as

the tools, pottery, and weapons that have been found in the house all exhibit craftsmanship of a very high level, which is an advantage of a more predictable lifestyle.

Excavation has continued steadily since the site was first discovered, and archaeologists have subsequently been able to slowly piece together a more accurate picture of what the daily life of prehistoric farmers and hunter-gatherers who lived there must have been like. They have now unearthed 18 different levels of habitation, layered on top of each other, covering a period of 1,200 years of continuous occupation on the site.⁶ The initial discovery and continuously surprising revelations that have emerged have forced a reevaluation of conventional ideas about the progress and network of Neolithic development in western Asia. The unparalleled artistic achievement displayed at Çatal Hüyük is a significant tribute to human skill and ingenuity before the invention of writing. Like Jericho in the eighth century B.C., Çatal Hüyük may seem like an isolated exception, but archaeologists are becoming increasingly aware of the fact that they have now uncovered only a fraction of the site and have upgraded the status of the settlement from a town to a city. There is still much more to find. Based on the evidence of artifacts collected, they now believe that there was active trade between this settlement and another that is a hundred miles away and that Çatal Hüyük may end up being three times larger than Jericho at its height.



Aerial view of Çatal Hüyük tumulus in Cumra, Turkey. © Images&Stories / Alamy

Vulture Shrines

In addition to the burial of the remains of deceased family members inside each house, Mellaart also found some minor discrepancies between the objects buried with the deceased in the houses and those found in the shrines. This, he thought, “suggests that the privileged dead buried in the shrines had been people who during life had enjoyed affluence, respect or authority; in fact members of a higher social order or distinction than their relatives buried in the houses.”⁷ The use of red ochre, which has been found in the excavation at many other Neolithic settlements elsewhere, and was sprinkled on the bodies of those of especially high regard, was found in about 5 percent of the individuals buried in the shrines. Some bodies were also decapitated, which is thought to have been done in the case of a distinguished ancestor who began a lineage.⁸ A similar practice was carried out in Jericho, in which some skulls were kept apart, plastered over and colored to look lifelike, as if to preserve the memory of special individuals in a tangible way.

The Houses of Çatal Hüyük

The approximately 2,000 houses of the Çatal Hüyük settlement had solid walls on all sides, both to conserve heat during the winter, which can be extremely cold on the windswept Anatolian Plateau, and to provide defense against wild animals, since attacks by outsiders do not seem to have been a problem. The trapdoors into the houses were on the roof and were usually located on the south side of the house. They also served as a chimney for the hearth and oven placed directly beneath them and had a wooden canopy, or pergola, above them, which protected the interior of the houses from rain and snow. Access into each house was by ladder, but the side rails and rungs were squared off and the size of each step was quite substantial. The lack of windows on the sidewalls means that the interiors must have been relatively dark, mostly lit by oil lamps and the fireplace. This fireplace was formed of mud packed into a container with a circular base, sloping sides, and an open top, with a U-shaped cutout in front to place the wood inside it.

The walls of the house were made of sun-dried brick, formed in a wooden mold. Apparently the technique of *terre pisé*, or rammed earth, which involved building wooden shutters into which the earth was placed and then pounded until it was compact, after which the shuttering could be moved up to make the next course of the entire wall, was unknown. The bricks were used to fill in a wooden frame of columns that held up the wooden roof girders.⁹ Bundles of reeds were then placed across the roof beams and covered with a layer of mud, which was the roof. Woven mats were placed on top of the beams before the reed bundles were placed on top to prevent the infiltration of dirt and dust into the house below. Black mortar made from ashes from the hearths and crushed animal bone from the refuse dump was extremely strong, and the brick courses were bonded, or interlocked, for stability.

Parallels with the Anasazi

Since this house type is so similar to that of the Anasazi in North America, built 6,000 years later, it begs comparison with it in some key areas. First of all, such common party wall compartmentalization, with entrance from the roof and no

windows in the walls, meant that the interior of the houses was very dark and smoky. The Çatal Hüyük houses were only one story high, compared to the Anasazi pueblos that were stacked up on terraces several levels in height, which meant that the earlier Anatolian houses did get some light through the opening in the roof, but only a minimal amount. Second, the woven mats above the rafters that were intended to stop the mud dust from the roof from entering the house were not perfectly tight and did allow dirt to fall in. All those who have been involved in investigating the Çatal Hüyük houses, however, have commented on how scrupulously clean they must have been, even though there was no drainage system of the kind found in the Indus River cities of around 2800 B.C., nearly 3 millennia afterwards. Refuse was removed to a dump outside the wall on a regular basis and covered with ash, and the walls were renewed annually. Third, the fact that both Çatal Hüyük and Anasazi settlements had no streets as such, because there was no space between the houses to allow them, meant that the roof terraces became the public space for work and play as well.

The platforms, which were used for sitting and sleeping as well as to inter-deceased family members, were also covered in woven mats, before being laid with carpets and pillows.¹⁰ Wall paintings in the houses at Çatal Hüyük varied in location and subject, but sometimes were clusters of circles or circles within circles that seem to represent stars or constellations.

CONSTANTINOPLE, “THE NEW ROME”

In early July 1203, the Venetian Doge, Enrico Dandolo, led a fleet of 200 ships and 25,000 men up the Dardanelles toward Constantinople, which, as the historian Procopius had once described it, rose from the water in front of them like “an exhalation in the night.” Unlike the Crusaders who accompanied him, the blind Doge was undaunted by the sight of the 14 miles of land and sea walls that had previously repelled rapacious armies of Avars, Sassanids, Arabs, Bulgars, Russians, Attila “the scourge of God,” and assorted Turkish tribes before him. The land walls that had been enlarged to their final configuration by Theodosius II, the grandson of Theodosius the Great, were undoubtedly a marvel of military construction. They were arranged in a double row behind a wide moat, with a formidable no-man’s land between them. In addition to this lethal combination, there were nearly 100 huge towers along the walls, which were placed at regular intervals. They protected the main gates to the city that were placed between them, so that any invaders could be attacked diagonally from above to best advantage. Each of the gates, in turn, was named according to either an identifying characteristic or the section of the city that they gave access to, such as the White Gate, or the Gate of the Life-giving Spring. While one of the Byzantine names for Constantinople itself may have been Theophylaktos, or “Protected of God,” equal credit for the 1,000 years of safety before the Venetian invasion should also be given to the cliffs of brick and stone that combined with a naturally defensive topography to keep the city secure. The bronze equestrian *quadriga* that had crowned the main doorway of St. Mark’s Basilica in Venice (until it was removed recently to protect it from air pollution) had originally been brought from Rome by the Emperor Constantine



The ancient city walls of Constantinople. *Source:* Steven Daenens; Flickr

as a centerpiece for the Hippodrome of the new city that was to bear his name. It was based on a Greek work done in the second half of the fifth century B.C., and it was just a small fraction of the treasure that the Venetians carted out of the city after a desperate nine-month long struggle that had brought about its tragic destruction. It is sad to think that the richness of the Piazza San Marco, which has been so admired for centuries, was gained through the desecration of what had been the only existing repository of the classical traditions of Greece and Rome, and that this represents only a hint of the treasure that was taken.¹¹

Greek Beginnings

Byzantium, the city that the Crusaders and Venetians of 1203–1204 had looted, had its beginnings in the seventh century B.C., when King Byzas from Megara in Greece first saw it to be a uniquely defensible location on which to establish his small kingdom, surrounded as it was by the Marmara Sea on the south, the

Golden Horn on the north, and the swift deep waters of the Bosphorus at its tip. This wall of water on three of its sides made only subsidiary walls along the shore and a single land wall necessary in order to make any settlement totally secure. A legend surrounding Byzas's choice of this site for the new city relates that after he consulted Oracle at Delphi, he was told to build opposite "the land of the blind," in clear reference to the lack of vision of the Greeks in Chalcedon, who failed to seize it first. Byzas established the first settlement at the tip of the peninsula at a place now called Sarayburnu, or "the Nose of the Palace," because a royal residence has been there ever since.

Because of its strategic location between the Hellenic West and the Persian East, with the power to control sea and land traffic between two continents, the new city quickly took on a key role in the Persian Wars of the fifth century B.C., as well as in the Peloponnesian War between Athens and Sparta that followed. Byzas's city, which was then nearly 200 years old, suffered several invasions by each side in the later war, as each tried to gain the upper hand in the important political arena of Anatolia. It was eventually the Persians, who, by using their navy to help the Spartans, managed to turn the tide against the Athenians, leaving the city at rest. The

whirlwind passage of Alexander the Great through Byzantium on his way into central Anatolia and beyond, at the beginning of the Hellenistic Age, opened up a new chapter in the history of this entire area, of which few indications except fragments in the Istanbul Archaeological Museum now remain.

The Roman Phase

The Romans were not far behind Alexander with the establishment of the province of Asia in 133 B.C., and their greatly expanded ambitions, matched with unparalleled engineering ability, had a much bigger impact on the city than anything before. After 300 years of relative quiet during the Pax Romana, ill-conceived political alignments in a Roman factional struggle brought retribution in A.D. 196 by Septimus Severus, who leveled and burned nearly everything standing in the city. Following this conflagration, a new wall was built that stretched from the entry of what is now the Galata Bridge across the peninsula to the Sea of Marmara, nearly doubling an urban area primarily restricted in the past to the Acropolis. The rapidly increasing inability of the Roman Empire to defend and hold its far-flung frontiers against outside incursions as well as the agitation of a growing Christian population within it led to a momentous change in the historical course of what had been, until then, a relatively small city within its control. Having succeeded his father Constantius Chlorus as one of the tetrarchs in the tripartite system set up by the Emperor Diocletian, Constantine was not content to share power but methodically set out to eliminate the other members of the ruling faction. His final victory over his brother-in-law Licinius, ruler of the West, at Chrysopolis, now Üsküdar, in A.D. 324 left him as sole ruler of both the eastern and western factions of the Roman Empire, clearing the way for his decision to move its capital and establish a New Rome at Byzantium.

The New Rome of Constantine

This decision was not made lightly, but was the culmination of Constantine's long experience in this part of Asia Minor during the reign of Diocletian, when he had held a government post in Nicomedia and had overseen an extensive building program carried out there. Constantine's New Rome was intended to be not just a substitute for its famous Latin counterpart but a superior mirror image. Where Rome had seven hills and 14 regions, its new replacement was to have them as well, even if a seventh hill had to be partially built to maintain the similarity. Constantinople was also not to be deficient in riches and glory, as thousands of pieces of sculpture and other works of art were imported and manufactured to adorn the new city, which used the Severan plan as its base.

This plan already included temples, a hippodrome, and the baths of Zeus-Xeuthippes, a hyphenated deity of Thracian and Anatolian origins, and all of these played an important part in Constantine's decision to move his capital here. His plan augmented the preexisting Roman structures in several important ways, which are instructive of his long range intentions for both the character of the new city and its role as the center of his new empire. Constantine first altered the combination of temple, circus, and bath that he had inherited from Septimus Severus by replacing the pagan religious building with a pair of Christian churches that he named Hagia Sophia (Holy Wisdom) and Hagia Eirene (Holy Peace) in order to

subtly ease the transition from old customs to new. Figures representing the concepts of wisdom and peace had been used in Roman buildings like the Celsus Library in Ephesus, which predated the naming of these two churches and thus would have sent out a crystal-clear message that Constantine intended this city to be the heart and conscience of a new Christian empire, just as Rome had been the epicenter of a pantheistic one. To extend the revision even further, he linked his own palace directly to the twin churches, which, along with an elongated hippodrome whose form can still be traced today, set up what Constantine felt to be the Utopian triumvirate of palatium, sacerdotium, and circus, or palace, church, and stadium. Virtually nothing of the great palace remains now, but it has been suggested that it was probably very similar to Diocletian's huge residence in Split, which was a city within a city. By inserting the palace into the old reciprocal relationship between temple and circus that had effectively replaced the theatre as an institution of social gathering and entertainment at this time, Constantine symbolically put himself in the position of arbiter between the church and the people. Considering himself to be a thirteenth apostle who was destined by God to expand the mission of Christianity on earth, he saw himself as the leader of both the Church and the State, without favoring one to the exclusion of the other.

Streets Adapted to a Different Topography

From this metaphorical head, located at the peninsular tip of the city, a spine, or *regia*, ran through the old barrier of the Severan walls to an oval forum of a size and form similar to that found in Jordanian Jerash (Gerasa) today. Like the *cardo maximus* of that almost perfectly preserved Roman city, its sides were lined with columns with shops behind them, continuing a late Roman trend toward the extension of the commercial activity of the old Greek *agora* along the street. This oval forum, which was later transformed into the Forum Taurii during the reign of Theodosius I, was the first major processional event prior to the square Philadelphian Forum to the west, where the main *cardo* branched into two in order to conform to the widening of the peninsula at that point. The northerly branch of the two ran parallel to the Aqueduct of Valens, past the Constantinian Mausoleum and the Church of the Holy Apostles to the Charisian Gate in the land wall.

The second branch turned along the coast of the Sea of Marmara to the south, running through the Forum Bovis and the Forum Arcadii to the Golden Gate, which was the main entrance into the city from the landside. The Constantinian plan for New Rome was remarkable for both the speed with which it was implemented and its adaptation of what had become a standard gridiron formula onto a challenging, hilly topography. It is important to note that Constantinople did not spring up *de novo*, but rather was an extension of both the early city plan of Byzas and the Severan rebuilding of that plan. As such, it reused the main elements of the middle avenue or *mese*, the tetrastoon *agora*, which became known as the Augusteion under Constantine, the Zeus-Xeuthippes baths, and finally the major north-south orientation of the Hippodrome, which was greatly enlarged to fulfill a wider social function. In spite of its Christian basis, the city was not, however, totally organized around religious foundations as was its Ottoman counterpart, but closely followed the template of Rome.

A Long Succession

The subsequent long line of Byzantine emperors that followed Constantine in a continuous 1,200 year succession that was broken only by the Venetian interregnum considered itself to be the rightful heir to a classical tradition that had been saved from certain extinction after the fall of Rome. For the Byzantines, the physical resemblance of their city, in its final form inside the Theodosian land walls, was too close to that of its fallen parent on the Tiber to be mere coincidence and was instead considered to be Divine Will. The gradual evaluation of that classical heritage, during a remarkably long period of political stability threatened only by internal theological debates, was characterized mainly by a constant embellishment of Constantine's original concept of the unified duality of Church and State. The emperor and the patriarch both continued to refine their roles based on the original idea of a delicate balance between the two.

The Hagia Sophia remains as the best formal expression of the wish to perpetuate a classical heritage in the Byzantine East. The form commemorated separate but equal status of the emperor and patriarch meeting beneath a great dome and also symbolized the witness of heaven above. Ranking as one of man's greatest architectural achievements, the plan of the Hagia Sophia clearly expresses the blending of the classic Roman basilica with a circular Byzantine dome fitted to a square base. Anthemius of Tralles, who became the architect of record after the death of Isidorus of Miletus, was a past director of the Academy of Athens and a noted geometer in the best Platonic tradition, making him the perfect bridge between the traditions of ancient Greece and those of Byzantium. Transcending its role as a purely religious building, the Hagia Sophia has become one of those rare monuments that now represent an entire culture, not merely a single function. The domed typology of the Hagia Sophia, due to its great imperial symbolism, was thus eagerly adopted as a model for all future mosques in Istanbul, regardless of the purely canonical origin of its centralized form.

From Constantinople to Istanbul

In 1253, Constantinople was conquered again, but this time the invaders intended to stay. The first act of the Turkish commander Mehmet the Conqueror upon entering the city was to march to the Hagia Sophia and claim it for Islam. The Ottoman Empire, which grew from here and at its zenith almost encircled the Mediterranean Sea, encompassing the Tigris and Euphrates valley as well as Syria, the Balkans, and Greece, ruled that world from the "Sublime Porte" of Istanbul for nearly 500 years. Each of the highly visible tops of its seven hills became a preferred building site for sultans or emirs who wished to build a mosque or charitable foundation, which led in turn to a radical alteration of the skyline of the Byzantine city. Research into the documents involved with the building of these monuments, however, shows that the only criteria used for site selection was the desire for clean air or a clearly visible elevation rather than any comprehensive plan for a unified, domed, and spired silhouette running the entire length of the peninsula. The final result, then, while extremely impressive, is another of history's fortunate accidents, a series of events totally unrelated to uniform aesthetic concerns or a comprehensive urban strategy.

Physical Changes

It is understandable that an event as cataclysmic as the Turkish conquest of the eastern capital of Christendom would bring about other major adjustments in both the form and population of the city, which took about a century to be fully realized. Since Constantinople's population had gradually but steadily diminished prior to the conquest, Mehmet II found himself the sovereign of a virtually empty city. After some tentative attempts at resettlement that were generally resisted because of the sultan's initial refusal to grant ownership of real estate, a dual policy of land grants to prominent citizens and *waqfs* (religious endowments), as well as forced deportation and resettlement, totally reorganized the existing urban fabric, giving it a new social mix. New districts, bearing the names of origin of people resettled from Karaman, Trebizond, Belgrade, or elsewhere, began to spring up throughout Istanbul as people began to pour into the vacated city. Eventually this chaotic and somewhat haphazard policy of repopulation became more systematic, once the essential need for a basic citizenry had been satisfied. Certain classes or trades from various areas throughout the Ottoman Empire also began to be relocated en masse specifically because they could be of some exact service to either the court or the city.

In addition to this influx of culturally diverse ethnic groups, Mehmet also drastically altered the Byzantine makeup of the city by introducing the Ottoman *külliye* into common use. Basically a self-contained village unto itself, the *külliye* is a complex providing social services symbiotically related to a mosque and providing housing facilities, kitchens, hospitals, schools, and libraries, which are meant solely for the welfare of the public. This new institutional type had within it the seeds of a totally distinct urban organization, and it progressively transformed Istanbul into an Ottoman city. The imperial *külliye* gradually occupied the key points of the urban fabric and the city's continuously linear structure, which had been virtually fixed since the time of Theodosius, but was progressively replaced by a discontinuous, point-by-point configuration that has left an indelible mark upon it.

THE HITTITES

The Hittites, who referred to themselves as “the people of Hatti,” exercised great power in central Turkey at about the same time as the Trojan War, ruling an empire that stretched from the Euphrates to the Aegean. Recent intensive research into the daily lives of what had previously been a mysterious people has uncovered a fascinating picture of what we now know to have been a great Bronze Age civilization, which was destroyed around 1200 B.C. Awareness of Hittite culture is relatively new, since it was only in 1923 that ruins found at Boghazköy, Alacahöyük, and Yazilikaya were agreed to be common to it and that archaeologists finally agreed that it was the Hittites that Ramses II was referring to in his stele at the Temple of Karnak, which he erected to celebrate his victory over “The Great King of the Hatti” at the Battle of Kadesh fought in 1275 B.C. in what is now Syria.

Background

Excavations at the Hittite capital of Boghazköy in central Anatolia have unearthed cuneiform tablets, and among these was the treaty between Ramses II

and Hattisilis, the “Great King” that Ramses referred to, using wording that is identical to that found at the Temple of Karnak. There are also records of the Hittites’ dealings with Troy, referred to as “Taruisa,” in which there are also references to Priam’s son, Paris, personally. This extensive clay archive also shows that the Hittites, in addition to being in constant contact with the Egyptians, also had diplomatic relations and trade agreements with the Babylonians and Assyrians as well as with city-states such as Mycenae, Tyre, Sidon, Byblos, Jerusalem, Megiddo, and Knossos, or Crete. Evidence from an inscription on a statue base from Thebes confirms this heretofore unrecognized level of interaction, since it describes a diplomatic voyage to both Mycenae and Knossos, in 1300 B.C. This explains the Mycenaean pottery found in Amarna of about the same date.

Such evidence shows that globalization is nothing new, since these kingdoms were involved in diplomatic intrigue of a kind that would be very familiar to us today. At the time of the Trojan War the Hittites were involved in a war with the Assyrians to the east of their empire, so they wanted to keep peace with the Greeks, to the west, to avoid a war on two fronts. When the Greek forces under the leadership of Agamemnon landed on the coast of Asia Minor, they raided villages and towns along the Aegean coast, upsetting the delicate alliances the Hittites had established in the region. The Hittites conceded control of Miletus, which the Hittites called “Millewanda,” to the Greeks. Some historians and archaeologists now speculate that the Achaeans, under Agamemnon, fought with the Hittites for control of Troy after the Achaeans had captured it, which conjures up the image of two great Bronze Age armies, representing two completely different cultures, meeting on the battlefield after Troy had fallen. The date of the Achaean attack in 1240 B.C. dovetails almost exactly with the disappearance of the Hittite capital city of Hattusas, as well as with Pharaonic Egyptian records of an invasion by “peoples of the sea,” whose origins are still unknown. The result of the collapse of both Troy and Hattusas was disastrous for Anatolia, marking the end of the Bronze Age there and causing a Dark Age that lasted for two centuries.

Before their passing, however, the Hittites left an indelible physical record of their culture on Anatolia and the kingdom that they ruled from it. It is now believed that their culture, which was very rich, was a blending of the Indo-European people, who first arrived on the plateau around 2000 B.C. and settled near Kultepe, about 200 kilometers to the southeast of present day Ankara, and the Hatti, who were indigenous to the region. Five temples have been uncovered at Hattusas and Alacahöyük, as well as a very sophisticated religious center at Yazilikaya.

The Yazilikaya temple, which consists of a built, introductory section that acts as a protective gateway placed in front of an open ravine on which a continuous mural depicts the entire pantheon of Hittite gods and goddesses, provides a fascinating insight into their hierarchical society. The shrine takes its name from the Hittite words for “carved rock,” since more than 1,000 deities are etched into the cliff face that is only accessible after first passing through the primary temple in front of it. This is a remarkable integration between human-made and natural forms. The long, linear gateway building was organized into a series of nonsymmetrical spaces that appear to have served as places of worship and administration for the shrine. It closes off the north of a rocky defile whose walls have been turned into two

sequentially ordered sculpture galleries. The story that they tell weaves the lives of King Hattus I or “the one from Hattusa” and King Tudhaliya IV, who commissioned the construction of the gallery, with those of their gods, who are depicted as being very humane and loving.

Hittite civilization passed through two principal phases, now referred to as the Old Kingdom and the Empire, with the historical dividing line being the middle of the fifteenth century B.C. During the Old Kingdom period, Mursilis I incursions reached as far as Syria and Babylon, which he occupied in 1595 B.C.

Hittite Houses

The mystery surrounding the Hittites is beginning to be revealed, as excavation at important sites has continued yielding a great deal more information about their daily lives. While not always on a grid, the main streets of Hittite cities were usually straight, and images of chariot-riding royalty, such as those on the walls at Yazilikaya come to mind when walking on their ground covered surfaces. Sites for the Hittite cities, such as Boghazköy, were typically chosen with defense in mind, so they are usually on steep slopes, making it necessary to use terraces.¹² Like the early cities of the Indus River civilizations, these also had a well-integrated drainage system to take rainwater and water from melting snow off the slopes efficiently, as well as the sewage from the houses, and those clay pipe systems have been found. Unlike Mohenjo-daro and Harappa, however, the individual houses seem even more haphazardly oriented, with units of many different shapes and sizes facing in different directions being the norm. Courtyards are a ubiquitous organizing device, but beyond that it is difficult to determine a consistent typological pattern. Even they are used differently than they are in the Mesopotamian, Egyptian, Chinese, and Indus Valley cultures included here, being pushed to the front of the house and used more as a buffer between the entrance and the street than an internal temperature regulator and microcosmic symbol of a natural paradise.¹³ This is the case at Boghazköy, but in other cities such as Beycesultan, the courtyard is used differently, once again with an upper floor supported by columns, overhanging it like a porch or sometimes simply as a roof. The houses we have been discussing that were joined together using party walls within a roughly rectangular block system in various cities were generally for the less well-to-do, while those at the upper end of the social spectrum preferred to live in freestanding houses outside of these precincts, often on rocky, easily defended promontories. The royal palace on the cliff-side site of Buyukkale, near Boghazköy, protected by steep mountainsides on the north and east, and massive walls on the south and west, is a good example of this preference. This palace dates from 1,500 years before the reign of Hattusilis I, but reached the apogee of its magnificence in the mid-1600s B.C., during his residence there.

Hattusas was divided into two sections, with a smaller lower portion on the northern side of a mountainside, a higher portion on the south, and a citadel at the top, in between. This citadel, known as Buyukkale, was an elliptically shaped fortress, protected by a massive castellated wall placed along the top of a cliff, with three levels that corresponded to the slope of the hill it was built on. These levels, in turn, were organized around a series of courtyards that became progressively



Cave dwellings in Cappadocia, Turkey. Courtesy of Shutterstock

smaller as the slope rose, and these acted as incremental filters between public and private areas. The lowest courtyard column was open to the general public and was used for general administrative functions, followed by a more restricted religious section in the middle and the King's palace in the smallest and most secure level at the top.

Unfortunately, because of the steep site and the need to build the palace up on a strong structural base to accommodate the heavily contoured site, the foundations that archaeologists have uncovered are fairly repetitive and mundane, telling us very little about the room arrangement of the above residence that they supported, which has long since disappeared. What they can decipher from these thick and repetitively compartmentalized foundation walls, however, is the overall configuration and enormous scale of the complex, as well as some indications of its various functions, entrances, and exits, which all give a fairly clear picture of how it was used. Shaped roughly like an elongated fan to conform to a terrace on its hillside site, the palace is divided into four clearly identifiable zones, which are the citadel entrance court immediately inside the main citadel gate, followed by the lower, middle, and upper courts, with walled

gates at each corresponding to the break in the various terrace levels as the palace steps up the hill. With the exception of this topographical relationship, the divisions are reminiscent of those used by the architect Sinan in the design of Topkapi Palace, which he realized from the first Ottoman Emperor Mehmet (the Conqueror) in 1425 at Sarayburnu, in Istanbul. The reasons for the compartmentalization in each case, however, are the same, related to the protection and privacy of the ruler and his family, although it is not clear if Hattusilis I also had a harem as Mehmet did. His residential quarter of Hattusilis I no longer exists at the highest and most imposing final quadrant of Buyukkale, but the gate that the king used at its southeast corner still does, leading to a second gate and a ramp for his chariot that would make it easier to leave the citadel without going through all of the other sections. Archaeologists believe that each of the four courts was faced with arcades, but beyond that no substantial architectural evidence remains.

Assyrian influence is evident in both the construction techniques that were used and the introspective, internalized approach taken in the design, which carries over to houses within the city as well. The only difference is that the Hittites tended to surround courtyards with spaces that had a diverse range of functions rather than to group similar activities together as the Assyrians did.

MESOPOTAMIA

Mesopotamia is the northern tip of the Fertile Crescent; its name is derived from the Greek words for “between the two rivers.” Those rivers, the Tigris and the Euphrates, have their source at Lake Van in Turkey. They begin nearly 250 miles apart, but gradually move closer together as they approach what is now Baghdad. They then begin to separate again on their way to their delta at the Arabian Gulf.

The Hit-Samara Line

A limestone escarpment that cuts across Mesopotamia from the contemporary cities of Hit on the west and Samara on the east divides it into two distinctly different geological and topographical zones, and this difference had a significant impact on the kinds of houses that were built there in ancient times and on our present ability to study them. Because of the deep channels they have cut into the limestone substrate above the Hit-Samara line, the sites of ancient cities such as Carcamish, Nineveh, Nimrud, and Ashur, which are near their banks, have been left undisturbed. South of this line, many cities are covered in sediment, since the rivers were free to meander across a broad, flat, muddy plain. In each case, either with the rivers in deep channels, or flowing freely across the plain, extensive irrigation was necessary to make farming feasible and the construction, control, and protection of these essential systems had important political implications for the region in the past.

As armies spreading Islam approached the Tigris and Euphrates river valley from Arabia, moving in from the desert to the southwest, they ended up on top of the divisive escarpment, looking down on the valley and to the Zagros Mountains to the east, in Iran, in the distance. They called the escarpment “*al-Hajara*,” or

the cliff, and the barren limestone plateau that separated the two rivers above it “*al-Jazirah*,” or the island, since it kept them apart in individual valleys. To the south, they could see an enormous, flat, fertile plain extending all the way to their common delta, which has no equivalent in the Near East.

A Land of Extremes

This region typically has temperatures between 110 and 130 degrees Fahrenheit in the shade during the summer, with no rainfall for eight months of the year. The rivers flood when the snow in the Taurus Mountains in Turkey melts in the spring, providing a reliance upon an annual cycle similar to that existing in Egypt in ancient times. In Mesopotamia, the floodwaters arrived in unmanageable quantities and at the wrong time for planting. This, along with the relative depth of the water in its various valleys, meant that irrigation canals and reservoirs were necessary, forcing the development of a governmental system capable of organizing, building, and maintaining them. Because of extensive cultivation and irrigation, salinization began to increase. As saline water began to evaporate on the soil, salt was deposited, which lowered fertility. Salinization started in Mesopotamia in the Tigris River in 2400 B.C., spreading up into the Euphrates soon afterward. By 1700 B.C. it had affected the harvesting of wheat, which has a low tolerance for salt, to the extent that it was reduced from being 20 percent of the total source of food to being about 2 percent. It was replaced by barley, which has a higher saline tolerance.

In spite of the challenges presented by irrigation systems and salinization, the development of a sophisticated civilization in Mesopotamia represents as much of a success story in the early advancement of the agricultural revolution as that of Egypt, at the other end of the Fertile Crescent, to the southwest. As indicated earlier in the discussion about Çatal Hüyük in Anatolia, the transfer from a hunting and gathering culture to agricultural communities is one of the most momentous events in human history. This transformation did not happen all at once, occurring in layered stages in different regions around the world. It was initiated by climatic changes that took place after the Ice Age. The progressive rise in temperature encouraged agriculture, which demands a stationary, rather than nomadic, lifestyle, good organizational and planning skills, a knowledge of astronomy, the use of mathematics for record keeping, as well as writing, which is the most important advancement of all, since it is one of the criteria for the establishment of civilization. Cuneiform writing was well established in Mesopotamia by 3000 B.C.

The wheat that succumbed to salinization was derived from several wild varieties and was the foundation of that civilization until it was replaced with barley, and it was supplemented by legumes and lentils. This basic diet was augmented by milk and meat from domesticated cattle, sheep, and goats as well as meat from pigs. As people began to rely on agriculture, social behavior began to change. A year's supply of grain for a family of four can only be harvested during a brief period in the spring when the crop ripens and needs tending. It also cannot be carried around very easily, meaning that people had to remain in one place.

Three Early Cultures

Archaeologists have identified three early cultures that existed in Mesopotamia between 6000 and 4000 B.C., which they have named after the contemporary place

names where they were discovered: the Hassuna, Samarra, and Halaf civilizations.¹⁴ Hassuna was an agricultural grouping characterized by clusters of mud brick courtyard buildings joined together by party walls, which, due to recent interpretations of cuneiform tablets and cylinder seals, seem to have been privately owned.¹⁵ There is evidence of weaving and exquisite jewelry that has been related to this culture.

In the case of Samarra and Halaf, a wide range of residential structures have been discovered that range from circular, domical homes to larger detached houses that indicate a wide range of social levels.¹⁶

In part because of the geological differences that have just been described as defining this region, it subsequently divided into the Tepe Gaura culture in the north and the Uruk culture in the south.

The Marsh Arabs

Because of changes in elevation and the existence of promontories, the northern cities were often designed like citadels with walled enclosures on the heights and villages typically housing farmers below in the valleys where the fields were located. In the south, because of the predominantly flat river plain, the settlements were dependent upon irrigation canals. Even further south, in the delta region now called the Shatt al Arab, people lived on islands in woven reed houses and used reed boats to go back and forth from them to the banks of each of the rivers. These houses and the way of life of the Marsh Arabs who built them have remained remarkably similar over the centuries, threatened only by the retaliatory damming and draining of many of these lakes by the regime of Saddam Hussein. In spite of the hardships that both accompanied and followed in the wake of his overthrow, the Marsh Arabs have been persistently working to undo the damage done to their ancient ways of life during the 1980s and 1990s and have made remarkable strides in doing so.

Uruk

Warka, which is about 150 miles southeast of Baghdad and now 12 miles from the Euphrates River, was once the site of Uruk, which emerged in 4000 B.C., and was home to one of the first literate urban societies in Mesopotamia. It was one of a number of cities in Sumeria that had a high degree of economic independence. It thrived between 3500 and 3200 B.C., but even then it only occupied an area of 12 hectares, or 3.5 square miles, with a population of about 10,000.

It is perhaps best known for the White Temple that has been found there, one of the best examples of a high temple built on a platform with battered walls. The columned hall takes its name from parallel rows of round 2 meters wide supports. These columns, like walls, are made of mud brick, decorated by black, white, and red ceramic tiles organized in complex patterns.

While this temple obviously falls outside the topic of houses, there are aspects of the construction techniques needed to build it that are relevant to the domestic architecture of the city and to Mesopotamian houses in general.

First of all, the lack of wood in the region meant that Sumerian builders had to be extremely ingenious in their use of mud. Sir Charles Leonard Woolley recounts the way that they strengthened it, first by using bitumen, which is also plentiful in

the region, to stabilize the soil used for the bricks. In addition these bricks are tapered at each end for additional durability. The ceramic tiles that cover and protect the massive columns inside the White Temple are actually cone-shaped, with the sharp end pushed into the mud brick while it was still soft, up to the edge of the ceramic surface. These techniques, when adapted for domestic use, meant that walls and decorative ceramic surfaces were very beautiful but also very tough.

Sumer

Sumer, which means “the land,” crystallized into individual city-states by the third century B.C. There was the Dynastic Period during which various powerful kings ruled from their cities before Mesopotamia was unified by Sargon of Akkad in 2370 B.C. For obvious reasons this Dynastic Period is also called Pre-Sargonid. Sargon’s kinship marked an important transition from Sumerian to Akkadian rule and a revolution in political ideas. In the Dynastic Period, Sumerian city-states competed for power and each had its own patron deity who was seen as possessor of all physical things, with the king as an agent. Cities continually fought to adjust boundaries, and yet there was general allegiance to “the land” of Sumer itself. In this early period, there were a dozen or so cities with a finite amount of land bounded by the mountains and plateaus on each side, with no ambitions for territory. When Sargon took over, there was dynamic authority and statesmanship as well as a concept of absolute monarchy. The Akkadians were of non-Sumerian, Semitic origin, with a different language. The story of Sargon is similar to that of Moses in many ways in that he was an orphan who eventually became an advisor to the king of the city of Kish and was then named king when his mentor died. Once he became king, he started on a spectacular military career, subduing each of the other cities in Sumeria one by one. He founded a new capital at Agade, which has been mentioned in ancient texts but has not been discovered yet, north of Sumerian territory. It was used as a base for conquests outside of Mesopotamia, going deep into Anatolia and Arabia, and as far west as Cyprus. Sargon established a Mesopotamian empire. His reign lasted 55 years, but his dynasty was brought to an end by an uprising of Sumerian cities in 2120 B.C.

Ur

After this, Ur became the urban center of Sumeria. It is located beside the Euphrates River, which surrounded it on three sides, with dry land on the fourth. A second, heavily buttressed wall surrounded a sacred precinct inside the city, which also contained a colossal three stage ziggurat. The core of this ziggurat is mud brick with a skin of baked brick set in bitumen, and it has triple stairways converging at a single tower. The presence of drainage canals indicates that it may also have been planted with trees.

Because of an extended period of documentation of Mesopotamia by British archaeologist Sir Charles Leonard Woolley, Ur has also been well studied. It covered about 90 hectares, or 200 acres, with a density of 150 people per acre and had two peaks of prosperity from 2474 to 2398 B.C. and then from 2112 to 2095 B.C.¹⁷ Once again the courtyard typology predominated in Ur, and houses for the more well-to-do usually had more than one level, with stairs typically located near the main entrance. Service-based spaces, such as the kitchen and storage rooms,

as well as guest and servants' quarters were located on the ground floor, while areas requiring more privacy, such as family living and bedrooms, were located on the upper floors.¹⁸ If a house had more than one story, its mud brick walls were thicker. Since wood was scarce before Sargonoid times when conquest and extensive trade made it more accessible, there were few windows, because these required wooden lintels, and interiors were dark. Lighting was provided by oil lamps. Roofs were structured with palm tree trunks, which are fibrous, but strong. These were covered with a mat of woven reeds and then a layer of clay.¹⁹ Houses had toilets and bathtubs connected by drains to a main sewer. There was also a wide selection of furniture in a typical house, with cuneiform inventories listing chairs, tables, beds, stools, and storage chests. Water and wine were stored in clay jars.

Mashkan-shapir

Somewhere around 2000 B.C., Larsa, along with a partner city called Mashkan-shapir, eclipsed Ur as the most powerful and prosperous urban area in Mesopotamia. Mashkan-shapir had an especially fortuitous location near the Tigris River, south of what is now Baghdad. It was a thriving political center and the focal point of an extensive network of trade, surrounded by a wall and a secondary moat, inside which the inner precinct of the city was located. It remained powerful for about



An 8,000-year-old fortress right in the middle of the Kurdistan regional capital, Hewlêr (Erbil). Courtesy of James Gordon; Flickr

275 years, until the ascent of Hammurabi. The city had five districts, with one large one in the center framed by others on the north, south, east, and west all divided by canals.²⁰ The most monumental building in the city was a ziggurat temple dedicated to Nergal, the god of death, and the separate graveyard indicates the city may also have been a religious center. There is no indication of economically segregated residential districts, since highly prized objects, such as stone bowls and utensils, were distributed evenly across the site.²¹

There is a strong possibility that there was an artisanal population living throughout the city, since, as archaeologists have said, “the production of goods seems to have been in the hands of artisans who lived with in broader residential neighborhoods that housed both commoners and members of the elite.”²²

Centralized Rule

In 1900 B.C. Hammurabi set up a strong centralized government in Mesopotamia, destroying other cities and ruling from Babylon. His code of laws is well known. His dynasty held power until the Hittites invaded in 1595 B.C., followed by the Kassites and then the Assyrians, who also used Babylon as their capital. The Kassite period lasted for about 300 years (from 1595 to 1235 B.C.) and is differentiated by the use of molded brick. The Assyrians built the city of Ashur at a bend in the River Tigris for protection and maintained it as a capital for over 2,000 years. The Assyrian approach to religion was coldly formal, with deities represented by symbols rather than humanistic forms. Like Sargon, they created a military empire and trade routes. Sargon II, an Assyrian, built Khorsabad in 705 B.C. The city was square, with sides a mile long. It had seven gates and lowered walls, and the main palace was planned around two main courtyards, showing a total transfer from religious to secular authority at this point in time. The city walls here are 20 meters thick, and roofs were barrel vaulted. The zenith of activity for this city was between 625 B.C. and 562 B.C.

Babylon

Babylon became powerful in its own right as a city when King Nebuchadnezzar extended it across the Euphrates River. The king’s palace was in the northwest corner of the city, which was organized around a processional street. His palace had five courts.

Following 539 B.C., the Persians, under Cyrus, began to dominate the area from their capital in Persepolis, bringing the brief glory of Babylon to an end. Persepolis had no temples but only secular buildings such as the hundred columned halls, which were later burned by Alexander the Great.

TOPKAPI PALACE

The Topkapi Palace stands at the highest point of the tip of the peninsula, where Istanbul juts out into the Marmara Sea and where the ancient Greek acropolis had been. After Sultan Mehmet II conquered Constantinople in 1453, he first thought to build his palace in the Bayezit area because the *Saray-i Atik*, or “Old Palace” as it was called, was already there, having replaced Constantine’s Great Palace as the

residence of the Byzantine emperors after the eleventh century. Not totally satisfied with this choice, however, Mehmet decided to build at the *Sarayburnu*, perhaps because of its almost mythical connections with the city's imperial past. After the Byzantines had abandoned it, a hospital and a home for the elderly had been built there in the twelfth century, as well as several monasteries that stood on the Marmara side of the hill. Construction of a new palace, or *Saray-i Cedid*, was started in A.D. 1467, on a slope overlooking the water, which ensured a constant breeze and sweeping views of Galata, Üsküdar, Marmara, and the juncture of the Golden Horn and Bosphorus below. Continuously altered during the following 400 years of its use, the palace constantly evolved into the eclectic complex seen today. In the course of that evolution an extension of one of the pavilions built over the sea walls took the name *Topkapisi*, or Gungate Pavilion, because of the cannons strung out along the shore below. With the building of the railroad in this area in 1863, this pavilion was removed, but the name remained and eventually replaced that of *Saray-i Cedid* for the whole complex. In 1478, Mehmet the Conqueror ordered the construction of the 3 meters thick *Sur-i Sultan* or Sultan's Wall around the palace, which joined with the old Byzantine walls to encircle the entire site.

A Series of Courtyards

Having more or less arrived at its general form by 1465, the palace complex is characterized by a series of compartmentalized open spaces. Those progressively decrease in size and degree of public access in successive courts that are each surrounded by its own wall and each entered by a grand gate. The first of these is the *Bab-i Humayun* or Imperial Gate, which leads to the *Alay Meydani* or procession center, the scene of countless opulent audiences and reviews of elite Janissary corps in the past. The Janissaries, whose name is a corruption of the Turkish phrase *Yeni-Ceri* or "new force," were an elite army recruited to serve the sultan. The *Alay Meydani* was relatively accessible to the public during ceremonies and was rimmed with utilitarian spaces such as bakeries, armories, servants' residences, and storage rooms, which must have filled it with a buzz of activity.

One of the most beautiful buildings in the *Alay Meydani*, or First Court, is the *Cinili Köşk*, which is sometimes referred to as the *Şişe Saray* or Glass Palace in court documents of the past. Having been built in 1472, prior to the palace wall itself, the kiosk is set above a high platform, which acts as its base, and is fronted by an impressive colonnade that precedes a center court flanked by four *iwans*. The blue tiles that decorated this interior, which are flecked with gold and alternated with white, provide an unusual catalogue of faience styles from different regions of Turkey, which are all brought together here. The *ferid* field, which once preceded the kiosk, now holds the Istanbul Museum of Archaeology, which is frequently overlooked, but holds great treasures. The transition from the First Court to the Second is marked by the middle gate or *Bâbüsselâm*, which is flanked by towers on each side and capped with turrets. A macabre attraction of this gate is the *Cellâd Çegmeşi*, or Executioner's Fountain, where he used to wash his axe after each execution. The sultan alone was allowed to proceed past this gate on horseback to enter the divan court beyond, which was, in reality, a large garden surrounded by arcades and galleries. Written evidence in the palace library indicates that this court was

heavily planted with large shady trees and laced with curving stone pathways that were then commonplace in Turkish landscape planning. Looking at the straight, flat concrete pedestrian expressways that have now been installed to handle the large crowds that visit the palace each year, it is hard to imagine just how different this enclosure must have been in the past.

The *Divan*, or Imperial Council, met in this court, as did the Janissaries, for ceremonies and financial allotments, in a monthly display calculated to impress all those present with the incredible wealth of the empire. Regiment by regiment, the troops would march past the reviewing stand of the sultan to receive their *ulufe*, or salary, in front of the seated ambassadors and foreign dignitaries invited to attend. Coronations or *culus*, would also take place here, reinforcing the ceremonial character of the space.

On the right-hand side of the court, three gates gave access to the kitchens, as well as the housing of the staff that ran them. The kitchens, whose domes and chimneys are an unmistakable part of the palace skyline, were built by architect Sinan in the sixteenth century and are an organizational masterpiece, divided into units that were meant to serve separate groups of people reported to reach 10,000 or more on certain days. Today, the kitchens are quiet, only housing one of the world's most valuable collections of Chinese porcelain. At the far end of the court are the barracks of the Tasselled Halberdiers who were charged with taking care of the fires in the Harem. The tassels on their helmets, which gave them their name, were not only decorative, but were meant to prevent them from seeing the *odalisques*, or women of the Harem, as they carried out their tasks.

The Harem

As one of the oldest sections of the palace, the ward of the Tasselled Halberdiers is exquisitely decorated with floor and hearth tiles, lacquered flowers engraved in wood, and a technique of working in gold, called *edirnekari*, which is used on the windows. On the left side of this court, beside the imperial assembly that gives it its name, is the Carriage Gate or *Araba Kapisi*, which leads to the Harem and which is also the most popular part of the palace today. A square, 40 meter high tower, meant to be a watchtower for all of the palace grounds, marks the entrance to the legendary seraglio, which is a maze of nearly 300 rooms, only a small portion of which are open to the public today. Containing not only the women's quarters, the Harem also housed the Black Eunuchs who guarded them, the sultan's private apartments, and those of his family and relatives. Not originally a part of the palace complex, the Harem was built by Sultan Selim's son, Murad III, in 1574.

A complete world unto itself, the Harem was in reality not the scene of the hedonistic orgies it is often imagined to have been, but was instead the domain of the *Valide Sultan*, the sultan's mother, who had complete control over it and introduced only the few girls she found favorable to her son, using the *Kabisa Kadin* or Head Stewardess as her instrument. As may be imagined, such an arrangement led to a great deal of intrigue among the women there, who were chosen from all over the Empire. Tales of bored women being placated by drugged sherbets, while true, are exaggerated. The Harem was instead a closely knit matriarchal society, into which the sultan could only intrude following carefully prescribed etiquette, on special silver shoes whose unmistakable clanking on hard tile floors would

announce his presence. The Harem also effectively served as a jail for relatives and offspring who were deemed to be a threat to the sultan, and even those young princes not thought to be so were confined there for schooling until they were quite far into manhood. Because the Harem as an institution was felt to have effectively isolated future leaders from both the outside world as well as the day-to-day decision making of the court, it has been cited by historians as one of the prime causes for the weakening of the Ottoman Empire in later years.

The Harem consisted of three main divisions, the first of which belonged to its guardians, the Black Eunuchs. The second belonged to the *Valide Sultan* and the *Haseki Sultan*, his primary wife, as well as ladies-in-waiting, concubines, and servants. The third and last section was given over entirely to the sultan's private apartments. Directly after the Carriage Gate, which got its name because of the charmed few Harem residents who left there by carriage to go shopping in Istanbul, was the *Nobetyeri*, where the Black Eunuchs stood guard over the main entrance. A small prayer hall, called the Black Eunuchs' mosque, stands close to the *Nobetyeri*, as does their main court, which is accessible through a large metal gate and is among the most impressive spaces in the entire Topkapi Palace complex. The court is also surrounded by the chambers of the *Hazinedar*, or treasurer, and the chief of the Black Eunuchs.

The Princes' School also located here deserves particular mention in that its extremely ornate, baroque revetments were designed in 1749 by *Beşir Aga*, who was the chief of the Black Eunuchs at the time and who was later executed in 1752 for unspecified reasons. The beauty of the decoration indicates that these men were more than just mindless guards, armed with huge curved scimitars, as they are so often portrayed. Beyond the courtyard of the Black Eunuchs is the *Car-iyeler*, or inner court of the concubines, which gives access to their quarters above. These are far less extravagant than those of the Black Eunuchs, almost resembling a prison. Below the court is the concubines' hospital, whose size indicates that their life was less than idyllic. As a further confirmation of this, a stairway running down from the hospital leads to a morgue in the basement whose only exit is the *Meyit*, or Gate of the Dead.

The Third Court

The *Bab-i Sa'adet*, or Gate of Felicity, is the entrance to the Third Court of the Topkapi complex and is contemporary with its founding. The entrance itself is domed and framed by extended arcades that give it a more delicate feeling than the *Ortakapi* that precedes it. The throne of the sultan was placed under the domed canopy of the gate on ceremonial occasions, and it was here that he, as commander in chief of the army, would receive the holy banner of Islam before each military expedition. Also called the *Akagalar*, or the White Eunuchs' Gate, after the troops that were used to guard it, it leads to the *Enderun* and *Arz Odasi*, which is the throne room of the sultan where foreign ambassadors and dignitaries were both presented to and took their leave of him. Moving in from the Gate of Felicity on the left-hand side of the Third Court is the *Kutsal Emanetler*, or Treasury of the Sacred Relics, which is a square building divided into four sections, each covered with a dome. Known to those inside the palace as the *Hirkai Sa'adet*, or Pavilion of the Holy Mantle, this section housed not only the garment it was named for but also other

sacred relics of Islam specifically brought here from Egypt by Sultan Yavuz Selim, who was known in Europe as Selim the Grim. Carefully guarded, the *Kutsal Emanetler* was ceremoniously visited only on certain special holy days, when the sultan and his retinue would stay in the *Arzخانه*, or Presentation Room, and have the relics brought out to them. A number of the relics belonging to the Prophet Muhammad and the four caliphs that succeeded him still survive here, so that many people from all over the Islamic world come to visit this section of the palace. In keeping with the religious nature of this section of the palace, the Agalar Mosque, as well as the Harem Mosque, were also located here. The Agalar Mosque, which was intended for those in the *Enderun*, was an important school for the higher education of Janissaries who showed great promise. It has since been turned into a library for rare manuscripts and houses many exceptional and priceless miniatures. Noted historian of the early phase of Muslim life in Istanbul Hilary Sumner-Boyd, in describing the crucial role of the *Enderun*, has said:

This elaborately organized school for the training of the Imperial Civil guard appears to be unique in the Islamic world . . . the pages who attended it came from the Christian minorities of the Empire . . . and received a rigorous training, intellectual and physical, which in contrast to the usual Islamic education was largely secular and designed specifically to prepare the students for the administration of the Empire. There can be no doubt that the brilliant success of the Ottoman state in the earlier centuries was to a large extent due to the training its administrators received in this school.²³

The Fourth and Final Court

Vaulted passageways at the rear of the Third Court lead into the fourth and final compartment of the carefully differentiated succession of spaces that make the Topkapi Palace so unique. While the Second and the Third Courts are enclosed, the Fourth Court at the tip of the peninsula is planned around the spectacular panoramic views of the Golden Horn far below. A series of kiosks are strategically placed on different levels across the narrow expanse of the terrace that both complement and contrast each other in form and personality, making this stepped garden a sculpture court of broad-eaved pavilions. Perhaps the most famous of these is the Baghdad *Köşk*, which was built in 1639 in honor of the Ottoman conquest of that city in the same year. Attributed to the architect Kasim Ağa, this broad-eaved kiosk rests on a high podium and is supported by many columns. Like the *Revan Köşk*, it has four *iwans* that radiate out from a doomed central space, all of which are covered with the most beautiful tiles and lit with colored glass windows that create ever-changing patterns on the walls and floor of the interior. The kiosk has been placed at the extreme right-hand side of a paved area called the Marble Terrace, at the center of which is a delicate canopied viewing pavilion called the *Iftariye*, or Feast of Ramadan Pavilion, because it has been used by sultans in the past to receive guests during the festivities associated with that period of the Islamic year. Built by Sultan Ibrahim in A.D. 1640, the exquisitely worked and gilded roof, which is inscribed with verses related to him, is supported by extremely thin columns, allowing an open view of the Incirlik, or Fig Park, immediately beneath it and the city far beyond. Acting as a hub for the other pavilions on the terrace that wheel out from it, the *Revan Köşk*, also called the *Sarık* or turban room

in the past, was built by Murad IV to celebrate the capture of Erivan in the expedition against Persia in 1635. The *Revan Köşk*, rather small in scale, is faced inside and out with exquisite tiles that line the curved interior face of its central dome and the ceilings of its four *iwans* as well. The kiosk is historically significant as the scene of a bloody massacre in 1730, when Sultan Mahmud I lured Patrona Halil and his followers there on the pretext of conferring the title of Grand Vizier upon the revolutionary leader. When they arrived, they were all killed by the sultan's huge bodyguard, Pehlivan Halil Ağa, who was also a famous wrestler of the time. This was in revenge for the overthrow of Sultan Ahmed III, and the assassination of his own Grand Vizier, Nevşehirli Ibrahim Paşa, two months earlier. The basement of the kiosk, which is always cool because of its massively thick stone walls, was also used for the preparation of the bodies of dead sultans, adding to the dark shadow that the slaughter of Patrona and his group has cast on its beauty.

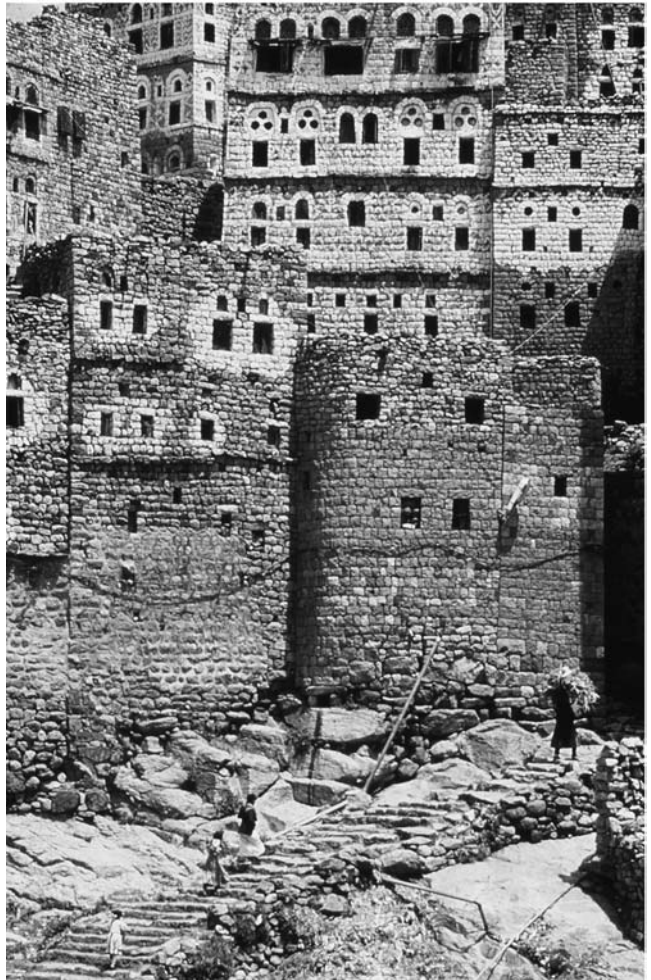
A wide, shaded arcade separates the *Revan Köşk* from the Pavilion of the Holy Mantle behind it, linking it with the *Sunnet Odası*, or Circumcision Room. This single space was used for the ceremonies marking the entry of a young prince into manhood. The Iznik tiles, which are remarkable throughout the palace, are outstanding here. On the Marmara side of the Fourth Court a sense of enclosure is achieved by a linear complex of buildings, the first of which is called the *Esvabi Odası*, or the Room of the Robe, followed by the Sofa Mosque, which was built in 1859, along with the *Yeni Köşk*, which is next to it. The *Mecidiye Köşk*, which effectively turns this line of buildings, creates an enclosure called the *Lala*, or Sultan's Tutor garden. In a slight play on words, this name was later changed to the *Lale*, or tulip garden, in recognition of the flower that was to become an obsession in Istanbul in the beginning of the eighteenth century. In contrast to other famous Islamic gardens, such as the Alhambra in Granada, or the Royal Meydan in Isfahan, Iran, the Topkapı Palace is unusual because of the progressive unity of its spaces. In the Alhambra, for example, each open space and the accompanying buildings that surround it, are conceived as separate and distinct units that are aesthetically self-contained, having little or no visual or physical connection with those adjoining them. In the Topkapı, however, the spaces, which are also interiorized and compartmentalized, are sequentially linked in scale, proportion, and overall character, based on the desired degree of public or private access to them. An oriental philosophy, similar to that found in the Forbidden City of Peking, and which seems to indicate the common ethnic root of both designs, judges the royal procession from exterior to interior to be the unifying link in the spatial chain of spaces, rather than the highly individualized character of each.

YEMENI HOUSES

Traditional houses in Yemen, in both the cities and the villages, are highly individual. A thorough study of each by architect Rasem Badran led to the key insight that Sanaá, which is the capital, is an aggregation of elements found in villages throughout the rugged terrain of this frontier nation and that these elements both mirrored and were adaptations of those found throughout the region. The advantage that Badran's study has over others that have been done on Yemeni houses is

that he has gone beyond the similarities, toward the particular elements that make them unique. The elements discovered in the early part of the study revolved around the verticality of the individual house, generated by familial climatic defensive considerations. Stacking of floors within the house allows for a hierarchical separation related to increasing degrees of privacy. Badran recorded this segregation, noting that houses in Yemen are usually five to six floors in height with vertical separation of the floors according to the function and the users of the space. Usually the ground floor, which is called the *masam*, is used for small commercial purposes or for keeping the livestock while the first floor is used for storage. The second and the third floors are the male areas with guest rooms while the fourth and the fifth floors, called the *marawb*, are for the women, with the kitchen and the family living areas located there. The *mafrag*, or the lookout point, is on the top of the house, which is a combination of a covered and an open space.

The tower form also allows the top floors of the house to receive the cool breezes that flow through the high mountain passes and elevated desert regions that are a typical feature of the Yemeni landscape. Such tower houses are also found elsewhere in the Arabian Peninsula, most notably in the port city of Jeddah and in the Hijaz. While the social determinants for vertical stacking are the same in Jeddah and Makkah as they are in Yemen, and the houses look similar in many ways, climactic variation, as well as the availability of local materials, has resulted in different external expressions in each case. In Yemen, the prevalence of stone makes it a logical building material while wood has been used in the northwestern part of the Arabian Peninsula. Wood is scarce in Saudi Arabia, but as a port city, Jeddah has access to it through trade, primarily with India, and nearby Makkah shares in this supply. The defensive component of the house is also unique to Yemen, since it has historically been a tribal society with settlements primarily identified with one family or group. This means that conflicts between settlements are a frequent fact of life. Agricultural land



The traditional Yemen house is built of local materials and is organized in a vertical tower-like structure based on consideration for family privacy. © Curt Carnemark/World Bank Archives

is scarce in Yemen because of the large amount of rocky soil, and so the tower form allows the use of the land to be maximized and protected. Jeddah was originally a walled city until the mid-1940s, when the walls were removed and replaced with a ring road; the tower house form helped conserve land, but the defensive aspect was no longer a consideration.

Further investigation into the environmental implications of the tower house in Yemen reveals interesting and surprising implications related to certain details. One of these is size, location, and ornamentation of the window openings, which are far from random. The placement of internal spaces and the openings to the outside in each are directly related to the daily sun path, “to the extent,” Badran has recorded, “that people themselves classify houses according to the amount of light they receive.”²⁴

Comparisons

Badran began his study of the Yemeni house by looking at similar urban situations in Cairo, Tunisia, and Morocco. This comparative analysis led him to conclude that the city center, with its large mosque, the Masjid al Jami'i, and its commercial activities, was a constant, but that Sanaá had developed very differently from cities in the two other countries. The reason for this, he believes, is that, “in other cities, the residential neighborhoods have spread out horizontally and are based on the internal courtyard, which creates a private space for each house.” But in Sanaá, the verticality of the houses, which developed because of the need of an agricultural society to protect its land, crops, and herds, creates a more direct interface with nature, since sunlight and natural ventilation are more prevalent at the higher levels of the house. Traditional Arab houses in other countries are typically found to be modest and plain on the outside, while having a rich series of spatial arrangements within. In Yemen, however, the exterior elevations of all of the traditional houses are richly decorated, and this ornamentation, which looks like icing on gingerbread, serves several important functions. First of all, it provides a means of social differentiation, sending key clues to everyone in each neighborhood about the status of each family. Second, this ornamentation contributes to environmental mitigation, since it reflects the sunlight away from the windows and thus reduces both the heat and the glare.

The tower, as opposed to the party wall typology, perpetuates an individual or family mentality rather than a group or communal one, and this ornamentation underscores that individuality.

The Space of the Yemeni House

The *mafrag*, similar to a *majlis*, or reception room, is the highest and most prestigious space in a traditional Yemeni house, and its scale and magnificence is also broadcast by external decoration. Because of the isolation of individual families in tower houses, this *mafrag* also serves the function of a courtyard in the sky, as open as possible to light and air. Light is augmented and controlled by *kamriya* (the use of colored glass) similar in appearance to large panels of stained glass, which visually enhances the house interior.

Part of the prestige value of any house in Yemeni culture depends on its orientation. Since the best direction, environmentally, is toward the south, the Yemenis call a “complete house” one facing in that direction. A house facing east or west is “semi-complete” and one facing north is “deficient.” The allocation of functions inside the house changes in each case.

The house’s vertical growth is a gradual process, and it happens according to the family’s means. In order for a house to look finished at each phase, it is capped with a wide white band that serves as a horizontal marker on the elevation. Vertical growth of the house also requires an efficient drainage system, which the Yemenis have developed as external channels incorporated into the ornamental system.

Translating the Analysis

Badran translated his investigations into the formation of rural villages and towns and residential districts in cities such as Sanaá into a list of generational aspects that are responsible for form. He found that each residential neighborhood is a result of the following constants.

The first, the most important of these, is the *abiyar*, or well, since a source of water is obviously necessary to sustain life. The amount of water available also governed the size of the community it could support, as well as being a socializing element, where people of the village or residential district in the city would meet outside the house. Egyptian architect Hassan Fathy, whose translation of a traditional village at New Gurna near Luxor will be discussed in Volume III of this series, has been criticized for only providing wells in each neighborhood, rather than having running water in each house, since it was available at the time of construction. He replied that in traditional villages the well served an important function in allowing young men and women to meet and interact outside of family restrictions, and this was one of the few times they could do so. Step wells in villages throughout rural India, which are no longer used now that mains deliver water to individual houses, were known to serve this purpose of presenting women of marriageable age to prospective husbands, who watched them collect water in loti jars and carry it home on their heads.



Mud house at Dar al Hajar, Yemen. Courtesy of Shutterstock

The mosque is equal in importance to water in each Muslim neighborhood. Before the advent of broadcasting systems, the call to prayer, which is given five times a day in such settlements, was originally given by a *muezzin*, who climbed up to the top of the minaret to sing it out. In addition, there are three other consistencies:

1. The *bustan* is supervised by the same family that takes care of the mosque.
2. The mosque, *Al-Jami*, is located on or close to the *bustan*.
3. There are specific commercial districts, called *samsara*, in which the *sugs* or markets are located. The number of *samsara* in a city reflects its culture status because trade requires interaction with other towns, cities, and districts; this exchange brings a transfer of knowledge along with it. The *samsara* include places for traders to stay, similar to the *cravanserai* or *khans* in other cities.

One major environmental advantage of the Yemeni way of building that Badran recorded, in addition to the extensive use of local materials, is that the vertical house has a very small footprint and thus occupies a minimum of the already scarce agricultural land. He also noted that this organizational system and the ornamental additions that result from it create neighborhoods in a human scale.

Notes

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Encyclopedia of Homes
through World History*

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through World History*

Volume 2

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James Steele

With research by Olivia Graf



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Introduction

THE SPREAD OF DIVERSE CULTURES, FAITHS AND CROSS CURRENTS OF POWER

Each of the books in this three volume set is organized into five major sections, representing their equivalent in global regions, in order to ensure generally uniform coverage in an examination of domestic architecture throughout the world. These regions, in the order of their appearance are the following: the Americas, Africa, Asia and Australasia, Europe and the western Mediterranean, and finally West and Southwest Asia.

The naming of the last category reflects the growing preference for that designation in that part of the world previously known as the Middle East, due to a global shift in the locus of power from Europe, and especially Britain, as well as America, to Beijing. The Kingdom of Saudi Arabia, the United Arab Emirates, Oman, Yemen, Syria, Lebanon, Jordan, Iraq, Iran, Turkey, and the various other nations that make up this region were once seen as being midway between Britain to the west and “the Orient” to the east, and therefore called the Middle East. By referring to themselves as being part of “West Asia,” these nations are now not only using a new lodestone but have also chosen to be more proactive about their identity.

THE AMERICAS

Activity in the first of the global zones covered during the relevant time period discussed in this volume was concentrated mainly in the Mississippian culture in the Northern Hemisphere during its early phase, until the arrival of colonists later in the period. To the south, it was dominated by the Aztec, Incan, and Mayan kingdoms followed by the effects of the Spanish incursions and subsequent colonization in each of those dominions. The domestic typologies in each of these cultures, both

north and south, was understandably different, but did surprisingly share one general characteristic.

Whether in Cahokia or a Mayan city-state or an Aztec settlement or an Incan outpost, the tendency was to live life outdoors, in the public realm, so that the line between institutional and individual existence was blurred. Generally benign climates in most cases abetted this social habit, so that houses were seen as a utilitarian adjunct to outdoor activities, meant to support only the most rudimentary daily needs. The forms of the cities of each of these cultures can only be understood in this light.

AFRICA

In Africa, which is the second region covered here, Al Qahira, or Cairo, was one of the most important focal points of power, due to a partially fortuitous but mostly intentional and aggressively followed sequence of political events at that time.

Al Qahira

Islam had only just burst out of its birthplace within the Arabian peninsula, after which it spread rapidly across North Africa and up to the middle of Spain to the west, and into the former Seleucid kingdom to the east, including what is now Syria and Iraq. Umayyad rule was replaced by the Abbasids as the influence and scope of the religious and political power of Islam grew. The new Abbasid capital of Baghdad, which was founded in A.D. 750, however, was destroyed by the Mongols, who then went on to level Damascus in 1260. Emboldened by these gains, the Mongols then headed south toward Cairo. This city had been founded by the Fatimids, who had traversed North Africa from their base in Tunisia to do so in A.D. 969, and had subsequently been ruled by the Tulunids and Abbasids, before being taken over by the Mamluks, prior to the Mongolian invasion. The high point of Ayyubid rule was the tenure of Salah ad-Din, the scourge of the Crusaders, or Saladin as he is more popularly known. He brought the Mamluks from Anatolia to Cairo as mercenaries, and after his death they seized power. They proved to be capable, if fractious, administrators and wonderful builders. Several of their surviving public institutions such as the Mosque and Madrasa of Sultan Hassan, the Mausoleum of Sultan Qaitbay, and the Madrasa and Mausoleum of Qala'un are among the most glorious examples of Islamic architecture in the world. The Mamluk houses, particularly those of the upper-middle class, are also models of environmental adaptation to a dense urban context.

Following their pattern established in demanding surrender from other cities in the past, the Mongols camped far from Cairo, at the edge of the Sinai peninsula to the north, and sent emissaries to the Mamluks. No city had yet been able to withstand them, and they typically massacred all inhabitants, whether they surrendered or not. The Mamluk sultan ordered that the emissaries be killed, had their heads put on spears above the gates of the city, and then marched out with his troops to defeat the Mongols at the battle of Ain Jalut.

Cairo then became a haven for refugees from other areas of Mongol depredation, as well as for those fleeing the fall of Constantinople to the Turks in 1245.

It became a cosmopolitan metropolis that attracted intellectuals, artisans, artists, architects, and opportunists from its hinterland. This must have been an exciting time to live in this fabled city, which has now been reduced to a teeming enclave of humanity fighting for survival within a broken network of failed infrastructure and little hope for the future.

ASIA AND AUSTRALASIA

At about the same time, further to the east, Zhu Yuanzhang established the Ming Dynasty in China, and it was under the Ming Emperor Yongle that the city of Beijing, meaning “Northern peace,” was founded in 1403. It was sited according to both the rules of Kaogongji and *feng shui*, which by then were well established. The Kaogongji were a set of city planning codes and engineering regulations that controlled the work of builders, dating back to the Qi Dynasty and formalized as the *Zhou Li* in 140 B.C. They stipulate that an Imperial city should be laid out as a square of nine *Li* on a side. The *Li* was determined by an even more ancient system related to the amount of area a family needed to have equal access to a well in the center of each block. The square city plan was then bisected symmetrically with both an east-west and a north-south axis, and a gate was placed at the point at which each of these main streets penetrated the city wall.

Beijing

The plan of Beijing deviated slightly from this rigorous formula, due to the additional requirements presented by *feng shui*. Literally meaning “wind and water,” *feng shui* was originally a system of geomancy in which buildings and settlements were sited according to the most advantageous orientation. The site for Beijing was chosen because of a large mountain range to the northwest, which would block the cold winds and sandstorms coming in from the Mongolian desert in that direction. There was also a large river located to the south. This made the location a perfect choice, since the most auspicious siting in *feng shui* terms is believed to be the presence of a mountain to the north and water to the south.

At Beijing, the location of the river meant that the square Kaogongji model had to be skewed to adapt to it, and its course was altered slightly to ensure that it penetrated into the heart of the Imperial district. By diverting one part of the watercourse and curling it around to end at the Emperor’s throne, the *feng shui* masters felt that they controlled the flow of energy or life force or *Chi* to the ruler. The city plan, then, represents an amalgamation of the symmetrical Kaogongji system and its *feng shui* alternative. The original plan looks like a box within a box resting on a pillow-like rectangle. The innermost part is the Forbidden City, given over to the exclusive use of the emperor. The second, surrounding enclosure is the Imperial city, dedicated to the use of his courtiers. The third and final Outer city to the south, which is the rectangular pillow, contains the Temples of Agriculture and Heaven, to which the Emperor traveled on the occasion of a solstice or eclipse to offer both prayers and thanks for a bountiful harvest.

The common people living in Beijing fit into this rather rigid framework in a hierarchical way, related to their social position. Irregardless of that, however, the

typology of choice was the courtyard house, because it allowed for the closest physical translation of the Confucian structure of Chinese society itself, with houses only getting grander as the families' wealth and influence increased.

Kyoto

After an initial period of gestation in Nara, from A.D. 710 until 794, Japanese Imperial power was relocated to Kyoto during the Heian Period, which lasted until the Kamakura relocation of the capital to Edo in 1185. The city plan of Kyoto was originally also based on the Chinese Kaogongji system, specifically as it was realized at Chang'an, which is now Xi'an, indicating the extent of Chinese influence on Japanese architecture and urban planning in the past. During the Heian Period, which was one of the longest and most peaceful times in the convoluted history of that nation, domestic forms for all classes continued to evolve and coalesce. The Shoin form was one of the most prevalent typologies, based on a refined light frame system. It has a single platform-like floor that is raised off the ground on short columns, a flexible room arrangement delimited by movable rice paper screens, and a large gable roof that is characterized by wide overhanging eaves. The merchant class at this time developed a mixed use residence of their own, similar to a Chinese shophouse, which had commercial activities on the ground floor, facing the street, and living quarters to the rear and above.

These typologies continued to be refined up through the Tokugawa shogunate in both Edo and Kyoto, so that they now continue to symbolize the traditional Japanese approach to domestic architecture in the public consciousness.

EUROPE

The multidimensional, tempestuous nature of the historical period covered in this volume is reinforced by events taking place throughout Europe during this time, as well. It was an equally transitional period for Britain and continental Europe, and similarly based in spirituality in the initial part of the historical period, which slowly eroded into secular issues. At first, the monastic movement was consolidating, which resulted in huge, self-sufficient estates. These were a spiritual and intellectual refuge in what was generally a lawless and violent time. In many of these monasteries, such as Certosa di Pavia, monks had individual dwellings that also included small allocated garden plots, which still survive, giving us a good idea of how they lived at that time. In others, such as Rila, near Sofia, Bulgaria, there were communal dormitory arrangements that were typical in France, Germany, and Britain as well. The Cistercians, which were one of the richest of the orders, had enormous, estate-like communities located throughout Europe. The ruins of these alone, which still remain in parts of Britain and France, are awe-inspiring. The wealth and influence of such orders challenged the authority of royalty itself and led to confrontations of the kind incited by the Tudors, when Henry VIII seized all monastic holdings.

The early part of this period was also the time of the construction of the great Gothic cathedrals, which rose with startling speed after the structural and stylistic innovations introduced by Abbot Suger at St. Denis, near Paris, in A.D. 1144. This

first spiritual essay in stone was followed in rapid succession by such milestones as Notre Dame in 1163 and Chartres, which set a typological standard for all others to follow, in 1194. The Gothic movement in its birthplace in France arguably culminated in the construction of both Amiens and Reims cathedrals in the mid-1200s, which remain two of the most magnificent testimonials to spirituality in human history.

The general focus on religious monuments related to this period in the past has tended to obscure the residential conditions of the people who actually built them. This gap has been exacerbated by the desire of individuals involved in the realization of a cathedral to not be specifically recognized, since they viewed their efforts as being for the glory of God. The physical examples of their houses, at a variety of economic levels, as well as the descriptions of them, have accordingly been very sparse. One of the best-preserved examples, which is the house of the merchant Jacques Coeur, is presented here.

A Secular Revolution

This age of faith in Europe, translated architecturally into stone and stained glass, came to an abrupt halt due to the catastrophic destruction caused by the Black Plague from 1347 until 1352. It was also eventually supplanted by a secular surge as the Middle Ages waned. This started in Italy, specifically in Florence, as the flow of wealth from mercantile activities increased. A convenient watershed for this conversion is A.D. 1425, which was the date of the design of the bronze doors for the baptistery of Santa Maria Della Fiore in Florence by Lorenzo Ghiberti. These mark an irrefutable transition from the stiffer, more severe style of the high Gothic period, to the more fluid and realistic worldview of the early Renaissance, which arguably started here. Michelangelo's famous sculptural contributions to this style, which followed soon afterward, are uncannily reminiscent of the output of the ancient Greek school of Praxiteles and are indicative of the extent to which he subconsciously channeled classical ideals, in this protonationalistic period.

WEST AND SOUTHWEST ASIA

During this transformative period in Europe, Islam burst out of the Arabian peninsula, where it had originated, and spread rapidly across North Africa up into Spain, to the west, as well as moving into the territory formerly occupied by the Seleucid empire. As Umayyad rule was replaced by the Abbasid Dynasty, its new capital of Baghdad became the focal point of power for Muslims. It was founded in A.D. 750, but had only a relatively short period of glory before being destroyed by the Mongols, who then went on to level Damascus in 1260.

This rapid expansion was facilitated by the ability of Muslim architects to syncretize foreign typologies and to adapt them to their own social and religious norms. This stylistic appropriation, in which time-tested forms were fused with the multitude of different cultures that the Islamic forces encountered as they advanced into new lands and conquered them, was one important element in the

Introduction

successful spread of the faith. It led to a wide variety of adaptations on both sides in both the institutional and domestic sphere.

One of the most impressive examples of this integration is the Alhambra in Granada. Along with the Mughal achievements in northern India, which date from the same period, it represents the survival of pure Islamic forms in the midst of the chaos caused by the devastating incursions of the Mongols into other parts of the Muslim empire. Nasrid Spain was both figuratively and literally an oasis of culture, and the Alhambra, or Red City, was a bastion of Islamic civilization.

The Americas

NORTH AMERICA: THE EAST COAST

The Baltimore Row House

Baltimore, Maryland, is well known for its row houses and the social interaction they have promoted, but this did not come about by accident or historical coincidence. The row house itself is a relatively recent urban invention, having first appeared in the seventeenth century in commercial enterprises such as the Place des Vosges in Paris and Covent Garden in London. The motive behind each of these endeavors, for both King Henri IV of France and the Duke of Bedford in Britain, was to promote local goods and skills by concentrating activity that involved living, working, and selling the goods that were produced in a part of the city that could most effectively support this activity.

At the Place des Vosges, which is described in detail elsewhere in this volume, King Henri IV sought to promote French textile production and to offset Italian domination of the market. He intended to do so by establishing a center where craftspeople could be taught to cut, spin, and weave cloth with the same degree of expertise as their competitors. To do this, he proposed having the artisans live above their workshops and also allowing them to sell the goods they produced to the public as an added incentive that would encourage them to relocate. To lend additional authority to the venture, he had a residence for himself built there in 1605, which resulted in the square initially being named the Place Royale. The Duke of Bedford may have had somewhat similar, partially altruistic motives in mind when he planned Covent Garden in London on land that had once been a garden in the Abbey of St. Peter in Westminster. Covent is a corruption of the original use of this property as a convent. As with the Place Royale, now Place des Vosges, Covent Garden was originally intended as both a living and a working environment, although it served a different mercantile sector as a farmer's marketplace.

The Palladian Contribution A century later, Robert Adam raised the profile of the row house from its original mercantile purpose to that of an elegant alternative

to a country estate for people of means who were then considering ownership of a *piéd à terre* in the city as well. The Duke of Bedford had commissioned architect Inigo Jones to design a small church, named St. Paul's, at the far end of his square in recognition of the ecclesiastical history of the site. Jones had introduced the Renaissance principles of Andrea Palladio into England in the early part of the seventeenth century, after having spent some time studying in Rome. Even though they were somewhat naively applied in his designs for the Banqueting Hall in Whitehall and Queen's House in Greenwich, his work had an enormous influence on others. One such advocate was Robert Adam, who took Palladian concepts to new heights in the design he and his brother James unveiled in 1769 for a block-long four-story high row of houses they named Adelphi Terrace. To avoid any hint of repetition and also convey a sense of exclusivity, they punctuated the row, which they placed on a high plinth or base in the best Palladian tradition, with a pedimented bay at each end and in the middle. This made it seem like a single royal palace in which its occupants happened to be guests rather than occupants of row housing. Following a pattern set by the provision of parks such as Union and Franklin Square for the earlier construction of upscale row houses around them, the city of Baltimore followed suit. Middle class neighborhoods had parks included in them such as Madison, Johnson, and Collington Square. These were set aside between 1853 and 1880.

New Building Materials and Techniques The impact that new or improved materials that became available during the Industrial Revolution, such as plate glass, higher strength steel, and reinforced concrete, had on the building environment from the middle of the eighteenth century onward has tended to obscure the equally substantive changes that took place in the production of more conventional materials as well. In this second, hidden revolution, which was also mostly fueled by steam, stone could be removed from a quarry and shaped much faster than it had been before machine power became available. Brick presses completely changed the way these masonry units were traditionally produced and also provided builders with the option of using brick as a thin veneer, at 4 inches thick or less. Tile could also be mass-produced, making it possible to use it in hallways and vestibules.

One such steam-powered machine, invented in 1850, premixed the sand, clay, and water in the correct proportions, then extruded the mix into a long thin hand that was cut, dried, and then fired on a conveyor belt.¹ Similar technological advances affected carpentry as well. Machine cut details made it cheaper and easier for builders to provide all of the various parts of the cornices, windows, and doorways, as well as the winding interior stairs that were a typical, space-saving component of less expensive row houses, making them more affordable and attractive for the market they appealed to. These advances also extended to plumbing and heating, so that builders were able to offer better kitchen and bathroom sinks, bathtubs, toilets, stoves, and boilers, as well as piping, to builders.

The combined dynamics of novel financing methods, architectural innovation, an economic system that encouraged entrepreneurial innovation regardless of social level, newly available construction technologies, as well as a healthy dose of civic altruism produced the row house neighborhoods that characterize Baltimore today.

There are several other notable examples of the row house form in Britain, such as the effort by John Nash to unify the elevation of Cumberland Terrace during the Regency period and the innovations of the Circus and Royal Crescent introduced at Bath by John Wood the Elder and his son. But it was not until the Building Act was enacted in London in 1774 that investors were offered an incentive to provide housing for people of different classes, since it listed four district “rates” of dwelling from more than 950 square feet to 350 square feet and below.²

American Precedents There were also a number of important American precedents that were known to Baltimore architects and builders, such as Tontine Crescent in Boston, by Charles Bulfinch in 1793, followed by another scheme that involved four similar houses built in a row on Park State near the Boston State House in 1805, and still another called Colonnade Row involving 19 four-story houses that Bulfinch designed, which were completed in 1810. There were similar projects in Philadelphia, as well, and all of these presented investors, builders, and city administrators and planners with the attractive prospect of fast and efficient construction, a reasonably rapid and high rate of financial return, and a unified, orderly, and generally elegant face along the street.³

A Late Start Because of its position to the south of Philadelphia along the Atlantic coastline, Baltimore did not receive the same amount of attention as its more politically important neighbor in Pennsylvania. Baltimore was founded in 1729 and had been a reasonably busy port both just before and during the Revolutionary War, but it became extremely active after 1800. Its population grew accordingly, including people of many different ethnicities and economic levels. They all required shelter, and entrepreneurs stepped in to take advantage of the situation and solve the housing shortage in the process. British investment devices had accompanied architectural precedents to America. The most important was a system called ground rent, which allowed investors and builders to lease raw land long enough to build on it and then to sell the entire property, in many cases before the first payment on the land was due.⁴ This system was introduced into Baltimore in 1742, well before the Revolutionary War, and even before a majority of the streets in the city were completed.

The First Row Houses The first row houses in Baltimore appeared along the wharf in 1796 and were built as shophouses that combined space in a raised ground floor with residences above. They were followed by Cumberland Row, built by the same developers and presumably named after one of them: Cumberland Dugan.⁵ This project, which was completed in 1800 and is located just to the north of the first, quickly became a local landmark. The British invasion during the War of 1812 put a temporary halt to speculation in Baltimore, but soon afterward investors started to more fully appreciate the opportunities presented by row house construction. Many of these were builders who took advantage of their knowledge of the trades, ready access to materials, and the ground rent system to begin to change the face of the fledgling city and the mix of building types as well. They provided smaller, more comfortable, and more budget-conscious models for working class customers, typified by row houses that were two rooms deep and two and a half stories high with minimal ceiling heights throughout. These were heated by locating a fireplace in each of the main rooms, and a separate kitchen was added at the back to protect against fire.



Baltimore townhouses. Courtesy of Michael Carøe Andersen; Flickr

To make a return comparable to that of building upper income houses, these builder developers had to exchange quality for quantity and also focus on location. So they essentially established entire neighborhoods of row houses within reasonable walking distance to the places where the inhabitants worked. In addition to the docks and shipyards, the major industries in Baltimore at this time were textiles, slaughterhouses and the tanneries associated with them, railroads, and breweries; and so this is where these neighborhoods started to grow.

Within a relatively short period of time this housing type was reduced to just two stories in height, varying from two to three bays wide. They were called “Italianate” houses, because of their minimal quasi-Classical trim.⁶ Brick facades had arched lintels and wood tympanums.

But, most of the design effort went into the cornice, which was made of wood, featuring a large crown molding that included such familiar Federalist conceits and lintels, egg and dart moldings, and scroll brackets. Over time, houses became progressively smaller until they were only 13 feet wide. In spite of their increasingly reduced scale, builders still felt it was necessary to cater to social convention by including an entry, vestibule hallway, and front parlor.

The Colonial House

For Americans, the term “colonial,” when associated with residential architecture, furniture, or objects related to that period of their history, is a subjective

word, heavily laden with patriotism and nostalgia. The colonial house can be traced to beginnings in New England and a simple gable roof farmhouse that was typically one room wide and two stories high.⁷ It was well adapted to its setting, with the steeply pitched roof able to protect against heavy rain and snow, and the depth of the house determined by the length of the trees that were cut down during the clearing of the site and were used as cross beams. Stone was also cleared to make planting possible, and this, along with the wood, was the major material used for construction. Houses were usually oriented to take maximum advantage of the early morning and late afternoon sun, with less fenestrated ends positioned to deflect cold north and northwestern winds during the winter. Glass was difficult to make, rare and expensive, and was used sparingly in either casement or double-hung windows. In a short time, the plan of the house, which was closer to a square than a rectangle, was nearly doubled, as farmers became more prosperous and more complex roof forms were introduced. This happened relatively early in New England. The General Putnam House in Danvers, Massachusetts, built in 1744, for example, has a gambrel, rather than straight gable roof, and a second floor balcony projecting out over the main entrance. With wealth came more awareness of stylistic possibilities by the owners and builders, but the hearth still literally remained the heart of the house with the main fireplace, which was generally large enough to walk into, used for cooking meals as well as for heat.⁸ Implements used to tend the fire, such as large iron tongs and long iron pokers, were typically kept nearby or hung from the mantel, and cooking pots were usually suspended from a bracketed metal arm that swung in and out of the fire. Other implements, such as brass bed warmers, with long wooden handles that were filled with water and heated in the fire before bedtime were also kept near the hearth. The fireplace was more than a place for cooking and a source of warmth in the colonial house; it was also the center of family and social life.

Plaster was initially as difficult to produce and as rare as glass during the Colonial period in America, and so the interiors of timber framed houses were finished with boards nailed horizontally. In addition to the gambrel roof, other refinements on the basic pitch were quickly added, such as the extended gable typical of the Cape Cod saltbox, the gable and hip, double hip, monitor gable, Dutch gambrel, gambrel and monitor, and lean-to forms.

The colonial house has since become an American icon, symbolizing austere national beginnings, core values related to family and community, and closeness to nature and the land reflected in the materials, such as brick, stone, and wood, used in the house. Ironically, however, it was originally viewed with disdain by the aristocracy on both sides of the Atlantic. The British deemed it a bald attempt to adapt their own vernacular forms into a new separatist style, without the crafted skill evident in the original. Thomas Jefferson, on the other hand, typified the preference that the wealthy landowners of the United States had for the Classical image, evident in his written opinion that the indigenous architecture of Williamsburg, Virginia, was “rude and misshapen.”⁹ As an architect as well as a statesman, Jefferson’s promotion of Greek and Roman models, infused with Renaissance and Palladian idealism, in his design for the University of Virginia and Monticello, as well as his unrealized proposal for the White House, was consistent with British fashion at the time. These designs, as well as his fulsome praise of the Second Bank



Colonial style house. Courtesy of Shutterstock

of the United States, designed by William Strickland and built in Philadelphia in 1818, place him squarely in the Palladian camp, promoted in Britain by Inigo Jones, based on Italian models. Jefferson was also drawn to the Neo-Classical style because of what he believed to be its metaphysical associations with democratic institutions in ancient Greece and Rome and their similarity to the ideals on which America was founded.

National Acceptance It was not until 1862 that colonial architecture, particularly as a residential style, began to receive critical acceptance. In an article by James Elliot Cabot, a disciple of Ralph Waldo Emerson, who himself owned an old colonial house in Concord, Massachusetts, Cabot praised the “homes of old New England” as being a refreshing alternative to the eclectic historical clutter of the Victorian houses that were then in vogue. He also said that colonial houses were more practical and economical because their low ceilings conserved heat and their windows and dormers let in more natural ventilation during the summer.

His article was followed by the first in-depth analysis of the colonial style by Richard Upjohn who presented his study, entitled *The Colonial Architecture of New York and the New England States*, to the Third Annual Convention of American Institute of Architects in 1869. Since he was best known as a Gothic specialist at the time and the conservator of the Stephen Van Rensselaer mansion in Albany, New York, Upjohn’s conversion may be seen as a significant turning point in the

acceptance of the colonial residential style. He praised its simplicity and sympathy with natural surroundings as well as its patriotic historical associations and the attention to detail evident in its construction as opposed to the lack of care evident in more contemporary styles.

Popular novelists of the time echoed this professional interest. In *The Spy*, written by James Fenimore Cooper in 1821, the author includes many nostalgic descriptions of colonial homes. Washington Irving did the same in stories based on the legends that he collected from those living in Dutch settlements along the Hudson River Valley. His affection for the colonial style is also evident in his own renovation of the Van Tassel house into his own home called Sunnyside in 1835. It is considered by several historians to be the first notable attempt at a colonial revival style, even though it has several overlays of English Gothic Revival and Dutch Colonial in its details. The fondness that novelists had for colonial houses may also be found in Nathaniel Hawthorne's *House of the Seven Gables* (1851) as well as Henry Wadsworth Longfellow's *Evangeline* (1847), *The Courtship of Miles Standish* (1858), and *Tales of a Wayside Inn* (1863). All these helped to fuel the popular imagination, conjuring up romantic images of times past. Another, less well known, writer, Donald G. Mitchell, who was a friend of Washington Irving, not only promoted the varieties of colonial domestic bliss in print, but also did so through his design of the Connecticut State House replicated at a much smaller scale in a colonial revival style at the 1876 Centennial Exhibition in Philadelphia. Its half timbering, projecting second floor, steeply sloping roof, stone chimney, exposed beam ceiling, plastered walls, and small window panes with divided lights brought the colonial revival style to a wider audience in a much more tangible way and helped to accelerate a trend.

Pattern Books Entrepreneurs, sensing a sea change in popular taste, capitalized on it by first starting an active underground market in recycled parts from colonial houses, such as the stairway from the John Hancock House, which was relocated to another in Manchester, Massachusetts, and then by producing prefabricated houses, which they sold through pattern books. An example of these is one published by the Pallister Company of Bridgeport, Connecticut, in 1878. Survey drawings of old colonial houses also started to appear in professional journals such as *American Architects* in 1876.

Official sanction of the colonial style was secure after H. H. Richardson's F. W. Andrews House appeared in Newport, Rhode Island, in 1872, and the Thomas Robinson version in 1877 by Charles Follen McKim. The house has been cited by historian Vincent Scully as being the first actual, truly accurate revival of the seventeenth century American residential forms. These were carried over by McKim, who had been Richardson's lead designer, when he became part of the McKim, Mead, and White partnership in 1879, in the Shingle Style houses produced by the firm. Stanford White's own summer house at St. James, Long Island, built in 1892, is a good example of the balance between the formal and the picturesque qualities of the colonial revival that they were able to achieve. A backlash against it, however, began to occur just before the end of the nineteenth century, but its association with patriotism kept interest in it alive until the end of the First World War.

Jamestown, Virginia

The colony of Jamestown, which is one of the first permanent European settlements in North America, was founded on May 14, 1607, by an expedition organized by the Virginia Company based in London. It was sent with royal approval, indicating a close connection between government policy and the desire for commercial gain. Three small ships carrying a total of 105 passengers, made landfall at the mouth of Chesapeake Bay on April 26 of that year, naming it Cape Henry in honor of the eldest son of King James. Following government directives, they then sailed up the Bay to find a less exposed site for their settlement, which would be less visible and more easily defended if attacked by Spanish, French, or Dutch ships that were also exploring the coastline with the intention of establishing a colony there. The nondescript place they selected, now called Jamestown in deference to the King of England, is on the James River. It is about 40 miles inland from the Atlantic Ocean and about the same distance from Richmond, which is now the capital of the Commonwealth of Virginia. It was a low-lying, marshy area that was strategically good because it was easily defended, with the river being deep enough beside it to allow supplies and anticipated exports to be taken off and on the ships, which could dock at its bank. But, the settlers soon found that the site was uninhabited for a reason. During tidal surges, the land becomes even more waterlogged, meaning that it was difficult to grow crops there, and it was plagued with mosquitoes. The settlers erected a palisaded fortress on this peninsula, which became an island at high tide, in the shape of an equilateral triangle, with semicircular redoubts at each point. These were intended to provide full rifle coverage of each of the three long sides, to make the most of the limited firepower that the settlers had inside the stockade. The settlement only covered an area of almost two acres. They built their houses out of materials at hand such as wood, mud, and marsh grass, and they also built a church.

Because of their inability to raise crops on the peninsula and the scarcity of wild game there, as well as the lack of potable water, the settlers were forced to forage for food and water further inland, which brought them into conflict with the Powhatan, who were the original inhabitants of the area. Many died from salt water poisoning, infection, dysentery, or injuries from battles with the Powhatan. The people who had been selected for this initial expedition were bondsmen, farmers, or woodcutters, as well as several others who were not accustomed to manual labor. They found it difficult to adapt to the harsh conditions they found themselves in and were immediately faced with a struggle for survival. Nine men made up the first governing council of Jamestown, as recorded in the charter of the Virginia Company. In addition to the captains of the three ships, who were Christopher Newport, Bartholomew Gosnold, and John Ratcliffe, these were Gabriel Archer, George Kendall, John Martin, George Percy, Edward Wingfield and John Smith.

The Stuff of Legend Of these nine, it is John Smith who is arguably remembered best, due to the fact that his journals and letters of this time, which included his dealings with chief Powhatan and his daughter Pocahontas, made him a celebrity when they were published in London soon after his return. He was the working class son of a yeoman and had military experience as well, so he did not share the elevated social status of the other eight members of the council. He was also

originally excluded from joining it because of allegations that he had concealed plans for a possible mutiny during the maiden voyage.¹⁰ But, he proved to be very capable at solving all of the major problems that the settlers faced, and he was eventually made president of the council, which is the basis for his now being referred to as “the first governor of Virginia.” He was elected in 1608.

Houses John Smith put the settlers to work on building their own houses, which, at first, were little more than hemispherical wattle and daub huts. Starting with a circular wooden base, the colonists looped long twigs from one side to the other, interweaving them as they went around the circle, filling in the gaps between the branches with mud mixed with straw, in imitation of the vernacular wigwams of the local tribes. These dome-shaped huts were soon replaced by small, rectangular wooden houses that were built by erecting an 8 to 10 feet long post at each corner of a foundation frame and then laying horizontal clapboard siding over these, finishing the construction with a thatched marsh grass roof laid on a series of trusses.

The attitude that these settlers and those who followed after them had about the local environment differed widely from that of the Native Americans, who had no concept of land ownership, seeing the land only as a source of collective sustenance that must be respected and sustained. Slash and burn agriculture was practiced by many of the tribes in the Americas to be sure, but this can be argued to be a ritual way of replenishing the land instead of using animal waste as fertilizer. Each of the settlers claimed a plot of land and defended it by putting a fence around it and planting whatever crops they could in the small patch inside, just as they would in England. New animal species, such as pigs, sheep, and cows, were subsequently introduced, and the forest was cut down to provide the grazing pasture they needed. These changes to the local ecology, which started in a modest way, would soon have a dramatic effect. Even though these first settlers were decimated by disease, the Native Americans eventually suffered much more from the viruses that the Europeans introduced, including malaria, which did not exist before they arrived.¹¹

Soon after the first settlers arrived in Jamestown, Christopher Newport returned to England with two of the three original ships on what was to be the first of two missions to resupply the fledging colony with colonists and supplies. Shortly after his departure, John Smith organized an expedition up the James River to barter for food. When they reached a point where the river was too shallow to sail further, he left a small group on board to guard their purpose-built barge, and traveled on with a landing party that was soon ambushed by warriors of the local Powhatan tribe. The warriors killed everyone except Smith and two of his companions who were brought to Powhatan himself. After several days of deliberation, Smith was condemned to death, but just before he was about to have his skull smashed with a rock, Powhatan’s 11-year-old daughter Pocahontas put her head on top of his to stop the execution. Historians continue to debate her motives, but the result was beneficial for the Jamestown colony because Smith was then considered a member of the tribe and was able to have food sent to the settlement.

During his prolonged absence, however, the colonists had given up hope, thinking he and his entire party had been killed. They had decided to abandon the settlement and sail home just as he returned to it. A council member named Gabriel Archer argued that the deaths of the men who were killed during the foraging

expedition had been caused by Smith's negligence and poor leadership, and he was so convincing that the remaining settlers sentenced Smith to death by hanging. Just as the sentence was to be carried out, Christopher Newport returned with 80 new settlers and more supplies. Smith, who was in a much stronger position after Newport left on his second mission to resupply the colony, set out on an even longer expedition to find the mythical northwest passage that linked the Atlantic and Pacific, which was of great interest to the Virginia Company that sponsored Jamestown. During his time at Jamestown, Smith had been able to organize the defenses of the colony, as well as the construction of its houses, and keep it alive by negotiating for food and other supplies with the Powhatan tribe. But, his political position within the colony deteriorated once again, due to suspicions over his privileged place in the Powhatan tribe. His positive contribution to the enterprise became evident soon after his departure in 1609 due to a firearms accident. He returned to England for treatment of serious burns he sustained, and soon afterward trade between Jamestown and the Powhatan stopped. The delayed arrival of a supply ship, which was blown off course by a storm, led to famine and forced desperate measures to stay alive, during a period the colonists referred to as "the starving time." When the supply ship finally did arrive, the settlers had had enough and voted unanimously to return to England. On the way down the river, however, they met a second supply ship that was also carrying more settlers and a new governor of Jamestown, Lord De La Warr, who convinced them to return.

Difficult Times Continue The second supply ship that saved Jamestown also brought demands from the Virginia Company that the colony demonstrate at least the potential of profitability, since Jamestown was strictly an economic venture and they were anxious to receive a substantial return on their investment. Prompted by Spanish boasts of receiving a fortune in gold from their conquests in Central and South America, the Company demanded evidence of equal riches. They also asked for reassurance that their investment could be sustained by requesting that the Jamestown settlers solve the mystery of the "Lost Colony" of Roanoke and determine the fate of its less fortunate inhabitants before they invested further.

Roanoke Roanoke was an earlier attempt by the crown to establish a colony like Jamestown on a small island off the coast of what is now North Carolina. The first settlers there were not resupplied as promised and many returned to England with Sir Francis Drake after he stopped there on his way home from exploits in the Caribbean. When the supply ship to Roanoke finally did arrive, the people on board found it deserted; in order to maintain it, 15 members of the crew were left behind. This group, along with a subsequent reinforcement of 116 new colonists, was all missing when the next supply ship reached the colony several years later.¹² Memory of this "Lost Colony" made the Virginia Company fearful that Jamestown would suffer a similar fate. Massacres of the settlers, which occurred in 1622 and 1644, did little to mollify investors. John Rolfe, who married Pocahontas and created a sensation by returning to London with her, finally turned the economy of the colony around by introducing a new, more pleasant-tasting strain of tobacco to the area, and this became its primary export.

Virginia After Jamestown Virginia, named after Elizabeth I, the "Virgin Queen," prospered because of the tobacco trade, and large plantations were

established to process the crop. The houses were built in timber on a brick foundation. The tools available to the colonial carpenters, however, were not as efficient, and they had to make do with a broad axe, which they used to fell the trees, saws to cut the logs into planks, and an adze to smooth them. The houses were organized like a medieval English manor house with a great hall in the center and a kitchen or buttery at one end, to prevent the main part of the house from being destroyed by fire.

Virginia planter houses were typically one room deep and one and one-half stories high, with a steep, narrow stair in the corner of the great hall. There was a wide hearth in each room, since a fireplace was the only source of heat. It typically required about 30 wooden planks, 12 inches deep and 15 feet long, to build a four room, 1½ stories high house. Since nails were not widely available in America until the nineteenth century, girders, beams, and columns were pinned together by mortise and tenon joints and wooden pegs. During the Civil War in England, Royalists loyal to Charles I fled to Holland, where they were influenced by Dutch residential architecture, especially the use of classical ornament, based on Renaissance examples. Details included stepped or curved gables, intricate brickwork, and the new invention of weight and pulley sash windows.¹³

After the Restoration, many Royalists emigrated to Virginia, which by the late seventeenth century had a population of about 63,000. They prospered because of the tobacco boom, becoming landowners with large plantations along the banks of the James, Potomac, and Rappahannock Rivers, which were like self-sufficient villages in their own right. By 1700, Virginia was the richest of all the British colonies in the Americas. The less fortunate lived in one-story high huts, called puncheons, made of upright logs with their ends buried 2 feet into the ground, and the gaps between the logs filled with clay and then covered by horizontal siding.¹⁴ A new capital, located 10 miles north of Jamestown, was established in 1632, which was originally called Middle Plantation. The College of William and Mary was established there in 1693, and the name of the capital was changed to Williamsburg in 1705.

Residential Architecture as a Symbol of Patriotism During the period leading up to the Revolutionary War as well as after independence was attained, the Federal style, based on classical elements symbolizing democracy, became popular. Several books published at this time had wide influence, such as *The London Art of Building*, by William Pain, *Select Architecture*, by Robert Morris, and *Useful Architecture*, by William Halfpenny. These and others prompted the building of two-story plantations with pedimented temple fronts and flanking one-story wings. This trend was followed by the Gothic Revival in the 1800s, led by Augustus Welby Northmore Pugin in Britain, and informed by books such as the *Cyclopaedia of Cottage, Farm and Villa Architecture* by John London in 1833 and *The Architecture of Country Houses* by Andrew Jackson Downing in 1850. Pugin spearheaded the Arts and Crafts Movement in England and was its ideological conscience, preceding John Ruskin and William Morris in that role. Pugin argued that Gothic architecture was the best antidote to the social ills caused by industrialization because of its spiritual basis and communal traditions as opposed to Renaissance Classicism, which he characterized as having pagan roots. This led to the so-called “Battle of the Styles” in the mid-1800s between those who maintained that Palladian

Classicism, which had been introduced to Britain by Inigo Jones a century earlier, was truly representative of national aspirations, and backers of Pugin, who believed otherwise. The debate never affected America as deeply, but had patriotic implications there, instead.

THE SOUTH

Monticello, Virginia

Thomas Jefferson was a man of many talents. He not only wrote the Declaration of Independence, served as an ambassador to France and president of the United States, but was a self-taught and very accomplished architect as well. In addition to conceiving the master plan and Rotunda of the University of Virginia and a small retreat for himself in Bedford County, Virginia, he also designed his own home, which he named Monticello, near Charlottesville. He started it when he was 25 years old in 1768, and it remained a work in progress for 41 years, not being completed until the last year of his presidency in 1809.¹⁵ In that time it grew from 6 to 21 rooms, reflecting Jefferson's life experience, changing tastes, and expanding horizons. In its first iteration it had a parlor in the center, flanked by a bedroom and dining room, on the ground floor, and two bedrooms and a study above, on the second. In 1776, which was a memorable year for America, he added an angled, bay-like projection and portico that extended out of the southwest side of the parlor. He also added similarly angled extensions to the dining room and bedroom. After his five-year residence in Paris as the U.S. ambassador, he seemed to have been inspired by what he saw there, which led to his nearly doubling the size of Monticello from 1796 to 1809. He had rented a townhouse on the corner of the Champs-Élysées and the Rue de Berri and wrote a friend about his experience there, saying, "In Paris particularly all the new and good houses are of a single story, that is of the height of 16 to 18 feet generally."¹⁶ He was also impressed by the Maison Carrée, a well-preserved Roman Temple in Nîmes, the Hotel de Salon, which has a dome and a portico projecting toward a garden entrance of the Tuileries,¹⁷ and the Municipal Grain Market in Paris by Jacques Molinos, which also has a dome. He also collected books on architecture, which, in addition to Andrea Palladio's *Quattro Libri*, included Charles-Louis Clerisseau's *Antiquities de la France*, as well as *Select Architecture*, by Robert Morris, which was subsequently adopted as a pattern book by other wealthy Virginia landowners, and *The Rules of Drawings*, by James Gibbs Morris, which carefully adhered to Palladian principles.¹⁸

In 1796, he removed the upper story of Monticello and used mezzanines for the bedrooms above, to conform to the custom of doing everything within one story that he had seen in Paris. He also created a new entrance hall, complete with its own columned portico on the northeast side of the house to counterbalance the one in front of the parlor on the southwest. A series of four small spaces were also added, with two on each side of the entrance hall. These were pragmatically named the North Octagonal Rooms, in the northwest corner, the North Square Room and South Square Room flanking the Entrance Hall, and the Library in the northeast corner, which spills out to the south, to join Jefferson's cabinet. He designed a bed that spans between the opening between his ground floor bedroom and this



East façade of Monticello. Courtesy of the Library of Congress

cabinet, or study, that allowed him easy access into either room, depending on his mood. Elegant glass doors with an arched fan-lit lunette above each of them connect the Entrance Hall and the Northeast Portico, but only a pair of small stairways, symmetrically located along the relatively narrow hall that separates the original part of the house from Jefferson's later addition, lead up to the bedroom mezzanines above. This is probably due to Jefferson's aversion to anything that might be considered pretentious or a conceit. As the director of the restoration at Monticello has described the house, it follows the logic of the French parti, with "an asymmetrical distribution of high-ceilinged rooms for the main floor. The result was the irregular plan of the second level."¹⁹ It is remarkable that this rather eclectic interior arrangement of highly personalized spaces is not evident from the outside, since the rational composition of both northeast and southwest elevations conveys an impression of dignity and reserve. The dome, however, which was a first in domestic architecture when it appeared, is a strong hint of the unique character of the spaces within.

The Dependencies Jefferson, like other landowners of his social class in Virginia, used slaves on his estate. Monticello has two flanking L-shaped wings, which contain all of the service functions, such as kitchens and storage rooms. These are partially buried into a hillside to preserve an uninterrupted view of the landscape, but

have raised terraces that connect them to the main house. Although these “dependencies” and their terraces appear in Jefferson’s drawings as early as 1770, they were not completed until he left office.

Jefferson’s wife died in 1782 and his family lived elsewhere until 1809, when he retired. They then returned to Monticello to live with him.

Plantations

The mere mention of the phrase “southern plantation” conjures up mixed reactions today, with the romantic notions now clouded by the overwhelming realization of the human exploitation that was involved in maintaining the way of life that this institution represents. This is because, more than just being a house, the plantation was a complex social and economic construct that grew along with the burgeoning expansion of the United States itself and is part of its frontier history. The romantic view of plantation life prevailed as relatively recently as the 1930s, if the popularity of *Gone With the Wind* is any indication of its durability. And the stereotypes that were part of that image lasted just as long. Some, related to the great house that was the focal point of the plantation myth, still endure, and many of these are based on fact. The way of life that it supported lasted for a remarkably short period of time, from the pre-Revolutionary War explorations across the Blue Ridge and Allegheny Mountains, and the settlement in the fertile areas across the bluegrass region of Kentucky, the Nashville Basin, the Tennessee River, the Mississippi River near Memphis, and then down to New Orleans and the farming area of Alabama, between the Tombigbee to the Alabama River, until the Emancipation Proclamation on January 1, 1863.²⁰ During that period of little more than a century, large agricultural holdings evolved around the crops that brought the most money, which were cotton, tobacco, rice, and sugar.²¹

A Long Fertile Arc Settlers followed the path of least resistance and the promise of the most reward for their sacrifice, first through the Cumberland Gap through the Appalachian Mountains that separate Virginia and North Carolina on the east from Kentucky and northern Tennessee to the west, first bringing them into the lush bluegrass country around Somerset. Their path was established by explorers like Daniel Boone, whose name is commemorated in a national park that surrounds the Gap on the Kentucky side. From there, the way of opportunity arcs west and south, like an inverted fish hook across Tennessee, through Nashville, to Memphis. It then follows the Mississippi River down to Natchez, on the liquid border between Mississippi and Louisiana, down to New Orleans and then across to Mobile, Alabama, to the east and the Alabama River Valley between it and Montgomery.

The progress of settlement, which turned into a flood after President Thomas Jefferson negotiated the purchase of Louisiana in 1803, was subject to the fluid political situation along this fertile arc, given the colonial aspirations of France, Spain, and Britain in the area during the seventeenth and eighteenth centuries. Those in the British colonies ruled by King George III were prohibited from emigrating, and the French controlled the section of Louisiana, named after King Louis XIV, east of the Mississippi, which they held from 1699 until 1763. After the Treaty of Paris in 1763, it was ceded to Spain and then back to France before



Waverly Place. © Silver Smith–Silvery.com, 2008; Flickr

the United States took over in 1803. Each of these different periods of control left its own stylistic mark on the estates of the entrepreneurs who were resolute enough to ride out the changes, and there are also numerous regional differences between them because of variations in climactic conditions, but there are a remarkable number of similarities as well, based on the generic requirements of a large agricultural holding that was essentially a self-sufficient settlement in its own right.

No Typical House A description of a typical plantation might best begin by explaining there is no typical model, but there are some commonalities. The first of these is that, because in the regions where the majority of them are located throughout Mississippi, Louisiana, and Alabama, the emphasis was placed on shade and natural ventilation, gained through wide, overhanging eaves, wraparound verandas, and high ceilings along with windows with operable sashes. They also had gable roofs, since heavy rains are common throughout plantation country. Floods are normal as well, so the great houses of the estates usually occupied the high ground of properties that were typically located near rivers so that their products could be easily transported. There were also extensive areas that included spinning houses, if that product was cotton, refined by the invention of the cotton gin by Eli Whitney in 1795, and “the quarters” or “the dependencies,” which were the euphemistic terms used for the slaves’ houses. These areas also included barns and storage sheds, the outbuildings used for storing and preparing the food for the small army of people who lived on the plantations, including smokehouses, dairies, and kitchens.²²

A Classic Example One of the most outstanding examples of a working plantation that survived the Civil War is the sugar plantation called Evergreen, near Donaldsville, Louisiana. It is located about 100 yards from the edge of a levee that separates the edge of the plantation property from the Mississippi River, on axis with a symmetrical formal garden that lies between the great house and the water. A bridge over the levee permitted ships to dock on the river and load and unload at a wharf there that was designated for the use of the plantation. From that wharf and bridge, a road ran along the side of the long, narrow residential part of the property to a sugar barn located between it and the cane fields further inland. Several buildings were placed around the mansion, which occupies pride of place in the middle of the foreground plot, including managers' houses, offices, carriage houses, and the cook's house, located at the perimeter of a lawn in the back of the mansion that offsets the formal garden between it and the levee, in front.

The "quarters" for the slaves were located in rows along the roads that ran back to the cane fields with a kitchen garden and an orchard between them, which is the third of the four planted areas in sequence from the river, with the cane fields being the last. This sequence of open spaces from the water line inland says a great deal about the economic as well as social forces at work in what may be considered a prototypical antebellum plantation, from formal garden, for strolling by the Mississippi in front and for public viewing from the steamships passing by, to the more manicured lawn around which the business offices were organized, followed by the kitchen gardens and orchards tended by the slaves, and finally ending in the cane fields themselves, where they toiled and produced the wealth that supported the entire estate and the genteel lifestyle of those who lived in front near the river.

Environmental Positioning The organization and distribution of houses on the estate also reveal a great deal about expectations of comfort, which would have derived mainly from breezes coming from the river inland. The main house, which consists of a long, rectangular central house symmetrically flanked by square appendages, is placed lengthwise across the middle of the property and has a deep covered veranda running along the entire length of its front elevation, held up by tall slender classical columns with a smaller covered porch stretched across the back. With windows open, this is an ideal configuration for cross ventilation, especially since the harder ground surface of the kitchen garden would have induced a strong convective air current as it heated up during the day. This current would have come from the river, but also from the cool air that had been trapped in the foliage in the formal garden as well, providing a steady stream of cool air for most of the day, or at least until just before sunset. The *garconnières* provide servants' houses, which flank the mansion along its back line, at the edge of the lawn, and face toward it. While they have front porches, they would not have received the same benefit from this convective breeze because it would have hit the side, rather than the front, of their houses. Sitting on the front porch at midday or in the evening would have been pleasant, if there was an opportunity to do that, since the fresh air would have been rushing through that shaded portico. The slaves' houses, on the other hand, are oriented in a direction directly opposite to that of the mansion, since they are lined up along the access roads that lead to the cane fields. They are farthest away from the river breezes, and their houses are turned sideways to them.

Not all of the slaves suffered the same levels of heat, since there was a strict hierarchical system that prevailed on the plantation, in which servants who worked in the house were given highest priority to live in *garconieres* followed by the cook who lived in a special house near the midline across the lawn, opposite the main office, which was oriented in the same direction as the *garconieres*, followed by the laundress, seamstress, housemaids, gardeners, and carriage drivers.²³ It was the field hands who lived along the road in the back.

Beautiful Trees The trees flanking the formal garden, which provided the foreground for the mansion of the plantation, were lined up in rows that ran perpendicular to the river, with three rows on either side of the lines of flowers in a square formation in the middle. These trees were chosen to descend in scale from the outer boundary across the access roads to the row nearest the flower garden in the middle. The outer rows were giant live oaks, the central ranks were magnolias, and the inner rows were dwarf cedars, which focused attention on the house in the near distance, because when seen from the river, they would create a natural line of perspective that ended at the front door of the mansion.²⁴

Savannah, Georgia

Following a mandate from King George II, Parliament approved a plan to send several thousand colonists to America, to an area near the Savannah River, to help bolster Britain's claim to territory along the east coast of the continent. The settlers who arrived at the beginning of 1733 were not the first contingent sent there, since there was a palisade named Fort King George that had already been built in 1725. It was destroyed four years later, however, and remained a graphic reminder of just how dangerous this territory was. This new group of colonists was led by James Oglethorpe, who chose a spot about 10 miles upriver from the coast for a settlement, at a place where there was a natural harbor and a high flat bluff that would provide a strategic, easily defensible vantage point from which to counter possible attacks in the future.

A Philanthropic Venture The idea to found Savannah as the capital of the British colonial enterprise in North America was formulated in London in 1730 by a group of 21 philanthropists who called themselves the Georgia Trust. These were all reformers and were mainly members of the aristocracy and the clergy. They were eager to create a new, utopian community that would demonstrate their desire for social improvement, particularly as it was related to the penal system, as well as religious freedom. Sir Robert Walpole, who was prime minister at the time, was one of the most forceful personalities in the history of British politics, eclipsed only by Sir Winston Churchill. His interests and those of his political party were represented on the Board of Trustees by Lord Egmont.

This was a humanitarian, rather than commercial, enterprise of the sort best represented by Jamestown, which had preceded it, and was established as a charitable trust rather than a for-profit corporation. The financial contributions that were either made directly by the founders or solicited by them were not considered to be venture capital but rather charitable donations that were being made to finance a utopian experiment. James Oglethorpe, for example, who was one of the Trustees and was also the leader of the expedition, contributed 100,000 pounds sterling to the enterprise in 1733, which was an enormous amount at that time. He had a

personal interest in the issue of penal reform, since his close friend Robert Castell had died in debtor's prison because he was unable to repay the expenses incurred by the publishing of his book *The Villas of the Ancients Illustrated*. Oglethorpe ascribed to the Vitruvian principles put forward in this book, and wrote an introduction for it. Before joining the Savannah Board, Oglethorpe had successfully petitioned the British government for the release of 12,000 people from debtor's prisons.²⁵

In sharp contrast to the high idealism of the Trustees who founded Savannah, Parliament took a more sanguine and pragmatic stance in its support of the new settlement. They viewed Georgia as a useful buffer between the Spanish and French holdings to the south and British interests to the north, specifically in the Carolinas, which were well established by the time the new settlement of Savannah was being proposed.

Spacious Streets Oglethorpe brought a predetermined plan with him from London that had been drawn up by the Board of Trustees. They had been assigned to oversee the establishment of the settlement, which took its name from the river that sustained it. Their plan for Savannah was based on a square layout with sections called "Tythings" set aside for the houses of the settlers in each of the four corners, separated by wide "spacious" streets and a park in the middle named after its founder. It also included four lots, set aside as "Trust" property for public buildings.

The site plan that was implemented was logical, easily replicated, and expandable. It started with 32 long blocks lined up parallel to the river bank, laid out in groups of five houses each, with their rectilinear fenced-in backyards extending out from them. These were spaced to allow for square plazas between them and were divided by wide streets, with one park-like plaza for each 40 houses. In 1733 there were four of these parks, and as the block pattern increased, these grew to six in 1735, eight in 1790, twelve in 1799, fifteen in 1815, eighteen in 1841, and twenty-four in 1856. What is remarkable about the site plan, in addition to the stress that was placed on providing everyone with a garden and every cluster of 40 houses with a neighborhood park, as well as the insistence on wide, tree-lined streets, is that subsequent generations did not deviate much from it, until the twentieth century. The positions of the individual houses took precedence over most other public buildings except the church, which later incorporated into the block pattern as it grew. They were placed with their long front facing the river to take maximum advantage of the breeze, and their location alternated, from the front of the garden on one side of each street running parallel to the river to the back of it on the other, to provide as much space as possible for natural ventilation and privacy for each of them. This pattern continued to the furthest inland block in the first settlement and was maintained as the site plan was expanded so that, in combination with the neighborhood parks and long wide avenues, the city would remain as cool as possible during the hot summer.²⁶

The Novel Structure of the New Community The building blocks of this new social experiment were the ward, the garden, the trust lot, and the tithing lot, which are each replete with symbolic and etymological meaning. In addition to a ward, which connotes guarding something precious in old English, the word "trust"

has medieval roots, related to land that is held open for the common good. “Tithing,” however, is a religious term, stemming from the Biblical injunction that one should contribute one-tenth of one’s annual income to the poor and needy. These precedents were translated quite literally into the planning of Savannah, since the first plan was based on four wards with an open square or park placed in the middle of each of them when it was laid out in 1733. Two more wards were added in 1736.

Each public square had trust lots on both their east and west sides, which were set aside for public institutions, such as the church, library, and courthouse.²⁷ The tithing lots, which each measured 60 feet wide by 90 feet long, were laid out in blocks of ten and were reserved for private houses. The inspiration behind the organization of the tithing blocks appears to have been the English cluster of urban housing called a mews, which includes lines of row houses surrounding an open court in the middle, which was usually rectangular. A mews cluster also typically has a gate at each of its short sides to control access to the houses, which were entered from the court.

Four of the tithing blocks in the Savannah plan were laid out parallel to the river and were subdivided by placing a narrow alley or lane through the middle of each on the long dimension. This produced eight long and narrow building lots, which each had its own garden plot.

The Houses of Savannah The method used for the allocation of the building lots and the construction of the houses for those to whom the lots were awarded was very advanced for its time and remains so even now. James Oglethorpe and the rest of the Trustees decided that in this new egalitarian society, each of the houses should be identical. Oglethorpe set up an assembly line for the cutting and sizing of the wooden beams, rafters, shingles, and boards to be used for the structure, as well as the siding, flooring, and roof. Each house was one story high, 16 feet wide by 24 feet long, and had an internal ceiling height of 8 feet, with a small attic space above.²⁸ Each house was also sited in a similar way on its long, narrow, rectangular lot. They alternated from the front to the back of the short side of the rectangle from the first rank of lots along the edge of the river toward the far edge of the settlement near the forest to maximize the green area between the houses, since either the back or the front was used as a garden. The amount of open space throughout this fledgling settlement was also unusual for its time, and since this framework was generally adhered to by future generations, it has always set Savannah apart, leading it to be called the “forest city” in England in the 1800s.

To prevent flooding and to combat rising damp, each of the houses was raised 2 feet off the ground on a log foundation. Wide 1.5-inch thick wooden planks were used for floorboards. Feathered horizontal wooden strips were used for siding, and the roof was covered with wood shingles. The exclusive use of wood for the construction of the houses was the end result of a logical cycle of reusing the trees that had been cut down to clear the site. Wood from this clearing process was also used to build a palisade as a wall around the perimeter of the new city.

Because of his friendship with Robert Castell, James Oglethorpe was well acquainted with the Classical Revival style that was so popular in Britain when Savannah was founded. In addition to the Castell folio that he had contributed to, he also owned a copy of *The Designs of Inigo Jones*, by William Kent, published

in 1727. Jones had become aware of the work of Andrea Palladio while he studied in Italy during the early part of the seventeenth century, including the *Quattro Libri* in which Palladio explained his principles. He, along with his friends Robert Castell and Paul Foundriner, helped Lord Burlington to initiate the Revival often referred to as English Palladianism. Foundriner was later commissioned to engrave the first rendering of the new settlement in Georgia, published in London as “A View of Savanah [*sic*] as it Stood on the 29th of March in 1734.”²⁹

Houses Placed in a Natural Setting This engraving, which is remarkable in both its simplicity and the bird’s eye perspective used to draw it, confirms the descriptions of early visitors who describe Savannah as being made up of houses surrounded by white fences and planted with well-trimmed grass and trees. This helped to convey a sense of bucolic charm and order, in which a delicate balance was maintained between the houses and the parks in their midst.

The process of building the settlement happened quickly. After the colonists made landfall, they cleared the high bluff of the oak, pine, and cypress trees that covered it and started to build houses with the wood they had cut down. It took them about a month to finish the clearing, and over the next nine months, from March until December 1733, they managed to build 50 houses, as well as a 16 feet high log stockade and a jail, in spite of the fact that they had very few professional carpenters among them.

The houses were all of the same dimensions with identically sized, fenced-in gardens behind them, and this, in combination with the parks that were interspersed throughout Savannah at regular intervals, gave it an uncrowded feeling. Until brick kilns became available in 1736, timber was used for everything, including the chimneys, with gaps filled in with clay. Once bricks began to be produced, these replaced the wooden chimneys, which were typically placed at each end of the house.³⁰

The original wooden houses were only one story high, looking much like log cabins except for the fact that the logs were squared off. They typically had only one door and one window, and since no glass was available, shutters were used to protect the occupants from the elements. There were no iron spikes or nails either, so the logs were pegged together.

Savannah grew rapidly, but after the Revolutionary War, the economic activity, which may have helped to preserve the fledging city, moved from the coast toward Macon, and to the cotton fields in the southwest of Georgia.³¹ Macon was established in 1823, 90 years after Savannah, due to the instability caused by the War of 1812 and the population shift that followed it.

The Greek Revival Southern plantations conjure up an image of Palladian temple fronts soaring high above wide front porches leading into deep porticos on all of the other sides of these grand houses. But Palladianism was replaced by a desire for a more refined sort of Classicism in Savannah following the second, more abbreviated encounter with British forces in 1812. It was perhaps a reaction against its colonial associations. A Greek uprising against the Ottoman Empire soon after the British were defeated by the forces of Andrew Jackson at the Battle of New Orleans helped fuel a passion for Hellenic rather than Roman precedents, and Greek Revival became the style of choice as a symbol of democratic principles.³²

As has so often been the case, this style was spread by a number of publications at the time, such as *The Builder's Assistant* by John Haviland, which first appeared in Philadelphia in 1818 and helped launch the Greek Revival movement there.

In spite of the high level of patriotism attached to this new fashion, it was British architect William Jay who helped to popularize the Greek Revival style in Savannah in the early 1820s. Unlike its less restricted appearance elsewhere along the East Coast, however, those who followed his lead had to deal with the strict building guidelines related to house and building lot size that had done much to ensure Savannah's enduring charm. This meant that their efforts were primarily confined to details rather than major formal decisions.

Strong Ties to Britain Savannah had strong ties to Britain because it was founded during the reign of George II and was proclaimed as the seat of the royal colony in 1752, during the rule of George III. So it is not surprising that it was a strong Tory stronghold during the Revolutionary War and for some time afterward. This connection became even stronger during the reign of Queen Victoria, which started in 1837, until the Civil War interrupted trade. Atlanta was also founded in that year and became the capital of Georgia in 1868, eventually eclipsing Savannah in economic and political importance. But with the invention of the cotton gin by Eli Whitney in 1793, trade between Savannah and the Cotton Exchange in Liverpool boomed, and for several decades it was one of the busiest seaports on the East Coast of the United States.

A Prosperous Upper Class William Scarborough, who built the first trans-America steamship, the *Savannah*, in 1818, as a result of that lucrative trade in cotton, commissioned a talented British architect from Bath, named William Jay, to design his mansion in 1819. It is located at 41 West Broad Street, in the Oglethorpe Ward, which runs perpendicular to New Franklin Ward and Bay Front, next to the river. Devastating fires that had swept through Savannah in both 1796 and 1820 had led to building ordinances requiring the predominant use of brick and stone, and this mansion represents that change in attitude. The Scarborough House is a study in restrained Classicism and the pervasive influence that this architectural philosophy has had on this city. The first evidence of this affinity is a projected Doric portico supporting an arched bridge-like structure that also carries a pair of flanking stairs leading up to the main entrance. These flanking stairs and four columned porticos, on which the outer pair of supports are longer than the inner ones, establish an axis on which the symmetrical plan of the ground floor is based. The front door leads one to a large rectangular entrance hall with a secondary room inscribed in its center. This central part has another series of four Doric columns, supporting an open atrium that contributes to a feeling of formality and elegance first introduced by the portico, outside. A fanlight above the portico lets light flood into the atrium space, augmenting an overall impression of dignity and grandeur. A pair of sitting rooms flank the central entrance hall in the front half of the house and a large reception room. There is also a verandah that is open on each of its short sides and is enclosed along the entire back elevation of the house.

The Richard Richardson House William Jay had originally come from Bath, England, to America to supervise the construction of the Richard Richardson house in Savannah, which he had also designed. This residence, which is now

known as the Richardson-Owens-Thomas House, was finished in 1818, one year before the William Scarborough house, to which it is stylistically related. The Richardson house has been referred to as one of the “finest English Regency houses in America,” and surpasses the Scarborough house in that regard because of the delicacy and subtlety of its proportions and detailing. Where the Scarborough house is massive and formal, its predecessor is light and far less serious. It also has a classical, raised Palladian portico and a pair of flanking stairs leading up to it, but in this case they are elegantly centered around a horizontally stratified and slightly bulging base. Four columns support a two-story high pedimented temple front, rather than the heavy horizontal architrave, with a series of academically perfect tryglyphs that Jay also used in the Scarborough design soon afterward. The spontaneous feeling introduced by the curved stairs and the delicacy of the slender columns supporting a minimal pediment at the top is further enhanced by quoins on the corners of the lower half of the front elevation, divided panes in four pairs of windows that lighten it, and shutters on each of these windows as well. The front elevation, which is equally divided by a horizontal cornice, is further articulated by the almost playful device of disengaged columns at the edge, surmounting the quoins that Jay used below. This makes the elevation seem to become progressively lighter and to visually rise up.

St. Augustine, Florida

There were two waves of Spanish colonization in St. Augustine, Florida, from 1565 until 1764 and 1784 until 1821. During the first of these, the Spanish intrepidly moved into Central and South America, causing the downfall of well-established kingdoms such as those of the Aztecs and the Incas. During this first wave of exploration and conquest, Juan Ponce de Leon, who was the governor of the island of Puerto Rico, landed on the coast of Florida on Easter Sunday 1513. He named it Florida because the Easter season in Spain is referred to as *Pascua Florida*. Although the attention of the Spanish government was focused on the natural resources and wealth that they were able to extract from their conquests farther south, they sent six expeditions to settle this area over the next 50 years. Activity by other European powers in the Americas, such as the English and the French, added a sense of urgency to these ventures, not just because of pride but also because of the threat that other navies posed. The French were ambushing Spanish ships as they rode the Gulf Stream along the coast of Florida on their way home from Central and South America, stealing the treasure that the Spanish themselves had already stolen. It was important that a permanent settlement be established on this coast to protect Spanish interests and shipping lanes.

St. Augustine On September 8, 1565, Admiral Don Pedro Menendez de Aviles sailed into the mouth of the Matanzas River, located on the northeast Atlantic coast of Florida, to destroy a French settlement that had been established there and to remove it as a threat to Spanish interests. After it was captured, he renamed it St. Augustine, since the battle took place on the feast day of that saint. The settlement, however, proved to be relatively exposed. It was attacked by Sir Francis Drake in 1586 and burned to the ground, and pirates constantly raided it, most thoroughly in 1668. The Spanish intended it primarily as a military fortress, and

so its primary structure was the Castillo de San Marcos, which was built of stone. But the settlement was also seen as a colony, and so houses were built there within a town plan devised by Gonzalo Mendez de Canzo. British forces, coming overland from the Carolinas, attacked again in 1702, and by ship again in 1740 in a group led by General James Oglethorpe, who was the governor of the British colony of Georgia. And yet, in spite of this, nearly 30 houses from this early period survived. This is even more miraculous considering that they were built of wood and thatch.

Ceded to Britain Florida was ceded to the British as part of the treaty of Paris that ended the French and Indian War in 1763, and a new wave of colonists started to build houses of a different style. The British used St. Augustine as a military base to support their activities during the War of Independence being fought to the north, and many Tory refugees from the conflict found their way to the settlement during this time as well. The British colonists built larger houses than their Spanish predecessors, using masonry as well as timber frame construction. They built them to last, not realizing that the vicissitudes of international politics and the fortunes of war would affect St. Augustine once more. A second treaty, ending the Revolutionary War, gave American colonies their independence in 1783, but also returned Florida to Spain. This led to another building campaign in St. Augustine, starting about 1790, in which new settlers built many large houses, as well as several public buildings and a new church.

Within a little less than 40 years, however, America was growing so fast that there was increased pressure to expand its territory. John Quincy Adams, when Secretary of State under President James Monroe, negotiated a treaty with Spain to cede Florida to the growing union in 1821, and Spain was amenable because it was occupied in the Napoleonic War at home. This ushered in a new period of uncertainty for St. Augustine since it was now no longer under Spanish control, but was also not yet officially a part of the United States, and would not be formally admitted to the union along with the rest of Florida until 1845. In the interim, it was in limbo, vulnerable to attacks by indigenous tribes, in the same way that the British settlement of Jamestown, Virginia, had been in the early 1600s.

The comparisons between these two colonial settlements is interesting. Although St. Augustine was founded first, 42 years before its British counterpart farther north, it was always considered a military rather than an economic enterprise. The Spanish simply wanted to use it to protect their economic interests elsewhere in the Americas and not be a financial resource on its own. Its position on the Gulf Stream also guaranteed St. Augustine a steady source of supplies and protection, which was lacking in Jamestown in its early years, making it a difficult enterprise from the start. But at this point in its tumultuous history, 256 years after its founding, the inhabitants of St. Augustine experienced the same kind of hostility from Native Americans that those in Jamestown had known several centuries before. This all changed when Florida was granted statehood in 1845, but peace again was brief, since the Civil War started in 1861, with Florida joining in on the Confederate side. St. Augustine, however, was captured by the Union early in the War and was spared for yet another destruction.

A Layering of Influences Because of its shifting fortunes as a pawn being passed between two European powers before achieving relative stability as a result of statehood, it should come as no surprise that the houses built during this period

show evidence of cultural layering. During the first Spanish settlement, from 1565 until 1763, homes were rather hastily built of wood and thatch, since this was a military outpost with a transitory population, as its history of numerous attacks that devastated it several times demonstrates. The worst of these, in 1702 left only about 20 houses standing, but because they were also wood frame construction with thatched roofs, they have not survived.³³ No house in St. Augustine today predates the fire of 1702. Then British settlers replaced the Spanish, bringing their own building traditions with them, which included mortise and tenon wood frame structures, clapboard siding, double-hung windows, and hipped or gabled roofs and dormers. The Spanish replaced the British again, which has resulted in a hybrid house type with what has been referred to as the “St. Augustine Plan.”³⁴ This has a walled patio, or garden, in three house types, which follow the “common plan” and the “wing plan” or the St. Augustine Plan.³⁵ The common plan houses, which make up 70 percent of a tax map made by Mariano de la Rocque in 1788, are rectangular one room cottages, with a fireplace and a ladder or stairs up to a sleeping loft. Sometimes these had two rooms with a door in the middle of the wall that separated them and approached a square rather than a long rectangular shape; they also had porches and detached kitchens. Having the kitchen outside the house was necessary to prevent fire and to keep the house cooler. The St. Augustine plan, which makes up 21 percent of the houses on the 1788 map, is a refinement of the common plan in that it is also rectangular but is more spacious, with two to four rooms and two floors. It has a loggia on the garden, patio side where the stairway is typically located, and a balcony on the upper level, overlooking the street. A gate in a fence or a low wall around the garden opened into a stone pathway leading to an arcade under the loggia, where the main entrance was located.

Compared to the plan of a typical colonial American house, the St. Augustine house is more flexible and adapted to its climate. In the colonial “central hall” type, a door in the front of the rectangular plan leads into a wide central hall where the stairway to the second level is located. Doorways in the walls of this hall lead to rooms on either side. In the St. Augustine plan, the organization of the spaces on the ground floor is less axial, having an asymmetrical arrangement determined by the patio and the loggia. The main entrance, at the back, is off-center and the main rooms on the ground floor are grouped along the long front wall. Loggias and covered porches look out onto patios or gardens because they are oriented toward the prevailing breeze. This sequence of spaces that the breeze travels over before entering the house makes it much cooler. The roof over the loggia blocks the higher summer sun, but allows the rays, at a lower angle during the winter, to penetrate deep into the house during this cooler period of the year. Masonry walls provide thermal mass, keeping the house cool in the summer and warm in the winter.

The third type of domestic arrangement found in St. Augustine is the wing plan, which is L-, U-, or H-shaped.³⁶ Since this type represents little more than 9 percent of the houses on the Rocque tax map of 1788, it was obviously less popular than either the common or St. Augustine types.

Materials Preferences for the materials used for house construction shifted with each change in occupancy. The Spanish inhabitants favored masonry and the

British liked to use timber. For masonry, the Spanish settlers relied on a local limestone mostly made up of shells and corals that they called *coquina*, and then faced it with plaster. The construction of the Castillo de San Marcos, between 1672 and 1686, provided a training ground for masons working in stone hewn from a local quarry, but the building of this fortress used up almost all of it. Tabby, which the Spanish called *ripio*, or *piedra de ostion*, was used for facing walls and floors. It is lime mortar with oyster shell aggregate.³⁷ The Spanish settlers plastered the *coquina* walls to waterproof them, since otherwise they had such a broad grain that moisture could penetrate through them.³⁸

It also provided a cleaner interior wall surface. Tabby walls were plastered for the same reason. The British remodeled many of the houses they found when they took over the city, adding wood frame portions to them, and then covering these with clapboard. The Gonzalez-Alvarez House in St. Augustine, which is the oldest surviving Spanish Colonial house in Florida, has a *coquina* base and a wood frame second story that was added after the British occupied the city.

THE CENTRAL REGION

The Log Cabin

The log cabin has a special place in the national history of America and the affection of its people, conjuring up images of young Abraham Lincoln, who is one of the most famous and popular presidents of the United States, learning by candlelight in his childhood home. When colonists came to North America, wood was plentiful, and the agricultural tradition they brought with them, in direct opposition to that of the Native Americans they found here, required that they clear the land of trees. The log cabin is a logical consequence of having to use the wood that was cut down. One of the most obvious examples of this exchange, described elsewhere here in great detail, was the founding of Savannah by James Oglethorpe and the group of British settlers that he led in 1733. The site he chose, which was far enough up the Savannah River to be relatively safe from attack by rival colonial powers, was entirely wooded. The first task the settlers faced was to clear the trees and to set up a sawmill that would convert the logs into the squared-off timbers they would need to build their houses. These had been pre-designed in London, as part of a grand, utopian plan for a new kind of settlement planned around open parks and squares. The houses, which were all one story high, were based on a modular system that would allow the timbers to be standardized for use in each of the houses. The logs were laid up horizontally and connected at the corners with notched joints that were large enough to allow them to interlock. The gaps between the logs were filled with clay mixed with straw. The advantage to this kind of construction, in addition to the fact that it utilized a readily available source of material, was that it was quick, especially when many hands were available to lift the logs into place. In the earliest instances, before glass became available, windows were simply gaps left between the logs, with shutters used to close them. The log cabin was rarely more than one story in height, and gable ends were difficult to build because of the triangular form. While it seems counterintuitive, chimneys were also made of logs with a clay facing to prevent them from burning.

Floors were made of wood planks and the roofs were made of wood shingles, so that no parts of the trees that were cut down were wasted.

Size Limited to the Length The length of the log cabin was governed by the average length of the trees in the vicinity of construction, and only the part of the trunk that was straight could be used, excluding the top, where it started to taper. This usually meant that the maximum length of the house was about 20 feet. But, this could be extended by additions connected to the end of the house. The width of the cabin was also determined by the length of the beams available to span it, as well as their ability to handle the dead load of the material used for the roof, as well as snow load, if any.

As time went on and other materials, such as brick, glass, and tin roofing, became available, and methods of construction improved, log houses were extended up to two stories, with brick fireplaces and tin roofs. In the southern part of the United States, it became common to separate both ends of the house into opposing square rooms, which each had its own fireplace, by putting a passageway or open breezeway between them. A stairway in each of the separate rooms then led to a common floor above, used for eating and sleeping by the owners of the house. These cabins, called “dog trot” houses because animals could wander freely through the middle, served an important social purpose in a more conservative age by allowing the woman of the house to entertain female visitors on one side, while male guests could meet with the men on the other. After the guests left, the family members would then go up to their private quarters. The opening between the two lower halves of the dog trot house also allowed natural ventilation to cool the house, and even encouraged it, if the house was oriented properly. And they invariably were since early builders understood the importance of good orientation.

The typical log cabin in the southern part of the United States throughout the 1800s was a rectangular, two-story frame structure, with a brick chimney attached to each end and a gable roof, often covered in tin sheets. There was usually a lean-to porch added along the front, as a way of shading the windows on that side and keeping the interior cooler, and of meeting guests outside the house. The interior of the house was typically divided into three rooms on the ground floor as well as a central hallway and stair, and the kitchen was usually in an attached shed-like structure in the back to avoid a house fire. The three rooms were a sitting room, a living room, and a dining room. The walls were left exposed on the outside, but were plastered inside.

A Community Effort The Amish, who are members of a religious sect that has settled throughout the United States but are concentrated on the East Coast and, especially, in Pennsylvania and Ohio, reject the use of modern technology and still build their houses in the same way that the first settlers in America did hundreds of years ago. House or barn building for them is a community effort with the only payment that is offered being a piece of pie and lemonade. Log cabins were built in the same way in the past, and construction started by finding the most suitable tress and cutting them down, if the wood had not been milled already. The average house required about 80 trees, which took about three days to cut down. These were then sawn so that their sides were flat, and cut into either side pieces or end pieces. A stone sill was often laid, to prevent the logs from lying directly on the

ground. The first end logs were set down and notched to receive the longer side logs. The notches were cut about one-third of the depth of the log. The longer side logs were then laid in and their ends were notched. The process was repeated until the house was about 3 feet off the ground. A subfloor of smaller round logs, about 10 inches in diameter, was laid across the width of the house, and then planks were added, which were the finished floor height. The window boxes were placed on top of the last log level to be placed, so that it acted like a plate for them. After the window boxes were secured, construction continued, but more notches were necessary because of the shorter horizontal members that were needed between the windows. Sometimes the doors and windows were cut out after the logs were placed.

The Sod House

As pioneers moved west across the United States and new territories became open to them, they decided to remain in various places for a wide variety of reasons. Government land grants, for example, were intended to encourage people to settle in certain areas and were a major enticement that drew many to the plains of Nebraska. Raw earth, or sod, was often the material of choice for a pioneer homestead because it was plentiful and cheap and because other materials, such as wood and stone, were in short supply or were too expensive. Many sod homes were built in Custer County, Nebraska, because of the financial incentives that were offered to build there, so these can be considered to be typical of the type.³⁹

Location Was Critical This area in Nebraska is not entirely flat, and so the careful selection of a site to claim as a homestead was crucial. Settlers avoided plots that were too exposed because they would not offer protection from wind, rain, and snow. The soil there was also frequently grainy and not solid enough to make good sod bricks. They looked for sites near towns or villages where they could sell their crops and buy provisions, as well as look for help in case of trouble. They also looked for a site near a good road to get back and forth to town as well as a good source of water, such as a river or stream in the vicinity. Wells were difficult and costly to dig. The bottoms of low hills, *arroyos*, or canyons were favored. Since the entire point of securing a claim was to farm the land, the majority of it obviously had to be flat, so finding the right balance between tillable and buildable land was important.

Many of the sod houses in Nebraska are partially connected to or excavated from a low embankment. This not only provided a solid anchor for a house and eliminated the need to build one of the walls, but also placed the building near the major source of the material needed. In addition, it protected the house from wind, if the hill was in the right location, and wind-driven rain and snow. These kinds of houses were called “dugouts” for obvious reasons and were preferred if all of these conditions could be met.

If these conditions could not be met, the pioneer family would seek a site away from a valley, or *arroyo*, to avoid flash floods, and would orient the house to avoid the cold wind and major sun exposure from the east and west. A survey of 12 sod houses that still survive from this early period in Custer County, Nebraska, has revealed that the plan shape of choice was the rectangle, in even measurements of 8, 12, and 14 feet being the most commonly used. A wider survey has confirmed this, showing that the average size was 16 feet wide and 20 feet long.⁴⁰ The builders

established north by finding the north star at night, and once the north-south axis was established, they set the long walls perpendicular to it, so that the shortest faced east-west to minimize heat again.

Because of the shortage of stone, no footings or stone walls were built first, as they usually are in other regions and parts of the world where mud brick and pisé homes occur. If wood was available, the builders would sometimes drive posts into the ground that would help create a solid foundation for the house. To cut the sod, two or three people rode on a cutter, which had rows of sharpened bars, like knives, attached to a cross bar. The weight of those standing on this bar forced the knives into the soil, up to a depth of about 4 inches. Before the cutting started the grass was cut, but some length of it was left above the ground to add to the strength of the sod blocks. As soon as the sod was crosscut, the blocks could be removed, or lifted out, to be used to build the walls of the house.

Early settlers tried to use a turning plow, which has a curved edge that rolls the soil over as it passes, but this broke up the sections of sod and made them unusable. The transition from this to the knife cutter that was then created to do the job is indicative of the kind of inventiveness that revolves around vernacular architecture, regardless of space or time. Sod houses are among the most elemental and primitive types of dwellings imaginable, as an architecture of last resort built by settlers who had meager resources and a limited supply of materials to do so, and yet there is an evident evolution of accumulated wisdom that comes through in the same details that were developed through a punishing process of trial and error. Mistakes could be costly and dangerous. If a wall caved in, it represented more than an inconvenience, since exposure to the elements during the cold winter could mean death, provided no one was killed by the weight of the wall itself.

Laying Up the Wall The most basic evidence of this accumulated wisdom was the way the sod wall was built. The turf blocks were laid, grass side down for cohesion, two or three rows deep, and side by side for more stability. The joints of each row were staggered in relationship to the next row to prevent a cleft from forming that the wall might split along. After three courses the direction of the rectangular sod blocks was shifted to add further stability. This kind of interlocking is also used in staking hay and straw bales when they are being collected from the field and when they are stored in the barn, in alternating rows of bales laid lengthwise and then crosswise, to keep the entire stack from toppling over, and so there was an obvious agricultural precedent for this technique. The most important consideration in making each sod wall, over and above this interlocking sequence, was to be sure that the centerline of the wall remained true. Because of the weight of the wall, the slightest deviation from a straight centerline could mean collapse. To counteract that possibility, since the outside of the wall was frequently battered by heavy winds or wind-driven rain or snow, the walls were built wider at the bottom than at the top as a way of providing extra bracing. Walls were laid from the corners inward for additional stability, and each course was completed before the next one was started.

Another clever adaptation to the special characteristics of this building material was the care taken in making openings, that is, putting windows in the walls. Glass was a very rare and precious commodity at this time, and so the decision to put a

window in a wall was not taken lightly. Settlers often brought panes of glass with them on their wagons when they traveled west, and great care was taken not to break it. When the top of the exterior wall reached the height of the top of the window, and the wooden box or boxes in which the windows would be set had been placed where the settlers wanted them to be, wooden poles from any saplings found on site or nearby were laid along the wall at the height of the top of the window to tie the entire assembly together, before another course of sod blocks was begun on top of that. A space of about 6 or 8 inches was left between the bottom of this sapling course and the top of the window box to account for settlement, so that the weight of the sod blocks on top of the window would not bear down on it and crack the precious glass panes. This gap was filled with cloth to prevent the cold air from coming in, but to still allow the saplings to deflect a slight bit, as necessary. Holes were drilled in each side of the deep window boxes so that long wooden pegs could be driven through them into the sod blocks, to secure the window in its opening. Once the outer walls were complete, the entire surface was usually plastered, if the family could afford it, to protect it from the elements.

The Roof Building the sod walls to be straight and true was certainly important, but the roof of the house was the most important part of all, especially since the plains are prone to heavy rain and snow that can last for days. The problem, once again, was that wood was scarce, so that sod had to be used as a roofing material as well. Sod is not well suited to this use because it gets heavier when it gets wet and dissolves. There are many recorded instances of roofs collapsing during heavy storms, of families being covered under tons of wet sod, and of the survivors then having nowhere else to live. Many of these heartbreaking stories have been captured on film and in pictures that are kept in the archive of the Nebraska Estate Historical Society.

The challenge for the builders of a sod house was to achieve a proper angle of pitch for the gable ends. If the pitch was too shallow, water would accumulate on the roof and be retained by the sod, which would soak it up like a sponge. If the angle of the gable was too steep, then the water would drain out of the sod and drip off the eaves; however, the additional compressive stress caused by the sharper pitch might also cause the roof to collapse, and the sod might slide down and fall off when it got wet.

The gable roof was achieved by using a large ridge pole that acted as the unifying transverse chord of a series of roof trusses that spanned the width of the house. These rested on a plate that ran around the entire perimeter of the house, and, in this case at least, there was no substitute for wood. A triangular truss was often exposed at each end of the sod house, and the ridge beam was allowed to project out past the surface of the end walls, too. Finding a ridge pole that could span from one end of the long, rectangular house to the other, especially in this region where wood was so scarce, was not easy. Getting the ridge pole in place was also difficult due to its weight, requiring additional wooden supports or poles that could be leaned up against the long side of the house so that the ridge pole could be rolled up into position at the peak of the trusses used to form the gable ends. Once the ridge pole or beam was in place, the triangular part of the gable end was filled with sod blocks because doing so earlier might have damaged the wall.

Cedar was the most desirable wood for the wall plate, roof trusses, and ridge beam because it was relatively resistant to rot and insect infestation coming from the sod around it. A horse-drawn wagon was frequently used as a construction platform to avoid the problem of leaning a ladder against the sod wall and possibly damaging or collapsing it.

THE WEST

The Bungalow

The bungalow is a very popular house type found primarily in the United States, although it was developed by the British during the Imperial Period in India. It takes its name from the “*bangla*,” which was the vernacular house in use in Bengal when the British first arrived there in the seventeenth century. The *bangla*, or *ben-gala*, was rectangular with wattle and daub walls, a raised floor for better cross ventilation, a thatched roof with wide overhanging eaves, and a wide front porch that sometimes extended around to all of the other sides of the house, which had a secondary roof of its own.

British Adaptation The *bangla* appealed to the British because it was easy to build and could be adapted to their lifestyle while still retaining its climatically sensitive features. To keep the central interior space open so that it could still be cross



Government Rest House from the days of the British rule. It is known as Bhoot Bangla (Ghost Bungalow). Courtesy of Gautam Dhar; Flickr

ventilated and remain cool, they appropriated part of the verandah space on its periphery for bedrooms and bathrooms, since these would be used primarily during the cooler periods in the early morning and at night. They also kept the crawl space under the house for cross ventilation, and limited its height to one story, with a symmetrical plan, for ease of construction. The ceiling heights were maximized to promote airflow and openings were placed at the top of the walls, near the roof line, so that hot air could escape. The British also retained the customary use of two roofs, placing a flat one over the verandah and a slightly pitched gable or gambrel roof over the main part of the house itself. This depended on the status or rank of the occupant, since these were built for civil servants as well as military officers. These bungalows could be upgraded and began to take on classical pretensions, with porticos, colonnades, and *porte cocheres* added to the basic equation. More than just being elemental shelter, they were also used for entertaining, especially on the open verandah. Journals written by those stationed in India when the *Raj* was at its height, such as that of Lord Trevelyan when he served as secretary to the British resident of Mysore State in the 1930s, record a life of privilege and relaxation after exercise on the parade ground or the day in the office was over. It centered around the bungalow and the club, with its tennis courts, polo fields, and croquet cricket pitches. The residential areas, called the civil lines for nonmilitary personnel and the encampment for those who were military, were set distinctly apart from the area where the local people lived, creating a distinctive tripartite structure in a British colonial city. Both the civil lines and the encampment were organized behind walled compounds, with bungalows aligned along wide avenues that were used by horse-drawn carriages before the automobile was introduced and motorized vehicles afterward. In addition to the club, which was the social focal point outside the home, there were also public gardens with raised four-cornered platforms, called *Chabutra*, for sitting out in the cooler night air.

Each bungalow had servants' quarters and typically also had a number of kitchens, divided between those for the staff and a more elaborate one to serve the primary occupants. Each of these was located at the back of the house.

At the beginning of the Empire, housing was rather spartan and the inhabitants were usually bachelors, so furniture was limited to a dining table and chairs, a sofa, and lounge chairs in the large central room, and a bed, as well as rattan chairs, on the verandah. But as the *Raj* became more established and entire families started to occupy the houses for extended periods of time, they were more amply furnished, and the interiors included luxuries such as chandeliers, mirrors, and carpets.⁴¹

The British retained the idea of raising the floor of the house at least two feet above the ground to promote ventilation and to prevent snakes, rodents, and insects from getting inside. This also kept the house dry during the monsoon rains. But they substantially changed the materials used for the walls and roof. They first excavated a deep trench for a foundation of small stones on the bottom, for drainage, followed by large blocks laid up with mortar extending up far enough to provide a sill for the floor and brick walls above. This level could be as high as four or five feet above the ground. The brick walls that replaced the *bangla* mud walls used earlier were fired for more than two weeks. Those walls were covered with stucco and frequently washed with colors, such as red oxide or beige. Classic

columns were added later, and the builders preferred the Doric order because it was easier to carve, as were parapets, to conceal the sloping gable roof.

The roofs of the British bungalows were framed using teak girders and joists, and teak was also used for the floors. Teak was imported from Myanmar, which was then Burma, also occupied by the British at the height of the Empire. Roof rafters were exposed and were covered with tile. Windows were simply openings in the wall covered by shutters until glass became available, and when it did, a fanlight was sometimes added over the front door. The verandah was often fitted with a large cloth panel in a wooden frame that was hung from the ceiling and was pulled back and forth by a servant, as a fan to cool those sitting outside in the evening.

A Successful Transplant The route that the bungalows took, from its beginning as a house of British colonial officers and government officials in India to a popular residential type that was built throughout America between the turn of the century and the beginning of World War I, is difficult to trace. What can be said for certain, however, is that it followed the same trajectory as the growing popularity of the Arts and Crafts Movement that it came to symbolize. The name “Arts and Crafts” did not officially appear until 1888, when an exhibition society using the term as a prefix was formed to display the work of the members of the Art Workers’ Guild. This initiative was led by Walter Crane and W. A. S. Benson, and Guild member F. J. Coben-Sanderson proposed the name “the Arts and Craft Exhibition Society.”⁴²

The Arts Workers’ Guild, in turn, was based on the model of artistic collaboration provided by William Morris, who had established Morris, Marshall, Faulkner, and Company, which was founded in 1861 and later reorganized as Morris and Company in 1875, and was established to produce handmade products for the home that a working-class family could afford. Architects such as Richard Norman Shaw, Charles F. Annesley Voysey, Charles Rennie Mackintosh, and Edwin Lutyens in Britain, among many others, started to translate the Arts and Crafts sensibility, of providing a human alternative to machine production made possible by the Industrial Revolution, into residential form. Although each took a slightly different path, they shared a preference for vernacular precedents, natural materials, handcraft, and intimate scale, which is also essential to bungalow typology. Because of differences in lifestyle and climate, the bungalow was not imported intact from India to Britain, but can be identified in slightly altered form as the English cottage. The link to the United States may be found in the interest that several intrepid entrepreneurs took in the British Arts and Crafts idea and their skill in promoting it back in America after they had visited the leaders of the movements.

The American Connection Gustav Stickley, who was a furniture maker, was born in Wisconsin in 1858. He visited Britain in 1898, and met with C. R. Ashbee, C. A. Voysey, and several other Arts and Crafts luminaries. When he returned to America, he established a workshop similar to the Art Workers’ Guild in Eastwood, New York, first called United Crafts and then in 1900 changed to the Craftsman Workshops. In addition to making furniture, Stickley started publishing a magazine called *The Craftsmen* to promote Arts and Crafts ideals, as formulated by John Ruskin and William Morris, throughout the United States. The magazine

was published from 1901 until 1916. He also started to offer house plans for what he called the “Craftsman bungalow” in the magazine.⁴³

Elbert Hubbard followed in Stickley’s footsteps, visiting William Morris in 1894, several years before his death. Inspired by the Kelmscott Press, Hubbard started the Roycroft Press upon his return to America, named after seventeenth-century English bookbinders Samuel and Thomas Roycroft; from his house in East Aurora, New York. From this modest start, Hubbard expanded his publishing enterprise into the Roycroft Community, employing about 500 workers in making furniture, metal work, and leather goods, in addition to publications. Hubbard and his wife died when sailing on the *Lusitania*, which was sunk by a German submarine in 1915. But by then, both he and Stickley had already succeeded in popularizing the Arts and Crafts aesthetic and the bungalow typology that best represented it in the public consciousness.

Reasons for Success The bungalow was a great success because it offered an economical alternative to larger, more formal living arrangements of the times that depended upon domestic help to run and maintain them. Just prior to World War I, retail chains, such as Sears and Roebuck and Montgomery Ward, started to offer pattern books of bungalow plans and precut packages for delivery to the building site. The bungalow became associated with more a casual holiday lifestyle, possibly because of its initial exotic associations with British postings in India. It was especially popular in California, since many Americans looked at that state as a place of escape when they migrated there. This type of house was invariably compact and efficiently laid out on one floor, as its British colonial predecessors had been. A typical plan would include a front porch, which is the vestigial verandah, with a wide front door leading into a small entry vestibule. From there, the plan would usually be divided into bedrooms and bathrooms on one side, and a living room, dining room, and kitchen on the other with a fireplace prominently positioned as a focal point in the living area.⁴⁴

In a decided departure from the British model, however, the roof, which is almost always gabled, became a prominent feature of the American type, with deep overhanging eaves and exposed rafters, or brackets, used to emphasize an image of domesticity and shelter. The prevalence of natural materials also lends a feeling of warmth, and these, in addition to wood siding beams, rafters, and floors, extend to the cobblestones often used as a plinth base and brick used for the fireplace front and chimney.

In Los Angeles, the bungalow was the building block of several booster campaigns, used by the local Chamber of Commerce to attract new residents to the city from all over the United States. It is actually one of the earliest examples of the tract house, and it spread quickly because developers could select it from a catalog and have it delivered as a package and built inexpensively, using prefabricated pieces.

The Greene brothers, who designed such masterpieces as the Gamble House and the Blacker House in Pasadena, were undoubtedly a major force behind the propagation of the bungalow typology in California, even though their houses were far more handcrafted and custom made. Part of the appeal of the bungalow when it first appeared, in addition to the factors already mentioned, was that, in spite of its mass produced format, it also had enough handcraft in it to seem

custom-made. The style captured the essence of domesticity as well as the idea of independence, a single house on a sizable rectangular lot that subliminally conveyed the image of shelter with its protective overhanging roof and welcoming front porch. Even though it was prefabricated, it allowed builders just enough latitude to personalize it without compromising good value for the money. It gave each family the illusion of being part of the American dream, the sense of belonging to a community, and the feeling of being special.

The Pueblo, Santa Fe, New Mexico

In the southern part of the United States, where the native American tribes such as the Navajo developed a highly sophisticated form of stacked group housing in pueblos, a domestic tradition of individual houses later emerged and has endured. This tradition has overlaid the Native American construction techniques with those of subsequent invaders to create a distinctive type of house. The area around Santa Fe, New Mexico, has many examples of what are now referred to as pueblo adobes.

Recognizable Elements The features that make this housing type distinct are described in the following sections.

Adobe Because of the shortage of wood in this region, which is limited to short, snarled, *pinon* pines, earth has been the most popular material in the southwest because it is readily available and cheap. The Navajo used it in an ingenious way, by wetting it and then pouring it into formwork that was only about 3 feet high, letting each layer dry out before the next layer was added. The so-called “puddled” adobe was fast and relatively easy to use, compared to *terre pisé*, or rammed earth, which is also an ancient method and also involves formwork. As the name implies, rammed earth requires that laborers pound it into the forms as each layer is built. The puddling method, which involved pouring wet earth, rather than dry, into the forms, made the earth more homogeneous in consistency and contributed a smooth, even surface to the finished wall.

The Spanish contribution to this construction method was the introduction of the mud brick, made by using a wooden mold. This mold, which looks like a picture frame, is open on the top and bottom so that the brick can be left on the ground to dry as soon as the mold is pulled off. The size of the bricks, which typically weigh between 25 and 30 pounds, was governed by the weight that was comfortable for a laborer to lift, without the brick being in danger of breaking apart. One advantage of *adobe* brick over the puddling technique was that two layers of wall, or essentially two separate walls with a space, or cavity, between them, could be built instead of one, providing insulation from the excessively hot days and cold nights that are typical in this region. Sometimes straw was packed in this cavity to increase the insulation value of the construction. In time the term “double wall” became synonymous with a good, comfortable home.⁴⁵

In spite of the rectilinear form of the bricks, residents continued to prefer the wavy appearance and irregularity of the puddle *adobe* technique, and they battered the walls or made them wider at the bottom than on the top to achieve this bell-shaped look. The resulting walls are sometimes up to 4 feet thick.

Even in the most arid conditions, *adobe* must be coated to last, since the most minimal amount of moisture from a light snowfall to frost or the morning dew can weaken it. In the past, the women had this responsibility, using clay or lime wash to do so.

Again, because of the shortage of wood, windows were kept to a minimum, but this was not only because of the lack of material to make lintels and frames but also for defensive and environmental reasons. In the early days in this territory settlers were subject to raids by local tribes such as the Apaches and Comanches, so that their houses were built like small fortresses. The extreme heat and cold mentioned earlier was also a factor in the decision to reduce openings in the walls to an absolute minimum. Furniture was also built into the walls whenever possible, creating *banco*, or seating made of *adobe*, and *nicho*, or niches, which are arched openings used for shelving or for storage. Rather than being built at the end of a room, fireplaces were placed in the corner to also save material. These included a flat metal griddle for making tortillas.

Natural Materials The first sawmill in Santa Fe was built by the U.S. Army in 1850, and more lumber for house construction became available after that time. Another recognizable feature of southwest *pueblo adobe* architecture, in addition to the earth used for the walls, then became the wooden beams, or *vigas*, and joists, or *latillas*, used for the roof. These, in combination with the brick, tile, and flagstone flooring that started to become available from other areas of the country, meant that the house was entirely made from natural materials. Prior to the availability of these flooring materials, the earth was simply tamped down to make it very hard.

Courtyards The courtyard, or *placita*, is the third identifiable feature of the *pueblo adobe* house. It is a reminder that Santa Fe was part of the Spanish Empire in the Americas, located at its northmost point. The Spanish occupied the region in the early 1600s, and they met stiff resistance from the Native Americans in the region. Mexico gained independence from Spain in 1821, and New Mexico became a U.S. territory in 1846.⁴⁶ The Santa Fe trail as well as the railroad that connected the southwestern territories to the East Coast of the United States then made it possible for more modern construction materials such as nails, plate glass, tin sheeting, plaster, and wood for milling to be introduced there.

The courtyard, as a typology introduced by the Spanish, who in turn had inherited it from the Arabs during their tenure in the southern part of that country, has endured because it provides a solution to various environmental and social conditions. In a hot, arid climate such as that in Santa Fe, the nights are cool and can even be cold. The courtyard acts as a reservoir to contain that cool air, especially if it is planted, since the air is held in the surface areas of the blades of grass and leaves of the trees. Water, in the form of fountains also helps to cool the air, which can then radiate out and into the rooms surrounding the court. When more wood became available, it was possible to make bigger, double-hung windows with shutters facing the internal private courtyard side of the house. These could be shut during the hottest time of the day, from about 11:00 in the morning until the late afternoon. But if they were opened before that time, the cool air from the courtyard

would then enter the house by convection, as it heated, and could then be trapped inside the house when the windows and shutters were closed.

The increased availability of wood also made it possible to provide additional furniture throughout the house, including in the courtyard where *trasteros*, or outdoor furniture, began to appear. Local craftspeople started to produce a style of furniture unique to Santa Fe, including spindle style beds and daybeds, woven with rattan. Bedrooms were not distinct rooms in the old *pueblo adobe* houses, where people slept on the floor of the main room of the house on cotton mattresses stuffed with raw wool or straw and rolled these mats up during the day. They were placed against the wall and were used as seating until being unrolled again at night. As the material to make beds became available, separate bedrooms were added to the plan of the house.

Ladders and Stairs Yet another distinguishing feature of the Santa Fe *pueblo adobe* house is the type of roof it has. The Navajo *pueblos*, which are the direct architectural ancestors of these houses, had no doorways, but had an opening in the roof that provided access into each dwelling unit instead, for reasons of security. The residents used ladders to get in and out of their houses, and these ladders could be pulled in behind them after a hatch that covered the opening in the roof was closed. This habit of using ladders transferred directly to the *pueblo adobe* house, in its original form, also for security reasons. But there was another reason for their use, as well.

Heat Gain and Thermal Mass When the pueblos were built collectively by the Anasazi and the Navajo, their clustered configuration helped to keep the extreme heat at bay, due to the thickness of the walls and the use of the outer units for storage to act as a buffer to the heat. This technique of using party walls and a floor plan with little wasted open space as a defense against heat and cold is as old as human habitation itself, as can be seen in the example of the Neolithic settlement of Çatal Hüyük, which is discussed in Volume I of this set. But, once people started to live in freestanding dwellings, the advantage of clustering was obviously lost. No matter how thick the *adobe* walls were, how many layers of brick were used, how wide the cavity between them was, what kind of insulation was used, or how minimal the openings were, heat would penetrate into the interior by the end of the day.

Adobe has excellent thermal performance, being able to hold back the amount of heat coming through the wall far longer than other materials, giving it a quality that is referred to as high thermal mass. But, this also gives it the less desirable characteristic of thermal lag, meaning that, even though heat transmission is slowed down, it is just deferred until later in the day. This leads to the paradox of the interior of an adobe house beginning to heat up just as the sun begins to set, and becoming like an oven several hours afterward. One solution to combat this is to sleep outdoors, and in the early part of the evolution of this house, this meant the roof, which was accessible by ladder. When windows and shutters became available, as well as proper beds, the cool evening air in the courtyard was able to offset the heat gain through the *adobe* walls in the evening, making it possible to sleep in a bedroom inside.

CENTRAL AND SOUTH AMERICA: BRAZIL

Rural Plantations in Brazil

Portugal started exploring the coast of Brazil in the late fourteenth century and officially established a colony there in 1535. They divided it into what they termed “captaincies,” which were districts where each had its own administrator. These later became provinces. The first major economic resource for the new colony was sugar, and the main concentration of sugar cane fields was in Pernambuco and Bahia. Problems in the captaincy of Bahia led to the revocation of the power of the local administrator, and a governor general was installed in 1549. This, in turn, led to the founding of São Salvador de Bahia de Todos Santos, or Salvador soon afterward. It was then designated as the capital of the entire colony, which it was to remain until 1763, when the capital was moved to Rio de Janeiro. The last half of the sixteenth century was thus a tumultuous one for the fledging colony, and the vicissitudes of its political and economic fortunes are clearly reflected in the homes of those who were in the forefront of changing events.

Sugar Plantations The huge profits that the production of sugar generated because of European demand for the Brazilian variety were a powerful incentive for the colonial administration to maintain harmony between the major sugar-producing areas and the other captaincies through the enforcement of laws and the maintenance of a strong military authority. The shortage of enough indigenous laborers to harvest the sugar cane also led to the introduction of slaves into Brazil in the 1550s, in order to meet demand. By 1558, when Governor General Murilo Mendes took office, the cycle of planting, harvesting, and refining sugar was well established, and his tenure, which lasted until 1572, helped establish it as an institution in both Bahia and Pernambuco that lasted until 1620. He helped strengthen the sugar cane-based economy by organizing the distribution of land grants, so that, by the time he left office, there were more than 100 large plantations in the first sugar-producing region. The grantees were viewed as being in partnership with the Governor General and by extension with the Portuguese government, in an early version of a *quango*. In 1581, this arrangement was altered slightly when Portugal united with Spain, and Philip II took control of the sugar trade from Brazil. To increase profits, the Portuguese and the Spanish tried to exclude the Dutch from trading in sugar in Spanish ports, but this embargo was ill-considered. Dutch merchant ships controlled trade throughout Europe at this time, and Holland declared they were against Spain in large part because they were excluded from trading in Brazilian sugar.⁴⁷ They also invaded Bahia in 1624 for the same reason, but were repelled. They then turned their attention to Pernambuco, and from 1630 to 1654 devastated the region. One historian has described the destruction by saying:

Attacked by land and sea in long and countless clashes, the captaincies saw their cities and towns occupied, their cane fields destroyed, their sugar mills burned, and their stores captured. They suffered the flight of plantation workers, a lack of transport, a loss of harvests.⁴⁸

The Dutch then occupied Pernambuco, making Prince Maurice of Nassau-Siegen the administrator of Dutch Brazil, but the damage was done and production

decreased. Brazilian sugar had dominated the European market when the Dutch invasion started in 1630, accounting for 80 percent of it, and this fell to only 10 percent by 1700. This rapid decline combined with the incremental deforestation that had taken place due to the need for firewood to feed the steam engines that refined the sugar left the region in ruins.⁴⁹

The Dutch took what they had learned of Brazilian production methods and established new plantations in their Caribbean colonies, and a way of life that had supported and had been fostered by the sugar economy was over, at least in Pernambuco. That way of life had centered around a new agrarian aristocracy that lived a self-sufficient lifestyle similar to that of the *hacienda* owners in Mexico and those of the plantations of the southern states in America described elsewhere here. What is interesting, in comparing these three, similar kinds of houses, is that the livestock dominated the economy in Mexico as cotton did in the American South, but the house forms are remarkably similar. The difference in the case of the sugar plantation was the need for a mill to refine the cane and larger storage facilities to hold it. Other than that, the typology is much the same, beginning with the “great house” that was the focal point of the entire complex. If the grantee was rich, it would have been two or more stories high, and either it or the wall that typically surrounded the production and residential center of the plantation would have had a watchtower or two. There was always a chapel, as well, which was either attached to the house or built very close to it, and, depending upon the wealth of the family, this sometimes resembled a small church.

Gold and diamonds were discovered near what is now Minas Gerais in the middle of the eighteenth century and Rio de Janeiro and San Paulo became centers of a gold rush. Rio replaced Salvador as the capital of the colony in 1763, and as the mines began to play out, sugar cane was planted to fill the economic gap. In a shift of fortune, shipping from the Netherlands Antilles was interrupted at the end of the eighteenth century because of naval battles between Britain and France in the Caribbean, giving a boost to the revival of the Brazilian sugar trade.⁵⁰ During this second phase of sugar wealth, the nobility that it created were much more sophisticated in their tastes, with members of their families attending the best schools in Europe, and their estates were far less isolated and self-sufficient. They also imported construction material, furniture, and fittings for their houses, as well as the latest equipment for their plantations, giving the homes of this second stage of development a far more refined appearance than their rustic predecessors. The one-story plantation houses of the past, which had a veranda on the front, were replaced with two-, three-, or even four-story mansions, which adopted that latest European style, preferably Portuguese Baroque, at this time. They typically were either square or rectangular with a courtyard in the center.⁵¹ Rather than the simpler materials, such as wood or adobe that had been predominantly used during the first phase of sugar wealth when Salvador was the capital, the landowners in this second phase, centered around the new capital of Rio de Janeiro, favored thick stone walls instead.

But this cycle also came to an end with the introduction into the market of beet sugar and other varieties of cane sugar from outside Brazil. Attention shifted once again, this time to coffee.

Coffee Plantations The Portuguese had tried to grow coffee in the northeastern part of Brazil since the middle of the eighteenth century with little success, but when it was planted in the Tijuca Mountains near Rio de Janeiro, they found that the combination of the type of soil there and the climate were just right.⁵² But problems with land management led to relocation of the planted areas to other parts of the area. Brazil became independent in 1822, and the new government followed the example of its colonial predecessor in giving land grants to those who wished to establish coffee plantations. By the mid-1840s production from hundreds of new plantations was booming, but still, unfortunately, was as dependant on slave labor to harvest the beans as the sugar plantations had been on it to cut the cane. Once again, a new agrarian aristocracy arose, based on titles, such as baron, count, and marquise, that were bestowed by the government upon successful plantation owners.

As had been the case in the initial phase of the sugar boom, the plantation houses built during the beginning of the coffee economy were also simple, but within a short period of time they started to resemble those built during the second phase of sugar prosperity near Rio de Janeiro. The style in favor in Europe during this cycle was Neoclassicism rather than Baroque, which was more accurately rendered in wood rather than stone, with finely detailed joinery.

The coffee plantation in general had a large open courtyard, called a *terreiro*, in the center for drying coffee beans, which is what distinguished this type of complex from the sugar plantations, the *hacienda*, and the cotton plantations of the American South. This dominant open space was generally flanked on all four sides by the great house or *casa grande*, which took pride of place on one of them, and the working, living, and storage buildings on the other three, which included the *senzalas*, or living quarters, for the slaves. Washing the beans before they were dried was an important part of the process, and so these plantations also had an intricate system of stone water channels and pools to do this. These were often intricately carved, rather than just being considered as a utilitarian necessity. Wrought iron was also used extensively for balconies and gates.

Much of the interior design involved imported items from Europe, or even Asia, as were household items such as silverware and china. These included wallpaper, draperies, and carpets.⁵³

Plantation owners were so wealthy that they also often built second “town” houses in cities throughout the Paraiha Valley, with a preference for Vassouras, which was granted the status of being a city in 1857, largely due to its changed economic fortunes and growing population. But, this designation also coincided with the beginning of yet another change of fortune for the young nation, as the repercussions of the abolition of slavery in 1888 began to be felt. This, combined with the erosion of the fertile topsoil that the coffee trees needed due to clear cutting and an epidemic that started to kill them in the 1860s, led to the end of another era.

The Flowers of Paradise The *Flores do Paraíso* plantation, which was built near the town of Rio das Flores just before the coffee bubble burst, is one of the few remaining plantations that still survive after a century and a half of deterioration and neglect. The first owner, João Pedro Maynard da Fonseca e Sá, cleared the land, bordered by the Preto River to the north and the Paraíba do Sul River to

the south, in 1810, but it was sold after his death to Domingos Custódio Guimarães, Viscount of Rio Preto, who owned it from 1836 until his death in 1866.⁵⁴

The *Casa Grande* that the Viscount built on the plantation, with his contractor Mariano Procópio Ferreira Lage, was a two-story Neoclassical mansion, with a chapel and choir loft occupying one whole side of the house and storage facilities relegated to the other end, rather than being put in a basement as they were in many other great houses at the time. It had the equivalent of a *piano nobile*, or public reception room, at the top of a monumental staircase. Private family quarters were on the second floor. A long wide esplanade flanked by royal palms from the ornate iron gateway to the entrance of the great house conveyed a dignified impression.

In spite of its Neoclassical overtones, *Flores do Paraíso* also displays evidence of its colonial heritage, creating an interesting architectural dialogue between imported and local cultures. The colonial *fazenda*, or rural farm, comes through in the wide plank floorboards and clay tile roof, coexisting quite easily with elegant columns, elongated windows, and a grand staircase.

MEXICO

The Mexican Hacienda

Before the conquistadors arrived in Mesoamerica in the sixteenth century, land use in the Aztec Kingdom, in what is now Mexico, was based on rank and privilege. The nobility, or *pillis*, took precedence over everyone else except the emperor. When the Spanish replaced this empire, their goal, of what has been described as “agrarian exploitation,” was greatly facilitated by this preexisting system of exclusive ownership.⁵⁵ The difference between the Spanish and their Aztec predecessors, however, was one of economic intention, since the Spanish were primarily interested in the generation of wealth through the mining of gold and silver. This required a large labor force and the supplies needed to feed them, as well as an efficient means of transporting these precious metals to the coast and shipping them back to Spain. Land holdings under the Aztecs had been predominantly located near water, so that they could be easily irrigated.⁵⁶ But the scale of the colonial mining operations, primarily in Guanajuato, Zacatecas, and Pachuca, required agricultural production of an entirely different level of magnitude to support it. The large expanses of semiarid land between the areas around the rivers and lakes that the Aztecs had favored were not suitable for farming, but could support livestock.

Land Grants As both a reward for military service during the conquest, and as a means of implementing this need for agricultural production, the Spanish government issued *repartimientos* and *encomiendas*, which were land grants that varied in size, from thousands of acres to small villages, but also included the right to conscript labor from the original inhabitants of the land.⁵⁷ These were reinforced by *cédulas*, or concessions, that were passed in 1529, which more specifically prescribed the laws regarding labor, in an evolving colonial system.

The Hacienda As the Spanish colonial society in Mexico began to evolve from conversion to production, the focus shifted from proselytizing to developing an efficient method of extracting raw materials and shipping or selling them, as well as the development of systems that would support their extraction. Power moved

to the mine owners and merchants, and the owners of agricultural estates, the *estancias* and *haciendas*. As it was in America, when British colonists brought their own horticultural patterns with them and transplanted them in the New World, the Mexican landscape was completely transformed within a century of the Spanish invasion. This change has been succinctly described as being one of a land that “ceased to be an Indian countryside and became a *mestizo* countryside, in which different ethnic groups created a new population and new ways of life.”⁵⁸ The *estancias* and *haciendas* were the lynchpins of this lifestyle, the crucial link in the chain of “agricultural colonization” that was being developed by the Spanish government.⁵⁹

The *estancias* were more of a legal than a physical entity, as large tracts of land retained by individual property rights contingent upon the use of the land for raising and grazing livestock. The *hacienda*, on the other hand, was like a microcosmic city built by a rancher to include the main house for himself and his family as well as the living quarters for all of those who were needed to look after the herds of cattle kept there. Like a small village, it had, in addition to its houses, a chapel, a major plaza as well as several minor



Gogorron Hacienda. Courtesy of Héctor Hugo Rangel López; Flickr

ones, production and storage areas, streets joining all these areas, and gardens. In economic terms, the *hacienda* was a unit of production and as such was intended to be self-sufficient. The position in the social power structure that ownership of a *hacienda* offered actually seemed to be more of an incentive to own one than the income that it generated, which was generally marginal.⁶⁰

The Pieces of the Puzzle The *hacienda*, then, was more than simply a house and has been described as “a work place, a residence, a place of leisure, and of religion. This union of human endeavor, in an institution where landowners and employees coexisted in a closed and self sufficient world, had as its primary stage, the compound.”⁶¹ In this sense, it was similar to the ranches still found just north of the Mexican-American border, in Texas, and the huge sugar plantations in Brazil, described elsewhere in this volume. As is the case in those plantations, which fall into the same category as an agrarian instrument of colonial production, the heart

of the *hacienda* was the *Casa Grande* or big house. More than just a place for the owner and his family to live, the *Casa Grande* represented the power of the entire hierarchical system of which it was a part and the owner's place in that system. Consequently, it had to be impressive, and it and everything in it had to be larger than life. It also had to be exclusive, so that zones of privacy had to be well established and assiduously maintained around it. No surprise, then, that the *Casa Grande* was the first, but not necessarily the largest, structure that visitors were confronted with upon approaching the *hacienda* compound. This compound was walled or not, depending upon what else might be produced there, other than livestock. The chapel, as a second appropriate symbol of the close relationship between church and state, was typically larger than the *Casa Grande* and was placed near it, as if to maintain an appropriate sense of metaphysical as well as volumetric equilibrium between religion and production. If there was a wall around the compound, there was also a large entrance gate, called the *Puerto de Campo*, leading into it. Otherwise, the various buildings would be organized around the perimeter of the *hacienda* with blank sides facing outside to create a wall, surrounding a large internal plaza or *Patio de Campo*.⁶² The *Casa Grande* had an equally confrontational, if less imposing relationship with the houses of the workers and their families. Privacy for the residents of the main house was created by using an open portico, or arcade, called a *zaguán*, as a layer between the owner and his family and the rest of the compound.

These two space-planning devices, the *Patio de Campo* and the *zaguán*, were typically not utilized just once, but were often repeated at various scales as a way of ordering the entire compound. This characteristic of open spaces and arcades, each aligned according to its own system of internal symmetry, used as a hierarchical organizational system, has been compared to similar arrangements built by the Arab occupiers of Andalusia, such as that used in the Alhambra.

The possibility of a straight line of influence, from Arab Muslim residential design in Andalusia through to the Spanish after the *reconquista*, and then through the Spanish conquistadors to the Mexican *hacienda* builders, is intriguing. It demonstrates the power of cultural memory and suggests that this subconscious recollection transcends religion and its related laws and customs. It is also related to equally important issues, such as the separation of public and private realms and ways of dealing with environmental extremes. Similar parallels also exist between Islamic residential architecture and the earliest Florentine Palazzi, built at the beginning of the Renaissance, and these underscore this transcendental phenomenon. These cultures shared a similar concern about family privacy, and also wanted to be as comfortable as possible in a climate that is very hot for much of the year. Unlike the Florentine Palazzo type, however, the *hacienda* typically has more than one courtyard, so it also has more than one arcade. It is the axial organization of each of these, within an overall framework, best described as one of asymmetrical symmetry, that makes it even more identifiable as part of the Arab Muslim heritage of Andalusia.⁶³

Details Further evidence of this Islamic heritage may also be found in a range of details that can be seen in the *hacienda*. The first is the *zaguán*, which functions like the Arab *iwan*, in being an arcaded portico open on one side. In some cases these

were large enough to allow people on horseback or in carriages to enter them, with the purpose of making them dismount or get out of their carriages there and continue on foot. This is reminiscent of the *ziyada* of mosques such as Ibn Tulun in Cairo, where horses were tethered by riders who then went through a gate into the larger courtyard to wash and pray.

A second architectural element shared by these two cultures is the use of a tower near the place of worship. One good example of its use in a *hacienda* is the bell tower next to the chapel of Cienega de Mata, which telescopes elegantly upward in four distinct, increasingly narrower and shorter faceted segments with tall arched openings on each side. This bell tower, which is typical of many others like it announcing the start of services as well as special feast days and celebrations held throughout the Catholic and family calendar, is reminiscent of the *minaret* of the Great Mosque of Cordova, which was converted into a bell tower after the *reconquista*. The *minaret* also has segmented stages, as a refinement on a similar compositional technique used throughout the Umayyad and Abbasid Kingdoms during the early phase of Islam. Instead of a bell, the *minaret* is used by a person called a *muezzin* who gives out the call to prayer from the top at specifically proscribed intervals five times a day.

Another seemingly innocuous, but actually very significant, similarity between the Andalusian Arab house or palace and the Mexican *hacienda* is the use of benches in each. In each case these provided an intermediary means of meeting strangers or visitors in a semipublic area of the compound without allowing them to compromise the privacy of the *Casa Grande* and the family within. This strategy was also adopted by the *palazzo* builders of Florence, who cleverly elevated the concept to serve a political purpose. Their architects designed stone benches that were a permanent part of the lower, usually rusticated, exterior wall. They were meant to be used as street furniture by the public, who would then conceivably be so grateful for this kindness shown by the rich and powerful owner of the *palazzo* that they would not envy and resent their wealth and join a revolution against them.

The final similarity between the Islamic house in Spain and the Mexican *hacienda* is the sense of progression up to, into, and through the residential complex. One observer of this similarity has described the Arab-Islamic residence in Spain as having “alternative varieties of passageways and patios, with their corresponding effects of light and color. Their gradation tends to be: entrance work patio, passageway, principal patio, house of the proprietor, and garden.”⁶⁴ He could just as easily have been describing the general layout of a *hacienda*, and it almost sounds as if he is, since he has substituted the word patio for courtyard, or *meydan*, and “house of the proprietor” for *beyt al-raïs*.

A World Unto Itself The landowner and his large extended family, along with all of his dependant employees, lived out their entire lives within the social system that the *hacienda* proscribed. As such, it is a perfect case study of the way in which residential architecture is both the result of the socioeconomic forces that produce it and a catalyst in helping to determine how those forces operate. It is the perfect three-dimensional representation of a way of life that evolved for specific reasons in a specific context. It also has clearly traceable antecedents from another culture that developed in similar ways for similar reasons. These huge compounds, with their functionally symbolic pairing of chapel and *Casa Grande*, as well as houses

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for workers, *tinacales*, or granaries, for feeding cattle and horses, stables, corrals, workshops, and a multitude of other buildings needed to support the business of processing livestock, were a world unto themselves.

The *Casa Grande* itself, in spite of its scale, was as utilitarian as the rest of the compound with the exception of the formal reception room and the dining room and kitchen complex. The dining room used by the owner's family and kitchen that served it were usually located on the first floor if the *Casa Grande* was higher than one story, providing a feeling of being removed from the world of work below. And the kitchen, with its various open fireplaces for spit roasting meat and stoves, was one of the most festively decorated spaces in the house.

Africa

MOROCCO

North African Vernacular Houses in Algeria, Morocco, and Tunisia

The vernacular architecture that has developed in North Africa in response to the unique climactic and topographical conditions that exist there is as different as those microclimates. The area is huge. The Mediterranean coastline from the Straits of Gibraltar to Tunisia is more than a thousand miles long.¹ Because of the ocean breeze and changes of elevation along its length, this coastal region can vary from subtropical to semiarid. The Atlantic coast of Morocco is temperate enough to support agriculture on a large scale since the Atlas Mountains act as a protective barrier along the eastern and southern borders of the country. South of that is the Sahara, which is not as uniformly sandy as is generally thought, since it also has flat rocky outcroppings and salt flats.

The Magreb The Arabs who brought Islam to the area in the middle of the seventh century named it the *Magreb*, but they were not the first ones to settle there. Berbers are the indigenous inhabitants of the entire region, even predating the Phoenicians, who became the Carthaginians and ruled from Tunis, and the Romans, who set up large *latifundia* there after Carthage was destroyed. The Berbers themselves are not unified, falling into three subgroups called the Masmuda, the Sanhaja, and the Zanata.²

The Berbers When the Arabs arrived, about A.D. 680, these subgroups were further subdivided into smaller tribes who lived in a variety of shelters, from tents to tower houses made of mud brick in fortified villages, based on the degree of nomadism that they practiced. Those who did not rely on farming migrated, and still do move, from the lowlands to the highlands of the Atlas Mountains during the summer to find areas for grazing their sheep and goats in the cooler plateaus. They move downward when the weather permits. Their shelter while they are on the move is the tent, which is similar to the Bedouin tents found in Egypt and Saudi Arabia: It differs in being made primarily of wool from sheep or goats rather than

camels, but has the same structure and purpose, refined over thousands of years of use. It is perfectly adapted to nomadic life, since it can be broken down into separate parts and then folded or rolled to be transported on pack animals. The main cover, when it is finally sewn together and erected, is a long, narrow, rectilinear woolen cover, held up by tent poles or a wooden frame running across the narrow way and at the middle, and stretched out by ropes at the ends and corners that are connected to pegs driven into the ground. The responsibility of making and maintaining the tent, as well as directing its construction and breaking down before moving belonged to the women of the tribe.³

The Kasbah The Berbers who were not nomads and made their living by farming, as conditions permitted, lived in walled towns, called *ksour*, fortified against invasion by rival clans or others. These walls, like the tower houses inside them, were usually made of *terre pisé*, rammed earth, of stone if it was available, or of a combination of the two. *Terre pisé* requires a wooden formwork and several large mallets, and is an ancient technique of wall building that has been discovered in settlements that go back to the beginning of the agrarian revolution around 4000 B.C., throughout West Asia and China. The formwork, which is about one meter wide, is first set up on either side of the wall that is to be built, at the distance apart desired for its thickness, and then supported by diagonal bracing on the outside. Earth mixed with straw and cow, camel, sheep, or goat dung is put inside and tamped down in layers. The bottom layer is left to dry before the formwork is dismantled, moved up, and resecured, so that the next layer can be poured in. The lines that are caused by this incremental elevation of the one meter wide formwork are usually removed with a metal edge, but in some cases, as in Najran, in the southern part of Saudi Arabia, or in Sana'a, in northern Yemen, this joint is intentionally accentuated and the bottom of the top layer is slightly rolled over the top of the last. Inside these walled enclosures families live in individually fortified houses called *kasbah* in the north. In the south this name refers to a tower.⁴ These towers are typically rectangular in plan and have thick mud walls that taper inward as they go higher. They are still used in many parts of the south, but, like the tall tower houses in Yemen that they resemble, they are being abandoned for new concrete block low-rise replacements. The tops of the *kasbah* had crenellations, which were usually made as a series of triangles ending in points at the corners, that are a reminder that conflict was a daily reality for the inhabitants of these towns. However, it has always been so since the Berbers started building them, as they had to defend themselves against one invader after another.

When the Arabs invaded, they adopted the Berber house forms to their own use.⁵ They then layered the conventions of Islamic residential construction over this to create a hybrid type of house that conformed to them. Paramount among all of these was the need for privacy, which was not as important to some of the Berber tribes. Walls became more prominent, turning a blank face to the world. Another prominent change was the introduction of the mosque into the fabric of village life; actually, more than one, since each neighborhood had one as well as a large *juma'a* mosque for the entire village. *Suqs* also became a more central part of village life, although the Berbers also had outdoor markets. As walled sections

of villages expanded in the northern part of Morocco, these *kasbah* became *ksour* in their own right, sometimes identified with a single tribe.⁶

Algeria In Algeria, to the east of Morocco along the Mediterranean coast there are three regions that each have a different vernacular domestic architecture. These are like strips running in the same direction as the coast, starting with their mountainous zone along the water, followed by a dry plateau, and then the Sahara in the interior.⁷ The houses in each of these distinctly different microclimates are direct translations of the environmental characteristics of each of these zones. The houses in the coastal zone consist of mud brick walled rooms clustered around a central courtyard, to take advantage of the cool breezes and sunlight. Further south, the houses become more enclosed, with thick stonewalls and heavy sod or clay tile roofs. Stones are more frequently used as a building material because they are more readily available in the high plateaus.

The Kabyle House The Kabyle, who are a Berber tribe that have been immortalized by Pierre Bourdieu's classic article, live in such houses. Bourdieu has set the standard by which all other architectural anthropology must be judged, since he has performed such a memorable excavation of meaning. He extracts it from the daily activities of the inhabitants and the way in which the form and the structure of the Kabyle house describe social and cultural patterns.⁸ The house that Bourdieu describes is part of a village that occupies the top of an entire hill, with a mosque in the middle. The houses are generally rectangular and are sometimes placed perpendicular to the slope. In addition to the individual houses and the mosque, the village also has shops and a meeting house, set aside for men only. The houses vary in size, from 3 meters wide by 5 meters long to 5 meters by 10 meters, with stone walls that are 1/2 meter thick. These are clustered around family courtyards, based on patrilineal ties, so that an entire extended family can inhabit one cluster.

A typical house, as described by Bourdieu, has two rooms with the smaller one being two-thirds the size of the larger one. They are separated by a stone wall that is as thick as the exterior walls, which does not go all the way to the roof and has alcoves in it for storage. A second, wooden structure is built inside the walls to hold up the roof beams. There are three of these columns, placed in a row with an equal space between them at each end of the house, and one column, placed in the middle, beside the partition wall to help support the ridge girder. This central column is given a name by the family, reflective of the woman of the household, and the ridge girder is also given one that is symbolic of her husband. The partition separates the animals, which are kept inside for security reasons, in the smaller of the two areas, to the left of the front door, while the family lives in the larger section to the right. The stable area is 50 cm lower than the family area and has a loft above it where hay and straw for their food and bedding is kept. This also serves as the bedroom for the family. A fire pit is dug into the floor of the family area near the gable end, and pots are supported on stones above it. There is no chimney in the roof, so smoke from the cooking fire slowly escapes from vents under the eaves and in the gable ends, making the interior very smoky, similar to *minka* houses in Japan, where chimneys are avoided because they let in cold air. The front door faces east. There is a second door on the opposite long wall, leading to a garden. The Berbers have few material possessions, and so they designate a specific place

in the house for each of those that they do have, such as the weaving loom, the water jar, and the storage vessels that hold the grain that they use to make bread. Each of these also then takes on symbolic meaning, which Bourdieu was able to convey in such an insightful and poetic way.

The loom symbolizes protection, and it is placed parallel to the long back wall of the house in the family section, which is called the loom wall. The woman of the house spends a great deal of time at the loom, facing this wall and this, along with the garden, the cooking fire, and the sleeping loft circumscribe her world. So she is equated with protection of the house, procreation, fertility, and sustenance. Bourdieu, and those who interpret him, point to the loom wall as a clear example of the overlapping of sociosymbolic and functional purpose in parts of the vernacular house.⁹ Bourdieu also configures these sociosymbolic aspects in terms of male and female oppositions, with the woman being allocated the dark interior spaces of the house, which he associates with the mysteries of conception and birth.

There are also rituals associated with the construction of the house, just as there are in a majority of the cases in which vernacular architecture is concerned. These rituals involve ceremonies that are performed at various stages. The most important of these is the cutting, carrying, and placing of the logs that make up the inner wooden structure that carries the roof. All of the men of the village participate in this task, while the women receive them with ululations and then prepare food for them when the work is finished. There are also other rituals, related to entering the house and related to its symbolic values as a sacred vessel of fertility. The location of each of the walls of the house is also symbolic. The eastern wall, where the main entrance, the threshold, is located, faces the rising sun; its shining through the door also reaches the back wall where the loom is located, so it is called the wall of light. This inversion continues around the perimeter of the interior of the house, so that the north wall where the fireplace is located in the family area is associated with the characteristics of the south, which it faces, and of summer, and the opposite wall, where the stables are located, is associated with darkness and the winter.¹⁰

TANZANIA

Kilwa, Husuni Kubwa, Tanzania

Kilwa is a small island off the coast of Tanzania. It is one of many islands in the area around Masoko Bay, which has azure blue water, mangrove forests along the coasts, and an extensive thriving coral reef. Kilwa is unusual among the rest of the island around it because it is one of the largest and best preserved archaeological groupings of precolonial ruins in Africa, known as Kilwa Kiswani.

Kilwa was first settled in the eighth century, and the population grew to the extent that settlement spilled over onto the coast, where the ruins today are called Kilwa Kivinje and Kilwa Mosoko. Shortly after the *Hejira*, a Muslim army, led by General Amir Ibn al-As, entered Egypt and established an encampment called Al-Fustat near the Nile and built a mosque in 639. From this foothold in Africa, Islam quickly spread south into Nubia and west across the Mediterranean coast, but there had already been substantial contact in those areas with Muslim traders. In 969, a Shiite army, led by Sheik Al-Muizz and his general, Gawhar, moved across the

Mediterranean coast from Tunisia toward Al-Fustat, conquering it and establishing a new city nearby. They named it *Al Qabira*, which means “the Victorious” and is now modern day Cairo.

Islam spread quickly throughout Africa during this time, and numerous early mosques have been discovered as far south as Kenya. Kilwa was part of this Islamic expansion, one of many port cities, such as Lamu and Zanzibar, that were established along the eastern coast of Africa to help consolidate trade routes and commercial networks that were already well established, and to fortify them against attack. In addition to three port cities, there were many others that grew up a few miles inland as market towns, supporting the trade network that was rapidly developing. Islam provided a stabilizing influence where it spread, encouraging literacy through the reading of the Koran and the homogenization of local or tribal differences.

Swahili This unifying effect, fed by conversion, led to a distinctly different culture, with its own language and customs, called Swahili. It represents the mixture of indigenous east Africans with non-African Muslims. “Swahili,” in Arabic, means “coast dweller,” and Kilwa was a focal point of this rich cultural mixture from the twelfth century until it fell to the Portuguese in the sixteenth century. In addition to linguistic, religious, and social identity, Swahili communities along the east African coast were also notable for their divergence from the typical structure of an Islamic settlement, in their ability to adapt to local conditions. They were not heavily fortified, since attacks, when they did occur, were more sporadic and did not involve protracted sieges. Marketplaces did not have the same organization and structure as *sugs* elsewhere in the Islamic diaspora. They also did not have *ham-mams*, or bathhouses, due to the high humidity that is typical in the region.

The Husuni Kubwa The first fortress palace on Kilwa was built by a local Muslim ruler, Ali Bin al-Hasan in the ninth century as a sign of the strategic economic and military importance of the island. It was then the terminus of major trade routes coming out of the interior of Africa and one of the most active parts on the east coast, trading with the Arab world to the north and west. It is the ruins of this fortress-residence that are so important today, because they are well preserved and help historians and archaeologists understand what life was like in this diverse, economically thriving area. It has remained virtually untouched since it was captured by the Portuguese, more than 400 years ago. This is remarkable, since the main material used was mud brick, but builders also used *juss*, or coral rock, as well as mangrove wood, for roof beams, covered with thatch. The average height of the mangrove forest was 10 to 12 feet, so this was a limiting factor for the width of the rooms throughout the Husuni Kubwa, giving it a characteristically linear form. Mud brick domes were also used, presumably following a technique developed by the Nubians in what is now northern Sudan and southern Egypt, which allows them to build domes and vaults without any centering or supports. This ancient method, described in detail in Volume I of this series, involves making the outline of a parabolic arch on a vertical brick wall in wet mud and then building a vault outward from it that inclines toward the wall, being thinner at the top than it is at the base to stay in compression. To build a dome, four of these vaults are built, with one in each of the cardinal directions, so that a hemispherical structure can then be erected in the middle, using the same technique.

Kilwa and Husuni Kubwa are recorded as having more domes and barrel vaults than any other Swahili town or village in the region. The *juma'a* mosque, or Husuni Kubwa, from which the palace fortress takes its name, had a large dome, and it is tempting to think that this name is also derived from or is a corruption of the Arabic word “*qubba*,” which means “dome.” *Husuni* means “fortified enclosure.” Because of the topography of a steep hill running from the southwest to the northeast on the site where the palace was built, it is also oriented in this direction, strung out along the top of a cliff as a series of five main structures grouped around courtyards of various sizes. The *juma'a* mosque and a smaller one, the *Husuni Ndogo*, take pride of place in the middle of this linear sequence, with their *qibla* direction aligned with its central axis. This coincidence is too auspicious to be an accident of chance. It seems obvious that the site was chosen because it allowed the axis of the *juma'a* mosque, which is typically the first structure built in an Islamic settlement of any size, to match the direction toward Makkah, and the fact that the cliff at its edge, which offered security, was aligned in that direction contributed to its selection. Aligning the various segments of the palace along this axis also allowed the central courtyards to be shaded for most of the day, since long buildings on the eastern and western edges cast shadows on their half of the court as the sun rose and set behind them. This provided a third benefit from siting the fortress palace along the diagonal line of the steep cliff.

The original fortress, built by Ali Bin al-Hasan was enlarged in the thirteenth century. Because of the destruction of Baghdad by a Mongol army in 1258, and the collapse of the Abbasid Caliphate, the center of power in the Islamic world shifted to Africa in general, and specifically to Egypt, because the Mamluks stopped the Mongol advance at the Battle of Ain Jalut. This, along with the fall of Constantinople to the Ottomans in 1453, made Cairo a safe haven for people of all races and religions, especially attracting scholars, merchants, and artisans. This was the golden age of the Islamic world, when great strides were made in religious studies, architecture and urban planning, science, astronomy, mathematics, history, and geography, and Kilwa, under the protection of the Mamluk renaissance, was the beneficiary of these achievements. But, there was another, far more reprehensible side to Kilwa's wealth as well since, in addition to dealing in precious stones, porcelain, and spices from China and Southeast Asia as well as gold, ivory, and iron from Great Zimbabwe, it was also a hub for the slave trade, coming primarily from Zambezi. It controlled and then replaced the port of Sofala, which was used by Great Zimbabwe, mostly for the same purpose.

The Palace and Its Five Courtyards Husuni Kubwa, in its final form, was the largest residential compound of its kind on the east coast of Africa until the middle of the nineteenth century, even though it had been abandoned long before. It consists of a monumental entrance reminiscent of the Buland Darwaza at Fatehpur Sikri, discussed elsewhere in this volume, followed by a large *maidan* that is a series of long narrow spaces arranged in a square around a courtyard at the southwestern end of the main axis and a residential section. This contains two mosques, quarters for officials, and the ruler's private quarters that include a *barem*, at the opposite, northeastern end of the same axis, and a private entrance facing away from the cliff. Visitors would have entered through the impressive front gate at the top of the

monumental stair and passed through a *ziyadah*, or walled forecourt, leading up to the entrance into the *maidan*. Based on its similarity to such spaces in other Islamic palaces, such as the Topkapi in Istanbul, which has the same kind of compartmentalized plan of courtyards that decrease in size as they change from public to private use, this large *maidan* was semipublic. The courtyard, which is 45 meters long on each side, is surrounded by a chain of narrow rectangular spaces, whose width is restricted by the length of structural beams available. Having entered this *maidan*, the visitor was then on the main axis running through the entire complex, from this semipublic zone to the sultan's private quarters at the other end, even though they would have been accessible only to the ruler and his family as well as to representatives from select countries and those who served them. Another doorway, on the far side of this first large court was less direct than the first, shaped as a *magaz*, or L-shaped indirect passage that prevented an unobstructed view from one side to the other. This wall, which is really four walls, since it is made up of three rows of the generic strand of narrow rooms that enclose the first court is angled to align with a change in the direction of the face of the cliff it is perpendicular to, adjusting the rest of the axis in the process. Past the *magaz*, a visiting delegation would have then entered into another open forecourt and would have been led to the left, toward the cliff side on the northwest, to an audience hall located there.

Trade delegations, for example, would have paid their respects to the ruler by coming here, and he would have spent much of the day in this room. Its location and orientation were chosen to ensure his comfort in this hot and humid climate. Since his throne would have been located on axis with the entrance to the audience hall, at the opposite end of the slightly rectangular 13 meters by 15 meters room, he was seated against an arcade running parallel to the edge of the escarpment. A fountain and large pool placed next to the audience hall, to the northeast, between it and another sharp change in the direction of the slope at that point, would have helped to further cool the already cooler prevailing thermal air currents coming from the ocean and up the side of the mountain, which would have been directed into the audience hall and over the water by the altered diagonal line of the slope. The audience hall also had a high ceiling to impress visitors and also to help promote the stratification of air heated by the people in the room, which the breeze could then help to ventilate. Those who came to the audience hall were presented with a view of the ruler sitting on a raised platform, flanked by his entourage, about 3 meters above them. This forced them to look up at him, at first, and then to climb many stairs to arrive in front of him. The arcade around the room was used by petitioners, who were waiting their turn to deliver a request.

The Bayts of the Courtiers The individual apartments, or *bayts*, of the officials serving the court were located directly across the courtyard from the audience hall, on its eastern side. They did not look directly out onto it, however, but onto a wide corridor leading to the courtyard, in a way that is consistent with the use of a *magaz* to provide privacy. One large and five progressively smaller *bayts* are lined up along this hallway, which also leads to the private quarters of the ruler at its opposite end. Because they were separated from the courtyard and farthest away from the prevailing breeze coming from the ocean up the side of the escarpment, these houses would have been warm, especially after sunset, as the heat accumulated in the mud brick walls during the day began to radiate into the interior.

The last and most prestigious zone in this sequence, at the northeast end of the bent axis that begins at the monumental entrance, was for the use of the ruler of Husuni Kubwa and his family. It has a central, rectangular court, with steps leading up to a mosque one meter above it on its southwestern end and the ruler's bed-chamber, at a slightly lower level above the court at the opposite northeastern end. There were two stories of residential suites on the cliff side of the court, which had a splendid view of the ocean on one side and down into the courtyard on the other, and connected directly to the ruler's bedroom so they may have been used by his wives, who had the best location in the entire palace. The mosque effectively served as a point of demarcation between the private officials' court and the ruler's quarters. This courtyard may have served as a *fundouk*, or *wikala*, since there were also rooms strung out along its entire edge on a second level above; because caravans delivered the goods that were stored in the 38 separate rooms below, merchants stayed in the rooms above and the goods changed hands in a market in the *maidan* in the middle. The main entrance to the courtyard is oriented directly toward the port to facilitate travel between the market and the sea.

Zanzibar

Stone Town in Zanzibar is located on the Unguja Island, which is part of the Zanzibar archipelago. Its convenient location on the coast of East Africa, in the Indian Ocean, close to what is now Tanzania, made it a natural choice as a trading hub in the past. There are various foundation myths associated with Stone Town, including a visit by the Queen of Sheba in the first century. Muslim proselytizers came in the ninth century, followed by a wave of immigrants from Persia in the tenth, but what is known for sure is that it was a thriving commercial port during the Middle Ages, regarded as a gateway to Africa. It was ruled as Afro-Arab, or a Swahili dynasty, and was very cosmopolitan, due to the presence of people of many ethnic groups that traded there.

Stone Town occupies all of a triangular peninsula, covering about 200 acres. It started at the tip of this projection at Shangani Point as a harbor town built around a fortress, and as the city grew it started to occupy land across a wide river further inland, now called Ng'ambo. The river was filled in during the colonial period, and after a revolution in 1964, the Swahili houses in Ng'ambo were the first to be demolished. They have been replaced by modern flats. Stone Town itself, however, has been better preserved, offering an opportunity to study the houses of a typical Swahili coastal trading town in East Africa, as a synthesis of African, Arab, and Indian building traditions.

The Zanzibari House The urban structure of Stone Town is based on Islamic principles of city planning, and a typical Zanzibari house conforms to the pattern of other houses following similar religious, social, and cultural guidelines through the Arab world when they were built. A typical Zanzibari house is two to three stories high, with massive masonry or coral stone walls, very few, if any, windows, which are small ones if it does have them, and an elaborately carved wooden door. In plan, the house is organized around an open courtyard, which may be in the center or against one wall. The plain exterior was offset by a much more lavish interior, following the primary idea of privacy and presenting a modest face to

the public. As time went on, windows were made larger and balconies were added, but these were generally enclosed with the local equivalent of a *musbrabbiya* screen, called a *rosban*.

The Courtyard As is the case wherever the courtyard is used as an internal organizing device, which it has in western Asia for millennia, the primary reason for its use is climate control. Zanzibar is in a tropical zone, so the weather is generally hot and humid. This is mitigated slightly by ocean breezes, but these are also laden with humidity. Having an open courtyard inside the house allows the cooler night air to settle there, which then dissipates upward during the day as the sun begins to heat it. The Zanzibari house has a local refinement to slow this process down, through the use of arcades or shaded galleries placed between the courtyard and the living spaces, which are generally located along the exterior wall. A large room on the ground floor near the door, which also took advantage of the cool area trapped in the open courtyard during the night, was set aside to receive male guests. This formal reception area, known by various names throughout the Arab world such as *majlis* or *qa'a*, is referred to in Zanzibar as a *sable*. The possible etymology of this word is interesting since a cooling device called a *salsabil* was used in Cairo during the Middle Ages and was placed in the formal reception room that was called the *qa'a*. The *salsabil* consisted of a carved stone slab placed directly under a wind catch or *malqaf* that provided natural ventilation for the *qa'a*. Water flowed out of taps lined up along the top edge of this slab, which was placed at an angle against the wall, and the serpentine carvings helped to distribute it more evenly over its surface before it was caught in a basin at the bottom. As the air introduced into the *qa'a* by the *malkaf* blew over the *salsabil*, it cooled down, as much as 10 degrees Fahrenheit. Another tower at the opposite end of the *qa'a*, called a *shuksbeika*, allowed the air to escape again once it became warm enough to rise, due to ambient heat in the space created by the guests inside it. It is tempting to think that the reception room of the Zanzibar house was named after the *salsabil*.

In addition to the *sable*, there were other rooms on the ground floor that were allocated for service functions, such as the kitchen and storage areas. The upper levels were designated as a private area for family use only. In addition to the gallery or arcade that serves as an intermediate zone between the courtyard and the bedrooms on the upper floors to help keep them cool, the Zanzibari house has another local variation on the typical Arab-Islamic house that should be mentioned in relationship to the *sable*. This is the *baraza*, or bench, that was typically built along the outside wall of a house on the sidewalks along the street, which prevented water from entering it during the heavy rains that are common to this region. The *baraza* allowed the men of the house to meet with visitors without disturbing the privacy of those inside. This design feature was later used as a part of the Florentine Palazzo typology, introduced in the Medici Palace by Michelozzo Michelozzi, which is also based on the idea of a central courtyard, service spaces on the ground floor, family spaces on the floors above, and the use of rather plain, if not aggressively alien, exterior walls. These striking parallels, albeit used on a far different scale in Florence, give some indication of the extent to which Islamic domestic architecture influenced architects at the beginning of the Renaissance in their development of a new residential type.

Doors The doors of the Zanzibari house are also unique, though similarly ornate carved wooden doors decorated with large metal studs are typical throughout the *Najd* in Saudi Arabia, down into Yemen, Muscat, and Oman; those in Zanzibar seem to exceed all others in their intricacy and level of carving skill. They are massive and are made of tropical hardwoods such as teak and mahogany. They are usually covered with brass studs, indicating possible Indian influence, and the extent of their decoration was related to the wealth and status of the owner of each house. They conform to the Islamic prohibition against the literal copying of a natural form such as a tree, by having only abstract geometric patterns or by using calligraphy, which includes verses from the Koran and sometimes the name of the owner of the house. This desire to advertise the wealth and relative status of the owner is at odds with the level of modesty usually found on the typical Arab-Islamic house, and also contrasts with the otherwise plain walls of the Zanzibar houses themselves. Many of the houses with the most ornate doors were owned by Indian merchants. Each door is as individual as the family it announces. The level of detail found on these doors is echoed by that used on many of the enclosed balconies that appeared at a later date in Stone Town. These correspond to the *musbrabbiya* screens found in Cairo or the *roshan* of Riyadh, in being a device to protect the privacy of the women of the house, while still allowing them to see what was going on along the street, or in the courtyard below.

The *musbrabbiya*, on which these balconies are patterned, serves its purpose brilliantly, while also being a substantial piece of decorative art in its own right, underscoring the duality of such elements commonly found in traditional architecture. The *musbrabbiya* seems decorative, but served an important cultural purpose and an environmental one as well. It was typically made of tamarisk wood, predominantly imported from Gujarat, because it was hard enough to be carved, but still porous enough to absorb most of the humidity in the air passing through it. This hygrometric function of these screens is not widely appreciated and has only been researched relatively recently by a team from the Architectural Association in London.¹¹

The *musbrabbiya* is really a window seat projecting out of the wall surrounded on three sides and on its top by wooden screens made from interlocking spools turned on a lathe. This allows the screens, which are half solid and half void, to act like a veil so that people sitting in it can see out, but people below cannot see in. Like the doors, these balcony screens in Zanzibar were also adorned with geometric or calligraphic patterns, but unlike the doors, these were made by the different sizes, shapes, and locations of each of the spools. Decoration was enlisted for social, cultural, and environmental purposes, which is the case for many other elements used in traditional architecture, for example, in the wind towers mentioned earlier that let the air escape from the reception room, or *qa'a*, after it became warm enough to rise.

The materials that were used to build it were deliberately chosen to accelerate the flow of the air toward the escape hatch at the top. The sides of the *shuksheika* were made of thick masonry, while the top was made of wood, which heated up faster. Decorative designs on the underside of the wooden cap have also been

discovered to be purposefully laid out to make this wooden surface vibrate, like a tympanum, to increase airflow.¹²

Zanzibar was a hotly contested piece of real estate during the sixteenth and early part of the seventeenth centuries due to its strategic location. The Portuguese tried to occupy it, but were prevented from doing so by Arab traders from Oman, who took control of the city in 1698. From a relatively small population, the Omani expanded their foothold in Zanzibar, growing to about 5,000 inhabitants by 1840. They cultivated spices and grew coconut palms for trade on plantations near Stone Town harbor. These goods, as well as textiles, were the main commodities that were shipped to India, western Asia, Europe, and America. There was, however, also an active slave trade operating from this port, as well as others along the coast of East Africa.

Omani influence on the Islamic architecture of Stone Town is particularly legible in the mosques that were built after they gained control. One of these, called the Manara Mosque, is located in the Malindi section of the city. It takes its name from its distinctive minaret, which is similar to those found in Oman, since the word “minaret” is a corruption of the Arabic word “*manara*,” meaning lighthouse. As other mosques built after it, the Manara Mosque is very plain, hardly distinguishable from the houses around it, except for its signature tower.

During the late twentieth century, another layer of influence began to emerge within the rich ethnic tapestry of Stone Town. Over two decades, during the Al-Busaidi Dynasty, rich merchants put modesty aside and began to openly flaunt their wealth by building huge mansions inside the confines of the old city. One of these called the *Beit al Ajaib*, or House of Wonders, was built by Sultan Deyyid Barghash, who ruled Zanzibar as a member of this dynasty. It is three stories high with an attic floor above that, but its scale is imposing compared to earlier houses in the town. Its ground floor, which is raised up on a platform, has an arcade on the front façade, which is repeated as a verandah on the first and second floors above. It also has a projecting gable-roofed portico over the front door, continuing as a vertical element in the center of the front elevation. The broad galleries on the front extend around the other three sides of the house, which was built using reinforced concrete slabs and cast iron columns. It also had electric lights and an elevator, which were previously unknown in Stone Town even as late as 1870 when the house was built.

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Asia and Australasia

BALI

The Balinese House

Bali falls within the area that has been designated as Austronesia in terms of the similarity of the house typology that is found within it. But Balinese houses differ from that typology in several important ways, and those reveal a great deal about the unique character of the island.

The Austronesian Home Anthropologists, linguists, sociolinguists, and others have begun describing the shared culture of a large zone that encompasses the whole of insular Southeast Asia, also including Micronesia and Polynesia, the majority of Peninsular Malaysia, coastal Vietnam, Taiwan, and parts of New Guinea and is called “Austronesia.” The name is derived from the Latin *auster*, meaning island, and *nesia*, or south wind. Linguistic experts have identified 1,268 distinctive languages as being related to the Austronesian cultural family, or about 20 percent of all of the known languages in the world. But, in spite of this linguistic diversity, people within the Austronesian region share similar traditional knowledge, beliefs, morals, and social habits, in other words, the same culture. One of the most visible results of that shared culture is a house type that is based on a tripartite division of columnar base, raised platform in the middle, or body of the house, and a large, overhanging roof. Because these diverse cultures also share the historical experience of boat making, it was transferred into their domestic architecture as well.

The Javanese House Throughout Java, traditional houses follow a consistent pattern of having three separate units inside one compound, which are houses in their own right complete with a roof. The first of these, called the *pendapa*, is closest to the *regol*, the compound gate, and is used to receive guests. The second is the *prinagitan*, which is a covered passageway, that leads from the *pendapa* and the public part of the compound to the more private, family area at the back. The third is the *dalem agong*, which is where the entire family lives. Unlike the *pendapa* and the *prinagitan*, *dalem agong* has masonry walls on all sides for privacy. It is also

subdivided into three additional spaces, which are the *krobongan*, or *boma*, in the center, flanked by bedrooms, or *sentongs*, left and right. The location of the *krobongan* is symbolic because in the pre-Islamic period it served as a shrine to the fertility goddess *Sri*, considered to be the founding deity of the Javanese people. The *krobongan*, in the center of the *dalem agong*, is on a north-south axis with the *pendapa*, linking the sacred and the profane. The *pendapa* is also used for performances, which reinforce the Javanese idea that an act in life can attain sacredness if it is intended to do so.¹

The Balinese House The Balinese are predominantly Hindu, in the midst of the Muslim Indonesian archipelago. Their houses also conform to the tripartite division of *nista*, *madya*, and *utama*, or platform base, framed middle, and dominant roof, that is found throughout the Austronesian world. The base, however, is typically built into a system of bearing walls that are used on some of the structures in the compound, or when the structure is open, it is built to resemble a solid podium and is made of stone or brick. Depending on the financial ability of the family to pay for paving, the floor of each unit may also be made of stone, but if not, the four side walls of the base are filled with earth, which is tamped down to form a hard clean surface. The stone walls of the podium base may also be ornately carved if the family can afford it.

After the foundation walls are completed, the columns are erected on stone bases placed on the floor called *unpak*. As in the Malay house, the length of the columns is based on a dimension related to that of the housewife to determine the height of the rooms and the length and the width of each of the pavilions in the compound. The basis of this measurement is the *rabi*, which is the distance from the bottom of the palm to the tip of the index finger.² Until recently, these columns and the beams and girders that they support, which then support the room, were cut from a teak tree, but teak is becoming increasingly scarce and costly and its use is also being restricted. There are strict rituals and customs related to the felling and the cutting of the tree, which echo those found in many other parts of the Austronesia group, as well as Japan, where similar traditions were followed. There is a ceremony held before the tree is cut to appease the spirit in it. The directing of the growth of the tree is carefully rooted so that when the columns are cut, they are erected with the long grain going up in the same direction, so that the direction of the life force is maintained. No mechanical fasteners are used to connect the columns to the beams and beams to girders, both because they are costly and because they are felt to defile this life force. Mortise and tenon or simple lap joints are used instead, as they have been since the beginning of habitation on Bali.³

The order in which the columns are erected is also important, starting in what is referred to as the *kaja-kangin* corner of each house, which is the upper right corner, or plan. The sequence then moves clockwise from there. If there is a middle row, the sequence moves clockwise through the middle first, and then around to the row along the bottom.

The roof of the houses, or the *utama*, is made of thatch, of *alang alang* grass laid over round bamboo purlins that are assembled in either a hip or a gable configuration. The thatch is looped over the purlins in layers so that it is about 50 cm thick.

The walls of the houses are not load bearing, but are made of stone or brick, with sandstone, or *paras*, being preferred, since it is an abundant local stone and is easily cut. The purpose of the wall is privacy more than structural stability.

The Compound There are many similarities between the Balinese and Javanese family compounds. Both accommodate an extended family, centering around a married couple, their married and unmarried children, and their parents. The gate into the walled area is combined with a small wall, called an *aling-aling*, which prevents a direct view inside from the street. It also has several steps leading up to the compound level, which is higher than the four corners on the compound wall, to guard against evil influencers entering or leaving it. The entrance gate is also seen as a potential weak spot in the spiritual line between inside and outside, which is another reason for the *aling-aling* wall, and the location of the gate on the west.

The functions of the house are then divided into several pavilions in the Javanese tradition, but there are typically more than three of these. They surround a central courtyard, which is usually located diagonally from the front gate, called the *natar*. The pavilions closest to the gate are usually the *bale tiang sanga*, corresponding to the *pendapa* in the Javanese house, for receiving guests and the kitchen, or *paon*, which is freestanding. From the front wall inward, pavilions are organized according to a hierarchical placement, in which the most prestigious location is given to the head of the family, who lives in the *Umah melen*. The family temple, or *sanqgah*, is located near this pavilion, along the *kaja* wall, within its own sacred enclosure, which includes numerous family shrines. It also contains a shrine to the Hindu gods Brahma, Siwa, and Vishmu. There is also a shrine to *Sri*, the goddess of fertility, similar to that once found in the Javanese house, along with others to Rambut, Sedana, and Saraswati, the deities of wealth and knowledge.⁴

In addition to these pavilions, there are three others: for other members of the family, for weaving, and for rice storage. The *bale sakepat*, where children of various ages sleep, is typically located across the courtyard from the *Umah meter*. The weaving pavilion, or *bale sakepat*, occupies a protected position toward the back, as does the rice storage pavilion, *lumbung*. The *lumbung* follows the rice barn topology seen elsewhere in Southeast Asia, being raised up on columns with pronounced capitals on top to prevent rats and mice from getting to the rice, and a steeply pitched single gable roof to keep the contents dry.

CHINA

Hakka Houses in Hunan, China

The Hakka minority in China was originally part of the Han majority, but due to economic hardship and dislocations caused by warfare, they moved from the northern part of the country to the southwest in the thirteenth century. Over a period of about 1700 years, from the Jin through the Sung Dynasties, they endured five more major migrations, finally settling down in the mountainous areas along the borders of Hunan, Jianxi, Guangdong, and Fujian Provinces. Their name, which means “guests,” reflects their nomadic status, and today they continue this tendency since the Hakka are now found throughout Asia.



Tolou (A) houses made by the Hakka people. Courtesy of Foong Ngai Keong, Singapore; Flickr

Outsiders As perpetual outsiders, the Hakka have always had to compete for local resources, which has often led to conflicts in the past. This caused them to build communal housing, which was primarily designed for defense.⁵ These communal houses, called *tulou*, are often circular, although they are sometimes built in other shapes, such as a rectangle, square, U, or octagon, depending on the region in which the Hakka settled.

The Tulou *Tulou* means “earth building,” and these buildings get their name because the vertical walls are made of rammed earth. Archaeological excavations have confirmed that rammed earth construction is one of the oldest methods of building in China. Also referred to as *terre pisé*, this technique first involves the construction of wooden formwork, in much the same way as poured-in-place concrete does, but after the wooden formwork is in place, up to a level of about 1 meter high, earth is put into the space between the inner and outer walls of the form and tamped down by workers using wooden mallets. Once it is sufficiently compressed, the form is moved to the top of the first wall and the process is repeated. Stone and brick are also used.

The *tulou* typically has no windows at ground level for security purposes, and

this is where the livestock and the kitchens are located. Food is stored on the second floor and the living spaces, of which there are typically two, are located on the levels above that. The rammed earth walls have to be strong enough to carry four floors, so they are stabilized with additional materials and are about three feet thick at the base. There is typically only one entrance to the *tulou*, which has stone jambs and a stone lintel as well as an iron door, followed by additional smaller gates inside to provide several layers of protection against intruders. The round shape deflects artillery better than a flat wall, and the *tulou* are usually built over a water source or a well so that this, along with a large stockpile of grain, could allow the Hakka to survive a long siege. The front door usually faces south so that during times of peace it can be opened to allow natural ventilation to flow into the open central courtyard. All of the living spaces above the second floor are the same size,

and there are usually four stairways, one at each of the cardinal points, that provide access up to them, or their position is determined by *feng shui*. There is normally a hall in the middle of the central courtyard that serves as an all-purpose space for a school or for a communal meeting place. In some cases the living units in the *tulous* are designed vertically to take advantage of both the third and fourth levels, with a small secondary staircase inside to connect them. In this instance, a single family would use the levels for a kitchen and storage at the bottom with the bedrooms above. A typical room in the family quarters is about 30 square feet in size, with a small window on the outside wall and a large one facing inward toward the circular hallway that joins all the units and the courtyard beyond.

A Typical Tulous One of the best preserved *tulous* is called Huaiyuanlou, located in the western part of the Fujian Province. It occupies an area of approximately 1130 square meters and is 38 meters in diameter. Its main doorway faces southeast. It has four stories, with each level being divided into 34 equal bays. There are four symmetrically divided staircases serving each level. The rooms on the ground floor are used as communal kitchens and dining room, while rice is stored on the second floor. Bedrooms are on the third and fourth floors, in wedge-shaped apartments.

Distribution Circular *tulous* are mainly found in Pinghe, Zhaoan, Longyan, Nanjing, and Yongshing. U-shaped structures are predominantly located in western and southern Min and Hua'an, but also in Nanjing and Zhaoan, where square and rectangular examples are found as well. Some scholars believe that the square and rectangular ones predate the round form, which is a refinement that evolved in response to the development of firearms.

Houses in Pingyao

Pingyao is now the capital of Shanxi Province. It is adjacent to Hebei, in which Beijing is located, as is Tianjin, which is now a rapidly growing city with direct access to Bo Hai harbor. With its northern edge protected against invasion by mountainous terrain and a section of the Great Wall, and trade made possible by the Huang He, or Yellow River, as well as the Grand Canal extending to the southwest from Beijing, Pingyao thrived. Its accumulated wealth and status meant that it reached its peak of influence during the Ming (1368–1622) and Qing (1644–1911) Dynasties. It was founded in the fourteenth century during the Han Dynasty (206 B.C.–A.D. 220) and so is a repository of historical, residential styles that span many centuries of evolution. The walled city and its dependencies extend over an area of about 500 square miles.

The Walls The city walls of Pingyao, which are among the few still remaining in China, are made of rammed earth and brick arranged in a rectangular circuit that extends for about 4 miles, deflecting only along the southern side due to conformation to the topography. It is 32 feet and 8 inches high and varies in width at the bottom and top from an average of 30 feet at the base and 15 feet along the upper ramparts. As was the case in many walled cities like this, the gates are aligned with the cardinal points, with one each on the north and south walls called Gonji-Men and Ying Xun Men, respectively. There are two gates each on the east and west walls, and watchtowers located along the entire circuit spaced 164 feet (50 meters) apart. The curve in the southern wall deliberately gives the walled city the shape of a turtle, which is the Chinese symbol of longevity, and Pingyao has historically

been known in the region as the “Tortoise City.” A 13 feet wide and 13 feet deep moat once surrounded the city; the earth that was excavated to create it was compacted to make the wall. Drawbridges attached to each gate provided access across it.

Wealth Banking and commercial activity were the sources of the wealth of Pingyao’s residents, until the Qing Dynasty administration defaulted on loans just prior to the rule of the Dowager Empress Cixi and the overthrow of the dynasty in 1911. The Ri Sheng Chang (Sunrise Prosperity) founded in 1824 adjacent to the South Gate is thought to be the first bank in China.⁶ It had branch banks located in many of the large cities at the time, including Beijing and Guangzhou.

The City Plan The street system of Pingyao conforms to the grid plan of the model city of Chang’an, now Xian. It has four major avenues at the top of a hierarchical arrangement that serve 8 streets and 72 narrow lanes, in which the major buildings, such as the *Yamen* (police station), were located. In addition to banking and commerce, Pingyao was primarily an agricultural settlement, surrounded by open fields and known for beef, wheat, and cotton.

Courtyard Houses The houses in Pingyao, which date primarily from the Yuan, Ming, and Qing Dynasties, are of the courtyard type, which used to also be predominant in Beijing. There are more than 3,500 quadrangles of courtyard houses inside the walled enclosure, with various kinds of combinations of courtyards. Some have a single door leading into a single central courtyard, while others have compounds with two or three interconnected courtyards. The classic Chinese courtyard house or *si-be-yuan* is divided into four subtypes. The first is the Beijing *si-be-yuan*, which has square or nearly square courtyards, a gabled or double sloping roof, usually only one story, and a modest amount of decorations. The second is the Hebei *si-be-yuan*, which has a rectangular courtyard, flat roofs, a single story, and minimal elaboration on the outside. The third is the Liaoning and Jilin style, which also has a square courtyard, but is wider than those of the Beijing houses. It also has a gabled roof and a single story, with rather simple exterior details. The Shanxi *si-be-yuan*, like those in Pingyao, are unique within the typology, in that their courtyards are long and narrow, have single slope roofs like a Roman or Greek *impluvium* that directs rainwater to the inside, and have more than one story. Unlike all three of the other types of *si-be-yuan*, the Shanxi houses in Pingyao are also elaborately decorated and have a characteristically grey cast, due to the color of the brick used for the walls and the tiles used on the roofs.⁷

The main doorways into each of the quadrangles project out from the wall facing the narrow lane, with a prominent column on each side of a massive pair of rivet-studded wooden doors supporting an upward curving clay-tiled pent roof above. Open fret brickwork and pointed dentils often form the cornice of the upper part of the second story roof, above the door, as well.

While it is more imposing, somber, and elegant in appearance than its distant relative in Beijing *butong*, the Shanxi *si-be-yuan* shares the use of a south-facing gate, a *chi-hua-men* marking the point of transition into the first courtyard, a middle court, and a south court facing a three bay building at the end of this compartmentalized sequence, called a *sbi*, in Pingyao.⁸

Qiao Jia Dayuan There are also several magnificent examples of Shanxi *si-be-yuan* type in a family compound located just north of Pingyao, built by Qiao Guifa, who made a fortune by buying and selling tea.⁹ This cluster of more than 300 rooms, built during the Ming Dynasty, is now simply referred to as the Qiao family compound. It is closed by a 33 feet high wall and has six major courtyards, along with 20 smaller ones, covering a total area of 3,870 square meters. The main gate into the compound is imposing to an ancestral hall that balances the gate at the opposite end. The six major courtyards are evenly divided by this central road, into three to the north of it and three to the south. In each case, the main doorway into the compound does not line up with the doorways beyond the first narrow courtyard. Unfortunately, one of the six courtyard complexes was destroyed during the Cultural Revolution.

The Rooms of a Typical Shanxi Si-be-yuan The houses of the Qiao Jia Dayuan are typical of the way that rooms are arranged in a Shanxi *si-be-yuan*. After entering through the massive front door from either the northern or the southern wall of the central lane, through a pair of flanking rooms that were used as servants' quarters or storerooms or both, there is a long, narrow courtyard, parallel to the street that served as a security value, prior to moving through a *quo-ting*, or transitional hall, into the second court. Side rooms, or *xiang-fang*, with roofs that slope inwards toward the court that separates them are raised up on a platform floor that is several steps above the court, and have a deep overhanging eave supported by columns that create a narrow arcade, facing it as well. The second structure, after the *quo-ting* that runs between the two demising walls, is the *zheng-fang*, with a rounded, rather than single pitched roof, as the side rooms have, to conform to its double façade. It is two stories high and was used for formal or ceremonial events, in contrast to the *xian-fang*, which served as dining areas or bedrooms.¹⁰

Cold Winters Throughout northern China, heating was provided in houses in the past by *kang*, which are raised platforms that have flues under them that carry the hot air from the stove. These serve as large surfaces radiating heat during the day and as beds at night during the winter, with the flues closed during the summer.

Instead of using *kang*, the builders of the houses in the Qiao Jia Dayuan installed central heating systems based on the installation of clay ducts in the walls and under the floor that provided radiant heat. This required large furnaces and a great deal of wood and coal to keep the houses warm, indicating just how wealthy this clan was.¹¹ To maintain balance in the system, these ducts were vented at regular intervals through numerous small chimneys that have decorative caps on them.

Materials Wood was a rather expensive commodity, as opposed to clay, which is plentiful due to the loess on the geological plateau here. Wood structures were augmented with brick, or primarily brick compartments, or rooms had a wood verandah added, mimicking the details used in cave dwellings, with a brick arch on the lower level supporting a brick and wood story above.¹² These two styles, of a wooden structure faced with brick or the use of brick to replicate the image of a cave dwelling, coexist inside the courtyards. The cave dwelling metaphor recalls the fact that the loess soil in this region allowed people living there in the past to excavate it easily, and the walls of the pits that they carved were relatively stable, also allowing side rooms to be cut out, facing into the central sunken courtyard. Such

underground houses were common in the central part of the Shanxi Province, near the Yellow River. These underground houses were cheap and easy to excavate, warm in the winter, and cool in the summer. The doorways of the rooms facing into the central courtyard were decorated, and it is this façade style that is replicated in the Pingyao houses, as a symbol of regional identity by the builders. This is a bit ironic, given the fact that the owners, especially in family compounds such as the Qiao, were extremely wealthy, as indicated by the fine details of the verandahs overhanging the “cave dwelling” rooms on the ground floor.

Feng shui, or geomancy, was also an important factor in the design of each of the Shanxi houses, initially related to basic, common sense issues like proper orientation, but later evolving into a more complicated theory about how best to arrange courtyards and the rooms placed around and across them to maximize prosperity. In *feng shui* terms, courtyards that were long in the north-south direction and narrow in the east-west orientation were originally designed that way to maximize sunlight in the winter and protect against the sun in the summer, but eventually were considered to be a way of collecting good fortune.¹³ This idea later extended to an “auspicious” wall, and/or tower, that would bring more income to the family.

The Qiao Family Courtyards

The Qiao family compound is a remarkably well-preserved cluster of houses built in China in the eighteenth century. Because it is located in Shanxi Province midway between Beijing and Shanghai, about 54 kilometers south of the district capital of Taiyuan, this group of houses has escaped the ravages of invasion, war, and revolution relatively unscathed, providing an opportunity to see what life was like in a Chinese village more than 250 years ago.

Qiao Guifa The first member of the Qiao family to attain great wealth was Qiao Guifa. He was born during the Qing Dynasty (1644–1911) during the reign of Emperor Qianlong, who ruled from 1711 until 1799. Guifa was orphaned when he was a teenager and suffered greatly from being poor. He went to Bao Tou, in Inner Magnolia, and started making money by selling fodder for draft animals, trading up as soon as he was able into other businesses. Qiao Zhiyong expanded the family fortune until it grew to the contemporary equivalent of \$1 billion. Qiao Zhiyong advocated hard work, generosity, and modesty as the keys to financial success. He subsequently opened two private banks, followed by branches all over China, which used a checking and credit system that facilitated trading and brought great wealth to both Shanxi Province and the family business. This innovation made Pingyao an important financial center where the first bank in China, called the *Risheng chang*, was located.

The Family Compound The Qiao family compound includes six main courtyards and 20 small courtyards including 313 individual rooms. It was built like a stronghold, with 10 meter high walls around the entire perimeter and an 80 meter long central pedestrian spine dividing the compound roughly in two. The courtyards are organized side by side, using a party wall system, so that the entire compound is like a microcosm of a Chinese city. Each of the units is similar to the *hutongs* of Beijing, in which rooms surround individual courtyards, and these consist of two courtyards positioned sequentially. These rooms were designated in a

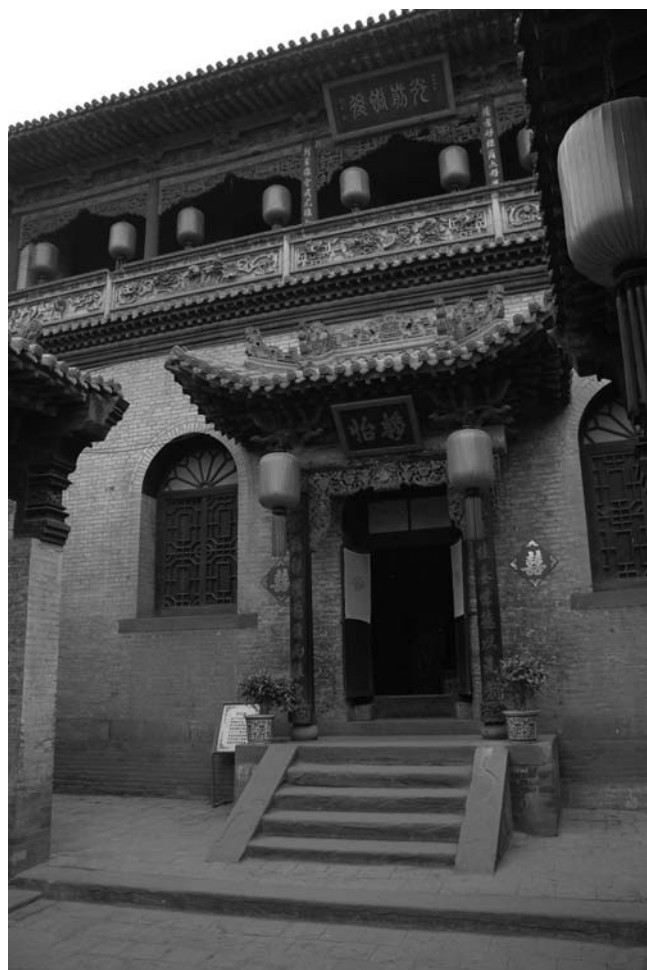


The Qiao family courtyard is located near Pingyao and was established by a rich patriarch who made his fortune as a merchant in that region of China. *Source:* James Steele

way that reflected the hierarchy of each part of the family so that servants lived in the rooms closest to the entrance and status within the family then determined who lived where, moving toward the most prestigious position at the rear of the quadrangle, farthest away from the entrance. The final hall was raised up on a platform base to designate its higher status.

All of the houses in the Qiao family compound are built with masonry walls, which support a wooden roof structure that is then covered with clay tiles. The masonry walls are unique, in that they are not like a typical bearing wall in which window openings are formed using framed openings and a lintel, but rather consist of a base, built on a foundation slab that also acts as a curb, which rise to a 3 feet–0 inch sill height, and then rise up as piers on either side of the window opening that continue upward to support a wooden architrave that runs around the entire perimeter of the top of each space.

The windows, which have ornately carved designs in each window pane, were then simply inserted into the space between the masonry piers giving the inner elevation of each courtyard a pleasing sense of security and order, based on the repetition of U-shaped openings. The fine balance between brick walls and piers, and wooden architraves and curved roof purlins, is also well defined. The thickness of the walls and piers, which is considerable, is a factor of the size of the individual bricks and the way they were laid up. Each brick is 29 cm by 14 cm by 6 cm, and these were interlocked in a way that resulted in a 43 cm thick wall.



The grey color of the local stone that was used to build the houses of the Qiao family courtyard is one of their most distinctive characteristics.
Source: James Steele

Eventually, and perhaps inevitably, the Qiao family fortune attracted the attention and envy of the Qing court, which requested large contributions. These, followed by the introduction of a competing banking system by the government in 1926 and the Japanese invasion in 1937, led to the rapid diminution of the status of the family, and they eventually left the region, scattering throughout China and even emigrating to other countries. The Qiao family compound, however, had a moment of international notoriety in the late 90s when it was used as a set in the Zhang Yimou film *Raise the Red Lantern*, because it is so well preserved and authentic. It raised public awareness of the compound both inside China and abroad, dramatically increasing the numbers of tourists going to see it. This has contributed a great deal to the preservation and maintenance of this historically significant site.

The Wang Family Compound There are several other courtyard and residential clusters similar to that of the Qiao family compound, one of these is the Wang family residence, which is also in Shanxi Province. The Wang family originated in that region, and the compound that still exists today because of excellent preservation took three generations to complete from the mid-1600s until the beginning of the nineteenth

century. The Wang compound is approximately 16 times larger than the Qiao family courtyard. It has 2078 dwelling units clustered around 231 courtyards, covering more than 150,000 square meters. As in the Qiao courtyards, the Wang compound also has a main gate leading to a long, axial entrance corridor, or road, which divides the compound in two.

Villas in Suzhou

Suzhou is a small city west of Shanghai that is the center of an agricultural district that thrives on the various tributaries of the Yangtze River that flow through it. It dates from the Han Dynasty and is, along with Yangzhou and Hangzhou, best known for the historically important villas and their gardens that grace the city.

The art of landscaping, in relationship to classically traditional Chinese architecture, reached such a high level here that its famous UNESCO World Heritage listed villas may be safely considered to be representative of their genre.

The majority of Chinese garden villas of the classical type were built in Wuxin, during the Song Dynasty, as well as Hangzhou during the Qing Dynasty and Suzhou during both the Ming and Qing periods. These villas were mainly built for private residential use by the aristocracy, high-ranking government officials or wealthy merchants within the city limits, although larger ones, used as imperial gardens and parks such as the Summer Palace near Beijing are another category of this type.

The garden villas of Suzhou present some of the best and most well-preserved examples of Chinese landscape planning in conjunction with residential architecture, and the current selection of several of these for placement on the World Heritage list has encouraged closer study of Suzhou. It was not damaged during the nearly constant warfare that characterized the Five Dynasties Period from 904 until A.D. 960, and so it prospered. While it is best known for the garden villas that were built during the Ming and Qing Dynasties, Suzhou has examples dating as far back as the Jin Dynasty and so has been a repository of the classical Chinese garden planning tradition for over 2,000 years.¹⁴

The basis of the tradition is a mixture of the Buddhist emphasis on change combined with the Confucian admiration for scholarship. It is the idea of a learned, refined person seeking refuge from the materialistic values of the everyday world by seeking isolation in a mountain retreat to think more clearly, write poetry, and reflect on the vicissitudes of life and the impermanence of wealth. During the Three Kingdoms Period, philosophers praised reclusion as the noblest way of life. Painters during the Tang Dynasty, such as Song Zhiwen, Wang Wei, and Bai Juyi painted the tower-like mountain peaks of Guilin and the built gardens that were inspired by their atmospheric rendition of that distinctive landscape, taking them into the third dimension. This started a tradition in which painters and calligraphers became garden and residential designers, and these artists began to accept apprentices. Later, during the Ming Dynasty, Ji Cheng attempted to codify, or standardize, many of the techniques that were being used, especially in the smaller scale replication of mountains and hills, in his book *Yuan Ye* or *Garden Building*.¹⁵



The windows in the Qiao courtyard, like those in traditional *butong* or traditional housing compounds throughout China, indicate the position of the person occupying each room within the family hierarchy.

Source: James Steele



Administrative officials who served the emperor, as well as upper-middle-class merchants and business people in China, preferred to build retirement villas in Suzhou. *Source:* James Steele

The Hermit Scholar A popular image that emerged out of the Three Kingdoms Period, mostly due to the influence of both Buddhism and Confucianism was the ideal of the hermit scholar, who would give up material wealth and possessions and retreat to a solitary existence in the mountains, following intellectual, philosophical, artistic, and metaphysical pursuits.¹⁶ During the Tang Dynasty this image was further refined into a cultural model for the aristocracy and courtiers as well. Rather than submitting to the inconvenience of divestiture and exile, they recreated the hermitage in their sumptuous houses, at the very least by including a study in it, where the pretend hermit scholar could write poetry typically expressed in calligraphy on scrolls and draw or paint at will.¹⁷

All of the architectural elements as well as plant types that were chosen to be included in their gardens were selected for their metaphysical associations with mountainous regions, seasons of the year, or well-known images of natural beauty. Each of the architectural elements placed within the garden, such as pavilions, were also given names that were intended to conjure up such associations as well.

In China, it continued to be fashionable for those who could afford it to build houses within gardens that resembled the landscape paintings of that time, to suggest that the owner was a refined scholar hermit and gentleman.¹⁸ The plant types that the landscape architects chose had important symbolic content as well as a contextual role to play. Pine trees, bamboo, and plum trees, for example, were used to evoke winter, and the lotus was used not only to imply a connection to Buddhism but also to provide a metaphor for a person who is above materialistic concerns because it grows in the mud but remains clean and pure.

Retirement Retreats As a result of the influence of the philosopher-teacher Kung-tze, known in the West as Confucius, and his promotion of the virtues of scholarship, a civil service examination was instituted in China that effectively acted as a gateway into government employment. It brought wealth, social status, and power to a family if a member of it passed this test. This status was not transferable, so that, when that family member died, another would have to pass the test or the family would lose it. Suzhou was favored as a place where civil servants would build country retreats or retirement estates, due to its bucolic setting, but because it was a walled city, plot size was limited to 6 to 7 hectares.¹⁹ During the Ming and Qing Dynasties it became customary for many of these government officials, who had become prosperous while in office, to retire in Suzhou and build a garden villa there. Suzhou has a high water table and many canals, so it was easy for garden designers to divert water to serve their purposes, Suzhou also has a special kind of multicolored stone, called *Taibu* rock, which comes from the West Dongting Hill, that garden designers favored because of its irregular surfaces and torturous formations.

The Garden Villas of Suzhou The villas of Suzhou have survived because they have been venerated either by being passed on within the same family or by being maintained and preserved by another if they were sold. At the very least, respective owners have followed the intentions of the first builder and have stayed within the framework established by the original owner, which makes these garden villas an incomparable and historically accurate record of a way of life that no longer exists in China. Tradition has had a profound effect on contemporary social attitudes, since it prevailed for more than 2,000 years, while residential habits have now dramatically changed. They represent a connection between painting and garden design, and the desire of each to capture the essence of nature, especially at its most extreme in miniature. Limestone peaks, such as those in the Li River valley in the southwest, especially the *Fenglin* or “peak forest” karst formations at Guilin, which were an especially popular subject for landscape painters in China, remain a spectacular geological feature that is unique to that region.²⁰ These peaks are formed by surface water draining down into the limestone substrata and eroding the stone in certain places, so that caves below the surface get larger. As the caves collapse, the ground level drops to a sedimentary layer of shale below the limestone, creating depressions between peaks that can rise up to 250 feet or more. These dramatic stone peaks are recalled in the Chinese gardens at Suzhou in several ways.

Garden Planning Techniques Used in Suzhou The architects and gardeners of the villas and gardens of Suzhou used several time-tested techniques that were passed down in a well-established apprenticeship arrangement from generation to generation in the villas, in no particular order of importance are as follows.

Themes and Zones Suzhou was urbanized even when the first garden villas were built there, requiring artists to base their designs on themes. These were then worked out in several compressed scenic areas, organized to convey the impression of extended space. Since they were located throughout the garden, these various scenes, or zones, were deliberately conceived to encourage the occupants of the house to walk between them, and for each member of the family to seek out the area that they preferred according to their mood on any given day. Maintaining a balance between the architectural form of the various parts of the residence and

the designers' particular rendition of wild nature that worked in unison with it and having all of this work as a whole was tricky, to say the least. It required an excellent knowledge of the physiological perception, or perspective and overlapping viewpoints, the places to introduce variety and change, how to manipulate emotion, and the use of contrast, conveyed through compression and dispersion, solid and voids, rough and smooth textures, proportions and scale.

A favorite device in the designers' repertoire to achieve contrasting feelings of compression and dispersion was the planning of the location of points of transition between themed zones, experienced on a route that changed from a closed, narrow dark pathway to an open terrace, or a bridge, and through the use of observation points, placed at carefully calculated places along this route.²¹

Ting and Tang The *Zhouzheng Yuan*, or Humble Administrator's Garden, named to deflect suspicion about the source of this retired government official's wealth as well as the circumstances surrounding his retirement, also contains four types of residential buildings typically found in garden villas of this type. The first of these is the *Lou*, or two-story pavilion, placed near the periphery of the garden beside a hill, and designed to harmonize with both its setting and the water. The second is the *Xie*, also built next to water, but more horizontal in form and with an open front and hipped gable roof to relate to it more. At the *Zhouzheng Yuan*, this is the *Xiang Zhou* or Fragrant-Isle Land Boat Terrace. The third type is the *Ting*, which literally means "pavilion." These come in a variety of shapes and sizes, either half or whole. The shapes include the hexagon, octagon, circle, fan, or square, with gable, hipped, or pagoda-shaped roofs. At the Humble Administrator's Garden Villa, there are several *Ting* of various shapes, in different locations throughout the property. The final type of element found in this garden that is typically also found elsewhere is the *Tang*, or covered passage. The *Tang* have been described as the "arteries and veins" of the Chinese garden because they are used to help mark the routes through it, usually in five ways. These are as a corridor along a wall, an open bridge, an ascension of a hill, a waterside corridor, or a two-story hall used as a border between zones.²²

One of the main challenges that the designers of these garden residences faced was to avoid the impression of segmentation, as well as to make the entity seem to be partly separated and partly joined. The architectural elements just mentioned helped to do that and at their best have been called "scenic objects in contraposition." But, they were also more than mere objects because the people that lived in the house occupied them as well.

Walls as Spatial and Temporal Markers Water courses, diverted around artificial hills, meant to resemble mountains were typically used as a device to unify a garden and articulate various parts of it, modulated by walls and plants of various heights as well. The wall is also one of the most ubiquitous features of a classical Chinese garden, and one that also sets it apart from its Japanese counterpart. Walls are skillfully used to set various areas apart without making them seem to be inaccessible. They have also been referred to as helping to "arrange space (and time) rather than defining or setting boundaries." But in looking at the development of urban planning throughout Chinese history, up to the Revolution, it becomes clear that the wall has an important social role. It has served, as one analyst has

described, as “a line clearly drawn between what is significant and what is insignificant, what is powerful and what is not powerful, who is kin and who is stranger, what is sacred and what is not sacred.” The divisions between the Outer, Inner, and Forbidden cities in the walled city of Beijing and the *butongs* that still remain there are clear examples of this.

The garden villas of Suzhou, however, cannot simply be viewed as Chinese cities in miniature since the walls in them do not demarcate lines of power, or separate the secular from the sacred. The city of Suzhou itself had a defensive wall, since the Tang Dynasty (A.D. 618–907) was divided into 60 walled *fang*, or residential wards. Each of these had a name, and only the houses of high officials could have direct access to a main road. But the walls in the garden villas modulated space rather than demarcated it, and served, along with the water courses, to also mark time by guiding movement through that space, organizing it and the views into and out of the various settings the designer has planned.²³

Balance This is the art of maintaining balance between architecture and the landscape so that neither one appears to dominate. The various residential components of each villa that fall into seven well-established categories generally do not exceed more than 15 percent of the entire site plans. The seven categories of these are large and small halls (*Tang* or *Ting*), lounges with windows on all sides (*xuan*), enclosed structures of more than one story (*lou*), open pavilions of more than one story (*ge*), waterside pavilions (*xie*), guesthouses (*guan*), and land boats (*fang*). The only consistent features of each of these are lightness and openness, to make them blend in with the garden, and a lack of partitions that would tend to defeat that purpose, so that they are usually one large room if on the ground floor or a series of stacked single rooms if more than one story. The ideal relationship between buildings and landscape is a sense of the “overlapping” of inside and outside. There is a tendency to view these various halls and pavilions as mere *follies*, in the sense of structures that have been used in both French and English gardens in the sixteenth and seventeenth centuries



Rather than being placed in nature, the villas of Suzhou were designed to be in perfect harmony with the environment, so that nature and architecture become one. *Source:* James Steele

as nonfunctional architectural elements intended only for aesthetic effect, but that is not true.²⁴

Borrowed Scenery A favorite technique used by Chinese architects and gardeners, as well as their Japanese counterparts, was to convey a sense of infinite depth in the views from these individual halls and pavilions to belie the relatively small size of the properties they occupied. They did this by layering plants and trees, according to scale, placing the tallest around the perimeter to visually blend into those in the distance, beyond the site lines. They also took advantage of seasonal changes in the foliage, to allow views through it, at certain times of the year.

Placement Each of the building types that have just been mentioned were also thoughtfully and selectively placed, according to their individual characteristics. Halls with windows on all sides were located in the open, for example, to take advantage of the scenery all around them, such as the *Yuan Xian Tang* in the garden of the *Zhouzheng Yuen*. Waterside pavilions, on the other hand, were sited according to fixed conventions related to the distance of the floor level above the surface of the water and distance from the shore of the lake or pond to achieve the maximum effect from the sight line to the water.²⁵

Courtyards The way that these architectural elements interrelated was also an important consideration, so that they were usually grouped to create courtyards or to define themed areas, microclimates, or environments of varying themes.

Observation Points A list of the ten observation points used at the *Zhouzheng Yuen*, or Humble Administrator's Garden Villa in Suzhou, along with the height of each above water level, begins to convey the level of skill of the planners involved, along with the themes used. These are clearly seen in the Distant Fragrance Hall, or *Yuen Xiang Tang*, of that garden. It is 1.91 meters above the water course that is used to unify the garden and is the most important of the observation points because it is in the middle, offering an unobstructed perspective view of most of its parts. Its name is based on a poem by Zhou Dunyi, written during the Song Dynasty, called "An Essay on Fondness for the Lotus," in which he says "the more distant the fragrance, the more delicate it is." The Distant Fragrance Hall is placed behind a wide lotus garden on the water near it and has doors that open wide to receive the scent of the lotus flowers brought into it by the prevailing breeze that blows over them. The other observation points and their height above the water are the *Xiang Zhou*, or Fragrant-Isle Land Boat Terrace (0.96 meters); *Jianshan Lou*, or Seeing the Hill, ground floor (0.91 meters); *Xiaocanglang*, or Little-Surging Wave Pavilion (1.10 meters); *Xiban Ting*, or West Half Pavilion (1.15 meters); *Xuexiangyunwei Ting*, or Pavilion of Fragrant Snow and Colorful Clouds (4.63 meters); *Daishuang Ting*, or Waiting for the Frost Pavilion (4.47 meters); *Wuzhuyouju*, or Secluded amidst the Wutong and Bamboo Pavilion (1.71 meters); *Hefend Simian Ting*, or Breeze from Lotus in Four Directions Pavilion (1.50 meters); *Xingji Ting*, Embroidered Silk Pavilion (4.51 meters).²⁶

Influence on Japan This trend also had an influence on Japan, but the gardens there were not as constrained by the restrictive conditions of urban sites, so that layouts were more organic and less formal, and the idea of *shakkaï*, or "borrowed scenery" could also be used. This involved the layering of near, middle, and distant views, using tall trees in the distance as the final layer. The samurai residence and

garden of *Shisen-do*, discussed in detail elsewhere in this volume, is a good example of this technique, so that, even though the site on the mountainside at the fringe of Kyoto is relatively small, it seems infinite. The Zen temple and garden of *Daitoku-ji*, the *Daisen-in*, in the same city was clearly influenced by the Chinese artist-gardeners, but in that case the area available for the gardens was constricted by the spatial requirements of the temple compound, and so the garden was designed to be a metaphor for the various stages of an individual life and, by extension, of human existence, within a small space. Life is symbolized by gravel, first raked to look like a stream, then a river, and then an ocean, with obvious parallels in human physical and psychological growth. Rocks of various shapes are placed alongside, and sometimes in, the gravel field symbolizing various attributes, such as curiosity, the willingness to explore, endurance, and strength. The *Daisen-in* Zen garden at Daitoku-ji has been intentionally designed as a three-dimensional representative of ink paintings of similar Chinese landscapes by Japanese artists Soami and Kano Motonobu, referencing similar monochromatic calligraphic art produced in China during the Sung Dynasty. This garden, which was built in A.D. 1325, is closely associated with the first two of three great unifiers of Japan, Oda Nobunaga and Hideyoshi Toyotomi, as well as with Sen No Rikyu, whom they patronized there. This is where he perfected “The Way of Tea,” now perpetuated as the tea ceremony. Rikyu, however, overstepped the conventional boundaries of modesty expected of him by placing his portrait at the top of the gate leading into the temple, and was forced to commit *seppaku* by Hideyoshi as a punishment in 1951.²⁷

JAPAN

Katsura and the *Sukiya* Style Japanese House

The Katsura Palace enters history in 1616 when records indicate that Prince Toshihito, after his marriage to Tsuneko, led a group of courtiers and geisha on a walk along the banks of the Katsura River and that he arranged entertainment at a pavilion he had ordered to be erected there for this event. Prince Toshihito's first son was designated as Prince Toshitada in 1626, and his father died three years later, soon after his son's coming-of-age ceremony.

Inspired by an Early Novel about Court Life Katsura was inspired by *The Tale of Genji*, by Lady Murasaki, about court life in Kyoto, which is considered to be one of the first examples of the novel form and describes the amorous adventures and distractions of a young nobleman. Toshitada turned his attention to the formalization of the entertainment pavilion his father had built. He started by creating a pond that is similar to one described in the novel, including rocks and trees that have direct relevance to it. By the time of the Tokugawa Shogunate, which was inaugurated at the beginning of the seventeenth century, the Imperial House was impoverished, and so there was very little money available to build with. Prince Toshitada, along with an advisor named Enshu and a team of carpenters and gardeners that he supervised personally, set out to augment his father's first pavilion called the Old *Shoin*, with its moon-viewing platform looking out over the water. He added what is now referred to as the Middle *Shoin*, containing the same theme of elegantly rustic simplicity that his father had used. *Shoin* translates roughly into



Katsura is the perfect example of a *sukiya* style traditional Japanese house because of its raised floor, light frame construction, wide overhanging eaves, and *shoji*, or rice paper, screen components. *Source:* James Steele

“study” and refers to the small houses built in the mountains by Chinese hermit scholars and the same kind of refuges that were inspired by them in Japan. Layered over this was the influence of the tea ceremony, introduced by Sen No Rikyu during the reign of Hideyoshi Toyotomi, based on the idea that even the simplest and seemingly most mundane act in daily life can be infused with spirituality through discipline, focus, and sensitivity. Tea houses, like the hermitages of scholars, were built of readily available materials, although they have typically lasted a long time. The kettle in which the water is boiled, the bowls in which the tea is served, the bamboo whisk, and even the ladle are chosen with great care and are objects of reverence. In Kyoto, tea bowls are still made in the same time-honored way, and the rougher and more natural their appearances are, the more precious and expensive they are.

The tea ceremony was introduced into Japan in the thirteenth century by monks during the Sung Dynasty in China, who were returning home after studying the principles of Zen Buddhism there, and was first performed in temples. In Japan, a local powdered green tea called *matcha* is whipped with bamboo whisks in a bowl while boiling water is poured on top of it, and the bowl is then passed from person to person as a symbol of friendship and unity. The ceremony was introduced to the aristocracy by the Zen monk Ikkyu (1394–1491) in a reformist attempt to curb excess, since it symbolizes the aesthetic appreciation of simpler things. Three basic forms of the tea ceremony emerged, which were named after the calligraphic styles they resembled, namely, *shin*, which is formal, like Kufic Arabic, *gyo*, which is more

free and cursive, and *so*, which is the least formal of all, written in leaves of grass. Sen No Rikyu developed the informal *so* style, performed on a grass or straw tea house, as a *minka* in miniature. He stressed the notion of transience and the sense of finality in each ceremony, which was to be like any other, in the sense of being a respite in the continuity of time that could not be revisited or repeated in quite the same way, with the same participants, ever again.

The Tea Ceremonies The tea ceremony started before the guests arrived, in the way the fire was started and stoked, by putting the especially selected water kettle on the fire to boil, as well as by placing a scroll prepared for the occasion in the *tokonoma* and putting a fresh *ikibana*, or flower arrangement, on the table. After all of the guests had arrived, the host or hostess put a water jar, tea caddy, tea scoop, whisk, tea bowls, and bamboo ladle on the platform from which the tea was to be served, near the hearth. After wiping the rim of each bowl with a clean cloth, tea was put into it from the caddy, and hot water was added with the ladle before it was beaten into froth with the bamboo whisk and passed to each guest, followed by a bow. After each guest was served, the utensils were removed, and the host or hostess bowed to the guests once again from the raised platform to indicate that the ceremony was over.²⁸

Once the tea ceremony was over, the temporary structure that was built as a shelter to protect the participants was intended to return to the ecological cycle from which its wooden posts, clay walls, and straw roof were borrowed, as a temporary structure built to commemorate a beautiful ritual shared by friends.

Ma While the typology of the house is a *shoin*, the style is called *sukiya*, based on this idea of rustic simplicity and elegant minimalism, constructed of natural materials. The goal of the tea ceremony is perfection, symbolic of that time in the life cycle when a human being, animal, or plant reaches its apex. This is expressed linguistically as *ma*, and represented by a character showing the symbol for the sun between the uprights and just above the crossbar of a *tori* gate. The period before this point of perfection is known as *wabi* and the point after as *sabi*, of expectations and recollection or youth and age. The rose in full bloom is *ma*, the bud is *wabi*, and the withering flower is *sabi*. There is also another layer in this philosophical position of the impermanence of nature, recalling Buddhist doctrine and the influence of Zen when Katsura was being built, and its teaching that life involved constant change. The tea ceremony and the hut-like shelter that is constructed for it celebrates the phenomenon of the durability of perfection and its place in the life cycle, as well as the impression that when we recognize we are in that moment, time seems to stand still, even though it must end. This dichotomy has been described by a student in a thesis prepared at the University of Southern California about *sukiya*, in which she says:

It is important to realize that change is often associated with sadness. Whether or not the change is positive or negative, change is always a jump from the known and understandable to the unknown or unpredictable. We glorify the past and future, but very rarely are we in the moment in which we cannot imagine a better time or place.²⁹

In contrast to this characteristically Western point of view, the *shoin* tea house, in the *sukiya* style, celebrates living in the moment, since, especially during the

uncertain times when the Katsura was built, anything could happen to any one of the participants or guests after they left gatherings that were held there. It also represented and celebrated hospitality, which was rare in such a violent time.

Paradise on Earth But, while they were inside the protective confines of the palace, the guests were secure. Katsura Palace seems to be misnamed since it was so humbly conceived and stands in stark contrast to the grandiose image presented by the *Nijo-jo* built by the Shogun Tokugawa Ieyasu in the middle of Kyoto at the same time. Katsura, in its final realization, consists of three parts, including a new palace added to the original pavilion of Hachijonomiya Toshihito and the Middle *Shoin* by his son Toshitada as well as five tea houses in the garden that surrounds it, named *Gepparo*, or the Tower of the Moonlit Waves; *Shokintei*, or the Pavilion of the Late in the Pines; *Shoiken*, or the Hut of the Smiling Thoughts; the *Shokatei*, or Pavilion of Admired Blossoms; and *Enrindo*, or the Hall of the Garden Forest. The New Palace, along with a music room were added by Yasuhito, son of the Emperor Gomizuno, in 1660.

The Perfect Integration of Architecture and Nature Each of these tea houses represents a well-known scene in Lady Murasaki's *The Tale of Genji*, but the garden itself also includes miniaturized replicas of well-known natural settings throughout Japan, such as the deep gorges of the Oi River and a peninsula called Amanohashidate, where a famous naval battle once took place.

The garden surrounding the Katsura Palace is a good example of a *Kaiyushiki* or stroll garden, designed to be experienced either in sequence while walking through



The typical Western approach to landscaping is to design the natural surrounding after a building is completed, but in Japanese traditional domestic architecture, house and garden are conceived together. *Source:* James Steele

it or as a collection of individual *tableaux* to be discovered. But more generally, it also conforms to the pond and island garden type used in the mansions, called *shinden*, that the aristocracy built for themselves: the *shinden*, or “hall for sleeping,” would be their primary house, and they would usually also have a *besso*, or country retreat, which is the category that Katsura falls into. The *shinden* usually included a pond, either naturally occurring or dug. If it was dug, it typically had an island in the middle, and the earth that was excavated to make it was piled along the south side to simulate mountains in the distance, which were planted with pines and Japanese maples. The pond was made large enough to allow boating. Wings usually extend out from the *shinden* at right angles to it, toward the pond, ending in pavilions at its edge. This style developed during the Heian Period (A.D. 794–1188) replicating both the palace style and temple forms used in China during the Tang Dynasty (A.D. 618–907).

During the Kamakura Period in Japan, from A.D. 1192 to 1333, the power of the aristocracy weakened along with their fondness for Chinese culture, and the *shinden* style evolved with *bisashi*, or verandas, added to the sides of the main hall, and with *mago-bisabi*, or a wide corridor, included to serve as the daily living quarters of the house.

Katsura Imperial Villa, then, contains this earlier *shinden* influence as well and serves as a composite example of several different and equally important stands of early Japanese residential history.³⁰ It had a profound effect on modern architecture, specifically through the writings of Bruno Taut and Walter Gropius who visited it and praised its elegant simplicity. Gropius described its timeless appeal as



Katsura was built by and for the Japanese Imperial family to be used as a place to escape both the rigors and the boredom of life at court. *Source:* James Steele

lying in its “lyrical, emotional reflection in natural texture and natural patterns” and the designer’s “love of the deliberately unfinished detail, corresponding to irregularity in nature. For the incomplete was considered to be still part of the fluid process of life.”³¹

The Kyoto *Machiya*

There is a unique kind of townhouse in Kyoto that has developed in direct response to the gridiron plan of the old city inspired by Chinese urban planning principles. Kyoto served as the capital of Japan for more than 1,000 years, from 794 until 1868, and was then called Heian-kyo or the “capital of peace and tranquility.”³² It was modeled after the Chinese capital of *Chang’an*, now

Xian, and had hundreds of standardized city blocks, measuring 394 feet by 394 feet, typically divided into 32 building lots each.

The peculiar configuration of these building lots meant that the houses were built to fit a long, narrow profile, and many of the artists’ and merchants’ houses that have survived from the Heian Period provide an insight into what life must have been like during that time. These were shophouses, with a function similar to that of the Chinese equivalent in the Straits Settlements or the slimmer, more efficient type found in Taiwan, among others, with the same basic components, but distributed in a completely different way.

Natural Materials In building their *machiya*, the merchants of Kyoto made efficient use of the natural materials available to them. In addition to the deformed timbers that they were required to use, since only members of higher social ranks could use straight ones, they used stone, clay, bamboo, and paper. They used a single stone under each column as a foundation for the house and as the stepping-stones leading into the long corridor along the side. The columns were not connected to their foundation stones, but were held in place only by the weight of the structure, making it easier for them to survive an earthquake, as did



The shophouses on *machiya* that used to line the back streets of Kyoto still exist in many parts of that historical Japanese city, contributing to its charm. *Source:* James Steele

the arrangement of horizontal beams used to support the roof. This also allowed for an open floor plan, since no additional load-bearing walls needed to be built. The roof was made of light, wooden shingles. The outside walls were vertical board and batten wood siding. Each board was lightly charred before use to make it weather resistant. The inner side of the exterior walls was covered with a bamboo lattice, which was then parged with a mixture of sand, straw, and clay.

These long narrow houses are divided into three parts, organized around a little inner garden. The first space, next to the street, is a shop designed with sliding or folding shutters that allow the owners to display their goods to passersby. The middle of the house is designed as the family area, separated by the garden from the workshops or warehouse in the rear. This permitted merchants to live and work in the same place. As is the case in the Chinese or Taiwanese shophouse, the shop, or the *mise*, faces the street, with either a sliding door or a hatch allowing the public to have access to this space. Sometimes there was a counter built across the front of this room to block public entry but to still allow transactions to take place. The floor of the *mise*, like those of each of the rooms lined up in a row behind it, were all raised and made of wood laid with *tatami* mats, unlike the hard-packed earth of the corridor or *toriniwa* running along the entire side of the *machiya*, from front to back at ground level, which provided access to all of them. The next room in the sequence after the shop was the *makanoma*, near the middle of the house, which included a steep stair up to a storage loft above. This stair was often built like a piece of furniture, with drawers occupying the space under the treads to provide



The *machiya* in Kyoto are similar to shophouses found throughout other parts of Asia in that they combine living areas with those for the sale and storage of goods. Source: James Steele

extra storage space in the tight quarters of this typically modest Japanese home. This middle space was framed to be a house in its own right, with a single tile-covered gable roof, pitched from the front of the house to the back covering the long, narrow, rectangular room. The framing, like that of the *minka* farmhouses found throughout Japan, was accomplished using a grillage of deformed beams. By decree, only the Emperor, the Shogan, the *Daimyo*, or nobles, and the *Samurai*, or military retainers, were allowed to use the best quality straight grained wood for their houses.³³ There was typically a small courtyard, open to the sky at ground level between the middle room and the formal reception room, for greeting guests, called the *zashiki*, at the back, which had an *engawa* to allow people to sit outside the room, but above the level of the garden. The *engawa* historically serves an important function in Japanese houses of all social levels as an inside/outside space that is too narrow to be a room and too wide to be a ledge, being just wide enough for a person to sit on it comfortably.

The *zashiki* also served as a private bedroom for the husband and wife of the house, with an enclosed bathroom, or *dozo*, down at ground level, across the corridor nearby. Cooking was often done in the *tooriniwa* as well.³⁴

Shisendo: A *Samurai* Retreat in Kyoto

There seems to be an essential incongruity in the idea of a fearsome *samurai* warrior also being a sensitive poet, architect, and landscape designer. But this paradox was typical in feudal Japan, where military leaders also prided themselves on such accomplishments. One of these *samurai*, however, was exceptional: Józán Ishikawa was not only decorated for bravery by none other than the Shogun Tokugawa Ieyasu, who was the last of the three great unifiers of Japan, but he also created one of the most beautiful and memorable of the traditional *sukiya* style retreats that still survive in Japan today.

A Fateful Choice Tokugawa Ieyasu had risen through the ranks via a long and complex series of machinations that finally put him in a position to be named Shogun by the Emperor at the beginning of the eighteenth century. His predecessors, Oda Nobunaga and Hideyoshi Toyotomi, had already laid much of the groundwork by subduing many of the various fiefdoms that were making claims to power, and it remained for Tokugawa Ieyasu to fight only one more major battle to bring them under control. This took place in a narrow valley near Sekigahara in early October 1600, and before the day was over, thousands had lost their lives on both sides. Józán Ishikawa, who was 18 years old at the time, served as a member of the Shogun's bodyguard at the battle and distinguished himself by saving one of his sons from harm. The Shogun subsequently, in 1612, offered him a promotion that would have allowed Józán to be part of Ieyasu's household guard. This was considered to be a very prestigious position, but he refused. He did participate in a military campaign in 1615 that was intended to eliminate the last factions of resistance to Tokugawa rule, but he was becoming increasingly interested in Zen Buddhism and left the Shogun's service to explore the faith. This was interpreted as disloyalty by the Shogun, and Józán was arrested, but because of his past record of bravery, he was not executed or asked to commit *seppuki*, just forced into early retirement at age 33.³⁵

Inspired by Chinese Culture Since Buddhism had been introduced into Japan by emissaries from the Paekche Court in Korea in the early part of the nineteenth century, it had taken hold quickly, first in Nara and then in Kyoto. Tokugawa Ieyasu built a palace in Kyoto called *Nijo-jo*, but moved his court to Edo, now Tokyo, to the north. Józán remained in Kyoto, which was the focal point of Zen Buddhism, and also began to immerse himself in the study of Chinese literature. He sought out a number of new friends who could help him pursue this interest. He read an anthology of Chinese literature, called the *Wen-boiiian*, written in A.D. 530, and started to associate with famous Confucian scholars of that time in Kyoto, such as Hayashi Razan and Fujiwara no Seika. In spite of all this effort, he seems to have been drawn more to the Chinese tradition of the hermit scholar in general than to Confucian philosophy, perhaps because it applied directly to his circumstances.³⁶ The model his mentors followed was that of the refined Chinese gentleman, or *wen-jen*, who sought peace in solitude, replicating mountains and streams in miniature to assume the role of a hermit in their garden villas in cities like Suzhou and Hangzhou. The Japanese equivalent of the *wen-jen* was the *bunjun*, who feigned the hardship of a hermit living alone in the mountains by building an estate within an elaborate garden that recalled a wild landscape like this, writing poetry, and living the life of an ascetic.

The Hall of the Poetry Immortals Józán Ishikawa started building such a retreat in Kyoto for himself in 1641, when he was 58. He dedicated his home to 36 of the most famous Chinese poets, placing their portraits around the soffit of a central hall of the house, with notable exceptions that reveal much about Józán's single-mindedness. The emphasis that Józán placed on these scholars indicates that he wanted to distance himself from Zen, as the variant of Buddhism that had been widely accepted by the *samurai* because of its stress on minimalism simplicity and purity, in favor of Confucianism, which focuses on scholarship and refinement. Stories in the *Analects*, by Confucius, such as the one in which he tells a student who complains of being an only child that "if you're a gentleman, all men within the four seas are your brothers," must have resonated with him, since he was ostracized at court.³⁷ Chinese poetry is *shi*, so these masters were the *shisen*. *Do* means hall in Japanese, so its complete name *Shisendo* means "hall of the poets," or "poetry immortals." His house is a masterpiece, which in spite of its small scale and delicacy presents a profound image of otherworldliness and detachment as alternatives to competitiveness and materialism. The property itself is larger than it seems, occupying a slope, part of a valley, and fields, which allowed Józán to remain self-sufficient while he lived there.

With the "Hall of the Poetry Immortals" as the center of attention in his retreat, Józán designed each of the other parts of it with vignettes selected from the most famous poems of the writers he had chosen in mind, and named them accordingly, so that with the Hall included there are ten distinct areas or zones in the house.

Lesser Paradise Cave The first of them, which Józán named the "lesser paradise cave," is the entrance from the street. This is flanked by thin, lashed, bamboo screens providing a barely noticeable, modest welcome for those who know it is there. After going through this screen, a visitor encounters a straight, thin stone stairway that then turns into a walkway of randomly placed slabs, ending at the second vignette, which Józán named "The Old Plum Gate."

The Old Plum Gate This is a second portal in a bamboo fence that surrounds the house, with a narrow thatched roof that indicates it is more important than the first doorway facing the street. Another walkway of randomly placed flagstones then leads to the middle of the L-shaped house, up and into the square Hall of the Poetry Immortals, which is really much more fragile than its highly serious name indicates.

Nest for Hunting Among the Rue After admiring the portraits of the 36 “immortals,” divided nine to a side on the soffit running around the room, one enters the fourth vignette, which is the “Nest for Hunting Among the Rue” that forms a second “L” facing west, in the opposite direction from the first. This has an *engawa* along its entire edge, which invites one to sit and contemplate the view of the garden that is just outside. This garden, as one eventually discovers, is divided into upper and lower portions, and the upper one, directly in front of the *engawa*, is made possible by a massive, curving, stone retaining wall that separates the top and bottom sections. The view into the top part is skillfully contained by meticulously pruned azalea bushes cut to resemble boulders or mountains in miniature, or many other things except an azalea bush, depending upon the imagination of the viewer. Since azaleas bloom on a regular basis, it takes constant picking and pruning to keep them well-rounded and flower-free so that they will retain their suitable level of abstract. This now requires the efforts of several gardeners on a regular basis, and it must have been the same when Józán lived there, raising the question of how he managed to pay for maintenance of the house. It is known that in order to provide for his aging mother, he took a post as a retainer for the Asano family, near Hiroshima, after leaving the service of the Shogun. He remained there for 12 years, and they may have continued to support him after he left their service with something similar to a retirement stipend.

Rather than grass or moss, Józán used unraked sand as a foreground for the azalea bushes, placing it between them and the *engawa*. Sliding panels on tracks, which can be lifted out and removed if necessary, make it possible to open up the entire southern side of the house so that the Nest for Hunting Among the Rue is really two raised conjoined rectilinear platforms, with an *engawa* running along their edge and *tatami* mats covering their wooden floors that project outward like offset wings from the square Hall of the Poetry Immortals between them. These platforms are ideally situated for meditation and contemplation since they allow a kneeling or seated viewer to concentrate on the composition in the foreground, and then to change perspective by looking out over the azalea bushes to the layers of increasingly higher trees in both near and far distance. This is a perfect example of the technique of “borrowed landscape” or *shakukai*, in which elements are placed in a garden to take advantage of a distant view by blending in with it. The tallest trees that terminate the view to the south from the two long narrow juxtaposed seating platforms, paradoxically providing a sense of containment and infinite distance, are deciduous and are located beyond the property line, matched by the smaller ones that Józán put in front of them.

The Tower for Whistling at the Moon The fifth conceit in this three-dimensional poem that Józán has designed is “The Tower for Whistling at the Moon,” which is accessed by a narrow stair hidden along the inside edge of the

western viewing platform. This small square redoubt, which Józán may also have used as a bedroom, is no longer open to visitors. It has its own gabled roof, a sliding shutter on the front, and circular openings on the side that recall its function as a place to view the full moon. There is a second echo of the full moon, in a circular opening covered by a bamboo lattice, at the top of the stairs that lights them. These two round openings provide a poetic counterpoint when seen from the lower garden when the full moon is visible and the tower is lit from the inside. This was surely Józán's intention when he decided where to place them, what size they should be, and what covering should be used over the smaller one at the top of the stairs. The roof is clay tile, as is the majority of the rest of the portion below this tower, with the exception of a thin thatched strip that extends out from the viewing room.

The Spring of the Vital Region Running water is the perfect foil to break the almost ethereal silence that Józán has created in this small paradise in the hills above Kyoto, since it contributed to the sense of being in a carefully edited version of the natural world in miniature that pervades his house and garden. The sixth vignette, or architectural stanza, he has provided is the "Spring of the Vital Region," which is a stream that is fed by a spring behind the eastern edge of the house, near the property line, and runs along the front amidst the abstract azalea hillocks of the upper garden.

The Pavilion of Leaping from the Deep This stream runs by the seventh feature, "The Pavilion of Leaping from the Deep," which is a rather grandiose name for a servant's room, and the eighth and ninth, which are "The Waterfall for Washing Away Ignorance" and a second smaller stream that flows from the waterfall called "The Shallow of Falling Leaves." The waterfall has a bamboo tube, called a *sózu*, mounted on a forked base that drops onto a small rock as it fills with water, causing a hollow knocking sound when it does. The *sózu* was typically used by farmers to scare away deer so they would not eat their crops, so its use here is puzzling unless it was a way for Józán to mark time as he sat writing poetry looking out at the near and distant view he had crafted.

The tenth scenario is called the "Embankment of a Hundred Flowers," which is a slope, built up of small rocks and planted with flowers, near the waterfall.³⁸

The Otosuso Technically speaking, the official name for the Shisendo is the Otosuso, or the *Trompe L'Oeil* Nest, which is the way Józán referred to his house, since the Hall of the Poetry Immortals is only one of the ten scenarios that he so carefully devised.³⁹

Józán lived at Shisendo for about 30 years, also using it as a base from which to visit famous sites in the history of Japanese literature such as Ishiyamadera, near Lake Biwa where Lady Murasaki wrote part of *The Tale of Genji*. It is unusual now, and even more unusual during the late middle ages in Japan, for anyone to reach the age of 89. It is tempting to think that the unparalleled serenity of the house he created in the mountains above Kyoto contributed to his longevity.

Tsumago

Tsumago is a small village located in the Kiso Valley, which is north of Nagoya in Japan. It is significant because it is one of the best preserved of about 70 rest stops located along the Nakasendo highway, which is a historically important route in

the middle of the country. This path, whose name means the “road through the central mountains” in Japanese, was one of the main routes connecting the central and southern parts of the country with Edo to the north. Another main alternative was the Tokaido road, which followed the shoreline and has now been mostly replaced by the tracks of the high speed rail line called the Shinkansen, which runs from Hiroshima in the south to Tokyo in the Kanto Plain. These routes became essential after Tokugawa Ieyasu became Shogun in 1603, and the center of power moved from Kyoto to Edo, now Tokyo. Travel along these routes also increased dramatically because of the law of alternative residence enacted by the Tokugawa Shogunate, which forced all of the nobles, or *daimyo*, to spend part of the year in Tokyo, as well as in their home districts. This law was intended to prevent the *daimyo* from acquiring too much power by taking them away from their base for a substantial amount of time, and also requiring them to spend a great deal of money moving back and forth with their entire retinue, as well as maintaining a second residence in Edo, large and lavish enough to entertain the Shogun himself. This ensured that the nobles would be less likely to finance a rebellion against their leader.

A Daily Pageant The diurnal parade along the Nakasendo must have been something to behold, with aristocratic men and women riding along it on horses or being carried in palanquins, along with large retinues of soldiers and servants on foot. During the Tokugawa period, which lasted until the Meiji Revolution in the 1860s, the strict hierarchy that had existed in Japan before Ieyasu became Shogun was retained and further entrenched, and the *samurai* became more like civil servants because they had far fewer battles to fight. Other than the Imperial household and that of the Shogun and the *daimyo*, the *samurai* were the final rank of privilege, followed by the merchants and farmers. Each person belonged to his or her specific domain *bakuban*, which they were unable to change. In this rigid hierarchical class structure, each had a distinct social responsibility, and those at the bottom of the pyramid had a status that was little better than a draft animal, since they did not even have a family name. Because of the Chinese influence, expressed through Confucianism, the classes below the *daimyo*, or regional lords, and the *samurai*, who were their soldiers, scholars, and farmers, made up the next social rank and were given preference over merchants, who were near the bottom.

Post Towns The post towns along roads like the Nakasendo and Tokaido were mainly populated by merchants, because they hoped to profit from the people moving along them. When they were first established, they catered mostly to government officials, and so they served a quasi-official function. During the nearly 250 years of Tokugawa rule, traffic along these roads became less strictly regulated, so that, in addition to being used as a means of control as check points by the government, they supplied food, drink, and accommodation to the members of the Imperial household, Tokugawa court, *daimyo*, or *samurai* who used the roads.⁴⁰ The way in which those services were provided was as carefully structured as the society itself, with an equal amount of hierarchy. The *daimyo* stayed in *honjin*, or “first level inns,” equivalent to a five-star hotel today, while those of lesser rank stayed in *waki-honjin*, or secondary inns, and so on down the line.

Tsumago Of the 11 post towns strung out along the Nakasendo highway in the Kiso Valley, which is now the Nagano Prefecture, Tsumago is still relatively intact,

with its shops and inns as well as its townhouses, either *machiya* or *minka*, which were the homes of the merchants, still remaining. This provides a good opportunity to appreciate what it was like to live in one of these towns during the feudal period.

As one of the three types of *minka*, with the other two being the *moka*, or farmhouse, and the *gyoka*, or house in a fishing village, the *machiya* evolved specifically for living above a shop that faced the street. The *machiya* of Tsumago are good examples of this type, which has an internal arrangement that is entirely different from that of the *moka* or *gyoka*, since its primary function was commerce and the production and storage facilities that are related to it. To facilitate this, the shop was located in the front near the street and the storage area was in the back, with access to a service alley. The front area is called the *omoya* and the storage area is referred to as the *kura*. Sometimes, a separate storage area was built, in which case it is known as the *zashiki*. The *doma*, where people worked, was in the center, and living quarters and bedrooms were on the floor above. Drawers were fitted under the stair so that no space was lost. If possible, a small garden was also included in the *doma* to bring fresh air and light into the house through an open courtyard that extended through to the roof.

Some of the items for sale were displayed on a counter that was open to the street or on the floor in the front, which was opened up to passersby during the day by removing shutters that were fixed in place when the shop was closed. However, the majority of the inventory was kept in the storage area and brought out as needed, so that the customers did not enter the shop as they do today.

A Three-Dimensional Record of Status Many factors determined the location of an inn or shop in Tsumago, and its position in relationship to the street, but the primary consideration was the social position of the owner and that of the clientele that the inn or shop served. If a *machiya* was owned by a merchant of low social rank, it would have a small amount of frontage and be located on the outskirts of the highway, while a wider façade and more central location indicated a more well-connected owner. So the size and location of each of the homes on the Nakasendo highway in Tsumago is not a matter of chance, but can be read as a tangible record of social standing in the community.

Over time, as the Tokugawa Shogunate became less concerned about being overthrown, and the long period of peace that their rule made possible raised the level of prosperity throughout the country, commoners started to travel more frequently and the Nakasendo highway received its fair share of them. This, in turn, made the merchants in Tsumago wealthier, which caused some blurring of the strict hierarchical system that had prevailed when Tokugawa Ieyasu was first appointed. This was finally resolved during the Meiji Period that replaced the Tokugawa Dynasty in the 1850s, when the rigid class structure was relaxed a bit, and *samurai* were decommissioned to facilitate modernization.

A Breathtaking Backdrop Tsumago stretches out, in a long, flattened “V,” along the base of a mountain range behind it, with an offset break in the middle of its extended angle where horses, palanquins, and servants would stay after everyone had settled in for the night. The Nakasendo is often referred to as a highway but is really little more than 20 feet wide at the most, becoming even narrower as it enters Tsumago, and moves up and down along the contours on the way through

it. Tsumago is unusual as a village in the conventional sense in that it is essentially linear and only one house deep on each side of the narrow road running through it. Aside from the wider open area used for stables mentioned earlier and the street itself, there are no public spaces as such, so that the equivalent of the park or common in the English village or the Italian *piazza* is missing. The inns had a small open courtyard in front to facilitate dismounting, and one of these still remains in Tsumago. It is called the Ryokan Fujioto, which advertises that it was “visited by *Daimyo* and their entourage during the Edo period.” It has a beautiful garden in front of it, between the entrance and the road. But otherwise, daily life was acted out along the street, as people moved along it.

Human Scale and Materials The *machiya* that lined both sides of the road were built of natural materials that were available locally, such as *hinoki*, or cypress from the forest in the Kiso Valley, and the roofs were thatched with straw from the nearby fields. Some of the houses are partially faced with plaster made from local lime, and if the house or inn is more upscale it might have a tile roof made from clay found near the town. Even the most prominent of these inns and shops are not large, and so the impression that they convey, as one moves down the street, is one of warm domesticity, made all the more appealing because of the steep, snow-covered mountains and forests that are visible in the near distance, directly behind them. These shophouses, which vary in size and are therefore each different even though they are lined up in a row, present an ever-changing façade that undulates up and down with the contours and in and out according to status, providing a rare glimpse of Edo-era life.



Tsumago is a typical port town, and it is similar to others built along the roads that connected all parts of Japan to Edo during the Tokugawa Period. Source: James Steele

KOREA

The Traditional Korean House

Korea is climatically similar to Japan in having four distinct seasons, but each one is even more extreme. In the north, winter lasts for nearly half the year and

temperatures can remain far below zero degrees Fahrenheit for long periods of time. For this reason, the original orientation principles associated with *feng shui* are even more important in the selection of a site for a village, since having mountains to the north will help to block the cold winds sweeping down from Manchuria, and having a river or other water source nearby to the south will provide one of the essential requirements for survival.⁴¹ This seasonal difference has produced the same formal dichotomy in the traditional architecture of Korea that it has in Japan, discussed in Volume 1 of this three volume set; this clear distinction between the heavily insulated *minka*, which some believe to have been derived from the earth sheltered *Jomon* prototype, and the light, wood frame *sukiya* style home, with its raised floor and flexible movable screens, which can be traced back to *Yayoi* typologies of a similar kind.

In Korean traditional houses this difference corresponds to the *ondol*, which has evolved to cope with the cold winters of the north, and the *maru*, which is perfectly suited to the hotter and more humid summers in the south, with regional variations being recognizable in each of these two general categories. In Korea, as in Japan, the development of each of these distinctly different types of houses also has socio-economic ramifications. The *ondol*, like the *minka*, is more prevalent among working class rural households, and the *maru*, like the *sukiya* style house is more frequently associated with the middle and upper classes. The *ondol* house is on a grade and has a radiant heat flooring system, similar to those found in northern China. This is connected to an oven or furnace that burns all day and night throughout the long winter months. The *maru*, which has a raised wooden floor, is more popular in the warmer and more humid south.

Consistent Plans Rooms in the traditional Korean house are typically organized in a linear sequence, with three or more rooms lined up in a row. These usually include a *taech'ong*, or main hall, which is larger than the rest, and one that is open on one side, sometimes called a *kungudul*, in the south. The kitchen (*puok* or *changuigan*) also doubles as a family room and the sleeping quarters. *Feng shui* also determined the arrangement of beds in the sleeping area, with pillows to the east or south next to the courtyard wall being preferred. Placing one's head to the east is felt to bring riches, and to the south a guarantee of long life; but it is in beliefs such as this that the original, common sense aspects of *feng shui* begin to veer into the realm of superstition.⁴² Bathrooms, or *chukkan*, and storerooms are detached typically.⁴³ There are several regional variations of this straight, single line house that vary from region to region depending on the need to conserve warmth, or not. In the north, houses consist of a flanking set of three rooms each, with an *ondol* floor and an enclosed courtyard between them. In the south, the arrangement is linear and the rooms are narrower on the raised *maru* floor, to maximize cross ventilation.

As this simple tripartite house plan evolved, it began to conform to the Confucian ideal of the segregation of the sexes, to include an *anbang*, or private room for the women of the household, in the *anch'ae*, or women's quarters. The corresponding section for men in the house is the *sarangchaé*.

A Woman's World The term "housewife" in the traditional Korean household is literal, as the house was a female's domain. This was symbolized, as one observer has characterized it, "by her ring of keys, particularly those to the storeroom and

twijus” (grain bins). These keys passed from her hands to the wife of her eldest son, but only after the younger woman proved herself worthy of such recognition by fully assimilating the character and heritage of her husband’s family. This consisted of mastering the intricacies of the administration of the household.⁴⁴

Male visitors or guests were entertained in the *sarangchae* and females in the *anch’ae*. The kitchen, where the hypocaust fireplace or oven that was the source of heat for the *ondol* was located, was on grade with a dirt floor, and an outdoor oven was used during the summer. Clay jars in a shaded area were used for food storage, and these rooms are called *kwang*, or there were larger ones, called *kokkan*.

Dining arrangements reflect the separation between men and women, who ate at separate tables, and also kept Confucian values, where the elder members of the family ate first. This division means that there was not one large dining table, there are several smaller ones that are easily moved from place to place.

The Difference between the Homes of the Upper, Middle, and Lower Classes

The straight line house, also called an *il* because it resembles the Chinese character for the number one, is the cheapest and most basic and therefore the most prevalent type of residence built by Korean families with limited financial resources. As these increased, a second parallel line of spaces was added to create a double row house with a courtyard in the middle. If and when possible, one side was closed in to form a “U.” Roofs are straw thatch (*satcip*), stone shingle (*mosaejip*), or oak or wood shingle (*kup’ijip*) depending again on financial resources. Another variation on the growth of the straight line house was to just add the perpendicular leg to make it into an L-shaped (*kiyok*) house, open to the south, and turning its back to the north. The final configuration, of course, is a square, with an open courtyard in the middle, and this four-sided house is called a *muim*. A member of the middle or upper class, who had the means to build a square house with an open courtyard, did so without waiting until they could afford it, because it was the most preferred form of all. The basic unit of measurement used in the traditional Korean houses is the *kan*, which is the equivalent of a structural column bay forming a square space of unspecified dimension. The center to center distance between the columns typically ranges from six to ten *choks*, with one *chok* being 30 cm.

During the Chosun Dynasty, during the fifteenth century, when Seoul became the capital of Korea, strict regulations governed the size of the house that a family could build, as well as what materials, paint colors, and decoration could be used. In a published edict called the *Rule of Domiciles*, circulated during the reign of King Sejong, the requirements imposed on houses included specifications for those built by members of the royal family, which give us a good idea of the various scales considered appropriate for various members of society. These included rules such as a limit of “sixty *kans* for the *taegun* (rank of prince by the king’s first wife), fifty *kans* for the rank of *kun* (princes by the king’s secondary wives) and *ongjiu* (princesses by the king’s secondary wives); forty *kans* for the *chongch’iu* (king’s relatives) of class level two or above, thirty *kans* for class three and lower and ten *kans* for *sobins* (untitled citizens).”⁴⁵ These regulations continued on to include the five main classes of Korean society that they stipulated at that time, which were *yanghan* or gentry, *chungin* or low ranking civil servant, *igyoo* or semiofficial employees, *yangin* or “the common people,” and the *ch’omin* or the lowest class.⁴⁶

Construction of the houses of the wealthy during this period started with a stone foundation, usually granite, which projected from between 90 and 120 cm above grade. Granite footings were then placed on this platform to receive the wooden columns, which had to be square since round columns were reserved for royalty. Sculpting the edges of the stones used on the corners of the foundations, as well as the use of red paint, were also considered a royal prerogative, as was the carving of the roof beam and the privilege of using high ceilings to create loftier interiors.

The Influence of Confucianism The teachings of the Chinese philosopher Kung-tze, or Master Kung, who is known outside Asia as Confucius, had an especially pervasive influence in Korea because they meshed nicely with a preexisting belief in patriarchy. These beliefs had repercussions on residential design because they altered the customs of the bridegroom living with his wife's family until the children of the couple reached the age of 18, and then moving into the house of the groom's family, in exchange for preferential treatment of the eldest son.⁴⁷ Confucianism stresses primogeniture, as well as reverence for family lineage, so it brought the custom of living with the bride's family to an end, shortening the period of residence to three days, before the bride and groom moved into the groom's home. This need to provide more living space, as well as adherence to the Confucian teaching regarding the domestic separation of the sexes prompted the proliferation of the *muim*, square, or courtyard house, as the final stage of residential evolution.

The Courtyard as the Stage for the Rituals of Daily Life The courtyard has been described as serving a crucial role in the residences of other Asian societies presented elsewhere here, but function is even more particularized in Korea, since the four major rites of passage were carried out there. These are the celebration of *kwalle*, or the transition of a male member of the family to adulthood; *holye*, or marriage; *sangye*, or funerals; and *cherye*, or ceremonies related to the remembrance of ancestors. In some cases, these were interrelated, since the *kwalle* ceremony also included the selection of a bride for the young man, the date of the wedding, and the delivery of details of the young man's birth to his prospective bride's household, including the year, month, day, and hour that he was born, so that astrological comparisons could be carried out.⁴⁸

MALAYSIA

Shophouses in the Straits Settlements

Penang is the oldest British settlement in Malaysia, predating both Malacca and Singapore. The first Europeans to settle in Penang were the Portuguese in the fifteenth century. Prior to their arrival, Penang was virtually uninhabited except for a few small pockets of Malay villages. Penang's position in the Straits of Malacca made it a choice port of call. The profitable spice trade there attracted the British in the seventeenth century, and Francis Light, a naval captain, came to the island in 1765. He negotiated with the Sultan of Kedah, and promised protection and compensation in return for establishing a colony there. There were about 100

Malays living in Penang when the British landed on August 11, 1786. Penang was christened Prince of Wales Island and the British settlement was called Georgetown, after the reigning monarch of England, King George III.

The inner city was uninhabited when Francis Light arrived. He cleared the swampy, jungle area and marked out the four main roads, which are Light, Beach, Chulia, and Pitt Streets today. In the original town layout, Light Street and Beach Street followed the outline of the island's edge. The land between these two main streets was organized on a square grid, with streets crossing one another at right angles. The first settlement was only about half a mile in length. Pitt Street and Chulia Street bound this grid, and Beach Street was the principal commercial street, where the trading offices and *godowns* or warehouses were located. The section of Beach Street just north of Market Street housed the larger merchants' houses, especially those associated with the European firms. Those belonging to Chinese and Indian firms were located between Market and Chulia Streets. Armenian and Acheen Streets were home base for the Achenese traders.

By 1789, hundreds of convicts from Bengal were brought to Georgetown to help install public works, and they began working on the roads and making bricks. Within 20 years, the main streets were raised and drained. The original *attap* houses, made from palm fronds, disappeared rapidly, and brick houses replaced them. During this period, the city was bounded on three sides by water, to the North and East by the sea, and on the South by an inlet. The western boundary was Penang Road.

Rapid Growth When Francis Light died in 1794, the population of Georgetown had already grown to 25,000. At the turn of the century, the East India Company and other European companies had built out along the north shore of Light Street. Incoming vessels approached the town along Beach Street, and for convenience sake this is where traders set up their offices and *godowns*. From the beginning the commercial town was made up of various ethnic groups that defined its urban form. As the various groups settled in their communities, they named the streets and determined the style of the architecture in each segment. Eurasians migrating from Kedah built their church, presbytery, and homes along Bishop Street and Church Street. The Chinese population migrating from Kedah lived and traded along China Street, building their temple at the eastern end of their neighborhood on Pitt Street. The Indian settlers lived and traded along Chulia Street. They built their mosque at the southwest corner of town. A market was located at the waterfront end of Market Street, and these communities set up shops at the eastern end as well as along Beach Street. The residents were located in between and the various buildings of worship were at the western end. In addition, several lots along Pitt Street were reserved for religious institutions. The foundations for a multicultural settlement were established from the beginning.⁴⁹

By 1803, the original street names were agreed to by the ethnic communities who settled them. Even after the various ethnic groups moved out, or shifted in geographic location, the streets maintained their names, which illustrates the rich history of Georgetown. South of this formal grid pattern, the indigenous Malays and Sumatrans created their villages. A portion of their original village still exists today on Armenian Street and Acheen Street.⁵⁰

Between 1820 and 1850, the Straits' Chinese clans moved into the Armenian Street area. They changed its urban layout with their temples and the surrounding row houses for their clans. This unique urban layout is a special feature of Georgetown. The fortified compounds have narrow entrances located at the Beach Street end, where they traded and did business, while the high-quality shophouse residences developed along the western end.⁵¹

The early Indian Muslim community grew so rapidly that the boundaries of their settlement forced Chulia Street to be extended to Penang Road by 1803. Some of the early nineteenth century Anglo-Indian bungalows and Indian Muslim mosques and shrines survive there today, tucked behind the more recent shophouses of the late nineteenth century.⁵²

By the early part of the nineteenth century, Penang was well established as a British stronghold in Southeast Asia, and as an *entrepot* harbor providing fuel and supplies for ships sailing to and from the Straits of Malacca. When Sir Stamford Raffles visited the region at that time, however, he made the assessment that Singapore would make a more strategically logical place from which to operate and arranged for Britain to trade there in 1819. The result of this shift was that Singapore began to eclipse Georgetown as the most important harbor, becoming the first among equals as a Straits settlement along with Penang and Malacca.

The Shophouses In 1822, Raffles initiated the town plan for Singapore, which included a new typology now called the shophouse, planned with a specified width linked by a 5 feet wide covered arcade to ensure “conformity.” Raffles was a complex individual, who had visited other parts of the Empire, such as India, as an agent of the East India Company, and was also an amateur architect and



Traditional row house of Malacca. Courtesy of Grant Stewart; Flickr

archaeologist, having discovered, surveyed, and drawn the Temple of Borobudur in Central Java, Indonesia. The shophouse, which is really a multistoried brick row house connected by a covered sidewalk that separates it from the street, seemed a good way to facilitate trade, since merchants could live above their ground floor shops that opened onto the arcade and store their goods in the back.

The Kaki Lima or Five-Foot Way By 1856, the shophouse and its constituent features, such as the 5 feet wide covered arcade, were well engrained into the urban fabric of the Straits Settlement. In the Conservancy Act passed in Georgetown in that year, for example, these paths are described as a “public walkway alongside the building.”⁵³ Typically, this is an arched opening that connects one shophouse to the next, thus creating a continuous walkway and a unified façade from the street view. Although the five-foot way was first regulated in Penang by the Municipal Ordinance of 1887, the custom was already well entrenched by the middle of the nineteenth century. The five-foot way is a characteristic feature of shophouses in Penang, Malacca, and Singapore.⁵⁴

The Shophouse Façade In Georgetown there are only two types of facades found: a porch wall, facing the five-foot way with standard elements, or one with the full-width opening. The two façades are similar in that they are both used as infill between the two side walls or columns. Both have floor beams that span the entire width of the shophouse, allowing the ground floor façade below the beam to be free from structural elements. They are also both adjacent to the five-foot way, which can be covered with granite, terra cotta, or unglazed pattern tiles. The façade in a full width opening covers the entire face of the ground floor. As the façade



Traditional shophouse of Kuala Lumpur. Courtesy of Andre Chiew; Flickr

developed in later periods, it was broken horizontally with a main movable section that has louvers or a grill at the top.

The porch wall is composed of a central, usually symmetrical, door that has a window flanking each side. In rare examples, the door will be set to one side. It is often referred to as a Chinese porch wall due to the embellishments the Chinese settlers would add to the façade. One of the most common Chinese additions is a carved wooden door. These doors often have wooden signboards over them, as well, with grillwork in the center and shaped vents above the window. The vents are circular, rectangular, or fan-shaped. These shapes are outlined with solid hardwood framing and often filled with a decorative grill. The windows typically have vertical metal bars, which were the original security device. The window openings can be rectangular or have arched transoms above; and in later periods, they usually have interior casement shutters. Decorative glazed dado tiles can sometimes be found below the windows. Stylistically, this porch wall was changed very little over time.

Since the main façade of the shophouse is visible only above the arcade, it is here that the decorative influences of different styles are fully expressed, but the basic structure and simple rectangular shape of the shophouse did not change much.

General Construction Major fires affected shophouses in 1789, 1808, 1812, and 1826. After the last fire, it was determined that shophouses had to be built in brick and that terra cotta should replace *atap* as a roofing material.

Wood construction was then limited to floor, beams, and roof purlins. Often, granite bases, sometimes embellished with carving, were set in the brick wall to support the timber beams. As elsewhere, later technology introduced the use of reinforced concrete and steel for beams and columns. However, the beams and purlins in the roof structure timber and the wall infill material remained brick, which was always finished with plaster. All materials were locally available: brick kilns were abundant to supply the brick, the timber was plentiful, and granite was mined locally.⁵⁵ The evolution of the basic shophouse type, then, went through the following stages.

The Early Shophouse Style: 1820–1830 The earliest shophouses are very simple, being shorter with brick piers. In this period, the façade was only a means of filling the space between the two walls. Climatic considerations took precedence—it was important to maximize ventilation and minimize sun. The walls were constructed with timber and had a row of louvered shutters on the upper façade. The spandrel space between the upper beam and the window opening was originally wood. With time, this changed to brick. Plain masonry pilasters on each side bordered the upper façade. The window openings have a beam directly above them, which left no room for a frieze. The roof rafters extend beyond the façade to create an overhang. The rafter ends are finished with a simple fascia board. These structures are some of the oldest in Malaysia.

Traditional Shophouse Style: 1830–1880 With time, the portion of the upper façade between the windows and the first floor was enlarged and the spandrel became more decorative. It was molded with stucco-forming shapes or had vents made of timber grills and green glazed ceramic blocks inserted into it. This was a way to increase ventilation without the loss of privacy. More elaborate or expensive shophouses had a cast iron lattice infill at the spandrels. The pilasters remained

simple, but the consoles at the top were filled out to secure the purlins that support the end of the eaves, which have a frieze decoration right below them in many cases. Ceramic shard work is commonly used as a roofline decoration in this style.

The Late Traditional Shophouse Style: 1880–1900 The biggest difference between the Late Traditional Shophouse Style and the earlier shophouses is its added height, which increased ventilation. Owners were able to build taller buildings as their wealth increased; the taller buildings indicated wealth and prestige. The spandrel became more elaborate, adorned by stucco figures or ceramic decorations. The introduction of these stucco figures was one of the first European influences on the construction of the shophouses. In later periods, stucco figures began to replace the more traditional ceramic shard decorations. Fixed wooden louvered vents were added above the continuous row of wooden shutters, and in some instances, panes of glass are found between the shutters and louvers. The pilasters and corbels are much taller and more ornate. Tile eaves are more evident, replacing the exposed wooden overhang.⁵⁶

The Straits Eclectic Style: 1900–1930 The definitive mark of this style is that two or more molded openings are used to break up the façade. Typically, these intervals are achieved by the use of three bay windows with effusive stucco decoration. Full-length windows fitted with a pair of jalousie wooden shutters also identify the style. However, by the 1930s, these windows were no longer in vogue, and they were replaced by normal height windows. An arched or rectangular transom typically frames the opening, which is finished with glazing, grillwork, or fixed timber louvers. In its richest phase, the Straits Eclectic Style added pilasters between the windows with profuse stucco decoration. The open spaces on the building, namely the pilasters, spandrels, and area between the arches, are decorated with flowers, fruits, mythical figures, and geometric shapes.⁵⁷ Reinforced concrete allowed wider roof overhangs to increase the amount of shade on the building. The introduction of ceiling fans in the 1920s reversed this trend, since shade was no longer as important. The exaggerated decoration of the final stages of the Straits Eclectic Style gave way to a more simplistic look followed by Art Deco faces.

Art Deco, 1930 The European style of Art Deco, which takes its name from the *Exhibition des Arts Decoratifs* held in Paris in 1923, can be found in many shophouses in Penang. Architects responded to the new style by mining the vocabulary of the elements used in earlier shophouses. The typical triptychs of windows of the Straits Eclectic Style were reorganized into groups and usually were constructed with casement, rather than louvered, shutters. Ventilation openings were seen in long thin rectangular, circular, or horizontal banded openings above the windows.

Climatic Advantages In spite of this bewildering parade of stylistic trends, the basic appeal of the shophouse is its internal spatial logic. It is able to support an intensely mercantile lifestyle with environmental adaptations that make it comfortable to live in. Its long, narrow form and party wall alignment, punctured only by one heat-relieving courtyard near the center, dramatically reduced heat gain, as well as glare, and provided a way to deal with the torrential rains that occasionally fall in this region. Rain water is gathered under the central court in a cistern, and then into a piping system that takes it under all the rooms to cool them.

High ceilings and fans helped the air well do its work of naturally ventilating the long, narrow house, which is a brilliant adaptation to a severely oppressive tropical climate.

SINGAPORE

Singapore Black and White Houses

The British presence in the Malay Peninsula and Singapore started on Penang with their formal occupation of the island in 1786. Captain Francis Light, as an agent of the British East India Company, negotiated a lease with Sultan Abdullah of Kedah, who then controlled it, and saw British forces as a deterrent to territorial pressure then being exerted by Burma and Thailand. Light renamed Penang Prince of Wales Island, and proclaimed its new capital to be Georgetown, in honor of the reigning British monarch, King George III. Light died of malaria soon afterward, but the British contingent on Penang continued to increase, in spite of the breakdown of relations with the Sultan, when he realized that the East India Company had no intention of becoming involved in the Malay struggle against Thai and Burmese invaders.

Subsequent attempts by the Sultan to remove the British resulted in more troops being sent to the island, and in 1800, he was forced to extend the lease to the district of Prai, located on the opposite side of the one and a half mile wide passage between Penang and the mainland. The British renamed this area Province Wellesley. With control of a major Malaysia port and a foothold on the mainland now secure, the British had effectively removed any obstacle to their access to the interior, as well as the agricultural land natural resources they needed there. The island of Penang gave the British a serviceable harbor for both military and trading vessels to use. By 1830, the population of Penang had grown to about 40,000, in addition to the British colonists, a mixture of Malays, Indians, Chinese, and Arabs. But, primarily because of the leadership of Sir Stamford Raffles, who had remarkably diverse interests that included architecture, archeology, and urban planning, among other things, British interest started focusing on opportunities farther south.

Singapore as a Strategic Straits Settlement Britain was not alone in coveting the bounteous resources of Southeast Asia, being in heated competition with the Portuguese, Dutch, and French for access to them. The British East India Company established control of Singapore in 1819 and, as a result of the Anglo-Dutch Treaty, exchanged Sumatra and Java for the port city of Melaka at the midpoint of the Malay Peninsula. These acquisitions, taken together, gave the British strategic control of the western edge of the peninsula. These included its most critical location, at the narrow strait between Malaysia and Indonesia, where Melaka, now called Malacca, is located, since no trading ships could move from China, the Philippines, or states to the east without passing through it on their way back to Europe. They became known as the Straits Settlements, with their headquarters in Singapore, ruled by Britain and conferring British citizenship to their inhabitants. Although initially being ideally positioned to prosper, the Straits Settlements did not advance the financial interests of the British East India Company in the

early nineteenth century due to high overheads, poor administration, and corruption.⁵⁸ These factors, combined with the loss of their trade monopoly in China and the Great Indian Mutiny of 1857, which interrupted their import and export business in India, led to bankruptcy in 1867. Administration of the Straits Settlements then passed to the Colonial Office in London and conditions in each of them changed dramatically. These were most evident in the architecture and urban planning of each of the four cities of the settlements, Georgetown, Penang, Malacca, and Singapore. Infrastructure, including roads, water supply, and drainage systems, improved immensely. Regulations were passed to prevent destruction from the fires that had plagued the communities in the past, including 20 feet wide fire-breaks between districts and the replacement of wooden walls and floors and *attap* or palm leaf roofs with more durable materials, such as plastered brick and tile. Sir Stamford Raffles also initiated a 5 feet wide arcade at several steps higher than street level running along entire blocks of row houses with shops on their ground floor to protect pedestrians from the elements. These “five-foot ways” (*Kaki Lima* in Bahasa Malay) subsequently spread from Singapore to the other Straits Settlements as well, becoming one of their identifying features.

A Question of Semantics The question of whether Malaysia and Singapore were ever actually colonized by the British is surprisingly still very controversial, enmeshed in nationalistic sensibilities of post-independence pride and identity. Distinguished Malaysian historian Khoo Kay Kim, for example, contends that they were not, because of the retention of the autonomy of local government, such as that of the Sultan of Kedah in the case of the appropriation of Penang. But foreign control was exercised in far more subtle ways than through the overt diversion of authority, such as the manipulation of the rulers of each region as well as the village chiefs, or *penghulu*. By effectively dominating the strategic points of egress to and from the interior, as well as changing the ecosystem of the entire peninsula to accommodate the resources it needed to support the Industrial Revolution, then driving its expanding empire, the British were able to avoid the maintenance of a massive military force in the hinterland, but colonial exploitation was still inarguably the result.

All the Trappings The institutions that supported that power included housing for officers, civil servants, and administrators and their families typically located in its own segregated areas rather than what British planners referred to as the “native quarters.” This resulted in a characteristically tripartite pattern in colonial settlements, which consisted of that quarter, the army camp, and the civil lines where higher ranking soldiers and civil servants lived. In addition to the purpose-built houses behind the civil lines, these were also social facilities, such as a club, with sports fields, and a church, among other amenities. In Singapore, this area was concentrated near the northern shoreline of the river in the initial stages, and then on the Goodwood Hill Estate after the turn of the century.⁵⁹

From the mid-nineteenth century until the Japanese invasion of the Malay peninsula and Singapore, or a period of about 85 years, the British, and especially the high-ranking members of the colonial establishment, led a privileged existence involving a lifestyle that centered around this individual house. While it can be analyzed as an amalgamation of several different foreign and local influences, it is

unique and represents a perfect response to both the climate and the cultural conditions it was built to accommodate.

Three Influences Three distinct influences have been identified as having been the basis of the Black and White house in Singapore. The first of these is the Arts and Crafts Movement, which started in Britain. It began to achieve recognition soon after the Industrial Revolution, which gave the colonial adventure a new sense of mission in providing the resources needed to fuel it. This movement, which was instigated by several leading Victorian intellectuals such as A. W. N. Pugin, John Ruskin, and William Morris, had a distinctly moralistic agenda, which, crudely put, was to save industrial workers from the mind-, body-, and soul-numbing effects of mechanization caused by life on the assembly line. The antidote they proposed was handcraft, as well as a return to the architectural values and habits of the past, especially those related to the Gothic style. The spiritually uplifting value of this style was first promoted by Pugin, whose family background was French. This gave him convincing credentials as a proselytizer. He characterized the Gothic tradition as a spiritual palliative to industrialization that was also beneficial because it was community-based rather than relying upon individual initiative. Morris, who was instrumental in the founding of the Socialist League in London, is perhaps best known among the group because of the determination he showed in establishing a series of workshops intended to produce handcrafted goods for the homes at reasonable prices that even workers could afford. But production costs prevented him from selling his work to that segment, and so the irony of his career remains the discrepancy that exists between these principles and his actions.

The message of the Arts and Crafts Movement gained considerable momentum in residential design through the work of the generation that followed Morris, especially in the approach taken by architects such as C. R. Ashbee, R. Norman Shaw, C. F. A. Voysey, and Charles Rennie Mackintosh. Of these, Shaw and Mackintosh arguably had the most clearly traceable connection to the architecture of the Black and White Singapore house.

Shaw's judicious ability to mix several distinct stylistic languages, such as Queen Anne and Tudor, made his tract houses, such as those at Turnham Green Terrace, very popular. These made him one of the most famous and widely copied architects at the turn of the century during the period just prior to the First World War.

His ideas were transmitted to Southeast Asia by Regent Alfred John Bidwell, who was Shaw's contemporary. He was a graduate of the Architectural Association in London and later served as an assistant to the Superintending Architect of the London County Council, before joining the Public Works Department in Kuala Lumpur in the early 1890s.⁶⁰ Because of his education and experience, he would certainly have been aware of the leading proponents of English Free Architecture, as the style used by British Arts and Crafts practitioners was then referred to, because of the eclectic borrowing of vernacular elements mixed with a bold use of form that was characteristic of their work. Shaw was foremost among them, as was Charles Rennie Mackintosh. More than others, Mackintosh also explored the new aesthetic of Japanese minimalism that was just being publicized because of the opening up of that country to trade in the 1860s. Artists such as James McNeil Whistler started to emulate the spare clean lines of Japanese prints and screens soon afterward, and Mackintosh and his wife Margaret MacDonald did

the same in their architecture and interiors. The husband and wife team went one step further by abstracting the forms they used, removing their association with natural materials by painting wall surfaces white and using either lacquer black or white for their furniture as well. Initially, the use of white had a direct correlation to Scottish vernacular techniques of waterproofing, such as using a white-wash with aggregate added to it called pebble dash or harling. It was primarily used in rural areas as an economical alternative to ashlar. Mackintosh used it to make a social as well as an aesthetic statement, which included the minimalism and deliberate abstraction of forms that he and his wife favored. Ironically, however, it also parallels the growing pace of industrialization, and is symptomatic of the distancing from both tradition and nature that mechanization entailed.

In 1895, R. A. J. Bidwell emerged as the critical link between the Arts and Crafts Movement in Britain, as epitomized by Charles Rennie Mackintosh, and the colonial translation of its tenets in the Straits Settlements. In that year, he joined the Singapore office of Swan and Maclaren, before opening his own firm in 1911.⁶¹ His designs are distinctive, and they helped to create an easily identifiable style in Singapore just before the First World War. The Raffles Hotel, which is named in honor of the man who did so much to establish and ensure the future of an extended British presence in the Straits Settlements in Southeast Asia, is characteristic of his approach. Its thick, snow white masonry walls and crisp black details also echo the palette he used in his residential projects.

A Second Influence In addition to the perfectly understandable tendency of local architects, such as Bidwell, to emulate changing architectural fashions in Britain at the turn of the century, there were other, equally persuasive influences for them to adopt, closer to home. One of the most important of these was the bungalow, which is the second, clearly discernible design resource for the Singapore Black and White house. In spite of their undeniable strategic service to the British Empire, the Straits Settlements were still of less importance than larger colonies, such as India, in the grand scheme of things. Many of the military, administrative, and social structures, as well as the architectural prototypes that supported them, that had evolved as part of the *Raj* in India, were transplanted in their entirety to both Malaysia and Singapore, including the residential typology of the bungalow. Discussed in detail elsewhere here, the bungalow was an adaptation of the Bengali *bangla*, improved to include an even more pronounced overhang of the roof covering the one to one and a half story original, which was raised about 2 feet above the ground to encourage air flow, as well as a covered verandah, or porch. The British modified the vernacular hut further by adding features that contributed to its eventual nostalgic reputation of being a bucolic retreat and extended its popularity long after the sun had set on the British Empire.

The Malay House A third distinct influence on the architects who designed the classic Black and White houses in Singapore, in addition to the minimalist tendencies then being popularized by the Arts and Crafts advocates and the British adaptations to the Bengali *bangla*, was the enduring example of the Malay house and its regional variants. While it is physically very different from the *bangla* in appearance, the generic traditional Malay house shares many of its environmental strategies, such as being raised off the ground to ensure cross ventilation underneath and

the use of a prominent roof to provide shade. Although less numerous on Singapore island than on the Malay peninsula to the north, there is still a considerable Malay presence in Singapore and this was even more evident in the early part of the twentieth century. So, it is understandable that the Malay house would also serve as a model for colonial residences.

The earliest graphic representations of Singapore, dating from the early 1800s, show the amalgamation of these various building traditions very clearly, depicting clusters of single-story timber frame houses, raised up on columns, with steeply pitched thatched gable roofs and smaller porches projecting out at a 40 degree angle from the front elevation.⁶² The houses shown in these early drawings correspond almost exactly with British houses being built in Penang at the same time. In its final classic configuration, the Black and White house in Singapore was placed on a raised masonry podium base, with enough arched openings around its perimeter to allow air to circulate underneath. These houses ranged from one to two stories, with the lower ones having a verandah running around all but the rear elevation. Two-story houses typically have the verandah on the upper level, which then serves as a canopy shading the windows on the lower level. The projecting entrances of the earlier houses, placed perpendicular to the front door, were retained and refined. The houses built for senior civil servants on the Goodwood Hill Estate in the early 1900s, for example, have *porte cochères*, and a balcony running around the front and sides that is supported by slender columns that rest on a thin podium base, with prominent two-tier roofs. House plans typically center around a parlor and dining room on the ground floor flanking an entry hall and stair in the front center, with service spaces, such as the kitchen, in the back. The main social space in this tropical zone near the equator, however, was the verandah, connected by French doors to the main rooms to allow people and air to move freely from outside to inside. Ceiling heights were also high for the same reason: to prevent the buildup of heat in the interior as well as the psychological impression of being in a cramped stuffy space. The verandah also symbolizes the lifestyle that these houses painted to appear cool and formal as if they were in white tie and tails, aptly described by one enthusiast as being “inseparable from the image of the stoic Englishman, dressed for dinner, with a smoldering cheroot in one hand and a glass of whiskey in the other, watching the sun go down on another day of tireless empire building.”⁶³

TAIWAN

Taiwanese Shophouses in Lukang

Lukang, which means “deer harbor” in the Chinese dialect used in this part of Taiwan, is named after the herds that used to feed there. It was once the most important port on the western coast at the midpoint of the island, and was also the second largest city on Taiwan at the height of its prosperity. It is about 200 kilometers from Taipei to the north and Kaohsiung to the south. It is on the western plain of mid-Taiwan where it bulges to the west toward China across the Taiwan Strait, and is directly opposite to Fujian Province. It is subject to monsoons

coming in from the northeast from late September until March each year, which have had a great impact on the urban pattern of the streets and houses in the city.

Lukang is located on the Changhua Plain, between the Lukang and Yangtzechou Rivers, which originally gave it a natural advantage as a harbor for the trade coming across the Strait from China. Because the Changhua Plain is alluvial, it is constantly in flux and the elevation of land is constantly changing. Since the height of its power, the coastline has constantly moved farther and farther away from the urban center, and this eventually caused it to lose its prominent position as a trading center. During the Japanese occupation of Taiwan, dredging operations were not aggressively pursued, which accelerated the process of decline.

The earliest residents of this area were the Ping pu, who traded mostly in rice that was stored in square barns called *Lu*. During the Ming Dynasty, Han Chinese started to emigrate across the Strait to settle in the area, and their economy was primarily based on fishing and farming. They were followed by immigrants from Xinghua, in the Fujian Province of China, and then by others from Quanzhou, Zhangzhou, and Guangdong who were more inclined to trade, establishing strong economic ties with their home cities across the Strait.

Lukang was officially declared to be a trading port in 1731, primarily serving as a distribution center for rice. In 1784 the Qing Dynasty in China also designated it as a treaty port that could trade exclusively with Quanzhou. This resulted in more immigration to Lukang from that city, which explains why 80 percent of the people living there today can trace their origins to Quanzhou.⁶⁴ Lukang thrived from 1784, the date that it was named a treaty port until silting reduced access to it by large merchant ships in the mid-1800s. So, it prospered for about 70 years, and during that time had a population of over 100,000 residents. Nearly 100 ships sailed in and out of the Lukang harbor each day during that period, with some weighing as much as 500 tons. The local phrase used to describe this time is “Lukang Feifan” or “the flying sails of Lukang,” providing a graphic image of what the river must have looked like then.

By 1860, Lukang was no longer able to accommodate larger ships and so the Qing court decided to open up an additional four treaty ports to the north that would deal with foreign trade. When the Japanese invaded and occupied Taiwan, many of the Chinese immigrants who had come from Quanzhou left Lukang and returned home. This sudden decrease in population, in combination with the progressive silting of the harbor and the Japanese reluctance to dredge it, speeded the economic decline of the city. A new railroad that bypassed Lukang and directed development to Kelung and Kaohsiung instead sealed its fate.

A Time Capsule One positive result of this rather tragic, sudden decline and subsequent isolation, from an academic point of view, is that it has preserved the historical part of the city. This includes the houses in its commercial center, allowing historians to study a way of life that has disappeared elsewhere. In 1975 a scholar named Gu Weifu assembled a team of colleagues to survey this district, and they continued their study for 11 years. A conservation project to protect the unique shophouses in the commercial district then started in 1986.

No Wall Unlike many Chinese cities in the past, Lukang never had a defensive wall. It was also not subject to the strict planning guidelines, related to social

hierarchy and Confucian principles that prevailed for so long on the mainland, and so it grew naturally. It is a perfect physical manifestation of the commercial and economic forces that fed it. The only social constraints were familial, or clan, allegiances. These were made manifest in clusters of extended families, which formed in concentric rings, and are referred to locally as “life circles,” for reasons of security. There are ten of these in Lukang, the largest of which is the Union Peace Guild, or *Hebe-Hang*, life circle. Each circle has a gateway, or *Aimen*, through it into the next inner area. The *Hebe-Hang* is an exception to the extended family rule because it is occupied by a guild, but it conforms to the general rule because a large number of members of that association are from the Shi family, occupying more than 20 houses and warehouses in that district.

A Physical Manifestation of a Commercial Process The port of Lukang, with its piers for the loading and unloading of goods, its customs facility called the First Office, its connection up a slight incline to the main street, and the long and narrow shophouses that line that street, as well as the secondary lanes running parallel to it on each side that provide service access to it, provides an exceptionally clearly built diagram of how residential architecture adapted to commercial interaction in seventeenth century Asia. Goods were first unloaded onto the docks and then transported by handcart to the First Office. It served as a combination weigh station and customs and excise clearance facility and is located right next to the riverbank. After inspection, assessment, and payment, merchants had their goods transported up a stairway from the wharf to the main street by coolies.

The goods were then first transported to *Jiu-Jie*, or “old street,” where they were repacked and distributed to *Da-Jie*, which is the main commercial artery in Lukang. They were then designated for storage in each of the shophouses they were intended for before being sold. *Da-Jie*, which means Grand Street, was also referred to as “*Bujiantian*,” which means, “no sky could be seen.” This is because the shophouses there are clustered so tightly together along its length with upper stories that project out to block the sunlight. Alleyways played an important part in this process, since they served as conduits for the transfer of goods. Once they were repacked on *Jiu-Jie*, porters moved them to *Da-Jie*. Guild centers were also located on Old Street. The alleyways, which run perpendicular to Old and Grand Streets, form a hierarchical network between them, and have colorful names such as *Che Wei*, *Hou zhai*, *Yin Dong*, *Yao Lin*, *Jiu Jian*, and *Bu tou* roads.

Lukang is extremely dense, with thousands of shophouses backed into an area that is little more than 44 square kilometers. Unlike the Hutongs found on mainland China, in which courtyard houses were lined up in a long, narrow sequence behind blank walls facing narrow lanes, Lukang is a “street town,” with shops in each of the houses facing outward, toward the public. The relative uniformity of the house types was augmented by the fact that Lukang was under the control of the Qiang government and was primarily occupied by one ethnic group, called the Shan Bao.⁶⁵ This made management and control easier, with Lukang eventually being organized into eight separate districts. It also resulted in distinctive architectural styles in the houses and temples of what was essentially an extended patriarchal clan living in one village, so Lukang also has this structure. Because Lukang has never had a city wall, the major parameters of its growth were the

course of the river that served it, the meanders that changed that course, and the topography that allowed the main commercial street to stay dry if the river flooded.

Feng Shui In a sense, the configuration of the center of the city was shaped by geomancy, or *feng shui*, in a way that attempted to balance the pragmatic needs of a commercial facility with environmental considerations. It conforms exactly to the *feng shui* requirement of having a mountain nearby to protect it from harsh winds, as well as a source of water nearby. In this case, Mount Bagua is located to the east, rather than the north of the city, as the mountain range is near Beijing, where the site was chosen so that the mountain range to the north blocked the cold winter wind from Manchuria. In Taiwan the winter winds come from the center of the island to the east. The water source that satisfies *feng shui* principles in Lukang is the Zhoushuizi River. By running parallel to the river rather than perpendicular to it, the main and subsidiary streets also blocked the wind and rain coming from the east rather than channeling it into the residential district. All other streets beside *Jiu-Jie* are also relatively narrow to provide shade during the entire day from sunrise to sunset. The main commercial street, *Jiu-Jie*, was also called *Wufu Jie*, or Five Blessings Avenue. It is little more than 7 meters wide so that the houses on each side can shade an optimum amount of it.

The Houses In addition to the general principles governing the layout of the city and the position of the houses in it, there are three specific considerations that guided the internal organization of each house, over and above the functional requirements of living within a commercial establishment. The first of these, already discussed in relationship to the city plan, was “living breath,” or *chi*, as an extension of geomancy or *feng shui*. *Chi*, or natural forces, are further divided into ying and yang, or positive and negative, and the main goal was to find a place to build a house where good *chi*, or the ying “breath” of nature, or the earth, accumulated, so that they could be stored and not dissipate. This determined the main axis and orientation of the house, often dictating that it be symmetrical. It also governed the position and shape of doors and windows, as well as additions, if any.

A second governing concept is that of “gods and ghosts.” According to Taiwanese folk tradition, human beings reside in an intermediate world in which gods and ghosts exercise equal amounts of power. It is important, in planning and building a house, to encourage the gods to enter into the center of the house, while preventing ghosts from coming in. Small temples were built at the ends of streets, such as Five Blessings Avenue, as an additional prohibition to evil forces and mirrors, and protective symbols were placed on front doors for the same reason. Gods were, and still are, worshipped inside the house, while ghosts who are acknowledged as having to be appeased are confronted outside of it. This appeasement is carried out in many different ceremonial activities, including rituals that are performed during construction, such as the provision of a small spirit house meant to placate ghosts who may be angered by the disruption of their natural abode.

A third prevalent concept is derived from Confucianism and may be termed “ethical order.” In this system, the relationships between each person in a family occupying a house are viewed as ripples expanding outward from the center to the periphery, so that the most privileged part of the house is the middle. Family

members at the highest part of this order in Taiwanese, as in Chinese society, are elder males, and they are intended to occupy the highest part of the center of the house, on the left when moving inward from the front entrance. Those in the lower part of the familial, residential hierarchy occupy the lower ground floor, near the periphery to the right.⁶⁶

The row houses in Lukang are all of a similar type: 4 meters wide to the inside of the party walls, and 38 to 40 meters long. In one typical configuration, the ground floor is raised three steps, or about 2 feet from street level, with these stairs leading up onto what amounts to a long, 1 meter wide loading dock where boxes and bales could be dropped above and away from the street. Three pairs of wide doors open inward to make delivery easier, into a large front room. This is connected to loft space above by a steep narrow stair placed against the wall to one side. This loft has a light well that would have allowed larger boxes to be winched up to the attic storage space with rope pulleys. This loft would also have kept the goods on the upper level free from damage by overheating. The head room in the attic was severely restricted and, because of the semitropical climate of Taiwan, as well as the structural limitations of the materials that the shop owners had at hand, it was necessary to use two gable roofs instead of one long one. This would have allowed more headroom as well as one continuous storage space instead of two separate ones. The use of two gable roofs also made it necessary to put a wide gutter between them, since Taiwan is subject to heavy wind-driven rain that can often escalate to typhoon level.

This division of the roofing system meant that the shop owner had to build a second stair up to the attic at the back of the house, which is equally as steep as the one in front.

The Home Store These shophouses in the center of Lukang, or “home-stores” as they are literally named in Chinese, are, on average, about 4.5 meters wide, because plots of land with street frontage were very expensive. It was also advantageous to keep the street elevation narrow for both defensive purposes and as added protection from both the monsoon and the wind coming in from the Taiwan Strait, which could reach typhoon strength. To compensate for this narrow profile, the houses are longer than their counterparts found in other parts of Asia, sometimes extending up to 70 meters in length. To gain more space, the houses were built progressively higher, reaching three stories in their final form. There are several variations on this basic, long and narrow typology, but one typical strategy was to combine two or three houses together, and to interlock them by putting a long, narrow courtyard, running parallel to the street, in the front.

During the Japanese occupation, the main commercial street, *Da-ŷie*, was widened in order to make it easier to control, requiring homeowners to dismantle the front portion of their shops and to add a *Pailoumain*, or storefront.

The interiors of the Lukang shophouses are similar to a type built in Fujian during the Qing Dynasty called the *Mingman* house. It also has a wood frame structure, is long and narrow, shares its walls with its neighbors, and is based on mixed use. These Chinese counterparts are 5 meters wide and about 50 meters long, so they are a bit wider and much shorter than those in Lukang. They also differ in having a roof terrace, which is accessible from the second floor, and façades made of demountable wooden panels, so that the front can remain completely open

during trading hours and can be closed up at night for protection. As in Lukang, the *Mingman* houses also have an attic where goods are stored and an atrium in the center that has delicately carved wooden railings around it. This allows goods to be hoisted upstairs from the ground floor and lets natural light flood into the middle of the house, which would otherwise be very dark. The family shrine is typically located in this atrium space in each case, because of the quality of the light there. In both the *Mingman* and Lukang houses, the backyard is used for cooking and washing.

VIETNAM

The Bahnar Communal House

The Bahnar communal hall is much more than a place to hold meetings or to have social gatherings. It is a surviving physical symbol of a form of village-based democracy that has run parallel to centralized rule from the beginning of Vietnamese history. The Vietnamese village has traditionally functioned as an autonomous unit, respected by a long succession of rulers as a self-contained entity with its own laws and social conventions. These include the belief in a guardian spirit that protects the commune from evil and that is unique to it. This differs from village structures in other countries such as Malaysia, in which the *kampung* structure is primarily familial and tribal and leadership devolves to an elected leader, or *penghulu*. Laws in that case are based on establishing a precedent, or *adat*, and decisions are made according to consensus. The Vietnamese commune is gerontocratic rather than familial.⁶⁷ The ruling body of the commune is a council of elders, who may not belong to the same family. They decide on all issues that involve the village, and do so in the communal hall. So, this hall serves as a courthouse, jail, temple or *Dinh* to the guardian spirit, tax office, and banqueting hall where celebrations are held. The subversion of the identity of each individual in the village to the welfare of the commune means that the collective acts like an individual, so in that sense the communal hall is also a house that the entire village shares.

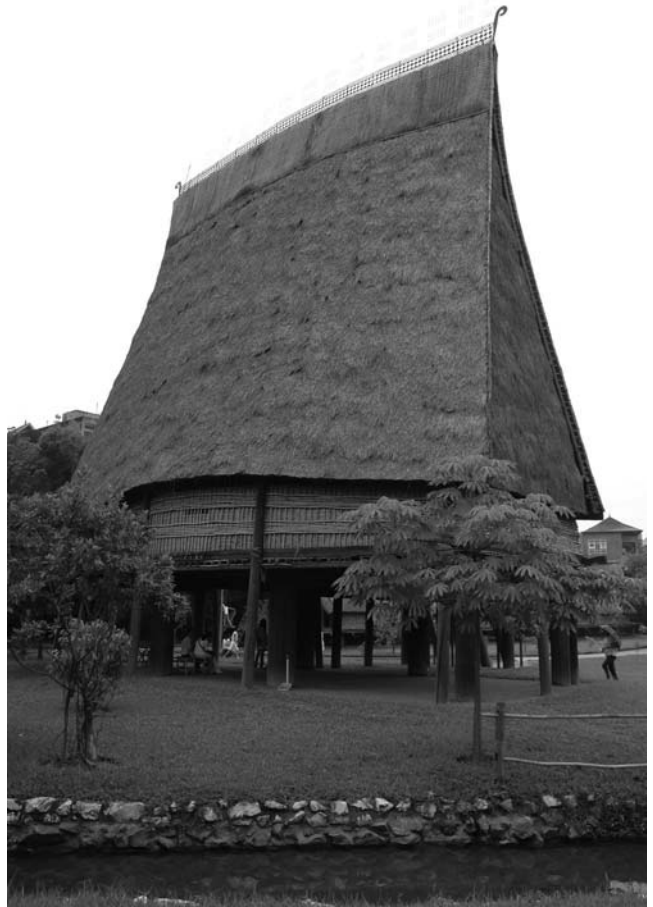
A Symbol of Democracy The importance of the commune is inextricably connected to what seems to have been the perpetual struggle of the Vietnamese people against the elements, as well as domination by others. Various tribes began to settle in the Red River Valley as early as 1000 B.C., under a series of leaders called the Hung. The Chinese invaded Tonkin in 300 B.C. and from there subjected the mainland for more than 12 centuries. They introduced the idea of a monarchy and a governmental bureaucracy based on meritocracy, as well as Buddhism, Confucianism, and Taoism. The Courtyard of the Stele at the Temple of Literature in Hanoi was founded by the Emperor Thanh Tong in A.D. 1070 to commemorate those who passed the doctoral examinations that would qualify them for governmental service. It is impressive testimony to the firm grip that Chinese values had on Vietnam at that time. This changed later in the eleventh century A.D., when the Chinese were expelled and a monarchy was established. This resulted in a landed aristocracy that became securely ensconced on large, governmentally controlled estates.

During this time, efforts continued to keep the Red River Delta navigable by removing accumulated silt. This was accomplished by using an elaborate hydraulic system to raise the water level through a series of dams, as in the Netherlands and other cultures in which a concerted collaborative effort was necessary to prevail against nature. The cooperation that this required engendered a strong unified tradition in the people.

The Ly Dynasty established its capital at Hanoi and was so strong that it was able to defeat the Mongols, who invaded Vietnam between 1280 and 1288. The Red River, which originates in the mountains in the north, surrounds Hanoi and has been the bread basket of that part of the country. Its only equivalent is the Mekong River Delta in the south divided by the mountainous region in the middle, where the hill tribes are concentrated. These are also called the Anuan Highlands after the original name of the country before it was changed to Nam Viet by the Emperor Gia Long in 1802. The Truong Son Mountain Range, which runs roughly north-south, provided a natural border between the Khmer Kingdom to the west with its strong roots in Indian culture, and Chinese influence from the east. The Champa Kingdom, which posed a great threat to the Khymers and is immortalized in dramatic carved friezes in the Angkor temples in Siam Reap, Cambodia, also once dominated this region. Their culture held sway from A.D. 200 to 1471.

During the Qiang Dynasty the Chinese invaded again and were able to briefly occupy Vietnam for 20 years until being defeated. They were beaten in a rebellion led by the Le Loi and a brilliant tactician named Nguyen Trai, whose writings on guerilla warfare inspired Ho Chi Min and General Vo Nguyen Giap during their war against the French and then the Americans in the 1950s, 1960s, and 1970s.

Autonomy Granted As a sociopolitical institution the commune reached the height of its strength from the fifteenth century A.D. until the eighteenth century, when it was officially recognized as an autonomous unit.⁶⁸



The Bahnar people are an indigenous group that live in Giatai and Kom Tum Provinces in the central highlands of Vietnam. Their community halls are distinctive in appearance, which symbolize a collective home for the people, and are divided into three main rooms that each serve an important social function. *Source:* James Steele

There are many different examples of the commune structure throughout Vietnam related to each of the different ethnic groups within it. But one of the most definitive is that of Bahnar, identified by their communal house.

The Bahnar People The Bahnar people are concentrated in the Central Highlands district of Vietnam. Their houses have a very distinctive shape, being raised up high on a field of tall columns and being crowned with a large, high, and narrow 20 meter deep crested roof. The height of the columns makes it necessary for the inhabitants to climb up a steep ladder to get to the front door. This ladder is really more like a stairway, since it is made by carving steps out of a long log that is then inclined up from the ground to the threshold. The houses are made out of local wood, such as sedonic, peck, or jackfruit, and it typically takes a construction team of four carpenters and four wood carvers about a year to complete a single house. Since the roof is the largest part of the structure, it takes the most time and attention. It is built using a mixture of wooden strips, straw mat, and thatch. These are woven tightly together to withstand the high winds and heavy rains that are commonplace in this region. This high roof also promotes airflow, allowing natural ventilation to rise as it heats up and to escape through vents at each end of the ridge, without stratifying and preventing the bottom layers from being exchanged by fresh air.

A Ritual Process The start of the building process is determined by consulting astrological charts for the most auspicious time to begin. The first act is to lift the enormous ridge beam that supports the dramatically arched roof comb into place, at the top of the vertical columns at each end of the house that hold it up. This is accompanied by a ritual called the *Thuong Luong* or Ridgepole Initiation ceremony.⁶⁹

This ritual is accompanied by a religious ceremony in which a banner embroidered with the zodiac symbol corresponding to the owner's birthday is placed on the altar of the village temple. This banner also notes the date of the Ridgepole Initiation ceremony, as well as has six coins sewn into the hem to ensure wealth.⁷⁰ The pole that supports the banner is wrapped with branches from the Cyeas tree, which is symbolic of longevity. The owner places a red hat, or turban, on the plate on the altar to be blessed, and this hat is then worn by the master builder of the house. The banner, which is called the *Thuong Luong* flag, remains on the altar until the construction of the house is complete.

There are other beliefs surrounding the building of the Bahnar house, such as the superstition that the carpenters can put a curse on the dwelling if they are dissatisfied in any way or are treated badly by the owner. This curse can be transferred to the house in several ways. One of these is when the carpenter writes the curse on a small piece of paper and inserts it into a joint between two pieces of wood. Another is when a carpenter traces a sign symbolizing evil in the air with his left hand and then puts that hand on one of the roof beams for the curse to take effect.

The influence that Chinese rule has had on Vietnam is also evident in the measurement system used in building the Bahnar house and communal halls, which is based on a device called the Luban rule, introduced by a Chinese engineer in the eighth century A.D. The most important dimension in that rule is the width of the front door, which has more deeply symbolic significance than any other

dimension in the house. Many countries in Southeast Asia that have been influenced by Chinese culture have a similar measurement system. There is some evidence that during the short reign of the Emperor Minh Mang, who ruled as part of the Nguyen Dynasty in Hue from 1820 to 1840, that about two centimeters were added to the Luban rule to make the height and width of palaces as well as their doorways and windows. In Hue, these are noticeably different from those in China and other regions such as Laos, which had been influenced by the rule.

The Luban rule had two components. The first is the *Bat Moc Xich*, of 42.7 cm, which was used to measure all of the wooden structural members used in the house. The second is the *Bat Mon Xich* measurement of 28.4 cm, which was used to calculate the width of openings, such as the doorways and windows. Each of these two subsystems has an addition subsegment, divided into four good and four evil parts. The four good, or blessed, parts are Inherited Blessing, Received Graces, Perpetual Life, and Great Contentment. These relate to *feng shui* in the sense that openings in the front of the house have to be oriented correctly in order to receive good fortune, and the width of those openings has to be carefully calibrated to do so. The master builder measures the openings from the left, giving priority to that part of the *Bat Mon Xich* that is chosen by the owner as being the most important of the blessings to the family.⁷¹

Such beliefs also extend to the open area around the house, since certain trees are believed to have apotropaic characteristics of being able to divert bad influences and evil better than others. Cherry trees are considered one of the most important guardians against bad influences. Another device that is typically used in all buildings, including houses, is to block the front door with something like a fountain, or a large bonsai, or a small tree, or a mound of rocks, at a distance far enough away to allow people to enter and good fortune pass around it, but for bad luck to be deflected.

The Bahnar are only one of the 54 different ethnic groups in Vietnam today, including the Vietnamese group, or *Kinh*, as they call themselves, and they have had to struggle to maintain their identity.⁷² Their distinctive residential style of architecture, seen in both their houses and their communal halls, has been one way to do this. For the Bahnar, their houses are as much a part of their distinctive identity as any other part of their heritage, such as their special dialect. The house, then, is part of the process that anthropologists and archaeologists have come to refer to as cultural relativism, in which architecture, like language, ritual, and religion, among many other things, shape the world view of the individual within each ethnic group, which they share with the group itself.

Most of the minorities in Vietnam are located in the Central Highlands. They were jointly referred to as the Montagnards or mountain people by the French colonists, which gives some indication of the foreign attitude about cultural diversity, or rather the general insensitivity to it. The Bahnar originally came from Kom Tum, which is that part of the middle of Vietnam where the long, narrow country is at its thinnest, before it begins to get wider again in the south. This is also where it shares borders with both Laos and Cambodia to the west, which were its trading partners in the past. Although there are now only three officially recognized districts in Vietnam, which are Bac Bo, or the north, Trung Bo, which is the center,

and Nam Bo, or the south, there are eight administrative regions, and Kom Tum is one of those.

The unity of the commune like that of the Bahnar is solidified by a complex layering, which has taken place over time, of religion and superstition, as the rituals related to the beginning of the construction of the house indicate. The blessing ceremony is carried out in a Buddhist temple, but involves a tantric ritual that includes the owner's horoscope, as well as symbolic emblems, such as coins, color, and references to the characteristics of certain materials. In a sense it is an easy transition from the collective mentality of the commune in which there is no such thing as private property and all farmland is worked by everyone, to the political system that is now in place in Vietnam.

Europe and the Western Mediterranean

FRANCE

Carcassone

More thorough historical consideration of the period commonly known as “The Dark Ages,” which is a term that was first meant to describe the time between the fall of the Roman Empire in A.D. 410 and the crowning of Charlemagne as Holy Roman Emperor in A.D. 800, now indicates that they were not as dark, or as long, as originally thought. There is little agreement now about the beginning and ending dates. Many historians now argue for a reduced time period, from the death of the Byzantine Emperor Justinian in A.D. 565 to the beginning of Charlemagne’s rule. What is beyond debate, however, is that the fateful decision by the Roman Emperor Constantine to move the center of the Empire to Asia Minor was followed by its fall in the West. This led to the fragmentation of the existing Imperial structure of Rome into numerous tribal states and the diminution of the classical tradition in all of the areas outside the control of Byzantium.

This dispersment not only brought the rule of Roman law to a halt, but also disrupted the free flow of trade that it had made possible. The rise of feudalism and the highly stratified class structure that it required also reduced the diverse social system that had existed during the Empire down to clear-cut categories of royalty, warriors, peasants, and priests. The population of many cities dwindled due to poor security, and Rome itself was reduced to one-fifth of its original size. Once thriving and prosperous urban areas were reduced to nothing more than villages, and protective walls were an absolute necessity, regardless of the size of the settlement.

A Durable Cité Carcassonne, in the Languedoc region of France, is one of the most enduring and memorable examples of the walled cities of this violent, uncertain period. It has survived because a change in transportation routes through the region gradually isolated it, and because a thoughtful restoration was carried out by Viollet-le-Duc at a crucial period in its history.

According to Viollet-le-Duc, who has also written a history of it, Carcassonne was given the privilege of self-rule by the Roman Empire because the Celtic tribes of southern Gaul, such as the Volces and Tectoages, did not oppose Imperial rule. It was classed as a “noble” city, which could elect its own internal government. After the fall of Rome, it was classified as a castellum or citadel and was captured by the Franks in A.D. 350, and then by Theodoric, the king of the Visigoths, in A.D. 439. The Visigoths built a new wall over the ruins of the Roman wall, as well as a second, inner wall, and added towers at strategic points along its length, which have square bases and curved vertical extensions. The bases were built using enormous blocks of stone, in a way that is reminiscent of the tomb that Theodoric ordered to be built for himself before his death in Ravenna, where he finally established the Visigothic capital. These blocks adhere by gravity alone and were not set with mortar. The wall itself has an oval shape and dips down slightly as it goes into a slight valley on the west. The towers are approximately 25 meters apart. The wall is made of layered ashlar, with each course being slightly less than a meter in height, indicating that the Visigoths understood and copied Roman construction methods.

A Strategic Position There is a commanding panoramic view from the top of the wall over the entire Aude Valley, including the road between Narbonne and Toulouse, the Black Mountain, and the foothills of the Pyrenees in the distance where the River Aude takes a sharp turn toward the east. This view makes it obvious why Carcassonne has been such a valuable piece of real estate since prehistoric times, since it controls the only valley leading from the Mediterranean Sea to the Atlantic Ocean.

New construction started in the city in 1096, when Pope Urban II came to Carcassonne to bless the Cathedral of Saint-Nazaire. The walls were repaired once more by Roger III in 1138, and then the city was fought over by various Crusader expeditions, including Simon de Montfort in 1209 and Raymond de Trincavel several years later. It was finally claimed as royal dominance by King Louis VIII in 1226, and was ruled by a seneschal in his name. Louis IX decided to make it even more formidable, and cleared out several residential neighborhoods, or *faubourgs*, between the city and the bridge. He built a circular barbican, connected to the castle by a bridge. In 1285, Philip the Bold added the Porte Narbonnaise and the Tresau Tower.

The technique of building two rings of walls, with a wide space between them, which was also used very effectively at Constantinople, added considerably to the defensive strength of the city. It provided a killing zone in which the enemy could be attacked from two sides if they managed to scale the first wall. This outer wall, or initial barrier, was a little less than half the height of the second inner wall, which was also located farther up the slope of the hill. This made it extremely difficult to penetrate this nearly 2 mile long circumference of solid stone, which was punctuated by 56 round watch towers with conical roofs. The strength of the walls forces invaders to lay siege to the city instead, and one of the largest of the towers was used as a storage vault for the food and water necessary to see the settlement through a protracted standoff. In addition, the walls and towers were laced with booby traps, such as false doors and sinkholes. The portcullises were also fitted with fail-safe devices to prevent one person from opening the gates.

The Castle As the blatant symbol of the strictly hierarchical nature of the feudal system, the castle was also the holdout of last resort. The castle of Carcassonne was a mirror image of the circuit wall it was attached to, with round towers of its own and crenellations in its walls that allowed defenders to fire down on the enemy below.

In addition to the castle, Carcassonne also has its own church located at the southern edge of the hill near the periphery of the city. It is dedicated to Saints Nazaire and Celse, and has a *parvis*, or public square, connected to its northern façade, so that it is in a protected place between the church and the city.

A Typical Medieval City With its formidable walls, bristling with towers, its castle and circular keep, cathedral and *parvis*, marketplace, shops, houses, and narrow, winding streets, Carcassonne is the paradigmatic example of a self-sufficient medieval city. It is a remarkably well-preserved reminder of a time that was characterized by violence, uncertainty, and political chaos, in which the life of the spirit abruptly replaced the sensual richness of the Classical Age that had preceded it. This was a time when nothing could be assumed to be sacred or secure and when a strong defensive posture was the only sensible one to take in building a city.

As a self-sufficient city, Carcassonne was home to a full range of people with different occupations, in addition to the farmers who provided it with food. These included weavers, butchers, blacksmiths, shoemakers, carpenters, potters, locksmiths, and merchants catering to every need that the inhabitants had. They usually lived above their place of business to save space within the tight quarters of the walled enclosure and to protect their assets more easily.

Jacques Coeur House

Jacques Coeur was born in Saint Pourcain, France. His father was a wealthy merchant and his family had achieved high status through trade during the Middle Ages. When he came of age, he established his own commercial trading company and became as financially successful as his father. He eventually became involved in politics, and, after gaining the trust of King Charles VII, he was appointed *Argentier*, or superintendent of finance.¹ During this meteoric rise to both commercial and political success, he either bought or built and sold several houses, but he is most remembered for his house in Bourges. It is important because it is one of the few houses of its class and type to have been almost perfectly preserved, offering a precious window that allows us to understand the lifestyle of the nobility of that time. It has also come to symbolize both the high degree of craftsmanship and the pervasiveness of Gothic principles during the high Middle Ages in France, which extended into residential architecture at all levels as well.

La Grande Maison de Jacques Coeur After leaving his family estate in Saint Pourcain, Jacques Coeur married Macee de Leodepart. She was also part of the landed gentry, and she also had property of her own. Ownership of real estate was viewed by the nobility as a hedge against uncertainty at a time when wars, plague, and inflation were commonplace and general lawlessness was then also devastating Europe. The Great House of Jacques Coeur, which was built in stages between 1443 and 1453, reflects the fear caused by the uncertainty of the times, as well as the rewards that came to those who were in a position to take risks in spite of the dangers that existed. It shows the owner's concern for security because it



House of Jacques Coeur Courtesy of Sarah Chapelier; Flickr

resembles a smaller and more delicate version of a castle, with a massive, portcullis-like door, and turrets and thick walls protecting an open, inner courtyard. It actually has two entrances, with the large one intended for people entering in carriages or on horseback, and the second smaller one for those arriving on foot. The quadrilaterally shaped courtyard, or *Cour d'Honneur*, initially appears to have been laid out without any concern for order, but is instead a result of the need to accommodate both an irregular urban site, as well as the circulation patterns across the court. A great deal of thought was also given to providing the best orientation for the arcades or galleries that line its inner edge. These were used for social events and receptions, since they provided an intermediate, shaded space between the inside of the house and the courtyard that would maintain the owners' privacy and yet give guests a sense of intimacy and protection. Portions of these galleries may have also provided a place for the short-term storage of goods that were unloaded in the courtyard. However, Jacques Coeur is known to have owned warehouse space elsewhere in Bourges, which casts doubt on this possibility.

Two Towers Existed There Two towers, which had been built with stone taken from the old Roman wall nearby, already existed on the site when Jacques Coeur bought it. After Coeur purchased the land, he built a third one to match them. Coeur's success made the nobles at court jealous, and eventually several of them conspired against him. He was arrested for murdering a woman named Agnes Sorlem in the early 1400s. His house had just been completed, but it was confiscated



The Bungalow The Bungalow was an extremely popular house style in pre-World War I America because it was relatively inexpensive and conveyed the promise of a less formal life style. The historical roots of this type of house are based on an adaptation of an indigenous dwelling in India by British officers who were based there during the time of the Empire. Its climactic advantages are related to the ability to promote cross ventilation, because it is raised up off the ground, and it has wide roof overhangs and covered porches that provide shade. Pattern book design allowed builders and developers to offer potential customers a wide variety of models to select from, and these were often discretely intermixed in the same first-tier suburban subdivisions, which are now adjacent to inner cities across the United States. *Source:* James Steele



The Qiao Family Courtyard The Qiao Family Courtyard is located near the ancient city of Pingyao, southwest of Beijing, China. It was founded by a wealthy merchant in the fifteenth century as both the headquarters for his business and the self-sufficient, walled enclosure for his entire extended family. This compound was subdivided into four parallel rectilinear quadrants, and each of these was further organized into a *butong*-like courtyard house. Like the *butongs* in Beijing, these quadrants consist of a guard house and servants' quarters facing the street for protection, followed by ranks of rooms running along a central courtyard for family members. The residence of honor for the heads of the household is raised up several feet above the other rooms and is located at the rear of the compound, running parallel to the street. *Source:* James Steele



Suzhou When court officials in China retired in the past, they liked to move to the Lake region west of Shanghai and build garden pavilions there. These were inspired by the calligraphic paintings of the Li River valley near Guilin, and the painters actually became landscape gardeners as well. The ideal was the idea of a poet hermit who escaped the pressures of everyday life and went to the mountains to meditate. *Source: James Steele*



Katsura Imperial Villa The Katsura Villa, or Rikyu, is located near Kyoto on slightly less than 14 acres. It was built during the early part of the seventeenth century by Prince Toshihito as a *shinden* style retreat, with an artificial lake and surrounding garden. The *shinden* house is based on a Chinese precedent that emerged during the Tang Dynasty. Katsura was inspired by a book that many historians consider one of the first novels, called *The Tale of Genji*, written by Lady Murasaki, who was a member of the royal court. It consists of a main house, the Shoin, a second part, called the Middle Shoin, and a newer wing, called the Goten. The *shinden* tradition here is overlaid with that of the *shoin*, which is a type of house introduced during the Muromachi Period (1393–1572) as a residence for the nobility. Katsura is characterized by a wooden frame that creates a raised wooden deck with white panels used as infill. The pond has been designed to represent sights that the Prince had either seen on travels around Japan or portrayed from the Genji fable. Source: James Steele



Tsumago When Tokugawa Ieyasu became the Shogun of Japan in 1601, he decreed that each *daimyo*, or noble clan, should travel from their home region to his court in Edo or Tokyo on a semiannual basis. This law of alternative residence, which had profound ramifications on the urban form of Tokyo today, required that the *daimyo* retain a household large enough to entertain the Shogun in style, so that these second homes in the new capital city were more like small villages than individual homes, and the high cost of maintaining them kept the *daimyo* financially unable to launch an insurrection against him. All of this travel back and forth between each of the far-flying regions of Japan and the capital made it necessary to build roads to each of them, and there were 11 main thoroughfares in all. These were initially used for the movement of troops and mail, and then opened up to the *daimyo* and their entourage, including *samurai*. The Tokaido, which ran along the east coast of Japan and has now been replaced by the *Shinkansen* line from Fukuoka through Kyoto to Tokyo, is probably the most fabled of these, but the Nakasendo road, which ran northwest from Edo, was equally busy. Tsumago is a post town that was built on the Nakasendo road, where ryokans, or inns and shops, were later added to cater to the nobility and their bodyguards moving along it. It dates from the early seventeenth century and has remained virtually intact because of its isolated mountainside location. *Source:* James Steele



Bahnar The Bahnar house has a distinctive high roof and is raised far above the ground to increase natural ventilation and provide protection. *Source:* James Steele



Chiswick In the mid-1800s, an entrepreneur named Jonathan Carr decided to develop a large property at Turnham Green, since the rail line from London had been extended that far west, and the construction of a station there provided the potential for home buyers. Upwardly mobile families, who had benefited from the fruits of the Industrial Revolution, were then seeking to escape London for the suburbs. Carr sought to replicate an English Village at Turnham Green, complete with village common, church, schools, and pub. He commissioned leading Arts and Crafts architects, such as Norman Shaw, to design the houses, which depart from the stylistic trend of the time and are Queen Anne inspired, built in red brick. Wealthy urbanites still want to live in this elegant community, but the houses cost much more today, in the rare event that they come on the market. *Source:* James Steele



Fatehpur Sikri The Mughal Emperor Akbar shared the architectural acumen of the other members of that exceptional Indian dynasty, but if anything, he was even more ambitious. He decided to build a new city, far away from Agra and Delhi, to which he and his court could escape during the hot oppressive summers in those cities. It was built of the local red sandstone in a series of interlocking squares, with individual precincts for royal, religious, and secular use. The Panch Mahal was set aside for courtiers and his harem, and one must imagine it draped in multicolored silk curtains, for privacy when it was in use. *Source:* James Steele

by the crown. When this attempt to destroy him failed, charges of treason were brought against him. He was imprisoned in the Convent des Cordeliers de Beaucaire in 1457. One of his employees, Jean de Village, who had married Coeur's niece, helped him escape, and Coeur fled to Rome where he sought refuge. He traveled on to the Greek island of Chios and died there in 1461. His body was returned to France and buried at the Convent des Cordeliers.

The proximity of this house to the great cathedral of Bourges indicates that Coeur may have been a religious man, and wanted to be near it. Unlike Gothic cathedrals in England, which were built on wide expanses of land called commons because everyone had access to them, located near but not inside the city, French cathedrals were in the midst of the urban area. Because of the restricted open area around them, a public square called a *parvis* was often dedicated in front of the cathedral, before construction even started. This space, which was often very confined, was alive with activity, since people coming to and from the cathedral before and after services were a captive audience. Musicians, magicians, jugglers, food vendors, and souvenir sellers filled the space, making it seem like a carnival was taking place there every day of the week. This is the atmosphere that greeted Jacques Coeur on his way to and from his house, which is close to the church.

The house was returned to the Coeur family in 1457, but passed from their hands through a series of owners until it was purchased by Jean Baptiste Colbert, a minister to King Louis XIV, in 1679. He resold it to the administrators of Bourges, who converted it into the town hall. It subsequently suffered several transformations, especially during the nineteenth and twentieth centuries, but the basic layout of the rooms has remained the same. One of the most unfortunate changes has occurred on the front façade of the house involving a group sculpture that includes three people. The main one is on top of the sharp pediment above the central doorway. This is flanked by two figures, one on each side of the portal, each set within a shallow niche facing forward. These figures have now been identified as King Charles VII above the door, flanked by Jacques Coeur and his wife Macee de Leodepart, and rather than facing forward the figures of Coeur and his wife are now believed to have originally been placed to appear that they were looking at the king, showing their loyalty to him. This small shift in position now substantially alters the original meaning.

This outward show of loyalty to the king, which was typical of the houses of the nobility at this time, continue on inside the House of Jacques Coeur, which is rare. One of these, which is a sculpture of a winged stag, a symbol of King Charles VII, and a winged doe that represents the Queen, is carved above the huge fireplace in the main reception hall. In spite of all his attempts to demonstrate loyalty, however, it is ironic that Jacques Coeur finally lost his house by being charged with treason.

Pride of Identity In addition to royal symbols, Coeur also included many of his own throughout the house, showing pride of ownership. “Coeur” means “heart” in French, and the symbol of his patron saint, James, is the scallop shell known in France as the coquilles Saint Jacques, or the shell of Saint James. Coeur displayed these two symbols, of the heart and the scallop shell, in carvings placed throughout the house. He also often included lilies, which again represent loyalty to the king. In a small chapel that is attached to the house, which is a common feature in houses

of the nobility in both England and France at this time, Coeur had his motto carved on the wall: "Nothing is impossible for the valiant of heart."² There are also beautiful stained glass windows in the chapel that depict the owner and include images of ships with him, depicting trade as the source of his wealth. These panels in addition to others showing images of his patron saint, as well as those of the Archangel Gabriel and Saint Catherine, hint at the pride that may have led to Coeur's problems at court. In addition to the windows, the ship motif also reappears on the ceiling of a large reception room on the second floor of the house, which has segments that are built to resemble the concave keels of a flotilla of ships.³

Winters in Bourges are very cold and fireplaces were the only source of heat during the Middle Ages, so there was typically at least one in every room, or one at each end if the room was large. These fireplaces were huge, at least 5 feet high and often as wide as the room itself with a large wooden beam used as a lintel or as a mantelpiece. In addition to heat, which was provided by large logs set on huge metal grates, the fireplace was also used for cooking and for light. Wrought iron candelabra were sometimes placed at each end of the hearth to hold candles placed at head height that were often 9 to 12 inches thick and several feet high. The only exception to the rule of having a fireplace in each room was that the hall where the servants slept was not heated.

Since the fireplace heated only a portion of the larger rooms, high-backed wing chairs were placed near the hearth to take advantage of the heat as much as possible. In the chapel, Coeur had two large stone chairs carved for himself and his wife on either side of the fireplace there. These would have been covered with cushions and coverlets to make them soft and warm, and they give a hint of the closeness of their union. Heraldry carved on the front of this fireplace, in which the coats of arms of both Coeur's family and that of his wife are combined, reinforces this image.

This must have been a happy house, in spite of the trouble that Jacques Coeur had with his fellow nobles. In addition to the gallery built to house social events in the main courtyard and the domestic touches such as the built-in seating near the fireplace, there are also loges, or small balconies, that were built at the sides of the main reception rooms inside, which were designed for musicians. One can easily imagine large social gatherings in the house, with the food being served by waiters and on large banqueting tables, fires roaring in the fireplaces, and musicians serenading the assembled throng from their projecting balconies far above. This house was designed for entertainment as well as being the focal point of the business life of a wealthy French family. Its form, or typology, of a multistory house built around a central courtyard, with formal rooms on a *piano nobile*, influenced the later development of the typology of the *hotel particulier*.

The *Hameau*, *Petit Trianon*, and Versailles

Few residences convey the spirit of their time and the political agenda of their owners to the extent that Versailles does. And few embody the distance from which an occupant has been detached from reality and the tragic consequences of that gap as well as the *Hameau*.

A Symbol of Royal Power It is no coincidence that the mention of Versailles elicits a vision of a glorious period in the history of a proud nation mixed with thoughts of wretched excess. The Palace of Versailles was intended by its creator, King Louis XIV of France, the Sun King, to be the most impressive royal residence that was ever built. He also wanted it to represent his government and reassert the power of the monarchy at a time, following the death of his father, when the nobility were asserting their strength and France resembled a republic more than a monarchy.

Versailles now stands on the site of a palace, called the *Petite Chateau*, which the architect of Louis XIV, Louis Le Vau, was instructed to preserve, as much as possible, to honor the memory of his father. Le Vau decided to do this by wrapping the new palace around the U-shaped footprint of the *Petite Chateau*. Since the “U” faced toward the east, Le Vau placed the king’s residential quarters, the *Grand Apartment du Roi*, on axis with the dawn, across the forecourt to the east, so that first light would shine on the face of the Sun King when he awoke. This was called the *relevé*, and it became a court ritual. He was not alone when he did so, but was surrounded by a small army of courtiers and attendants who gathered each morning to witness the event. This lack of privacy underscores the dual purpose of Versailles since it was conceived as both a political symbol and a personal residence, to centralize the French government around the monarchy through a cult of personality.

Construction of Versailles started in 1676 and took 41 years to complete. In the interim, its original architect, Louis Le Vau, died, and his idea for “*L’Enveloppe*,” surrounding the *Petite Chateau* with a shell that resembled an Italian villa, was taken up by Jules Hardouin Mansart in 1670. Mansart, who was a leader of the French Baroque school, supported the central location and orientation of the *Grand Apartment du Roi*, where the king essentially held court, and added *L’Escalier des Ambassadeurs* leading up to a more formal throne room at the *piano nobile* level as well. He added wings, extending out to the north and south, for members of the king’s immediate family and privileged members of the nobility who were trusted members of his court.

Enforced Residency As a part of his campaign to strengthen the monarchy and to use his palace to achieve it, Louis XIV officially required all members of the French nobility to live at Versailles for a part of each year, which partially explains its monumental scale. This weakened the connection between the nobles and their local base, where their support came from, making it more difficult for them to contest the power of the king.

Louis XIV also required them to pay for their period of residence at Versailles, which weakened their financial ability to oppose him. This political strategy is reminiscent of a similar idea, called the “law of alternative residence,” imposed by the Shogun Tokugawa on the *daimyo*, or nobles, at about the same time in Japan. Tokugawa required them to spend every other year in his new capital of Edo, now Tokyo. This presented the nobles with both a personal and a financial hardship since they not only had to be away from their home base for an extended period of time but also had to deal with the logistical and financial burden of having a large retinue accompany them. They had to maintain a fully staffed working household in the capital, capable of entertaining the Shogun if the need arose. The same

expectation applied to the nobility in residence at Versailles, since they were also expected to host, as well as be hosted by, the king.

A House within a Palace The U-shaped envelope around the *Petite Château* and the wings that were added to it provided separate apartments for both the king and the queen. Those of Louis XIV extend over, from his bedchamber at the center of the “U” to a linear seven-room suite strung out along the northern leg of the “U” and the queen’s apartments in a symmetrical arrangement on the south along the other. The conceit guiding the choice of the number seven was that it matched the number of the planets then known and the Roman gods associated with them. These wings were connected through the middle of the “U” on its western side behind the king’s bedchamber, by the Hall of Mirrors. The king’s apartment on the second floor of Versailles became even more domesticated as time went on. Louis XV used it as a private refuge and had it redecorated to suit his taste. He entertained a small circle of friends and *confidants* there, and even served meals that he had cooked himself.⁴ These favorites included his mistresses, such as Madame de Pompadour who also had an apartment on the second floor near the king.

The Hall of Mirrors The *Galerie de Glaces*, or Hall of Mirrors, which has come to symbolize the aesthetic fragility and the rarefied alternative reality that produced Versailles, became the *de facto* meeting place and public face of the royal residence.

As a long rectangular 33 feet long by 33 feet wide by 39 feet high hall, the Hall of Mirrors was designed by Mansart to fit into the space between two of the four symmetrically placed towers at each corner of the four square plan of the *Petit Château* that he had to build around on the site. Since the long hall on the east side was blocked by the segment of the old *Château* that still remained there and by the king’s bedchamber above, which he wanted to receive light from the rising sun, Mansart placed mirrors there and put 17 windows along the entire opposite wall on the west. The windows also provide an unobstructed view of the gardens, designed by Andre Le Notre. The tall arched windows are separated by reddish-brown marble pilasters with gilt-bronze bases, crowned by capitals in a “French order” conceived especially for the palace.⁵

The Hall of Mirrors was often used as a throne room by the king, who intimidated supplicants by making them walk its entire length, through all of the assembled members of the court, to reach him. For functions held in the hall in the evening, such as state dinners and balls, the hall was lit by 41 crystal chandeliers and 24 candelabras that between them contained 1,200 candles. The glow these cast in this space, reflected in the mirrors and the highly polished parquet floor, must have been magical.

Le Notre’s gardens, which primarily extended out to the west just beyond the windows of the *Galerie de Glaces*, are just as staggering as the palace they are intended to complement in conceptual terms. Covering thousands of acres, these gardens are also as effective as a bald statement of control, but in this case, this iron hand of the king is portrayed as being able to manipulate nature, rather than architecture, in a combined, extravagant symbol of his power over the state. The use of water alone illustrates this point, since it was originally directed to 1,400 fountains, of which only 607 now remain, dependent upon a highly complex hydraulic system. This system moves an estimated 6.2 million liters of water an hour.⁶ One of the

most impressive of these is the Fountain of Apollo. Its centerpiece is a statue of the Greek god of beauty on a chariot pulled by four horses captured at the moment they are breaking the surface of the water, with trumpeters announcing his arrival.

All of this required a great deal of labor, of course. More than a thousand residents, including the king's household and members of court, lived at Versailles at any one time, with each having an average of four attendants serving their needs, as well as maintaining both the house and the gardens.

Changes During the reign of Louis XV, the character of Versailles changed due to an increase in the size of the living space allocated to his mistress, Madame de Pompadour, on the second floor, and then for Madame du Barry, who had a six-room suite. It changed again during the abbreviated tenure of Louis XVI and his Queen Marie Antoinette, who were forced to leave the palace by an angry mob at dawn on October 6, 1789. The court in residence at Versailles, which had been rather subdued during the reign of Louis XV, came alive once again when Marie Antoinette was put in charge of the social calendar, and candlelight flickered in the mirrors of the *Galerie de Glaces* once again. She had become queen of France in 1774, coming from the Viennese court when she was very young.

While the king continued to occupy his own private apartments, as had been the custom at Versailles since it was first occupied by Louis XIV, Marie Antoinette found herself increasingly displaced by Madame de Maintenon, who occupied four rooms on the first floor, near where the queen's apartment was once located. This privileged location was due to her special status, frankly described as that of "the morganic Queen, recognized if not officially at least unquestionably, as the King's wife."⁷

Marie Antoinette retreated more and more from court life as time went on, however, spending more time with a small group of friends, on whom she lavished expensive gifts.

Le Petit Trianon and the Hameau Louis XVI presented to Marie Antoinette the gift of a residence called the *Petit Trianon*. It has extensive gardens, including a formal segment, near the residence itself, and a less formal, more organic portion, including a lake, that is nearly three times the size of the formal part. Four years after the *Petit Trianon* was completed, Robert Miqué designed a "hamlet," in imitation of peasant houses. It was inspired by a similar fantasy called the *Hameau of Chantilly* built by the Prince de Condé, but Miqué's hamlet was also roughly modeled after a farm village in Normandy, with the half-timbered façade and thatched roofs epically characteristic of the region of Caux.

In some instances Miqué replaced the thatch with small clay tiles, the half timbering with brick, and shutters with stained glass window panes, derived from Flemish rather than French prototypes. Craftsmen were brought from Normandy to build the 12 buildings of the *Hameau*, which included, in addition to *Le Maison de la Reine*, or house for Marie Antoinette, a caretaker's house, a working mill, a dove cote, a series of farm buildings, an orchard, meadows, and a bridge crossing over one part of the lake on which the hamlet was situated. Each of these buildings was intentionally made to have a patina of age, and when the village was completed in 1785, a farmer and his wife, along with farm hands and a milkmaid moved in, along with a caretaker and several resident "peasants." Soon after the queen herself occupied her "cottage," one of her visitors, Madame Campan, wrote that "the



Le Hameau Versailles Courtesy of Photos.com

pleasure of strolling through all the farmyard buildings of the Hamlet, of seeing the cows being milked, and of fishing in the lake, enchanted the Queen.” Another guest, Pierre de Nolhac, wrote that “the gardens were cultivated, the fields ploughed, the trees were pruned and the fruit gathered. From the gallery of her cottage, the Queen could see the donkey taking corn to the mill to be ground at the mill, (and) the washer women beating the linen on the banks of the pond.”⁸

Le Maison de la Reine The house of the queen deceptively referred to as her “cottage” consists of two separate buildings connected by a covered bridge. To reach it, Marie Antoinette would have been driven by carriage, or would have walked from the *Petit Trianon*, along a narrow pathway that passed in front of the caretaker’s house and the dove cote. She would then have crossed a small bridge over the lake near her house. The ground floor of the larger of its two sections consists of one nearly square main space with a fireplace on one side, with an attached kitchen near it, and a room for playing backgammon on the other. The first floor of the main house was used as a living room or drawing room, with a large central space of the same dimension as the dining room below it serving that purpose. The only difference between the two rooms is that the fireplace on the first floor is on the opposite wall, giving the lakeside elevation a balanced look with a chimney on each side of the main house. This façade also had a pair of doors in the center, leading out to a balcony with a view down the length of the lake, flanked by a low sill window on each side to also take advantage of this aspect. This arrangement mirrored by three windows on the opposite side, overlooking a forest, must have filled his room with light.

Miqué approached the design of the stairs between the two levels as an opportunity to emphasize and augment a studied eccentricity of the exteriors, so they

occupy far more space in the plan than necessary. A circular stair at the far end of the main house is treated as a tower, which, for proportional reasons, ends at a landing located halfway between the floors, switching over to a second stair at that point leading to an open porch. A third stair, located behind these two, provides a faster and more conventional means of getting from one floor to another. This preference for picturesque effect over pure function also extends to the covered bridge, or gallery, curved to conform to the shore of the lake that connects the main house with “*Le Billard*” some distance away from it. This *Le Billard* included a billiard room on the ground floor, with an apartment above, connected by an equally ornate stair at the end of the gallery to balance those used at the *Maison de la Reine*.

Sumptuous Interiors In contrast to the deliberately decrepit look of the exterior, which was instantly aged with moss planted on the roof and faux rot painted on the wood, the interiors of these fake farmhouses were extremely elegant. The passion for Chinoiserie at the time the *Hameau* was built is reflected in the décor of the queen’s drawing room, and the finest carpets, tapestries, and porcelain were used throughout.

Gardens Louis XIV had commissioned the *Trianon* as a pleasure garden, and Louis XV expanded the number of species grown there to make it a serious botanical resource, in keeping with his interest in science. Louis XVI, however, decided to change the character of both the gardens, at Versailles and the *Trianon*, soon after his coronation in 1774, to follow the organic English model, rather than perpetuate the stiff formal French one. He started his campaign at Versailles, but it was stopped by supporters of the work of the landscape architect Andre Le Notre, who implored the king not to destroy the original layout. Louis XVI felt he was more likely to implement his wishes for a romantic garden at the far corner of the *Trianon*, and asked landscape architect Claude Richard and architect Robert Miqué to design one there. They planted orchards of fruit trees, including peach, pear, apricot, and apple trees, and added plants and vegetable gardens later, according to a scenic concept. This was the setting into which the *Hameau* was placed.

Marie Antoinette received the news that an angry mob was advancing on Versailles along the road from Paris on October 5, 1789, at the *Hameau* and the following morning, she left it and the *Hameau* forever. In retrospect, it does show how far she had strayed from reality and how much she misunderstood the effect her excesses were having on the common people of France.

Hausmann’s Paris

Paris essentially gained prominence as the seat of the French kings in the *Ile de la Cité*. By the mid-seventeenth century, the heartbeat of the city was felt there at the *Palais* and the *Cours de la Reine*, built at the direction of Marie de Medici near the *Tuileries* gardens in 1616, which ran for a mile along the Seine. The *Cours* was the most important one of several carriageways and consisted of a wide central avenue flanked by twin narrower side lanes, separated by rows of trees. The middle avenue was intended for coaches and was wide enough for six across. It is reported that, on a given evening, an average of 800 coaches would use the *Cours*, not including people walking or riding along the side aisles. The *Palais* on the *Ile de la Cité*, where the Cathedral of Notre Dame also stands, was not the kings’ residence, but

housed the courts of law, including the *Parlement*, or Supreme Court, the *Chambre des Comptes*, the *Cours des Aides*, and the *Cours des Monnoies*. The Supreme Court was the main counterpoint to royal power and so its judges had enormous prestige. Their comings and goings to and from court in their robes of office were a daily source of spectacle in this part of the city. Because several of these courts dealt with state finance, it was logical that an exchange should also be located there. While it did not achieve the status of the exchange in Amsterdam, it did add to the liveliness of this part of Paris. Paris at this time was dominated by the crown and the legal community attached to it. This created a rich panoply for the citizens of Paris to gawk at daily, which they also participated in, like actors in a play.

Henri IV and his queen, Marie de Medici, thus had a great impact in Paris at this time, before the royal court moved outside the city to Versailles. This move may be seen as a precursor to the impulse for urban flight that would eventually lead to suburbanization. In addition to the *Cours*, they were also responsible for the *Place des Vosges*, originally *Place Royale*. Henri IV originally intended that the *Place* be surrounded by shops behind an arcade, with housing above, which is an early example of mixed use. Workshops for the production of silk fabric occupied one entire side. The square, the *Place des Vosges*, remains an *enceinte* of privilege today, with houses and apartments there now selling for astronomical prices.

Baron Haussmann In spite of all these and other substantial contributions made by royalty to Paris, however, prior to their preference for Versailles, it remained a medieval warren of narrow, twisted streets until well after the Revolution. This changed dramatically during the Second Empire of Napoleon III, when Baron Georges-Eugene Haussmann, as prefect of the Seine, embarked on a far-reaching rebuilding program of unprecedented scope in the early 1860s. Civil unrest in 1848 was a motivating factor behind the demolition of more than 20,000 buildings ordered by Haussmann to make it easier to control the streets and to improve sanitation.

Haussmann's extensive planning campaign is significant both for the way in which it was carried out and for what it achieved. After spending a year surveying and mapping the city, he began by forging an alliance between public, municipal, civic, and private power brokers to enact the laws and raise the funds needed for his revolutionary transformation of the capital. The tripartite division he established is legible in development today in the division of power between community groups, city agencies, and the development team.

This alliance, however, broke down, so he set up the *Caisse des Travaux de Paris* to raise money for land purchases through the sale of annuities tied to increased property values from the improvements he was making. He controlled the uses allowed in each district, as well as building heights, materials, and styles. A typical street composition consisted of attached rows of six- to seven-story buildings, with shops, offices, or restaurants on the ground floor, and housing above, as a classic example of the technique of mixed use. The uniformity of the façades of these rows, clad in stone and rendered in French Classical details, contrasted sharply with the individual staccato forms of the medieval fabric, placing the emphasis on the unity of perspective views toward distant landmarks along wide boulevards and avenues instead.

The uniformity of these new rows of mixed use blocks flanking widened streets invites description of the avenues and boulevards as outdoor rooms, which were suitably furnished as such. By a special administrative order in 1854, a department of *Promenades et Plantations* filled Haussmann's broad sidewalks with trees as well as specially designed street furniture that included everything from benches to public toilets, creating the recognizable and much loved Parisian streetscapes we know today.

Although Haussmann's tactics appear to have been draconian in retrospect, and his accomplishments would be difficult, if not impossible, to duplicate today, they have produced what is generally considered to be one of the most beautiful cities in the world. For that reason Paris offers valuable lessons that can be helpful to planners and architects today.

The first of these, in a general sense, is Haussmann's recognition of the need to understand and come to terms with the key role of private individuals and financial institutions in the development process, either in tandem with or independent of public authorities.

The second obvious lesson that Haussmann has to teach us is the subversion of ego to an overall vision. Although individual architects were involved in each segment of his plan and indeed had to be because of its vast scale, they had to conform to overriding aesthetic guidelines of height, width, and style. These design guidelines provided an aesthetic framework within which each architect had to work, so that no individual could derail the general objectives of the overall plan.

A third lesson is Haussmann's appreciation of the generative mechanics of mixed use, of not only allowing diverse functions to coexist within the same block, but actually legislating this intersection, which is the lifeblood of Paris today; this is one of the most famous and continuous urban success stories in the world today.

A fourth, but not the final, lesson provided by Haussmann's plan is his attention to detail, especially his enlightened consideration of streets as being more than a conduit for getting from one place to another, but as gracious outdoor rooms in the city, with landscape and accoutrements appropriate to their elevated civic status. Street furniture is often considered as being extraneous by city administrations, if it is considered at all, but in Paris it is an extension of the unified message that the architecture conveys. It gives dignity and grace to the outdoor rooms that Haussmann created.

The Chateaux of the Loire Valley

The Loire River, which is southwest of Paris, is one of the great river systems of France, along with the Seine, Rhone, and Garonne basins. One of its biggest claims to historical fame is a series of *chateaux*, or castles, that were built along its banks, beginning in the tenth century, but most are associated with Francois I during the period of Renaissance influence there in the early sixteenth century.

Chenonceau Is the Most Beautiful Chenonceau is inarguably the most beautiful of all of these castles for various reasons. First, it is the most memorably situated because, in its final configuration, it has a long segment built on a bridge over a tributary of the River Cher. And second, it has a romantic and equally tragic history as the background to several royal dramas or, more accurately, melodramas that transpired there. These followed a seven-act chronology that corresponds to

changes that occurred in the physical appearance of the *chateau* itself, making it a tangible record of the momentous events that shaped it and that influenced its form in return. The first act begins with the construction of a tower, or *donjon*, on the shoreline of the river by Jean Marques on property that the family is recorded to have bought in 1230. This tower followed the pattern of a medieval residence built for defensive purposes, in being square in plan with a round tower at each corner, but was demolished by agents of King Charles VII as punishment for an “act of rebellion” by Jean Marques against the state in 1411. It was rebuilt by the owner in 1432, but the family was finally unable to keep the property and sold it to Thomas Bohier in 1513, who was then the receiver-general of Normandy.

The second act in the history of Chenonceau began when Bohier used the foundations of a mill that Jean Marques had built in the river as the basis for his iteration of the house so that it was not next to but *in* the River Cher. Because of Thomas Bohier’s extensive responsibilities as an agent of the king in Normandy, which required that he be away from home a great deal, this phase of construction was directed by his wife, Catherine Bisconnet. She was the first in a sequence of women associated with the residence, which is now also known as “La Chateau des Femmes.”

The Bohier innovations include a long gallery or hallway bisecting the square plan, giving access to two rooms on each side, as well as a stairway to the upper level. Rather than being round, as most medieval castle stairs were, this is a scissor stair, with two straight runs, like those in some Italian Renaissance palazzi. It is also lit by an oriel window that allows a fleeting view out to the River Cher while moving from one floor to the other. The roof over the stair is held up by a rib vault. In



Chateau de Chenonceau. Courtesy of Shutterstock

addition to this innovative introduction of a circulation pattern, room layout, and straight stair, which was one of the first in France, the Bisconnets also left their mark on the chateau by carving “*S’il nous vient a point, nous souviendra*” on many of the doors, meaning “if we can finish this castle, people will remember us.”⁹

Unfortunately, Thomas Bohier died in 1524, and Catherine Bisconnet lived only four years more. In 1535, the third act began, when it became the property of Francois I to satisfy unpaid debts. So, the most exquisite house in the region that is so closely associated with this king became his through tragic circumstance. It also became his own prerogative. He is best remembered by the salamander, a royal symbol that adorns some of the rooms. There is also a large room on the ground floor, next to the Grand Gallery, that still carries his name.

Francois I died in 1547 after owning Chenonceau for 12 years, and this opened up the fourth phase of the complex history of this enchanting house. His son Henri II, who inherited it, gave it as a gift to his mistress, Diane de Poitiers, the widow of Louis de Brege, Grand Sénéchal of France. She was one of the ladies in waiting of Queen Catherine de Medici, who was well aware of her husband’s involvement with her. She is known to have been very beautiful. Being aware of Catherine’s jealousy, Henri II attempted to secure Diane de Poitiers ownership of the chateau through a legal contract in 1555.¹⁰

Diane de Poitiers While she lived in Chenonceau, Diane de Poitiers spent a great deal of time, energy, and presumably royal finances on the improvement of the house, including renovations carried out by the influential court architect, Philibert Delorme. The most important feature of his redesign was the construction of a vaulted, bridge-like stone foundation that connected the entrance tower on one side of the River Cher with the opposite bank. She was unable to finish the gallery that she intended to build above it, however, because she ran out of money.

But she was able to have a series of stone terraces built that she then had covered with soil to allow the planting of a garden next to the chateau, containing flowers, vegetables, and fruit trees, including exotic rarities in a very formal triangulated layout that is typical of French gardens of this time.

Like Francois I, Diane de Poitiers is also commemorated by a room named after her on the ground floor of the tower block, directly across from that of the king. It flanks the entrance to the Grand Gallery that she made possible, but never saw realized. While she lived at Chenonceaux, Henri II was killed during a jousting tournament by Gabriel Montgomery, the captain of his Scots guards, in 1559. Catherine de Medici then took power, and the fifth act in the history of Chenonceau began.

Catherine de Medici Intent on exacting retribution for Diane de Poitiers’s relationship with the deceased king, Catherine de Medici tried to have the deed to Chenonceau revoked, but was unable to do so since Henri II’s preventative legal measures were complete. However, she was able to force the king’s ex-mistress to accept a trade of Chenonceau for Chaumont, which Catherine owned. Chaumont is not nearly as romantic as the fairy-tale palace spanning the River Cher, so this must have been hurtful to Diane.

Catherine set about imposing her own personality on Chenonceau. She remodeled the north entrance elevation, literally putting a different face on the house.

She also had additional rooms built on the east side of the main tower block between the chapel and the library. Most importantly, and symbolically perhaps, she finally had a two-story wing built on top of the bridge Diane de Poitiers had finished, but had been unable to elevate earlier. After the gallery and residential wing were completed, Catherine entertained all the members of the court there, celebrating her final victory over her rival.

The gallery is 60 meters long and 6 meters wide, well lit by an equally spaced series of windows at both levels on each side. The chateau seems to stop abruptly at the end of this gallery-bridge, but Catherine did intend to build a smaller tower to match the entrance block on the opposite bank of the Cher. She wanted to anchor it there, and even had the foundations poured for it, but she died in 1563 before it could be completed.

The White Lady of Chenonceau With her death, the sixth act of the *chateau aux femmes* melodrama began. Catherine bequeathed Chenonceau to her daughter-in-law and then queen, Louise de Lorraine Vaudemont, the wife of her son King Henri III. Soon after they took possession of the estate, however, the king was assassinated and Louise went into an extended period of grief, wearing white, which signified mourning among royalty. She made large contributions to charity and spent most of her day praying in the chapel, along with nuns she had invited to join her there. Her most notable contribution to the house was to have many of the walls painted black.

A Salon for Enlightened Debate The seventh and final act also involves a female owner of Chenonceau, and it starts in 1773. The house had suffered a series of depredations under interim owners when Madame Dupin, the wife of Claude Dauphine, transformed it into a salon for *philosophes* responsible for generating the Enlightenment in France at the end of the 1700s. This can be argued to have contributed to the Revolution at the end of the eighteenth century. Guests there during the Dupin ownership included Montesquieu, Diderot, Voltaire, and Rousseau. Madame Dupin protected Chenonceau from destruction by Revolutionary forces by offering it as a bridge, and this saved it since there was no other bridge close by. This ravaged the interior, but the structure and the shell were salvaged, allowing it to be reconstructed.

Place des Vosges, Paris

The economy of France was suffering during the seventeenth century due to its reliance on imported goods. Henri IV tried to reverse the flow of capital that this caused by attempting to bolster local crafts, such as the production of textiles and silk. *Maisons des Moulins*, or textile workshops and mills, were built in Paris, as well as silk works, representing concerted effort by the crown to legitimize these industries. Henri IV issued an edict in 1604 that provided subsidies for silk workers who would move to this area, and he designated an area as the commercial and residential district where the shops and houses of the artisans would be located. This site was the *Parc des Tournelles*, site of the *Hotel des Tournelles* where Henri II died after being injured in a jousting match in 1559. After the *Hotel* was demolished, the square became a horse market before being renamed the *Place Royale* by Henri IV in 1605. The new name reveals his intention that in addition to being a textile

and silk manufacturing center, this district would also attract buyers to its shops and also become a venue for royal celebrations. Skilled artisans from Italy, Belgium, and Flanders, which were the centers of textile production at the time, were brought to the *Place Royale* to teach local craftsman how to cut and spin the cloth and how to incorporate silver and gold thread into the weave. Residences were allocated for them, and these were of a quality high enough that it would entice them to come to Paris to share their secrets.

The Place Royale The *Place Royale* proved to be very popular with the general public since open space was at a premium for them in Paris at this time. The king's wish that this would become an important and prosperous economic resource and the focal point of this industry was also realized, since it, along with Aubusson, became a center for the trading of precious textiles throughout Europe. To boast its stature further, Henri IV gave grants of land on the *Place Royale* to countries so that, in addition to artisans, it also included residents from the ranks of the nobility. The king's foray into the field of domestic manufacturing and branding proved to be a success. Orchards of mulberry trees were planted, and hundreds of thousands of silkworms were put to work munching their leaves to improve France's



Place des Vosges. Courtesy of Shutterstock

competitive edge in the market. Italian imports were banned and the commercial battle was on.

Such a venture was unprecedented in Paris, when the mills were built to accommodate all of the looms necessary for the mass production of textiles, and one zone was designated as the district where the artisans and workers would live and sell their cloth and silk. It would be some time before a similar situation would occur across the channel in England, since the Industrial Revolution there was still a generation away. When it arrived, however, there was a parallel concern about housing the workers who labored in the mills all day.

By 1605, the silk works complex at the *Place Royale* was operating at full capacity, in addition to having 12 half-timbered houses on the square and a raised stage for ceremonies involving the crown, since the king wanted to add the *cachet* of his backing to the enterprise to attract attention, and trade to it.

When it was not being used for ceremonies, the stage served as a place for demonstrations by visiting artisans, mainly coming from Italy, or as a marketplace for their crafts. The 23,522 square meter site, in the *Marais* section of the right bank of the River Seine, stretched from the *Rue del'Egout* to the *Rue des Tournelles*. The silk works was on the northern end, and the other three sides of the rectangular site were lined with a continuous stone arcade with shops behind it and houses above, which was a first in Paris. Each house had two rows of three windows each running vertically up their façade, set into a half-timbered structure, in which the wooden members were exposed. A steeply pitched roof over each house, which was half the height of its entire elevation, combined with the stone arcade in front of it to give the square a syncopated, yet unified, appearance. The king reserved one of the lots for himself, and a residence was built there between 1605 and 1607. It was different from the others on the square in that it served as an entrance into the commercial zone, as a reminder of the royal connection to it, near the silk works. Unlike the other houses, which had shops below, the king's residence occupied all three levels and was five bays wide; it was designed by Jonas Robelin and Gilels Le Redde in a Classical rather than half-timbered style. Before he had a chance to occupy the residence, however, or to see the square completed, Henri IV was assassinated in 1610.

A Vision of Equality Dies The king's vision of *égalité* also died with him, and its demise was due to his belief that aristocrats and working class artisans would want to live together. To ensure the success of the venture, Henri IV granted ownership of the lots to royal office holders rather than the artisans and shopkeepers who would work in the area, both as a gesture of his appreciation of courtiers who served him well and in a belief that the financial means of the nobles would ensure the completion of the project so that it would not have to be entirely built using government funds. The west side of the *Place*, for example, was given to just two nobleman, Pierre Fougeu d'Esaires and Charles Merchant.¹¹ Artisans and shopkeepers then accounted for less than 20 percent of the ownership of the *Place Royale*. At the time of the king's death, the competing interests of the two different types of owners led to the relocation of the silk works and the shift of emphasis from artisanal to aristocratic residences on the square. The half-timbered houses, described in a publication at the time by Pierre Le Muet as a "*Mariniere de Batir*

pour Toutes Sortes de Personnes,” or a “way of building for all sorts of people,” were replaced by brick houses for only the wealthy sort. The small proportion of *concessionnaires* who did retain ownership of lots on the square rented their properties to upper-middle class and upper class residents and lived elsewhere.

In spite of this transition, the new houses that were built did retain the footprint of the original plan, without the courtyards or extensive gardens that were typical of the *hotels particulier* being built by the nobility elsewhere in Paris. Some owners had to annex neighboring properties if they wanted a garden.¹²

A New Name and a New Character The *Place Royale* was officially inaugurated in 1612, two years after the death of Henri IV, in a form quite different from the one he had envisioned but still associated with royalty as he had hoped. The highlight of the ceremony was a double wedding, in which Elizabeth, the daughter of Henri IV, married Philip IV of Spain and the new king of France, Louis XIII, married Anne of Austria. More than 10,000 spectators watched this ceremony in the square, which was followed by a festival that lasted for three days and included a jousting tournament.¹³

In 1639, Cardinal Richelieu ordered that an equestrian statue of Louis XIII be placed in the middle of the *Place Royale*, underscoring its associations with the court, but this also made it a focus of attention during the French Revolution, when the statue was pulled down. To remove this association with privilege, Napoleon renamed it the *Place des Vosges* in recognition of its respect for his administration in being the first *département* in Paris to pay its taxes. Other residential squares in Paris were built following the lead of the *Place des Vosges*. The *Place Dauphine*, for example, was begun just before its predecessor was dedicated. Named in honor of the future Louis XIII while he was still dauphin, this second iteration of what had already proven to be a successful urban planning model was also built of brick with white stone details to house an upscale clientele. Following this coherent image of exclusivity, a third *Place* was designed by Jules Hardouin Mansart in 1685 in honor of the French victory at the battle of Nimègues in 1678, during the reign of King Louis XIV. A second equestrian statue there suffered the same fate as that of Louis XIII. The common denominator resulting in the success of each of these residential districts was the perception of prestige and serene dignity conveyed by the uniformity of the façades surrounding each of them, at a time when the legacy of medieval class was still very evident throughout Paris.

In its final form today, the houses that line the *Place des Vosges* appear without their connecting arcade, making it appear to be of one elegant design with each house joined at the hip to the one next to it, inscribing the entire perimeter of the square. The typology that is repeated is visually twice as wide as the original “*Maisons pour Toutes Sortes de Personnes*” originally proposed by King Henri IV for the *Place Royale* and is much more posh. While they are approximately the same height, they have four windows on each façade at each of their three levels, with stone balconies in front of those on the two upper floors, and dormers that are arched above the windows on the corners and gabled above the two inside ranks, continuing their stately vertical rhythm above the cornice line. Instead of the steeply pitched gables that were intended to repetitively terminate the houses of each of the artisans and shopkeepers in the original plan of the square, the houses today have roofs that are reminiscent of a chateau. These look like high caps that angle upward from

the top of the exterior wall on all sides, allowing a chimney on each end wall to stand alone in space. The brick face of each house is broken down in scale by a flattened rendition of the hybrid columns first introduced by Claude Nicholas Ledoux at the Salt Works at Chaux, which dates them as pre-Revolutionary. Those columns, which are made up of alternating, equally wide segments of round drums and square blocks, are a Ledoux signature, but also represent the growing influence of the Enlightenment. They are a blatant and rather awkward statement about the growing power of rationalism represented by the Platonic square over the forces of unpredictable nature, symbolized by the drum as the memory of the classical Greek column and the tree that inspired it.

The *Place des Vosges*, and the elegant apartments inside the houses that enclose it, which have had many famous occupants over the years, has been a model for similar squares outside of France as well. In London, for example, the Earl of Bedford followed the lead of Henri IV in his concept for Covent Garden, built in 1630, with attached houses along two sides, and a focal point, in the form of the church of St. Paul's by Inigo Jones, at one end.¹⁴ Although Covent Garden is now much changed, other notable examples in the city that retain their original charm are Great Queen Street and Lincoln's Inn Fields at Holborn.

GERMANY

Schinkelschule Houses in Potsdam

Karl Friedrich Schinkel was born in 1768 and moved to Potsdam in 1820. Friedrich Wilhelm III, who ruled Prussia from 1797 until 1840, had just embarked on an ambitious series of architectural initiatives to continue to enhance the royal seat that the Hohenzollerns had chosen along the River Havel as an alternative to Berlin. They had relocated there during the reign of Friedrich Wilhelm, the Great Elector, who ruled from 1640 until 1688. He had built his palace, or Schloss, there in 1660, and his successors had incrementally enhanced Potsdam in the century that followed. These successors were Friedrich III (1688–1713), crowned the first Prussian king in 1701, as Friedrich I; Friedrich Wilhelm I, the “Soldier King” (1713–1740), who likened Potsdam to Sparta and was born and died there; Friedrich II (1740–1788), also known as Friedrich the Great; and Friedrich Wilhelm II, the father of Schinkel's benefactor, who ruled from 1786 until 1797.

A Talented Team Schinkel's arrival also coincided with that of landscape architect Peter J. Lenné, whose involvement in royal projects started in 1816. Considering the fact that Schinkel's disciples August Stüler and Heinrich Ludwig von Arnim continued to implement his ideas and designs for almost a quarter of a century after his death, their combined impact on Potsdam lasted for almost 50 years.¹⁵ As a team in the same league as Edwin L. Lutyens and Gertrude Jekyll, or Robert Adam and William Kent, Schinkel and Lenné finally realized the founder's vision of a valley full of temples set among gardens as an earthly version of the Elysian fields, or paradise.

They started their collaboration at a time when the royal passion for all things Classical was at its height. This wholesale acceptance of Neoclassicism at the

beginning of the nineteenth century is all the more surprising, considering the heights that Baroque principles had reached in Berlin, Dresden, and Vienna during the 1700s, especially in the work of Fischer von Erlach and Neumann. One reason for the shift was the division of Germany into Protestant north and Catholic south and the partiality of Catholic religious institutions toward French Classicism, abetted by the nationalistic ideas of Abbe Laugier, a Jesuit priest.¹⁶

Friedrich the Great, however, who is best known as the Protestant king who defeated the combined Catholic forces of Austria and France at Rossbach in 1757 as the first step in the direction of a sense of German identity, was partial to Palladio.¹⁷ He had a translation of *I Quattro Libri* in his personal library as well as Lord Burlington's *Ancient Buildings Designed by Andrea Palladio*, translated as *Fabbriche Antiche Disegnate da Andrea Palladio Vicentino* in 1730 in Vincenza. Friedrich also requested that Lord Burlington send him copies of several of his drawings.

And so, by the time Schinkel arrived in Potsdam the stage was set for the Neo-Palladian conversion of Potsdam. Friedrich Wilhelm III decided to concentrate on Paretz, near Potsdam, and the design of a Neue Pavillion at the Schloss Charlottenburg, and his son the Crown Prince, who would become Friedrich Wilhelm III, took an active interest in this campaign as well, although he had different ideas about how it should evolve.

Schinkel and Lenné collaborated on a small palace, called Klein-Glienicke, and its grounds to the east of Potsdam, across the River Havel. For Schinkel it required the conversion and partial rebuilding of an existing Schloss that had belonged to Prince Hardenberg. At the same time, in 1824, he designed the Neue Pavillion in the vicinity of the Schloss Charlottenburg for the crown prince, who wanted it to be similar to a small palace, called the Villa Reale Chiaramonte in Naples.¹⁸

The Neue Pavillion Although the Schloss Glienicke, which was under construction for eight years, from 1824 to 1832, is much larger than the Neue Pavillion, the two projects provide a clear insight into Schinkel's approach to the classical language of Palladio. Although he later adopted the temple front, it is missing from these two royal commissions, as is the podium base that was a prerequisite of Palladian design.¹⁹ Without a pediment, or projecting portico, as well as a clearly defined *piano nobile*, both the palace and pavilion of 1824 appear as solid, compact expressions of power, set as sculptural compositions within the most idyllic, verdant context imaginable. This balance between monumental form and bucolic surroundings exaggerates the stark horizontal and vertical edges of each residence even more. Instead of a temple front, Schinkel has treated the middle third of the front elevation of the Neue Pavillion as a three-dimensional exercise in progression and recession, using the same line of three pairs of French doors in the foreground, as an entrance at ground floor level, only four steps above the surface of the verdant lawn around it, and pushed back on the first floor to provide space for a colonnaded balcony, which puts the same trio of doors in the shadow, above. This technique of carving sections out of the massive rectilinear block to announce the location of entrances and balconies continues around the perimeter of the house, with the balcony itself being a thin metal railing and deck attached to the solid masonry walls with brackets.

GREECE

Mykonos

The term “Greek village” conjures up a mental image of pristine white houses, stacked like sugar cubes upon a steep mountainside overlooking an azure blue sea. And yet, the Greek vernacular houses that have inspired this stereotype are a relatively recent entry on the historical timeline of that venerable nation.

On Delos, for example, which is little more than an elevated sandpit located about an hour by motorboat from Mykonos, archaeologists continue to discover house foundations that predate Hellenistic and Roman occupation of this long, thin island. Delos was considered a sacred place by the ancient Greeks as the birthplace of Apollo, to which it was dedicated. It was also selected as the location of the treasury of the Delian League organized by a number of Hellenic city-states, including Periclean Athens, as a defensive deterrent against the Persian Empire. The Greek houses of that time were far different from the orthogonal, white vernacular houses we now associate with the islands. These white houses are also not universally found throughout Greece, but are concentrated mainly in the Cyclades Islands, especially on Amorgos, Santorini, and Mykonos. Of these three, the houses on Mykonos alone have a direct relationship with the sea since the other two have a steeper topography. While Santorini is very picturesque, it is concentrated around the rim of a *caldera*, caused when a volcano erupted in pre-Classical times, pushing



A hilltop view of Mykonos, Greece. Courtesy of Shutterstock

the center of the island into the sea. This event, which was cataclysmic, is credited with bringing an end to the Minoan civilization, inspiring for the Greek legend of Atlantis, and sending airborne debris as far south as Egypt, where it may have been interpreted as one of the plagues mentioned in the Bible as having precipitated the Exodus.

A Friendly Harbor The upshot of the volcanic disaster that befell ancient Thera, which is now Santorini, is that the island has virtually no harbor, only several piers, jutting out from a cliff facing the sea, that are strategically placed to handle the numerous cruise ships that regularly visit there. The village, which is strung out along the top of the cliff overlooking the crater far below, can only be reached by taking a circuitous, switchback road from the quay to the top of the cliff.

Mykonos, on the other hand, is located on an island with low hills that roll gently down to the sea. It has a fishhook-shaped split of land on one side that creates a perfect crescent-shaped harbor, with land flat enough to allow a wide plaza to exist between the boat moorings and the houses and shops on its opposite side. A twisted labyrinth of narrow streets extends back from this curving plaza into the village, moving gradually up the gentle slopes behind it. Several prominent Greek historians associate the beginning of the Greek vernacular house found on Mykonos today with the Ottoman occupation, probably not earlier than the 1400s.²⁰ The courtyards that once graced each private home during the Classical Period moved outside in the contemporary model, transformed from an individual residential luxury to the collective necessity of a plaza or series of plazas that provide outdoor living rooms for the people of the village. These are sometimes allocated according to neighborhoods or the location of a church. Streets, which are often just wide enough for two people to pass, are not as random as they may seem to an outsider since they were aligned to block the hot summer winds as well as to thwart Turkish invaders, who brutally suppressed any hint of resistance by breaking into houses unexpectedly and punishing those suspected of involvement in it. The similarity of the exterior appearance of these houses, along with their anonymity was at least some defense against this constant threat.

After the war of independence, in the post-1828 era, more building took place on Mykonos, and several of the landmarks that have come to symbolize the island, such as the windmills along the ridge at Kato Myli and the Venetian style houses that overhang the shoreline, date from this period.²¹ The windmills were once used to grind corn sent to Mykonos from neighboring islands large enough to grow it but unable to ship it. The Venetian style, or “captains” houses as they are referred to on the island, were used for unloading and storing contraband, which was passed from ships directly to people waiting on the wooden balconies that project out over the water. In Venice, these balconies were not used for unloading, which was usually done in a warehouse area at water level under each house, called an *androne*. The captains houses on Mykonos also have large, enclosed window boxes remarkably similar to the Arabic *musbrabbiya*. They are supported by triangular brackets attached to the exterior wall of each house and hover over the water line, along with the open balconies. This whole edge of the harbor has now been transformed into restaurants that serve the tourist trade that now overwhelms the island during the summer season, including the large plaza where boats are still moored, going out to sea each day and returning with fish for sale.

The Houses The anonymous white faces of the houses on this island, which are typically two stories high, have the functional advantage of reflecting sunlight and the internal heat it can cause, and the thick masonry walls help keep the inside cool as well. The white surfaces are the perfect foil for the way this light changes during the day, from the pinkish-blue of early morning through the intense metallic glare at noon on a summer day when the color of the sea seems to change from blue to liquid mercury. These color changes continue on through to dusk, when this intense heat turns the sky deep purple and the water matches Homer's description of a "wine dark sea." The white houses also define shadows sharply, when there are any. They usually occur in the small alleyways or behind the exterior stairs that join one floor to another to save room inside the house. The heaviness of the walls and the heft of these stairs make the wooden balconies and the shuttered windows seem fragile by comparison, even though these are usually roughly made. Wood is typically painted gray, which is the traditional color for woodwork on Mykonos just as blue is used for trim in Sidi Bou Said in Tunisia. The exterior stairs also help inhabitants negotiate movement from one house to another, since they are stacked up on top of each other as they step up the hillsides. This balance between stone and wood, heavy and light, continues inside the house, where the weight of the gray slate floors is offset by the hand-carved girders of the exposed beam ceilings and the delicacy of wooden furniture and fixtures.

The pure cubic form of these vernacular dwellings is offset by more than 300 family chapels located throughout the village, as well as the occasional open squares, bakeries, and shops. The chapels are organic masterpieces of the mason's art, with each one being different, but it is the stark white houses that leave the most lasting impression.

ITALY

Ca d'Oro and Ca' Rezzonico, Venice

Venice is one of the most remarkable cities in Italy, if not the world, because it is mostly built on water. Beginning as a settlement built on pilings by refugees fleeing violence and persecution, it eventually became rich and powerful through trade by sea carried out by individual families, each based in a house that served as both a headquarters for their business and their residence. Goods from ships were typically off-loaded directly from them while they were anchored in a canal into the family warehouse on the ground floor, and an exterior stair was used for access to the upper floors to conserve precious space in the interior of the house. Building entirely on wooden pilings was difficult and expensive. This, along with the need to keep the profile of the house relatively compact to conform to the requirements of adjacent properties, presented architects and builders with unique challenges, resulting in a singular typology seen throughout the city today.

Because of its strategic location at the edge of the Byzantine Empire as well as the rapidly expanding Islamic world, Venice had an advantage over other Italian city-states in having access to lucrative trade, but it also had to have the military might to offset the risks involved. The Republic was governed by a consortium of families that had founded the city, 24 *casa vecchie* or "old houses," such as the

Contarini, Giustinian, Zeno, Dandolo, and Morosini families. They claimed direct descent from the original settlers who first ventured out into the marshes in the eighth and ninth centuries to seek refuge from violence and persecution.²² By the end of the Middle Ages, as the Renaissance was beginning to dawn in Florence, the “Most Serene Republic,” or *Serenissima*, as it was called, was only challenged by Genoa for domination in seagoing trade, and the prosperity and political power that came with it. By the middle of the fourteenth century, Venice had the second largest population in Italy, after Naples, but its primacy was upset dramatically by plague in 1348. The Black Death devastated the city, reducing the population by half and seriously hampering its capacity to organize trading posts as well as its military power. In the Genoese War of 1378–1380, Venice even lost Chioggia, which was retaken only with great effort. As a result, 13 additional families, called the *casa nuove*, or “new houses,” were added to the group that ruled the city because of the sacrifices they had made and bravery they had demonstrated in the war with Genoa. Venice soon reestablished its trading fleet and its navy and once again became the epicenter of trade between the East and the West.²³ It then started a concerted attempt to colonize the mainland, or *Terraferma*, in the early 1400s, and to stabilize and increase its population by acquiring territory in Padua, Vicenza, and Verona between 1404 and 1406 and then in Bergamo and Brescia.

The Venetian Palace Venetian palace design was influenced by the Arab *fundouk*, or trading center. This term is now translated roughly into “hotel,” perhaps because the original *fundouk* also had commercial and storage facilities on the ground floor and living accommodations on the floors above.²⁴ The Venetian *casa fondaco* also had a mercantile level that was directly accessible from the water, and included the *piano nobile*, or main living quarters on the first floor, with bedrooms and private quarters on the floors above that. The construction procedure started with the rudimentary equivalent of a cofferdam, involving the sinking of a wooden enclosure and then the draining of the site. Oak or larch piles were then driven about 15 feet into the ground and the spaces between were filled with stone and masonry rubble, before being covered with concrete reinforced with a woven larch-wood mat. The entire built-up foundation extended about 10 feet below high tide.²⁵ The warehouse at water level, called the *androne*, was typically screened from the view of people passing by in boats along the canal that provided access to it by an arcade, which still had openings large enough to allow supply barges inside. It was used not only for storing merchandise but also as a boathouse and storage area for food supplies for the family.

The Piano Nobile The main living area of the Venetian house was the *salone*, which typically had smaller rooms around it. Since these houses were also the source of prosperity for the entire family, they accommodated all of its members to the extent, as one historian has described it, that

Privacy was hardly a feasible concept for residents of a Venetian palace. The head of the family of the married brothers of a *fraterna* usually occupied the *piano nobile* and perhaps the floor above . . . the business offices and the strong rooms for the safe-keeping of cash and valuables were generally located in small rooms on the mezzanine level between the ground floor and the *piano nobile*. The attic contained the servants quarters.²⁶

Venetian architects and builders had an advantage over their counterparts in other Italian cities in that they had a ready supply of glass available from the island of Murano for glazing the windows of the palazzi. This convenience, along with the relatively stable political situation in the city, compared to that of Florence, for example, meant that the facades of the houses could be more open, which allowed more light inside. Wood, however, was scarce, since the small amounts that were available were used for shipbuilding, so it was very expensive.²⁷

The Stones of Venice It seems counterintuitive to associate Venice with Gothic architecture, which usually conjures up images of French cathedrals, buttresses, rose windows, stained glass, grey skies, mist, and rain. But as John Ruskin proved in his highly influential essay “The Nature of the Gothic” in his multivolume *Stones of Venice*, the connection between this architectural movement and the Serene Republic is very strong. But, as Ruskin also showed, the Venetian take on the style was quite different, involving a complicated series of overlapping phases and what Ruskin referred to as “orders.” Gothic principles upheld in Venice were followed throughout the thirteenth and fourteenth centuries and even well into the start of the Renaissance, in Florence and beyond.

The Ca d’Oro as a Typical Venetian Gothic Palace As Venice grew denser and open sites became scarce, it became necessary for architects to adapt, using asymmetrical plan shapes to get light into the interior of the house. Building over water made internal courtyards difficult to build, so L- or C-shaped plans were used, instead, to provide some open space between a house and its neighbors. The *Ca d’Oro* is a good example of how builders adapted to these constraints, and it can be characterized as the prototypical Venetian palazzo. The palace was the home base of the Contarini family, one of the original *casa vecchio* of Venice, and the idea to build it was put forward by Antonio Contarini. The family had high status in the city, having had three members elected to the position of *Doge*, or chief magistrate, and Antonio himself was named the procurator of the St. Mark’s Cathedral in 1414. In 1406, Antonio’s son Marin married Soradamor Zeno, from another of the *casa vecchio* families, and acquired a building site and house from the Zeno family as part of the dowry. The Contarini family had become wealthy through trade in woolen cloth and fine fabric, and had advanced their financial position through high office. The construction of the *Ca d’Oro*, or House of Gold, was an opportunity to consolidate their holdings and declare their status, as well as its future ambitions, since Antonio also hoped to become a *Doge*. In spite of the fact that Soradamor died in 1417, Marin Contarini proceeded with plans to build the palazzo, now considered to be one of the most beautiful in Venice, and most representative of the splendor of the *Quattrocento*.

The basic strategy was to maximize the site area, so the exterior envelope of the palace at 22 meters wide by 25 meters deep covers almost the entire property, with the exception of a small *cortile* or courtyard. The façade, facing the Grand Canal, is asymmetrical, with 60 percent of it on the left side, being taken up by progressively smaller arcades moving up from the wide arches at the water line, in front of the *androne*, to a smaller one, topped with elaborately carved quatrefoils screening a balcony in front of the *salone* on the *piano nobile*, and the smallest on the third floor above that. The remaining 40 percent of the elevation, on the right side when

viewed from the Grand Canal, is relatively solid, with only a small square window punched through the wall, high above the floor of each of the three levels. It also has narrow projecting balconies, with pointed Gothic arches above the narrow doorways leading out to them on the second and third floors, at the far right-hand corner of the house.

The charming spontaneity and somewhat eclectic character of this elevation is capped with a crenellation of crosses and may partially be due to the fact that Antonio and Marin Contarini wanted to reuse some parts of the Zeno house that once stood on the site; they apparently improvised as construction proceeded. A great deal of effort and a large portion of the family's resources were invested in the façade, since the interior of the palazzo is relatively restrained, compared to others built at the same time.³

Marin Contarini married again, to Lucia Corner, who was also a member of an “old house” and whose family palazzo is also renowned. They set up household in the *Ca d'Oro*, which was substantially complete by 1433. Shortly after the birth of their first child, Piero, however, Marin became ill and died in 1440.

The Ca' Rezzonico The *Ca' Rezzonico*, which is now a museum, approaches the *Ca d'Oro* in iconic status as a paradigmatic Venetian palazzo, but differs from it a great deal in many ways. First of all, it is more massive. Second, it was designed by an architect, Baldassare Longhena, who was selected because of his allegiance to Baroque, rather than Venetian Gothic principles that then prevailed. And third, it is freestanding, and quite deliberately so.

Intended to Impress Although the palazzo is now known by the name of the family who bought the incomplete shell of the house in 1751, it was begun in 1649 by Filippo Bon. The Bon family already owned two houses at the corner of the Grand Canal and the *Rio di San Barnalia*, which were torn down to make way for a new, more impressive residence. Every design decision that was made during the conception and realization of the *Ca' Rezzonico*, which took nearly a century of effort by the family to get to the stage of financial completion and made them bankrupt



Ca' Rezzonico © David Bramhall; Flickr

in the process, was made to impress. The site that they chose is located at a curve in the Grand Canal so that no matter which direction someone is traveling by boat, their first view of the house is a surprise. Since it is detached from its neighbors, with a sizable distance from each of them, and its elevations are unified rather than being as delicate and asymmetrical as those of the *Ca d'Oro*, which is seamlessly attached to the houses on either side, the *Ca' Rezzonico* makes a deliberately startling initial impact that leaves a lasting impression.

The choice of an architect skilled in Baroque rather than Gothic methods was equally deliberate as a way of being different and showing an awareness of the latest trend in Rome. The elevation itself is a carefully studied exercise in contrast and *chiaroscuro*. It is rusticated and recessed at the level of the Grand Canal, where the *androne* is located, but seems to progressively step forward into the light at each successive upper level, even though the actual distance of each projection is relatively small. The house has four stories, even though it appears to have only three to offset this impression, so that the top third seems higher than the bottom two. The fourth story, where the servants' quarters were located, is little more than an attic, lit by elliptical windows that appear to be high above the long arched relatively flat windows that light the third floor. A projecting cornice, disguised as a balcony beneath this line of seven windows, casts the *piano nobile* in shadow, and a similar device on that floor shades the *androne* below it, creating the optical illusion of rising and shining conveyed by the third story and attic on top.

In spite of, or perhaps because of, their high ambitions, the Bon family was forced to sell the house due to a lack of funds to finish it. It was bought by Giambattista Rezzonico, a banker and merchant, in 1751. Longhena had died in 1682, and so the Rezzonico family commissioned Giorgio Massari (not Vasari) to finish it, giving the palace their own name. Massari focused his attention to the side of the house opposite the Grand Canal. He created a large entrance on the landside, with a grand staircase leading up to a new ballroom that he located on the *piano nobile*. It is separated from the salon, in the front half of the *piano nobile*, by an internal, open courtyard. The *Ca' Rezzonico* is one of the few palaces in Venice to have the luxury of a central court because part of it is built on land. The addition of a ballroom by Massari is significant because the previous owners had been rather reclusive and were concerned about sharing family business issues with outsiders. The Rezzonico family, in contrast to the Bon's, felt just the opposite, that sharing their house and their extensive art collection was a way of conveying their status. Their collection was concentrated in the ballroom, which also has ceiling frescos painted by Giambattista Crosato.

In 1758, Carlo Rezzonico, the younger brother of the man responsible for the completion of the palazzo, became pope, so that the most lavish residence in Venice also became associated with the highest office in Christendom. Only half a century later, however, it passed out of family hands, and was subsequently bought by a series of illustrious owners, including poet Robert Browning and his wife, Elizabeth, as well as the American artist John Singer Sargent. The last private owner was Count Lisnello von Heirschel de Minerbi, before the house was taken over by the City Council of Venice in the mid-1930s.

The Renaissance Roman Villa and Its Palladian Variations

After reaching perfection in the Farnese Palace in Rome, the Florentine palazzo type, which had been introduced by the Palazzo Medici-Riccardi, began to exhibit Manneristic tendencies. Mannerism in architecture, which is usually associated with the transition from one style to the next, can be identified as a willful and spontaneous departure from the rules related to that style. Derived from the Italian word *maniere*, or “by the hand,” it involves an individual rendition of established norms, to shock, surprise, or delight. It often also involves using structural elements in nonstructural ways to do so, such as breaking an arch in the middle to show that it is not acting as an arch, or splitting a pediment in the middle for the same reason.

The Palazzo Massimo al Colonne Many would argue that Michelangelo, who was involved in the design of the Farnese Palace toward the end, was the *maestro* of Mannerism, most evident in projects such as the Porta Pia, with decoration carved to look like fabric and an elevation that, not coincidentally, looks like a mask. And, following the logic of those that maintain that he played a key role in introducing Mannerism into Renaissance architecture, we are then faced with the dichotomy of having the most influential and powerful figure of that period also being responsible for a direction that is often associated with decline.

There is no such subtle complexity involved with the Palazzo Massimo al Colonne, in Rome, designed by Baldassare Peruzzi, which was begun in 1523 and completed in 1532. He had to adapt his design to several difficult and unusual programmatic and topographical conditions, and in the process, perhaps, felt that the eclectic approach that he adopted was fully justified. The Massimo family had suffered a calamitous misfortune during the Sack of Rome, in 1527, when their ancestral home was demolished. Afterward, they decided to partition the site, which faces onto the arching curve of the Via di Pantalco, into three plots, for each of the three sons of the family: Pietro, Angelo, and Luca.

To confuse matters even more, each son hired his own architect. Pietro chose Peruzzi, while Angelo selected Giovanni Mangoni, and Luca chose Antonio da Sangallo. The portion built for Pietro, who was the eldest of the three sons, dominates the composition, which is skewed to take maximum advantage of the wedge-shaped site and its curving street front elevation. Peruzzi decided to use as much of the existing foundation that had survived destruction in 1527 as possible, and derived a dimensional module for new construction from it, adapting it as closely as possible to the *palmo*, which was the prevalent unit of measurement during the Renaissance. One *palmo* was derived from the width of the palm of the human hand and is equivalent to 22.34 centimeters. Basing his measurement on an anthropomorphic unit was also consistent with Peruzzi’s admiration for the teachings of Vitruvius, who was one of the few Classical writers whose commentaries on the architecture of ancient Rome have survived. Vitruvius preached about the need for order based on mathematical proportions taken from those of the human body. Peruzzi’s plan demonstrates a similar regard for ratios, with his favorite combinations being 1:1, 2:1, 3:2, 4:3, and 5:3.

Peruzzi’s strategy for dealing with the awkward site, which is at the end of a “T” junction, in which the curving Via di Pantalco is the cross bar, was to create a main axis that is parallel with the stem of the “T,” and actually continues the centerline

of this road. This becomes the spine of his asymmetrical plan, on which he hangs an entrance portico, facing the Via di Pantalco, a long, narrow entrance corridor, and then a minor and major courtyard, which open up in progressively larger sequence as one moves into the Pietro Massimo portion of the palace.

The façade of Pietro's portion is rusticated from the sidewalk up to the widely projecting eave, which acts as a cornice. In keeping with the scenographic attitude that Peruzzi seems to have had toward the front elevation, it is flattened and treated like a fabric, rather than being pronounced and rough as rustication was intended to be. The pilasters, which run up from the sidewalk to a *faux* balcony line marking the *piano nobile*, seem to be applied to this fabric-like surface of thin bricks, rather than doing any structural work, as do the stone frames around the small windows looking out from the two compressed floors above the *piano nobile*. There are six columns announcing the entrance into the slightly curved, elongated ellipse of the portico that runs along the Via di Pantalco, and these are irregularly spaced. They are grouped into two sets of three columns each, with a wide gap between them acting as an entrance, and the groups on each side are further divided into one pair and one single column each. This clustering provided Peruzzi with a way of using an odd number of windows running across the curved façade at each of the three levels above the portico, with the central window in a line of seven being right above the largest, middle gap in the colonnade below, and three windows on either side that begin to align with the secondary gap in that row. Once inside, in the middle of the main courtyard, Peruzzi treats the opposite side of this street façade in a completely different way, as a self-contained unit. It has a delightful little loggia on the ground floor that acts as a buffer between this main spatial event and a smaller courtyard between it and the street that precedes it. These façades are Doric to keep the viewer's impression on a less frenetic level. This forward façade of the main courtyard soars upward in three stages, with a pair of columns at ground floor level echoed in a more grandiose way by a taller pair of Ionic columns framing the opening to a double high balcony above them. This dramatic change of scale, from the front elevation, to this main courtyard elevation on its opposite side is consistent with an earlier Renaissance rule regarding exterior modesty shielding inner glory, to offset claims of ostentation. But Peruzzi altered that understanding, within the small framework allowed to him, making this façade appear to be a stage set upon which the owner, Pietro Massimo and his family, could perform by standing on the balcony and welcoming their guests who would have been looking up at them from below. A relatively small stair, which is modest in comparison to the much more monumental versions found in the Palazzo Medici-Riccardi and the Palazzo Farnese, would then have lifted the owners' guests and visitors up to this balcony and into the *piano nobile* reception hall beyond, with the grandeur and ceremony of this sequence not at all evident when approaching the house from the street. The ceremonial progression moves from portico to loggia to grand salon with great ease.

It is tempting to make comparisons between this central space, with its grand, covered balcony overlooking a major courtyard, and the *maq'ad* of a medieval Cairiene house, which conforms to the same pattern. Although no connections between the two can be proven, there have been other, similar relationships that

hint of at least a knowledge of the residential architecture of that region. It is also tempting to pursue that comparison to the relationship between the two courtyards in this position of the Palazzo Massimo, which would have generated convection currents that would have cooled both the stairwell leading up to the loggia and the grand salon itself, in much the same way that the *taktaboosh* of the Caiiene house is placed between two courtyards for the same reason.

The Villa Giulia Baldassarre Peruzzi died in 1536, soon after the palace was complete, and it remains his most memorable work because of his skillful ability to accommodate many difficult features in his design. Mannerism of a similar kind may also be found in the rapidly evolving villa typology that started to develop in the early Renaissance, as an attempt to recreate the Classical Roman villa. This evolution gained momentum toward the middle of the sixteenth century, reaching its apogee in the Villa Giulia in Rome, designed for Pope Julius III by Georgio Vasari, Barocchio da Vignola, and Michelangelo Buonorotti in 1551. The Mannerism that is used here is of a more integral and substantial kind, related to juxtaposition between orthogonal architecture and curves in the landscape and the stairs, as well as spaces that overlap horizontally and vertically.

Julius III became pope in 1551, but died soon afterward in 1555. During that time he commissioned several other important projects, in addition to the villa that carries his name. The Villa Giulia is located on the slope of Monte Parioli, in what was once a heavily wooded and secluded part of Rome, and was intended to be as self-sufficient as an ancient Roman *latifundia*.

This slope, and the valley below it, form a narrow strip of land facing the Tiber, which, at the time the villa was built, was located on the border of the city limits. The source of the water for one of the ancient aqueducts that served Rome, the Virgo, is also located near the site, and the prospect of the fountains and baths that could be included in the villa was one of the reasons that the pope chose it, because he suffered from gout.²⁸

The *Cortile del Belvedere*, built for Pope Julius II by Bramante, provided a contemporary precedent for Vasari and for Vignola, who is widely credited for the entire design of the Villa Giulia because of the large part he played in completing it after Vasari withdrew about halfway through. Although at a much larger scale, the *Cortile*, which was intended as a papal retreat near the Vatican, was also based on the idea of capitalizing on distant views, layered space, the integration of architecture and landscape in a series of stepped elevations, and fountains. The Villa Giulia was also built as a papal retreat, but the connection was by water, from a nearby harbor to a covered passage from a boat slip on the Tiber to a gateway on the Via Flaminia. The Villa was aligned on a north-south axis to match the orientation of the valley below, but the road leading up to it was at an oblique angle, so that the first view of it was in acute perspective, framed by an enormous grove of trees behind it, making it seem larger.

Unlike the *Cortile del Belvedere*, however, the Villa Giulia is formulated around a series of central gardens, and layering is achieved by excavation to achieve a circular court with curving stairways leading to it, and flanking wings that also accommodated the pope's brother, Baldovino del Monte. The courts, protecting gardens, were used for musical performances and plays, as well as social events, and the entrance of guests down the grand stairs must have given a theatrical aspect to

these events as well. A concave shell, inspired by the inside of the dome of the Pantheon, and called the *Casino*, as well as a *Nymphaeum*, were added by Vignola to contribute to the delicate balance between internal and external spaces, as well as between a somber, rusticated façade and a far more joyful, incrementally lowered hidden world beyond.

After entering the main, central part of the palace, two symmetrically placed semicircular stairways led to the first level, where all of the walls were covered with murals of landscapes similar to those that could be seen outside, adding to this feeling of a continuity of space from inside to outside. Three courtyard gardens, arranged along a central axis through the main residential block, also brought nature as well as light and air into the palace.

After the death of Pope Julius III in 1555, his successor, Pope Paul IV, took control of the Villa Giulia, which was then occupied by the Borromeo family. The main part of the house was used by the Papal Treasury, the *Camera Apostolica*. Several centuries later, Pope Pius VI ordered a substantial renovation of the villa that greatly altered many spaces, including the *Nymphaeum*, and a new loggia was built behind the main part of the house that has changed the original concept of gradual discovery through procession, leading through a succession of indoor and outdoor spaces. Further alterations in 1769 by Pope Clement XIV and again in 1870, as well as changes to the surrounding context that have eliminated the forest around it, have irrevocably altered the dialogue that Vignola had established between the courtyards and the natural landscape in the distance.

Today, the villa has been converted into the National Museum of Etruscan Art, and two more wings have been added to it to accommodate its extensive collection, further destroying the original intent of its designers.

Andrea Palladio Andrea Palladio was born in 1508 in Padua, not far from Vicenza, where he would first gain fame. His original name was Andrea di Pietro della Gondola, which he changed at the suggestion of a mentor, Conte Giangiorgio Trissino. He apprenticed as a stonecutter with Giovanni de Porlezza and Girolamo Pittoni and, while working on a house at Cricoli with Conte Trissino, made a valuable contribution to the design. Encouraged by Trissino, he said in his writings, he grew more confident in the possibility of becoming an architect, through his ability to design and then,

I resolved to apply myself to it, and because I was of the opinion that the ancient Romans far excelled all those who have come after them . . . I proposed to take Vitruvius as my master and guide, he being the only ancient author that remains extant on this subject.²⁹

Soon after the completion of the house he worked on for Trissino, he was invited by him to attend a school that he had begun in his residence, which included a concentration in architecture. In addition to his suggestion that the young man change his name, the count also suggested that Palladio accompany him to Rome to study the ancient ruins, which he did on three separate occasions for extended periods of time.

It is significant that two of the most influential architects of the Italian Renaissance, Brunelleschi and Palladio, who arguably bracket the period in their

divergent ideas about how best to reinvent ancient Roman forms, each started out by doing a thorough survey of them. Michelangelo was too restless, and somehow seemed to be able to spiritually channel the humanistic spirit of Classical Greece and Rome into both his architecture and sculpture. For dramatic proof of this, one need look no further than his statue of David, originally intended for the Piazza Signoria in Florence, and compare it to two cast bronze statues prosaically called *Warrior A* and *Warrior B*, now on exhibition in a museum in Riace and thought to originate from the school of the great Greek sculptor Praxiteles. These statues were lost in a shipwreck soon after they were completed in sixth century B.C. and were only discovered and recovered in the late 1980s by an amateur skin diver, who saw a hand of one of the statues sticking up through the sand at the bottom of the Mediterranean. There is obviously no way that Michelangelo could have seen them. And yet, his *David* has many of the same characteristics, from its stance and pose, especially in the position of the hands of *Warrior A*, to the facial expression that he used. In each case, it is as if the sculptors had breathed life into inert metal and stone, but the subjects are reflective instead of active, in spite of the fact that each of them is about to go into battle and fight for his life. This realization of and respect for an inner life and the idea of the body as the temple of the soul was the essence of Classical philosophy, and Michelangelo, alone among his contemporaries, came to understand that.

Palladio's first opportunity to put his hard-won, newfound knowledge into practice came in 1542, when he was 34 years old, with the design of a villa in Loredo, called *Godi Porto*, and an addition to the *Basilica di Vicenza* soon afterward. The high visibility of this civic project and his novel way of solving the problem of how to add on to it without destroying the character of the much loved original brought him instant recognition. By wrapping the existing building with a two-story high screen of columns and arches, Palladio created a portico, or ambulatory, around it that also served as a three-dimensional advertisement for the proportional system he had devised.

La Rotonda Palladio received many commissions as a result of the high visibility of the renovation of the Basilica, but perhaps the most important and influential of these was the *Villa Almerico*, designed for Monsignor Paolo Almerico, who served with two popes, Pius IV and V. The site was on the top of a hill, with the possibility of beautiful views in all directions to hills in the distance and the Bacchiglione River, which flows past it on one side. Palladio described the site as "having the appearance of a vast theatre."³⁰

Many of the villas in the region around the site were built as the main residence on agricultural properties, and Palladio had been involved in the design of some of these farms. This was an exception to that pattern because the client was a wealthy clergyman. His solution to having the potential for 360 degrees sight lines was to create an identical elevation facing each of the cardinal points, using a Greek cross plan. Like Vasari and Vignola, in their choice of a concave shell in the garden court of the Villa Guilia, Palladio was also inspired by the ancient Roman Pantheon, but elected to make this villa a commentary on the controversial issue of the temple front attached to a circular drum-like base instead. The historical controversy he tackled head on was the question of whether the Romans, in electing to attach a conventional rectilinear temple front to the circular core that supports the



La Rotonda. Source: Carla Costa; Flickr

Pantheon dome, did this intentionally or out of ignorance. The alternative, introduced during the Byzantine period at the Hagia Sophia in Constantinople by Anthemius and Isidorus, was a square base and main central dome with the transition accomplished by a sloping surface called a pendentive. In choosing to use four such temple fronts, supporting the central dome, Palladio was hinting that his predecessors surely knew how to accommodate a square base and the circular drum of a hemispherical top, but chose not to.

It is ironic that a pagan temple was chosen as the model for a residence of Christian prelate, but that same dichotomy also applies to many other residences built during the Renaissance. The fact that it raised no concerns indicates the extent of the secular inroads that had been made into the all-encompassing religious medieval social fabric during the *Rinasciata* reaching into the highest office of the Catholic Church.

Paolo Almerico had intended to retire in his villa, referred to as *La Rotonda* because of its four temple fronts and central dome, but it was still under construction when he died in 1589. It was inherited by his son, but then sold on to the Capra family, who completed the interior of the dome, although many of the frescos that had been introduced for the interior were not finished until much later. Subsequent owners never used *La Rotonda* as a residence, reserving it for entertainment and special celebrations. Perhaps the proportional and geometrical perfection of what has come to be referred to as a “temple-villa” discouraged permanent habitation. It does appear to be a grandiose *folie*.



Villa Foscari. Courtesy of Derek Evans; Flickr

The Villa Foscari Palladio designed temple-villas near Vicenza like *La Rotonda*, but none that were quite as perfectly self-contained. One that comes closest is the Villa Foscari, which also incorporates a Greek cross plan, but in this case it is axially elongated within a rectangular perimeter, with the whole volume covered by a gambrel roof rather than a dome. But, here too Palladio used a temple front, which he justified by explaining later that

in all my villas . . . I have mounted the gable onto the front façade, where the main doors are, so that these gables may indicate the entrance of the house and serve the greatness of the and splendor of the work by raising the front part of the building above the remaining parts.

Palladio's sketches of the plan of the Villa Foscari show that it was based on a grid, with wall locations in the cross-shaped central hallway determined by a golden section taken from the middle axis to each side. The house is also square in sections, with the height of the podium base being 20 percent of the total, the *piano nobile* 50 percent, and the top floor 30 percent of the house's entire height.

Like *La Rotonda*, the Villa Foscari is also sited beside a river, in this case the Brenta, near Malcontenta. Palladio was partial to such sites because they are cooler in the summer and provided the owner with a faster means of transport, but also because of the additional connection to nature that water provided.

Quattro Libri Like Vitruvius, Palladio also perpetuated his theory of architecture by writing about it. His *Quattro Libri della Architettura*, which also contain his sketches and drawings, describe everything from his own personal experiences as an architect in dealing with clients and builders to his detailed description of his approach to design. This amounts to a formulaic system that is easily comprehensible and replicable. It includes a theory of what Palladio believed to be the correct way to use geometrical relationships to determine the dimensions of all of the rooms of a house as well of those of its sections and elevations, rather than just concentrating on details. This theory of geometry extends to a system of proportion that dictates the placement of rooms, as well as their ceiling height and that of each floor. His system is based on hierarchy and symmetry and begins with a podium base and temple front.

Palladio likened his main aim of achieving harmony and balance in his architecture through the use of geometry and proportion to the human body, in which, he said, the parts are proportional not only to the whole but also to each other. Although his approach may be criticized as being too simplistic, his houses do seem to capture and replicate the dignity and integrity inherent in the residential architecture of Imperial Rome, including the formal relationships that may be found in it, its emphasis on procession, and the use of linkages, articulations, or places of transition between one pure spatial experience and the next, which at their best can uplift the spirit.

A Palladian Revival Inigo Jones introduced Palladio and his *Quattro Libri* into England in the mid-seventeenth century by using these ideas in several of his own projects in London and Greenwich. The elegantly simple and straightforward approach devised by the late Renaissance *maestro* from Vincenza then caught on among the British upper class after it was reintroduced by Richard Boyle, the third Earl of Burlington, nearly a century later. In 1725 he designed and had built a Palladian style villa near Turnham Green called Chiswick House, which is really more of an academic exercise, or a pavilion, than a residence. It nonetheless started a trend in the construction of large houses in a similar style by the aristocracy, now referred to as the Palladian revival.

Chiswick House resembles *La Rotonda* and Villa Foscari in its symmetrical, compact plan, podium base, and temple front, but is far less refined. Its plan is basically a square within a square, with the wide walls of the inner square supporting an octagonal drum that runs up vertically through the entire middle of the house, carrying a cupola style roof above. The drum has lunette windows at the top, which allow light into the central hall, and Burlington referred to this as a “tribune” in the Palladian manner. A pair of T-shaped stairs, flanking the portico beneath the pediment of the temple front, lead up to a grandiose front door, and a long corridor then follows in from this portico into the octagonal tribune inside. This corridor has a second rectangular equivalent, on the opposite side of the central tribune, which then leads out to another pair of stairs and the Italian gardens beyond. The massive walls around the tribune have spiral stairs in each of the four corners of its square enclosure that lead up to the second floor and down to the ground floor below.

A series of rooms, symmetrically flanking the central axis that joins the front entrance on the south and the garden to the north, begin with a square bed

chamber and *en suite* water closet along the front wall, connected to a rectangular living space in the middle and a gallery next to the garden wall in the back. Each bedroom and gallery has a fireplace on the eastern and western perimeters' walls, while the large living spaces have two on the same walls. The stairways accessible to each of these suites lead down to rooms of identical size and location on the ground floor, with the exception of a structural arcade running through the middle of each of the rectangular spaces from east to west. The rooms on the garden wall are designated as libraries rather than galleries. The ceiling heights in the sequence of rooms on the ground floor is less than half that of the suite in the *piano nobile* above, remaining consistent with the difference between upper and lower floors in Palladio's villas, as well.

Syon House Thirty-seven years after Chiswick House was finished, Robert Adam started his design of an equally formal Palladian residence-retreat called Syon House, farther west of London, near Kew, in Middlesex. Unlike Chiswick House, however, this rendition of Palladio's principles concentrated on the interior of a preexisting three-story high square brick structure with turrets in each corner and an open central courtyard in the midst of a heavily wooded estate, which already had quite a history.

Named after Mount Zion, Syon had originally been built as an abbey in 1415, and its founding charter establishes that King Henry V himself ordered it built. It was seized by King Henry VIII in 1539 as part of his dissolution of monastic holdings through the Act of Supremacy, and many inhabitants were executed. Ironically, the king's coffin was brought to the burned out chapel of the abbey on its way to Windsor for burial, and while it was there it was opened by stray dogs who ate part of the corpse.

As crown property, Zion, then Syon, was sold to the first Duke of Somerset, who converted the west end of the abbey church into a Tudor-style country house. He was executed in 1552. It was then bought by John Dudley, the Duke of Northumberland, whose daughter-in-law, Lady Jane Grey, was offered the crown at Syon by the duke, because she was the great-granddaughter of King Henry VII. Soon afterward she was put in the tower and later executed by Mary Tudor, who was the eldest heir of Henry VIII, and Syon was made an abbey once again by the Catholic Queen. After her death in 1558, Queen Elizabeth transferred it to Henry Percy, the ninth Earl of Northumberland who expanded its acreage, and added water features to it.

Robert Adam In 1750 Sir Hugh Smith, son of Henry Percy, inherited Syon House through his marriage to Elizabeth Seymour, who was the only heir of the eleventh Earl of Northumberland. They commissioned Scottish architect Robert Adam to remodel the interior and Lancelot "Capability" Brown to bring a sense of order to the sprawling grounds around the estate.

Robert Adam had just completed a "Grand Tour" of France and Italy, including a tutorial by Giovanni Battista Piranesi, before beginning work on Syon House. In collaboration with his brothers, William and James, he was also involved in the design of a number of other Palladian country houses at the same time. He based his redesign of Syon House on a rotunda, to be built where the open central courtyard had been. But, it was his use of color that really revolutionized Palladian formality. The asymmetrical entry space, for example, which is modeled after a

Roman basilica and has an apse on one end and a stairway on the other, has a black and white marble floor, but also pale blue stucco walls. Another has green marble columns recovered from the bottom of the Tiber, in Rome, combined with white and gold trim. The Red Drawing Room has walls covered in crimson silk and has a carpet that Adam designed and had made by Thomas Moore in 1769, as well as a painted wooden ceiling.

Whereas Palladio captured the dignity of the spatial experiences in Imperial Roman Villas, Robert Adam was able to evoke their use of lavish materials, from all over the Empire, as well as their luxury. In each instance, at both Chiswick and Syon Houses the reinterpretations of Palladian style were not precise. The Villa at Chiswick is much smaller than Palladio's average house and the central section is octagonal rather than circular like the hall that gives *La Rotonda* its name. Chiswick house also departs from Palladian practice by having three different elevations, rather than four identical façades. Lord Burlington followed Palladio's prescription that the height of a column should be 9-1/2 times its diameter, yet made the space between them wider than Palladio recommended. More drastic, perhaps, was Burlington's decision to double the front stairs, instead of having one sweeping monumental entrance, as Palladio typically did. These and other departures by his British disciples demonstrate their determination to interpret his directives at will.

The *Villa Medici*, Florence

The *Villa*, or more correctly *Palazzo Medici*, established a new residential type in Florence that then affected the design of public and private buildings throughout Italy and beyond.³¹ The concept behind the *Palazzo* and its final manifestation on the Via Lanza is testimony to the ability of architects to not only capture the spirit of their time, but to contribute to it and support it as well.

Background To fully understand the way in which the *Palazzo* achieves this, it is necessary to briefly review the political and economic situation in Florence and the surrounding region when it was built. There was no Italy as we know it at that time, just a series of principalities and city-states, including the Vatican, which were competing for power. They, along with other more feudal entities throughout Europe, were just beginning to emerge from the self-sufficiency of the Middle Ages into a more liberal period of free trade, funded by increasingly powerful banks. One of these, founded by Giovanni de Medici in Florence, was among the richest. In 1433, Giovanni's son Cosimo and his family were banished from Florence, and he relocated in Venice, reopening the family bank there.³² As a result, the economy of Florence almost collapsed, and the fact that the Medici were invited back within a year gives a clear indication of how powerful the family was. Cosimo went on to become the unofficial ruler of the city, retaining power by placing family members into positions of authority in the small guilds and by utilizing a prejudicial method of taxation to keep his enemies in line.³³ A period of relative peace and prosperity, which resulted from his leadership, allowed the newly rich to concentrate on spending their wealth, primarily on houses that reflected their improved circumstances. Several of these, such as the *Palazzo Pitti* and *Palazzo Davanzati*, begin to hint at the existence of a new level of confidence. The *Palazzo Pitti* does this

through its sheer size and its magnificent garden, which more than redeems the gross monumentality of the house itself. The *Palazzo Davanzati*, on the other hand, demonstrated thoughtful adaptation to a narrow urban site, as well as hints of the innovations that were soon to emerge, fully formed, in the *Palazzo Medici*.

Briefly stated, these are senses of dignity and monumentality previously reserved for public buildings, conveyed through the appreciation of Classical, and specifically Roman, principles, as well as the practical combination of commercial and residential needs under one roof; all intended to clearly express the power and social status of the owner.

Cosimo de Medici first approached the architect Filippo Brunelleschi to design a house for him soon after the family returned to Florence. Brunelleschi was almost single-handedly responsible for establishing the theoretical framework that made Renaissance architecture thrive.

Having lost a competition to design the bronze doors for the Baptistery of Santa Maria della Fiori, Brunelleschi left Florence in anger to take up a self-imposed exile in Rome, where he surveyed and drew many of the main Classical monuments there, which in most cases was the first time they had been analyzed so thoroughly. He seems to have internalized Roman engineering principles and techniques to an extent that had been lost on Romanesque builders, who were also searching for ways in which to revive methods of construction almost irretrievably lost during the Dark Ages.

Brunelleschi was not only able to reproduce them, due to his careful studies of ancient sites over about a five-year period, but he felt confident enough in his understanding to be able to reinterpret them in new, more refined ways. This translation included a revised reading of ancient Roman scale, which was unfailingly monumental and intended to intimidate and impress. Brunelleschi adhered to basic rules such as the use of the arch, rather than the translation that the Greeks preferred, and the spontaneous mixing of orders.

A second competition to cover the recently enlarged Cathedral of Santa Maria della Fiori led to his return to Florence, and by doing so he managed to build the largest dome since the construction of the Pantheon in Rome or the Hagia Sophia in Constantinople. He did so without major amounts of scaffolding, which was expensive and scarce, and Brunelleschi was able to live in Florence once more as a hero. His feat gave Florence, which typically cast itself in the role of underdog in its struggles with its local rivals, such as Sienna, a badly needed boost of confidence. It was no coincidence that not one but two statues of David once stood in the Piazza Signoria, since Florentines related so closely to the Biblical story of a small shepherd boy killing the giant Philistine warrior Goliath. By being able to claim that one of their own had single-handedly rediscovered the lost principles of Roman construction, and with a new leader that not only financially supported such investigation but was also facilitating civic prosperity at an unprecedented scale, Florence could finally escape the shadow of other city-states that had threatened it in the past.

Cosimo de Medici knew Filippo Brunelleschi well, and the architect was reportedly delighted to be asked to design the family residence. It was not only the most prestigious commission imaginable for a Florentine, but also the only residential design in the architect's experience, since he had concentrated mainly on additions

and corrections to the San Lorenzo cathedral after completing the *Duomo*, or simply the Dome, as Santa Maria della Fiori was subsequently known, as a result of his stunning achievement.

But Cosimo de Medici considered his design to be too grandiose and rejected it on the basis that it would make his enemies even more jealous of his power and wealth.³⁴ Rather than redesign the house, an angry Brunelleschi resigned the commission, and we can only wonder what he had conceived, since he destroyed his drawings and a model of it as well.

Michelozzo Michelozzi, who replaced Brunelleschi, was nonetheless guided by his predecessor's principles, based on the interpretation rather than the slavish imitation of ancient Roman techniques. Once his redesign was completed, building started in 1444 and continued for 20 years.³⁵ The result, while awkward in many respects, represents nothing less than the consolidation of many ideas about villa design of the Classical Roman villa as well. To these, Michelozzi has also added the unmistakable aspect of a tangible expression of power.

The *Palazzo Medici* has three distinctly described stories capped by an enormous projecting cornice. Each story is narrower and smoother than the one below it, giving the entire elevation the appearance of thrusting upwards in stages, but being finally restrained by the massive weight of the cornices on top. Michelozzi used symmetry, but then broke it in several important ways to emphasize certain elements, such as the main staircase, leading up from an open, rectangular central courtyard inside. This L-shaped stair is clumsy and rather narrow, compared to more elegant examples by others in the many *Palazzi* that would soon follow. But, it represents a conceptual breakthrough because it has pretensions of ceremonial grandeur, leading as it does from an inner arcade that makes its debut here, up to a *piano nobile*, or noble floor, where the family received visitors, guests, and friends. In later *Palazzi*, the ceremonial stair became a focus of attention, being much wider and more central in the plan.

Roman Precedents Michelozzi, as a disciple of Brunelleschi, evoked several Classical precedents in his design of the *Palazzo Medici*, which had been incorporated randomly by others before him but never synthesized to the same extent in one place. These precedents include the *insulae* or ancient Roman apartment block, the use of layering, the courtyard, the use of symmetry, rustication, and the entablature, or cornice. The *insulae*, or island, was a Roman innovation that can still be seen in well-preserved cities such as Ostia, Herculaneum, and Pompeii. It has shops at ground level and living units on the floors above, surrounding an open, central courtyard. Evidence of an efficient sewage and heating system has also been found in surviving examples. Parallels between these *insulae* and the *Palazzo Medici* become obvious once the precedent is identified, right down to the same monumental, foursquare appearance, and the convenience and security that having trade goods warehoused on the ground floor, or a shop located there, are also similar traits.

Insulae were used by the middle or lower class, but the villas of the patricians, whether they were located in the city or outside, had a different, although equally standardized, layout. They were based on the idea of spatial layering, of a continuous view toward and progression through to a garden. This sequence from front

entrance to the more private area in the back usually included a central courtyard with an arcade, or peristyle, if the size of the site allowed it, or several if the site was large and the owner was rich. Michelozzi uses this same principle of spatial layering since, from the main entrance from the *Via Larga* there is a direct view through the central courtyard into a garden at the back of the house.³⁶

The Courtyard The central courtyard of the *Palazzo Medici* has been likened to the cloister of a monastery, inferring that the house was still partially medieval in spirit, but it may be more persuasively argued that the courtyard, which is a perfect square in plan rather than a rectangle, with three arched bays on each side, mirrors the peristyle of a classical Roman villa instead. In this form, it is used in combination with the front entrance, which is similar to the Roman *oecus* on one side, and the garden, which is on axis with it, on the other. A statue of David by Donatello used to stand in the middle of the courtyard, but it has since been relocated to the *Bargello*. This was only one of the many pieces of artwork that Cosimo de Medici had commissioned for the house, underscoring the role that he and his family played in promoting Florentine artists and architects, as well as his attempt to establish a connection between the city-state and Imperial Rome.

A Central Axis In a way that is consistent with Brunelleschi's attempts to reinterpret Classical principles, rather than slavishly copying them, Michelozzi uses a central axis, but the house is not perfectly symmetrical. This use of what may be called asymmetrical symmetry recalls the evolution of the use of axial planning in Rome itself, since it was more strictly adhered to at the beginning of the Empire than it was later on. Hadrian's Villa, for example, is based on axial symmetry in each of its parts, but the entire plan is not symmetrical. The plan of the *Palazzo Medici* is wider on the right side of the main entrance because the stair is located on that side, and the rank of rooms along the *Via Larga* is wider than those along the garden façade at the rear.

Similarly, Michelozzi also uses rustication in an interpretive way, making the surface of the ground floor elevation rough to indicate that this level was used for utilitarian purposes. There was also a very real concern about security at that time, notably because of ongoing conflict with neighboring cities like Siena, but also due to civil unrest. Florence was a republic, established in 1250, with two political parties. The Guelfs were loyal to the pope and opposed to the idea of a Holy Roman Empire. The Ghibellines believed in the supremacy of the emperor.³⁷ In addition, the Guelfs were very powerful in the city, reflecting the growing strength of the merchant class at this time. These were divided between the major arts, *Arti Maggiori*, and the minor arts or *Arti Minori*. The seven major arts guilds were the lawyers, cloth manufacturers, cloth finishers, silk workers, bankers and money changers, furriers, doctors, and apothecaries.³⁸ These guilds were dominated by wealthy families and, after Cosimo de Medici returned to Florence, were controlled by members of his family. A riot, called the Ciompi Revolt, broke out in 1378 because of poor working conditions for unskilled laborers, and the prospect of civil violence like this led to the houses of the rich being built like fortresses. The cornice, finally, recalls the classical entablature and is used by Michelozzi as a proportional element to divide up the remainder of the façade. The ground floor elevation, which is rusticated, is three times as high as the cornice, while the *piano*

nobile, or second floor, which is finished in dressed ashlar, is only twice as high as the crowning entablature above it.

The final impression conveyed by this ratio and the progression of materials that the architect has used is one of sheer, raw power. Through his design strategies, Michelozzi has provided the Medici family with security and privacy, which was the greatest luxury of all at this time. In 1959, the Medici family sold the palace to the Riccardi family, so it is now referred to as the *Palazzo Medici-Riccardi*. The new owners subsequently extended the residence to the north, nearly doubling its size.

The Farnese Palace The Florentine palazzo typology, which had a profound impact on public as well as private architecture after it was developed, combined principles of Classical Roman villa design with strategies to accommodate the new domestic needs of an emerging upper class who wanted to proclaim their wealth and power. It is fitting, then, that the typology should culminate in Rome at the Farnese Palace.

Cardinal Alessandro Farnese, who became Pope Paul III, was a friend of the Medici family. Because he received part of his education in Florence, he had a broad knowledge of art and architecture. He acquired the site for his residence in 1495, at a time when his position in the College of Cardinals, under Pope Clement VII, was very strong. There was an existing house on the irregularly shaped site, but over the course of several years it was demolished and the streets around the site were leveled and straightened.³⁹

Antonio da Sangallo, who came from a famous Florentine family of architects, sculptors, and artists, was commissioned to design a new house for Cardinal Farnese, and construction started in 1516. After site work was complete and the area was leveled, the palace was necessarily detached from its context, and so Sangallo used techniques such as the repetition of windows on a flat wall and the absence of small details on the elevation to ensure that the building would hold its own as a freestanding object within the park-like space around it. Sangallo introduced several new ideas into the plan, such as an entrance that is like a basilica in microcosm, since it has a central, colonnaded nave-like hall flanked by side aisles, leading to the portico that surrounded the open central courtyard. As in the *Medici-Riccardi* palace, this courtyard is also square, but unlike its Florentine predecessor, this plan is symmetrical about an axis running through the Basilica-like front entrance to a second T-shaped entry on its opposite side. As in Michelozzi's plan, the stair in the Farnese Palace is also L-shaped, and also entered from the courtyard portico, but is grander, with a carefully articulated skirt and detail of the stair that are obviously related to the status of the owner and his growing influence in the Vatican hierarchy. The cardinal had originally requested that there be two stairways, so that one could serve as the upstairs apartments of his sons Pier Luigi and Ranuccio, but after Ranuccio died in 1529, the second stair was eliminated.

After Cardinal Farnese became pope in 1534, he asked that Sangallo create a more imposing residence for him, befitting his papal authority. The changes primarily involved the expansion of spaces on the *piano nobile* and the reconstruction of the structural vaults on the ground floor to make them higher and increase the impression of monumental scale. These changes were carried out throughout the

1540s, and by 1547 were substantially complete, but caused Giorgio Vasari, who was an architect who was active in the region during the High Renaissance and chronicled the activities of the most famous artisans of the time, to say that all of the changes meant that the palace looked disjointed.

As Michelangelo was to prove in his final intervention into the design revolving around the construction of St. Peter's, he excelled at bringing order to chaos and did so again at this stage of the evolution of the Farnese Palace design. Perhaps due to his reputation as well as family dissatisfaction with Sangallo's inability to adhere to an overall vision or image for the palace, and undoubtedly because of the strength of his own proposal, Michelangelo was selected to carry on the work in 1546. His scheme was primarily limited to changing the cornice, which everyone hoped would finally unify the appearance of the palace. Michelangelo's cornice as well as his redesign of a loggia looking out from the *piano nobile* finally achieved this. In addition to these improvements, Michelangelo raised the entablature over the vaults above the corridor leading to the *Salon*, and also proposed an alternation to the rear façade to the palace, widening three bays on the *piano nobile* level to create another loggia that would connect the internal courtyard with a garden outside. His idea for this second loggia was never realized.

An Image of Power Michelangelo died in 1564. Further changes were carried out by Giacomo Vignola in 1568, and finally by Giacomo della Porta, who completed the back elevation of the *Palazzo* to his own design. In its final form, after 73 years of construction to implement the ideas of four different architects, including those of Michelangelo, who is considered to be the most prodigious talent of the Renaissance, the Farnese Palace is certainly imposing. It conveys the impression of a massive, freestanding rectangular block with four distinct elevations. These are divided horizontally into three equally wide levels, clearly demarcated by cornice lines below repetitive rows of windows on each floor, and crowned by a much larger cornice at the top. Quoins at the corners also call attention to the uniform flatness and consistent materiality of the exterior wall, which has been treated as a neutral background on which the windows are placed. The rustication at the base and increasingly smoother surfaces of the stone facing used on the *Palazzo Medici-Riccardi* have given way to the idea of using the exterior wall like a tapestry into which openings framed with columns that are supported by brackets and capped with either curved or gabled pediments are cut. In spite of the fact that Rome was invaded, yet again, in 1527, Cardinal Farnese, who would become pope seven years later, felt secure enough to build the exterior wall entirely in brick.

THE NETHERLANDS

Amsterdam, The Netherlands

Rather than being a center of royal power and privilege as Paris was, Amsterdam began as an *entrepot* of trade, and as such is the best urban example of that genre. It grew up where it did because of an excellent, strategically located harbor, with a wide expanse to accept many ships and easy access to a series of waterways to distribute goods once they were unloaded. In the space of three generations its population grew 100-fold, reaching 200,000 by the middle of the seventeenth century.

The name of the city itself comes from the River Amstel, which created the harbor and the *Dam*, or town square, further inland, the source of its life-giving trade. Dutch ships, which traded all over the world at the zenith of the city's growth, unloaded and sold or stored the majority of the goods they acquired here. They were weighed and taxed here before transfer and, if stored, were kept in huge warehouses in and around the city.

The *Dam* began as part of the dyke that kept the sea from the low-lying polders inland, built across the Amstel in the thirteenth century. As it grew in civic stature as an urban square, the *Nieuwekerk* or New Church was built here, as were the *Stadhuis*, or town hall, the market, and the weighing house. The *Dam* kept the sea at bay, but this concentration of institutions around it ensured a steady tidal wave of humanity back and forth between it and the ships crowded around the harbor, including porters trundling cartloads of goods there to be weighed. Because clay is in plentiful supply and is also of good quality for making bricks, they predominate as the construction material in the city, giving its older sections the same kind of visual unity as Paris. The *Burgersaal*, which was built in 1613, was one exception to this rule. It was built in imported stone to convey its special civic role as a place where every citizen in the city was welcome. The city bank was there as well as courts, a council chamber, the city treasury, the secretariat, and a prison in the lower level. The bank was renowned for its reliability and was an invaluable cog in the Dutch mercantile machine. It was later supplanted by the *Beurs*, designed by Henri Berlage, as the city spread in its fan-like arc further inland. The *Beurs* was built of brick, which was taken up as the symbolic as well as pragmatic material of choice by the Amsterdam School, of which Berlage was the spiritual head. The *Beurs* is cited as also being one of the most potent precursors of the Modern Movement because of its honest use of materials and no-nonsense functionality.

Between 1616 and 1650, three new canals were dug to the southwest of the main canal, or *Singel*. The *Heerengracht*, *Kreizergracht*, and *Prinsengracht* would eventually be extended over the next 50 years to circumnavigate the city, and the inland walls were moved back to accommodate them. Small bridges were built as necessary on the radial streets that transverse these main arterial waterways, and a clear distinction was made between the water and land, with shops and industrial uses being relegated to 30 feet wide lots on the radial streets only. This width allowance was a notable departure from the 20 feet wide lots that were the norm in the oldest part of the city and that resulted in the characteristic long narrow residential footprint.⁴⁰ This resulted in the well-known images associated with such painters as Vermeer and others, controlled by extensively glazed narrow frontages. The wider lots were intentionally luxurious to encourage the wealthy to build their homes there, but they also fed speculation, as lots were purchased in pairs and subdivided into 20 feet wide spaces once again.

Nonetheless, these residential areas set a standard for carefully scaled, urbane excellence that has helped to establish a reputation for humane, contextual sensitivity. This has later perpetuated Amsterdam's image as an eminently livable city and as an ideal of urban balance, along with Paris and several other examples.

The Houses of Amsterdam Holland would not exist were it not for a collective act of will by the Dutch against natural forces and the sea. Since Holland is all

below sea level, it has required the laborious construction and constant maintenance of a complex system of dykes, dams, and canals to make it possible to farm the land and create a viable place to live. The concept of democracy for the Dutch means more than individual freedom, since their survival has depended on group cooperation and making decisions based on the common good. The clay soil of the Lowlands that they have reclaimed has also provided them with the raw material for making brick, and it is this material, which they refer to as *baksteen*, or baked stone, that has become most closely associated with the Netherlands in the public consciousness. The flat expanse of fields that reclamation has created reflect the water that surrounds them in an ethereal light that Dutch builders have instinctively attempted to capture by orienting toward it whenever possible wide expanses of glass in the front of the houses they have constructed. This “Dutch light” that famous artists such as Franz Hals, Rembrandt, Van der Helst, Gerard Dou, Paul Potter, Jan Steen, Raysdael, and De Hooch have each tried to describe in his own way infuses the interiors of houses in Holland with a warm golden glow that is not found anywhere else. It also contributes a great deal to an ineffable sense of domesticity when combined with the natural materials that the Dutch prefer, such as brick, wood, plaster, and stone.

The Dutch prospered enormously through their membership in the Hanseatic League, which was based in Flanders, but also had branches in London, Gotland, Hamburg, Amsterdam, and Novgorod. Their primary source of income was through trade in English new wool, which was woven in Holland and sold in textile form. Commercial ties between England and the Hanseatic League were so strong that they were ratified through special permission from the crown. King Henry III even authorized the establishment of a trading port in London called the Stealyard, which was administered solely by Hanse merchants.⁴¹

Hard Times This period of prosperity ended when the Netherlands seceded from the League in the fifteenth century and it came under the control of the house of Burgundy. By the mid-1500s the Lowlands fell under the power of Spain, first by Charles V and then his son Philip, which resulted in both political and religious persecution. William the Silent, Prince of Orange, and a small group of followers instigated a rebellion against Spanish rule toward the end of the sixteenth century, which continued to gain momentum against daunting odds even though he was assassinated in 1584. His sons Maurice and Frederick Henry carried on the struggle until it developed into what is now referred to as the Eighty Years War, which freed the Netherlands from Spanish rule and led to the foundation of the Dutch Republic.⁴²

Renewed Prosperity A second period of prosperity followed. It resulted in exploration by intrepid Dutch navigators who sailed all over the world and led to the founding of several colonies. The houses that the colonists built are reminiscent of those in Amsterdam, Rotterdam, Delft, and other major Dutch cities. Holland grew so powerful that it was able to sail a fleet of ships up the Thames in 1667, but expansionism ended with the marriage of William III to Princess Mary, the daughter of the Duke of York, and their subsequent ascendancy to the throne of England in 1689.

There are fascinating parallels as well as striking differences between Dutch and English architecture during the sixteenth and seventeenth centuries. The Gothic



Townhouses in Amsterdam. Courtesy of Shutterstock

system, which was more of a mode of spiritual expression than a style and which swept through Europe after beginning in France in the thirteenth century, was inflected in England during the reigns of Henry VIII and Elizabeth I to absorb Renaissance features from the south. Elements of this hybrid Tudor architecture, with its easily recognizable peculiarities of strapwork, leaded glass windows, complex brickwork, and ornate, twisted chimneys, was subsumed in Holland, emerging with a unique identity of its own. Its use in Dutch residential architecture was proscribed by the limitations imposed by having to use brick. Masons in the

Netherlands did not have the freedom that their French or English counterparts had in being able to combine brick with carefully shaped stone. The shortage of wood in Holland also meant that there was less firing time, so the bricks were thinner and the joints wider so that masonry units were as narrow as 1-1/4 inches to 2 inches and 7 inches to 9 inches long.⁴³ Contrary to popular belief, Flemish bond was not the most typical style of brickwork in Holland, where the decided preference was for English bond, in which one row of stretchers alternates with a row of headers.

Gables Perhaps the second most identifiable feature of the urban Dutch house, in addition to its distinctive brickwork, is the stepped gable. It is the direct result of the craft of masons adapting rectilinear, flat units to the shape of the Gothic pointed gable, which looks far different when rendered in stone. In their skillful hands this potentially restrictive necessity was transformed into a highly identifiable means of artistic expression as the continuation of a medieval building technique that had been adapted through regional preference. The angle created by the rise and the run of the gable as well as the pitch of the roof behind it is very steep because of the narrowness of the typical urban row house in Holland. Their width was restricted because of the scarcity of land and the fact that real estate taxes were related to street frontage.

To offset the possibility of repetition, masons added small sculptural carvings to each of these stepped gables. These included family crests, as well as their own imitation of Elizabethan strapwork, with the banding that gives it its name also cut in stone to contrast with the predominance of brick. The top of each step was also generally capped with stone as well, to prevent moisture from infiltrating into the gable, which would have weakened the mortar and threatened the front wall with collapse. These capstones were deliberately elongated to allow for curved edges, typically stepping out in gradual projections. The windows in the front wall also usually had arches over the top and the recessed brick panels inside each arch were decorated in various ways. These included trefoil patterns cut in stone, mosaics made of colorful tiles, a change in the type of bond that was used for the brick, or some other device.

The restricted head height in the uppermost floor caused by the steep pitch of the roof was often relieved by dormers that were regularly spaced along its length. These also let more natural light into the top floor, which was important because these long, narrow houses shared walls with their neighbors, so there could be no windows on their sides.

Interiors Because of their long, rectangular footprint, Dutch houses in Amsterdam have rooms arranged in sequential rows from front to back to make the use of space as efficient as possible. A side passage, which is often really nothing more than a long, narrow corridor, made circulation from front to back as direct as possible, without substantially diminishing the width of the rooms beside it. These were accessed by a door opening directly onto the corridor, or by a cased opening, to further enhance the feeling of open space. A stair was typically located at the end of this hall, with its length running parallel to the back wall of the house to save space.

A large expanse of glass at the ground floor of the front elevation was used to let maximum light into the front room and to cast it back into the space as far as

possible, and the ceiling height of the first floor was also the greatest for this reason, as high as 12 feet in some cases. This provided a feeling of spaciousness in spite of the restricted width of the house, which, along with the quality of the light and the warmth of wood floors and paneling, provided the feeling of comfortable, yet elegant, domesticity so palpable in the paintings of the Dutch masters in the fifteenth and sixteenth centuries.

The Transitional Phase As the attractions of the Gothic style began to wane and Renaissance influence became stronger, classical elements began to enter into the house builders' repertoire, and the stepped gable was replaced by single surface flat façades with a straight cornice, with double hung or casement windows cut into it. The pitched roof and dormers were hidden by the stepped pediment. The form that has become so closely associated with urban houses in Holland, and especially along the canals in Amsterdam, was eclipsed by less picturesque exterior elevations. This did not happen overnight, however, but during a so-called "Transitional" phase that lasted through a good part of the seventeenth century. The two styles were interwoven by builders rather than architects, who were translating popular taste into brick, stone, glass, and wood, while the architects such as Hendrik de Keyser concentrated on the layer buildings made necessary by the prosperity of the citizens of cities throughout the Netherlands.

Rural Dutch Houses

Because of its shortage of land, which the Dutch have had to laboriously and painstakingly reclaim from the North Sea, real estate is precious in Holland and houses in the countryside are built to make the best use of it. Historically, the houses of the landed gentry there invite comparison to country houses of the aristocracy of England, which is also a relatively small nation. Unlike their British counterparts, who perfected the landscaped estate in which the plantings are designed to look more natural than the existing context, the Dutch have had to make more out of less. The park-like settings in which the country houses are placed are much smaller in scale, as are the houses themselves. The emphasis, then, is on the use of a select number of well-placed trees to convey the image of expanse, as well as on water, in lakes, streams, or canals, which the Dutch knew how to do so well, rather than the seemingly endless extension of well-manicured rolling hills and valleys punctuated with a cleverly fabricated "ruin," or "*folie*," here and there such as those found in the gardens of landscape architect Capability Brown. In Holland, the country house and garden are more closely integrated, and the house, rather than being designed as the jewel in the crown or the perfect Palladian pavilion to be appreciated against a calculatedly natural background, is more in tune with its surroundings.

Huis Ten Bosch One classic example of this union between a country and its surrounding landscape is the *Huis Ten Bosch*, or the House in the Forest, built for Prince Frederik Hendrik, who was the third son of William the Silent. He was married to a German countess named Amalia of Solms, with whom he shared a love of art. They collected or were patrons to such famous artists as Rembrandt, and wanted a summerhouse in the country that would also serve as a gallery to display a part of their collection. They chose a property in The Hague, which was then a

province in the south of Holland, located along the road that goes north to Leiden, in a section known as the “Forest of The Hague.”

The couple chose Pieter Post to be their architect both because of his reputation as a master of Dutch Classicism and because he shared their love of art. He had previously been involved in the design of the *Mauritsbuis* in the center of The Hague, which was widely admired at the time. Post designed an equally Italianate country house for Prince Frederik and Amalia that was reminiscent of the work of Andrea Palladio in many ways but not literally so.

The main body of the red brick house is nearly square, and two stories high above its raised plinth base, which Post has used in the Palladian manner to elevate the house above the landscape and create a service level at the ground floor. Rather than using an attached temple front as a portico that shields the main entrance, however, as Palladio and his closest followers invariably have, Post has set a second two-story volume into the first, giving the house a more stable appearance, with fewer symbolically loaded associations that recall the humanist split that occurred during the Renaissance between the church and the wealthy upper class that commissioned Palladio to build mansions for them. The solid, flat façade of the entrance blocks the elegance in its simplicity that Post has used and balances perfectly with the mass of the main house around and behind it.

The Oranjerzaal The plain entrance component is only an introduction to the main body of the house behind it, which is crowned by a delicately carved octagonal cupola, with windows on each side that allow light to flood down into an atrium space below. This device is also reminiscent of many of Palladio’s houses as well as those of his followers such as Lord Burlington in his design of the Chiswick House. The room on the ground floor that is the beneficiary of this light, called the *Oranjerzaal*, was originally intended by Prince Hendrik and Amalia to be the setting for their art collection. But after Hendrik’s death in 1647, only about a year after the house was completed, Amalia decided to dedicate this room to the memory of her husband. Since he was active in the struggle for Dutch independence at that time, this gesture by Amalia was also interpreted as being a way to show support for that cause. A painting by Jacob Jordaens that she commissioned for the hall, which covers an entire wall, shows the prince in a chariot, in a victorious pose, with clearly recognizable figures around him taken from Classical history and mythology. Other more realistic scenes from the prince’s life painted by Gerard van Honthorst line the remaining walls. Corinthian pilasters are located at the points of the octagon around the perimeter of the room, seeming to hold up an intricately carved dome.

Amalia continued to live in the house until her own death in 1675, 28 years after that of her husband. She left the house equally to her children and the children of her eldest daughter, since the only son that she and Hendrik had, Prince William II, had died soon after his father. It was eventually taken over by William III in 1686, but he neglected it after becoming king of England in 1689. He returned there after marrying Princess Mary, to attend a ball in the *Oranjerzaal*.

The grandson of Frederik Hendrik and Amalia who had become the king of Prussia took ownership of the house after William III died in 1702, and it passed to William IV of Orange in 1732. The prince commissioned architect Daniel Marot, who had worked for the family for some time, to enlarge the house. Marot

added long, slightly curved wings to either side of the house that more than doubled its size and served as presidential and support spaces that were needed for the greatly expanded ceremonial role the house was now expected to serve. Marot also redecorated the interior of the existing house.

In 1734, William IV married Anne, the daughter of King George II of England, and she served as regent for William V after her husband died. While she lived at the house, it was filled with music, since she organized many concerts that were held in the *Oranjerzaal*. She had studied music with Handel, and many of the musicians who played or sang in these concerts were recommended by him.⁴⁴

The French invaded Holland in 1795 and William V and Queen Wilhelmina were forced to leave the country. Prince William VI reoccupied the *Huis Ten Bosch* in 1814, after being inaugurated “Sovereign Prince” of the Netherlands. He was subsequently declared King William I at the Congress of Vienna.

The Royal Household The Germans occupied the house during World War II and another restoration was begun soon after the end of the war. While Queen Juliana chose to live elsewhere, Queen Beatrix moved into the *Huis Ten Bosch* in 1980 and has remained there with her family ever since.

SPAIN

The Alhambra, Granada

The Alhambra, which has inspired many myths and legends, is still being explored by archaeologists and historians, with new discoveries being made every day. It was constructed over a 200-year period, but the majority of it was built during a high point of Islamic culture during the Middle Ages, and it is considered to be one of the finest examples of the residential architecture of that period. The original name, in Arabic, was *Qal'at al Hamra*, or the Red Fort, and it is arguably the most spectacular remnant of Arab occupation of the Andalusia region of the Iberian Peninsula from A.D. 711 until 1492. Muslim armies crossed over the Straits of Gibraltar from North Africa, occupying what they referred to as *Al-Andalus*. They were, and still are, generically and fallaciously referred to as Moors, and their style of architecture is called Moorish. The term *arabesque* is also used to describe the various elements and details of the Islamic architecture of this region, and the Alhambra is the most exquisite surviving example of its application.

A Strategic Location Rather than being just a single residence, the Alhambra is really an agglomeration of seven different palaces. Each was designed as an almost entirely individual unit, symmetrically organized around its own axis, with its own dependencies, and each of these axes was placed at right angles to the one before it, giving a majority of the complex its characteristically interlocking plan. The Alhambra also includes a palace at a higher elevation that was used during the summer to escape the heat. Its Arabic name was *Yamay al Arif*, meaning the Garden of the Architect, as an oblique reference to the idea of God being the creator, or architect, of all life. It is now called the Generalife. In addition to all of these residences, the Alhambra also has several mosques, bathhouses, workshops, barracks, prisons, and cemeteries as well as a building that was once the Royal Mint.⁴⁵ These are all clustered within a walled enclosure that protected an entire army. They



The Alhambra. Courtesy of Shutterstock

guarded its four main gates and occupied the 23 towers that surround it. This circuit wall, and the density of the buildings inside it, make the Alhambra appear to be a small self-contained city, and it is referred to that way today. The “upper city” is perched on the higher side of a ridge, called the *Sabikab*, to the southeast and the “lower city” is located on its lower edge to the northwest.⁴⁶ This ridge forms a line of demarcation between the foothills of the Sierra Nevada Mountains on one side and a deep ravine on the other, which eventually levels out to become a fertile plain, called the *Vega*. This strategic position made the Alhambra very defensible, but its builders were not the first to realize that the *Sabikab* was an important location.

The oldest part of this palatial redoubt is a fortress called *Al Casaba*, built by the Zirids, who were the first wave of invaders in the eighth century. They actually reinforced an existing tower that had been built there by the Romans, indicating the military importance of this site over time. The Zirids were followed by the Nasrid, who were Sunni.⁴⁷ To make the fortress more habitable and self-sufficient, they determined that it needed a more dependable and secure source of water. A series of Nasrid rulers, beginning with Muhammed I (Al Ahmar) in the early 1200s and continuing on through Yusuf I and Muhammed V in the late 1300s, were responsible for creating the part of the fortress that people think of

as the Alhambra today. The first acts of this dynasty were to strengthen and complete the perimeter wall and to build an aqueduct.

The Magic of Water In addition to sustenance, the steady supply of water provided by the Nasrid aqueduct also made it possible for them to have gardens, fountains, and baths in their palaces and to replicate the image of the heavenly paradise or *al-firdous* described in the Quran here on earth. These gardens are so memorable that they are better known than the interiors of the palaces themselves. The improbable delicacy of the pools, fountains, and planting in these gardens make them the most memorable and identifiable parts of the Alhambra, and also more imaginable than the living areas that occupy the spaces between them. The location and organization of these spaces, however, where the private lives of the Nasrid rulers were played out, reveal a great deal about their customs, values, and worldview. Of all of the Nasrids, Yusuf I and Muhammed V were really the most prolific and most inspired in terms of the architecture that they commissioned, and their two palaces, which form the core of the Alhambra, constitute its essence.

The Palace of Yusuf I and Muhammed V The Throne Room, where the Nasrid rulers held court, and the adjacent Audience Hall or *Al Mashwar* that precedes it and that is often referred to as the Hall of the Ambassadors dominate the composition of the center of this complex in the *Palacio des Comares*. The organization of the palaces of both Yusuf I and Muhammed V, and the way they interact, can best be understood by starting where any visiting dignitary would have started upon entering these spaces. The Throne Room was built for Yusef I in the early 1350s. He, and subsequent rulers, would have been seated against the north wall, on axis with the front door and that of the antechamber in front of it. The walls of the square room are so thick that secondary spaces were carved out of them, with the three smallest ones penetrating each of its north, east, and west sides. The palace of Yusuf I stretches out on axis with the Throne Room to the south, around the Courtyard of the Myrtles at its core.

The Courtyard of The Myrtles This court, which is one of the two most famous gardens of the Alhambra, occupies 10,360 square feet of its precious real estate. It is separated from the Throne Room and its long, narrow antechamber, called the *Salade de Barka*, derived from *baraka*, which is the Arabic word for blessing, by a screen of seven arches in which the one in the middle is higher than the three on either side of it. This detail emphasizes the importance of the Throne Room on the other side of the arcade, to the north, as well as the axial relationship of this particular palace to it. This garden is commonly referred to as the Courtyard of the Myrtles because of the long narrow line of myrtle hedges that flank the 7.5 meter wide by 34.7 meter long pool in the middle. But it is also known as the *Alberca* court, from the Arabic name, *al-birka*, which means “pool.” Four long, thin *bayts*, or houses, evenly distributed with two on each side, run along the eastern and western edges of this court, with each having a second story. These were the quarters of each of Yusef I’s four wives, and this arrangement recalls a similar one used in both the Quaid Palace in Iraq and the Husuni Kubwa Palace at Kilwa in Tanzania described in Chapter 2. The walls facing into the court along each of these residential wings are relatively solid, with only several sets of small screens in front of protected balconies provided to allow the occupants to look down onto the

garden below. An indirect passageway, or corridor, led through a secondary courtyard into Yusef I's private quarters on the east side of the *Alberca* court.

The Courtyard of the Lions Muhammed V wanted to differentiate his enclave from that of his predecessor and so it extends out to the east, perpendicular to the *Alberca* court. It is built around the second of those two famous gardens, today called the *Patio de los Leones*, or Lion Court. Although this perpendicular arrangement creates a primary east-west axis, this is carefully balanced by a secondary one running across the middle of the court, anchored by the *Salade les Dos Hermanes*, or the Hall of the Two Sisters, on the north, and the *Salade los Abencerrajas* on the south. The latter is named after a clan that was supposedly killed here by Muhammed IX. Each square pavilion is covered by an exquisite *muqarnas* dome and each has a fountain in the center. They terminate at a water line that runs through a fountain in the center of the court, which is ringed by the leonine statues that give it its name.

Muhammed V reached his personal inner sanctum through the *Salade los Mozarabes*, which led into the deliberately different double columned arcade, with its high thin arches, surrounding the 66 feet by 115 feet courtyard within.

In the Details The Alhambra represents the apogee of Islamic building art not just because it remained the consistent vision of an entire dynasty of Nasrid rulers, nor because of their ability to strike a delicate and judicious balance between their public and private realms in an interlocking series of well-proportioned, open and closed spaces. It is highly esteemed because it is a veritable three-dimensional encyclopedia of the technique, craftsmanship, and fine detail associated with that art. The courtyard gardens that have just been described, for example, belong to the same typology, but each has an identity as distinct as that of the family that occupied it, as well as having its own set of symbols. In the Courtyard of the Lions, for example, the four water lines, or channels, that radiate out toward the cardinal directions recall the four rivers of paradise mentioned in the Quran. The 124 marble columns used in its arcade, grouped in pairs, echo the rhythms of the palm trees in a desert oasis, evolving the origins of Islam, far away from Andalusia. This court is also a reminder that during their eight centuries of occupation of this part of Iberia, the Muslim rulers who built the Alhambra were inevitably as affected by the local culture as it was changed by them. It has traces of the *Patio des Doncellas* in Seville, which itself was inspired by Mughal and Persian gardens, with a similar division of the rectangular space into four zones, representing the four cardinal directions. The fountains in each of these gardens use very little water, which is also reminiscent of Mughal gardens, since in an arid climate it takes just a small amount of moisture to perfume the air and convey the psychological impression of refreshment.

The arches used in each of the courtyards are also different, befitting the personalities of each of their occupants. In general, the arches used throughout the Alhambra are much different from the semicircular Roman type that preceded them. Their sides are steeper, ending in a pointed rather than a round top, and the "Moorish" arch is steepest of all.

The carvings that occupy almost every vertical surface of the Alhambra are another distinctive feature of Islamic architecture during the time each of its palaces was built, as were the *muqarnas* used as the inner surfaces of its domes. Each

of these is based on geometrical abstractions of natural forms, since the literal translation of such elements was discouraged by this time in the Islamic building tradition. The level of skill displayed in each art form is staggering, echoing a period in which great strides were also made in mathematics, astronomy, medicine, science, literature, and history throughout the entire Islamic world.

Rural Houses in Spain

Spain is one of the largest countries in Europe and its climate runs to extremes. It is hotter and drier in its large plains than other countries around it and colder in its mountain ranges, which are more plentiful than in any other area except Switzerland. Spain has 15 main regions and covers an area of 200,000 square miles, or 518,000 square kilometers. Each of these regions has its own distinct identity and its own microclimate, and each is especially legible in its vernacular domestic architecture, ranging from the *pueblos* or villages high in the Pyrenees to the *cortijos*, or farmhouses, and humble *casas*, or homes that dot the plains. These are built in a wide range of materials that run the gamut from stone, taken directly off the ground on which the house sits, to wood and earth from the same source, and the progression of the use of these materials, from sun-baked adobe and rammed earth, or pisé, in the south, to the use of either rough or smooth stone further to the north, provides a visual and legible record of the history, topography, and climate of each region. The houses represent a physical extrusion of the social and environmental conditions in each place. The farmhouses and *casas* built by the people themselves are often all inclusive; that is, they act as a combination house, storage area, workshop, and barn, all under one roof. In fact, the part where the people live is often given less priority than that used to protect the animals and to store the work implements, the loom, the potter's wheel, the olive press, or the wine barrels. The animals and the tools necessary for a livelihood are precious and from an ancient habit are kept safe indoors, away from marauders, predators, and thieves.

Catalonia After the Reconquest, or *Reconquista*, when Muslims were expelled from southern Spain in 1609, their influence in domestic architecture remained especially strong. The Islamic house is typically built around a central courtyard, with thick walls for privacy and for protection against the heat and with few openings toward the outside. The Arabs called a plain "Al Basite," and in the Albacete province today houses either follow this same pattern or are hollowed out of the cliffs that rim the plain to escape the heat. *Adobe* and *Terre Pisé*, or rammed earth, are popular and inexpensive ways to build in such a hot, arid climate. If using *adobe*, a builder makes a wooden mold that looks like a deep picture frame with a handle attached, a long, narrow rectangle that is open on both sides. The mud is prepared in a pit by wetting the soil with many buckets of water, then adding straw to assist in cohesion. The wet, straw-laced mud is then mixed by tamping it by foot, as grapes were once tamped to make wine, until it is the right consistency. The mud is then put into the mold and placed on the ground to dry, after which the mold is quickly removed. The bricks are lined up with just enough space between them for the laborers to lift the mold away. The bricks dry quickly in this climate and can be put into a wall in a day's time, with a 5- or 6-foot high wall being possible in that interval. Wood frames are inserted into the walls where the doors and

windows will be, with the wooden lintels extending into the mud brick wall and bearing on it, being the most important step in this process. A wooden architrave, running around the top of the finished wall, is also frequently used to hold the roof beams or trusses. A rubble foundation is sometimes placed first, before the construction of the brick wall starts, to keep the base sound and dry since it does rain in these plains occasionally, just as the famous saying predicts. This stone “stem wall” is faced with a coating of tar, to help keep it dry and to prevent the farm animals from licking the brick above the stone and weakening it.

If *Terre Pisé* is used, this process is a bit different since wood formwork is required. *Terre Pisé* is just as ancient a technique as *adobe*, in spite of the need for forms, having been discovered by archaeologists as being used in house construction by many early civilizations, such as that of the Shang Dynasty of China. The technique has remained virtually unchanged. After a stone foundation, similar to the stone wall used in an *adobe* house, is put in place, a series of vertical stakes are pounded into the ground on each side of the foundation wall, placed wide enough apart that horizontal boards can be dropped in between them on both sides. These boards only extend up to about 3 or 4 feet high, reducing the amount of wood used as much as possible. Once this formwork is in place, the mud, which is prepared in the same way that it is for *adobe* bricks, is shoveled between them, and then a laborer stands on top of the wall and tamps each layer of mud down with a large blunt-headed wooden mallet before the next layer is shoveled in. This process is repeated, and the forms are removed and lifted to the next level until the wall is complete. Window and door frames are set in the same way as they are in the *adobe* house.

Sometimes stone *quoins* are used to stiffen the corner of a mud brick house, which strengthens it as well as gives it more distinction. The *adobe* or *pisé* house is coated with clay and limewash to waterproof it as soon as it is completed, and if stone *quoins* are used they are frequently left exposed as a decorative touch.

Until the Reconquest, nearly one-third of the people living along the Mediterranean coast of Catalonia, down to the border of Andalucia, were Muslim. They farmed the land, giving it the name “the Orange Blossom Coast,” with Murcia being known for its lemon groves and Valencia for its oranges and rice, making it one of the largest and most prosperous cities in Spain after Barcelona and Madrid.⁴⁸

After the Muslims departed, Catalonia began to trade with its neighbors, especially with nearby areas in what is now Italy and France, in Lombardy and the Piedmont, as well as in Languedoc and Provence; this led to an additional influx of wealth. Barcelona became the capital, and this reach extended as far as the Balearic Islands, Sardinia, Sicily, and Greece.⁴⁹ The Gothic quarter of Barcelona, which is still largely intact, is testimony to the level of wealth and the cosmopolitan nature of the city at this time, and the style, which was interpreted quite differently in this part of Spain than it was in France where it originated, was adopted for domestic use as well. This adaptation, from a sacred expression to secular domestic architecture during the Gothic Period, has not been well studied and is also not widely appreciated, but it has been shown to exist in many instances discussed in this volume, such as in Amsterdam, Venice, and Bourges. In Catalonia, the cloister was transformed into an interior residential arcade around a garden.

In the Catalonia Pyrenees, the Romanesque style predated and predominated the Gothic, having been introduced to that region by pilgrims, priests, and bishops coming down the pilgrimage trail to Santiago de Compostella or to the abbey church of Ripoll, which is almost as large. Romanesque style churches dot the steep valleys of this region, and the houses follow the same style. They are also built with rubble walls alternating with cornerstones and *quoins* of dressed ashlar. They also have deep eaves that overhang long balconies on the first floor to protect against the heavy rains and snow that can fall in the mountains, valleys, and foothills of this region.

Extremadura Extremadura is another distinctive region in Spain, most famous for its barren landscape and the fact that nearly a third of the *conquistadores* who were involved in the subjugation of the Aztec and Inca kingdoms in the Americas, such as Hernando Cortes, Francisco Pizarro, and Hernando De Soto came from this region. The port of Palos de la Frontera, near Huelva, was a major departure point for ships headed to the Americas, and many young *conquistadores* left Spain from here. When these soldiers returned, they were called “Indians,” and they used the wealth they had accumulated to build luxurious houses in their home villages and towns. These are called *casas solariegas*, or noble palaces, and are recognizable from the street by the coat of arms or *blazones* on the exterior walls and over the doors.

Like Catalonia, Extremadura was also influenced by Muslim residential prototypes, which again place emphasis on a central courtyard and a rather plain anonymous exterior, meant to conceal the wealth of the owner as well as provide privacy for the family inside. Unlike the homes in Catalonia, however, these were built by soldiers made rich by the gold and silver they had discovered in Mexico and Peru, who had also been involved in the development of the Plateresque style named after the silver that had been used to build the churches and monasteries it appeared on. This style overlaid the Arabesque features that they had been used to at home, creating an interesting mixture of not incompatible forms. In addition to the central courtyard, each used gardens and fountains to great effect, since each tradition is based on a hot, arid climate, in which the use of even a trickle of water can make a dramatic difference in both the microclimate and the atmosphere of a secluded, open space. *Aljibes*, or underground cisterns, were used to supply these fountains.

THE UNITED KINGDOM

The Garden City Movement

Ebenezer Howard was born in London and was well aware of the appalling social cost of progress: in his early career as a Parliamentary reporter in the late nineteenth century, he must have heard many debates about how to improve the urban blight of homelessness, drunkenness, drug use, vagrancy, overcrowding, prostitution, crime, and disease. He was also conscious of the utopian attempts by enlightened industrialists to provide amenable and decent community housing and facilities for their workers in mill towns such as New Lanark by Robert Owen, Saltaire by Titus Salt, Bournville by George and Richard Cadbury, and Port

Sunlight Village by William Lever, and he became determined to create a prototype of his own.

Appalled by the overcrowding and squalor in cities caused by the Industrial Revolution, Howard advocated the development of “garden cities” between city and countryside. Born in 1850, Ebenezer Howard moved to the United States when he was 18 years old to pursue life as a farmer. However, realizing that this was not his calling, he moved to Chicago, and then back to London, working producing parliamentary reports (a profession he continued for the rest of his life). He developed a private interest in social conditions and in 1898 published the groundbreaking book *Tomorrow: A Peaceful Path to Real Reform*, which was reprinted in 1902 as *Garden Cities of Tomorrow*. In this he called for the creation of new, properly planned, suburban towns of limited size, surrounded by an inviolable “belt” of agricultural land or a “greenbelt,” as it would later be known. He was aiming at a synthesis of the benefits of the country and those of the city. His ideas attracted enough attention and financial backing for him to implement his plan for Letchworth, a garden city in suburban London in 1903. Other schemes followed, including Hampstead Garden Suburb in 1907 and Welwyn Garden City in 1919, just after the First World War. The influence of the garden city continued to be felt in planning throughout the twentieth century, especially in projects such as Milton Keynes.

Bedford Park as a Model The model for Howard’s garden cities, since it was speculative as well as altruistic, is Bedford Park, begun in 1875. Considered to be one of the first garden suburbs built for rental rather than company employees, this community, named after the local Georgian residence Bedford House, was launched by builder Jonathan Carr on a 45-acre parcel at Turnham Green. Intended for families with incomes in the range of £300 to £1,500 a year, Bedford Park was initially hailed by *The Building News* as

a very laudable scheme that will supply for the middle classes that which the Shaftesbury Park Estate has partially done for the laboring classes—namely, houses well-planned, conveniently arranged and constructed with regard to both stability and comfort and architectural character; each house will have a plot of ground about 50ft frontage and 75ft deep, with gardens filled with shrubs surrounded by oak fencing and rents will vary from £45 to £65.⁵⁰

The new town was seen as experimental because it was self-contained, with communal public facilities such as St. Michael’s Church, the Tabard Inn, an art school, club, and tennis courts. Its individually designed detached and semidetached homes also had the latest sanitary facilities, with sewer traps, central heating and cooling, and external drainpipes to eliminate dampness; they also had no basements. The nearly 900 houses on the plot, which eventually increased to 113 acres, were built with varying floor plans in the Queen Anne Style. The choice of style is significant, deliberately failing to identify with either the Gothic Revivalists or the Classicists.

In addition, by choosing the Queen Anne Style, with its vaguely Dutch curved gables, red brick walls, elegant chimneys, and tall windows specifically sized to provide maximum daylight to each room, Jonathan Carr and his primary architects,

W. E. Godwin and Norman Shaw, were appealing to an upwardly mobile segment of the market. They were not interested in taking a polemical position in the growing struggle between management and labor exacerbated by the Industrial Revolution, but in capitalizing on the change in lifestyle. Although Norman Shaw is often identified with creating the style as well as the entire plan of Bedford Park, the first 18 houses were provided by Godwin, with additional contributions by E. J. May and Maurice B. Adams. The association of Shaw and Godwin with the Aesthetic Movement that thrived between about 1875 and 1885 and included the artist James McNeill Whistler and writer Oscar Wilde, as well as the commercial basis of their new community, further separated Bedford Park from the high idealism and political agenda of the Arts and Crafts advocates.⁵¹

The social and commercial foundation of Turnham Green Terrace as an integral community conceived and realized within a short train ride from central London is due to the financial acumen and good timing of Jonathan Carr, and his decision to choose architects and a style associated with an avant-garde aesthetic to specifically appeal to middle class clients anxious to escape back-to-back housing estates closer to the city. But his formation of the Bedford Park Company Ltd., in 1881, as well as his ceaseless personal involvement in this pioneering project, was also critical to its success. Ebenezer Howard used similar techniques—of brand recognition, public relations, incorporation, and individual commitment—for launching his own experimental utopias, first at Letchworth in 1903, Hampstead Garden Suburb in 1907, and Welwyn Garden City in 1919, but he expanded on the principles that had been so effective at Bedford Park in several key ways.

Carr understood marketing, but Howard grasped even more fully the power of the media and advertising, choosing concentric circles as the image, or logo, of his grand plan. Following an idea in the book *Looking Backward* by Edward Bellamy, Howard saw the need to include industry in his plan, allocating it to the outer ring in a series that began with civic buildings in the center, followed by his residential areas, playing fields, shops, and an agricultural belt (to feed the village), connected by wide boulevards. Unlike Carr, who took advantage of a singular opportunity, Ebenezer Howard wanted to enact Bellamy's vision of a "movement; a corporate migration of overcrowded cities into green pastures, to return people to their lost paradise."⁵²

Georgian Townhouses in London

The period of British history from 1714 to 1830, during the reign of George I to George IV, was an especially formative time. It was the beginning of both the Industrial Revolution and, with the exception of the loss of the "American war," the start of a vast colonial empire. Each of these changes in the national narrative had a profound effect on its structure. The Industrial Revolution is often viewed in isolation as a technological shift. It was actually much more far-reaching than that, penetrating to the core of British social structure. Prior to the emphasis on science, fostered by the Enlightenment and arguably launched during the Restoration, due to the enthusiasm of Charles II, Britain had primarily been an agrarian society, with class hierarchy based on the ownership of land. Raymond Williams, in his classic study of the Pre-Industrial Period, *The Country and the City*,

graphically defines the extent to which a stratified system supporting agricultural production preceded and then paralleled a similar system of industrial growth. Beneath the romantic vision of the English country estate lies the reality of the perpetuation of a form of feudalism in which people of a lower economic strata worked for those who owned those estates, which were factories in their own right. The “lord of the manor” was the foreman of this rural equivalent, and the country house stood in stark, affluent contrast to the cottages of the workers who were its dependencies.

With the invention of the steam engine came the serendipitous discovery that changed the rural landscape of Britain, which was described so memorably by historian Robert Hughes on his television show *The Shock of the New*. The power loom, which operates on the same principle as the railroad locomotive, was also driven by steam. It put cottage industries, which still concentrated on the making of textiles and had been a prominent trade good in Britain since the Middle Ages, out of business virtually overnight. The steam-driven looms were operated by a drive shaft that required a long rectangular building for maximum efficiency, and the factory was the result. The beauty of the power loom as far as manufacturers were concerned was that it could be located closer to distribution points and was not dependent on a water source as mill-driven drive shafts had been. The result was that factories began to be concentrated in cities with rail heads, such as London, Manchester, Birmingham, and Glasgow. Those who had once produced yarn on spinning wheels in their cottage to augment their income from farming, or as a source of income on its own, had to move to the city or starve. The factory owner replaced the lord of the manor as a social paragon.



The Georgian townhouse front view. Courtesy of Shutterstock

Colonialism Driven by the Industrial Revolution The British quest for colonial expansion, which had begun to be evident under George III, is commonly associated with the reign of Queen Victoria, from 1840 until 1901, but the stage was certainly set during the Georgian Period. The Industrial Revolution required raw material to fuel it, and Britain, being a relatively small nation, did not have enough resources to do so. It needed a larger market in which to sell the products and goods that it was producing.

The wealth that resulted from this social restructuring created a new middle class, which had been thwarted by the bivalent preindustrial arrangement of the rural landowner and the crofters and villagers dependent upon the estate for their livelihood. This middle class sought to get out of the rapidly growing cities as soon as their economic circumstances would allow them to, to new garden cities such as Letchworth and Hampstead Heath or to suburban developments that mimicked a lost, bucolic idyll, such as Turnham Green Terrace, designed by Norman Shaw. They wanted to escape the pollution from smokestacks that darkened the skies and the buildings, as well as the multitude of social problems that the massive rural-urban migration of the late eighteenth and early nineteenth centuries had caused in the cities, so graphically portrayed by Charles Dickens in *Bleak House*.

The Georgian Townhouse as the Representation of Social Success Before conditions reached the crisis proportions that forced social reformers such as John Ruskin and William Morris to take action in the mid-1800s, however, the newly affluent middle class also adopted the urban townhouse as the residential type that would also represent their altered social standing. Classicism corresponded to these upwardly mobile ambitions by enabling this class to overlay them with democratic allusions, based on associations with a Periclean past. What advocates of the style seemed to overlook, however, was that the new social order in Britain that adopted it, like the Athenian city-state that inspired it, were equally based on the exploitation of cheap labor. Inigo Jones, who was a designer of stage sets as well as an architect, had been the first to introduce Renaissance principles, as reconfigured by Andrea Palladio in his *Quattro Libri della Architettura* or *Four Books of Architecture*, into Britain in the seventeenth century. His early efforts, in his design of a small church named St. Paul's on the plaza of Covent Garden, as well as the Queen's House at Greenwich, prepared the way for a Georgian style based on the same ideas. Richard Boyle, the fourth Earl of Cork, helped to ease the transition from the rather stiff translations of Palladianism produced by Jones to a newer, more sophisticated rendition that could easily be adapted by the rising middle class.⁵³ Boyle developed a rather formulaic approach that concentrated on four basic elements that he adopted for Palladio's principles. The first of these is the notion of the *piano nobile*, or "nobile floor," which Palladio in turn had derived from the Florentine palazzo typology developed by Michelangelo, Peruzzi, Sangallo, and others at the beginning of the Italian Renaissance as a means of ensuring the privacy of the family by locating the formal reception area aboveground on the first floor.

In the Georgian townhouse, this translated into relegating service functions, such as the kitchen, the servants' quarters, and the storage areas to a lower floor one-half level below grade, easily accessible to delivery staff by a stair from the

street down into a stairwell that also allowed a minimal amount of light into this subterranean world. A much grander, second stair led up another half level to the reception area of the house in the front, high above the sidewalk and the street. A second device that Boyle borrowed from Palladio was symmetry, which made the original architect's villas throughout the *Veneto* memorable as well as easily replicable. This replicability was further ensured by Palladio's ingenious use of simple geometric forms, which he effortlessly combined, such as the Greek cross plan and circular dome he used as the basic formal elements of the *Villa Almerico*, or *La Rotunda*, described in detail elsewhere here. The fourth element that Boyle adopted is more literally the so-called "Palladian window," which is equally formulaic and replicable, consisting of two double-hung lights in a rectangular frame that is flanked by a column on each side and crowned with a lunette, or arch.

New Desires Coincide with New Materials A third component of this confluence of social and stylistic forces that led to the creation of the Georgian townhouse type, in addition to a newly affluent middle class and the attraction of an architectural style that would euphemistically rationalize the method of its rise, were the historical coincidences of the Great Fire of 1666 and the new materials made possible by the Industrial Revolution that followed it. The Great Fire destroyed nearly two-thirds of the city of London, and much of the loss was attributed to the use of wood for house construction, leading to building codes that required brick facades. The Industrial Revolution also made longer sheets of glass and better grades of iron available on a large scale, as well as better quality brick, due to the higher firing capacities available.

During the reigns of George I and George II, the Palladian style predominated, prompted by the renovation of Burlington House by Richard Boyle, who was assisted by Colen Campbell and William Kent. Boyle wrapped the ground floor in rustication, placed the *piano nobile* on the first floor, and replaced solid walls with as many large windows as possible to fill the interior with light. He added Ionic columns to the exterior wall above the rustication, but otherwise left these surfaces plain. He also added wings to the house with Palladian windows used on them.

Burlington House became a model of the Palladian style for others such as the Adam brothers and Karl Friedrich Schinkel. In its final form the typical Georgian townhouse admirably suited its purpose of providing a suitable urban residence for a recently wealthy middle class. It was dignified without being pretentious, due to its relatively plain façade, understated Palladian detailing, and clearly but subtly defined *piano nobile*. The front door was usually wide, with an arch and elegant fanlight over it, leading into an entrance hall raised three or four steps above the sidewalk level, and a hall stair that led to the reception room on the first floor above. This typically had the largest window of all, either of the Palladian type or with a straight brick lintel, with a sill that went all the way down to the floor and a wrought iron railing outside, matching a higher fence at street level. The windows above those of this *piano nobile* got progressively shorter on each of the two stories above, so that those of the attic story were almost square. Rooms were heated by fireplaces, which were a central feature of each room, and were aligned to be served by a pair of chimneys that flanked the front elevation.

The Regency Period The Prince Regent, who ruled during his father's illness and later as George IV, changed this trend with his penchant for the theatrical.

His patronage of the architect developer John Nash and his desire to get from his palace in Regent's Park to his Royal Pavilion in Brighton as expeditiously as possible resulted in Regent's Street, which cuts a straight path through the tortuous street patterns of London.⁵⁴ Nash used the idea of attached row houses of similar design in certain places along its length to convey the idea of urban unity, as well as clusters of attached residences, such as Hanover Terrace in Regent's Park, built in 1827, to contribute to this perception. Robert and James Adam had already provided a prototype for such clusters in their Adelphi Terraces in London, built between 1768 and 1774, which was a grouping of 24 identical row houses, in the Palladian style, designed to look like a single palace.

The Royal Crescent and the Royal Circus at Bath Spa The crescent forms that John Nash used with such authority on Regent Street, however, were really popularized by John Wood the Elder and his son, John Wood the Younger, in Bath. In his attempt to allude to the Roman history of the spa city, John Wood the Elder made visual references to the Coliseum in his design of a circle of identical row houses surrounding a park there, built in 1754, both by being the inverse of the original and through his use of the Doric, Ionic, and Corinthian orders in vertical progression on each of these three floors. Between 1767 and 1775, his son, John Wood the Younger, then built an arc of 30 attached houses facing out to fields in the lower distance using Ionic columns on each of the two stories there.

The Soane House John Soane was born in 1753 and came from a working class background. He was apprenticed to architect George Dance in 1768, and started attending the Royal Academy soon afterward. He was especially influenced by lectures given by Thomas Sandby in his early years there, and he proved to be a very talented student. He continued to work during his studies, but left George Dance's office after four years to join the firm of Henry Holland. He received a silver medal for skill in measured drawing from the Royal Academy in 1772, followed by a gold medal in 1776, and he received a traveling fellowship that had profound influence on both his career and his life. He became an avid scholar of classical architecture as a result, as well as a collector.

He started his own practice at the age of 27 and for 12 years concentrated on the design of small country houses. He then started to do projects for both the Office of Public Works and the Office of Woods and Forests, and was also recognized as a Royal Academician in 1802. His interest in Classical architecture continued to grow, undoubtedly abetted by the discoveries at Pompeii and Herculaneum during the late eighteenth and early nineteenth centuries, as well as the relative easing of the restrictions of travel at this same time. This interest was compounded by his study of Gothic architecture then being promoted by Augustus Welby Northmore Pugin, which might normally be seen to be contradictory given the "War of the Styles" between Gothicists and Classicists to establish the one true national architecture for Britain that Pugin initiated. In addition to Classical and particularly Late Roman architecture and Gothic principles, Soane was also influenced by the aesthetic theories of Payne Knight and Price regarding physiological perception. These were to soon become evident in his own work during what has been defined as his Picturesque Period, no more so than in his design of his own house beginning at No. 12 Lincoln's Inn Fields in London. Before becoming involved in that

project, however, which was more like a 40-year-long work in progress and personal obsession, he completed the institutions for which he is best remembered in the public realm, the Bank of England designed in collaboration with George Dance and Dulwich Picture Gallery, generally considered to be the first operational public museum.⁵⁵

The John Soane House John Soane had a family home in the countryside that he had designed called Pitzhanger Manor. Because of his teaching commitment as a professor of architecture at the Royal Academy as well as ongoing commissions in and around London, he decided he needed a house in town and bought No. 12 Lincoln's Inn Fields in Holborn in 1792. It was convenient to the Bank of England building site during its extended period of construction. It also offered him the opportunity to store his growing collection of artifacts gathered during his many trips to exotic places, such as Egypt, which then became much easier as the British Empire expanded.

Because of the awkward angle of its interior party wall adjoining No. 13 next door, Soane's original house was cramped, with a series of spaces that telescoped down in size in their progressive sequence from the front elevation. The first of these, served by a small hallway leading to the stairs, looks out onto the street and the small park beyond and is a nearly square front drawing room. It has a doorway on its far wall, opposite the street façade, which is then on axis with the remainder of the rooms on the ground floor, which end with a small architect's office at the back. This house is so narrow that the hallway stops beside the front room and access to the rest of the house from that point on is through the middle of each of the rooms that follow. He planned some changes to the ground floor in 1808 to make the narrowest part of the wedge, which included his office, more habitable, but in 1811 he took the opportunity to buy No. 13 next door when it became available.⁵⁶

The House as a Museum The possibility of expansion that the acquisition of No. 13 provided inspired Soane to consolidate his far-flung collection of ancient architectural pieces there. In combination with the Dulwich Picture Gallery, which is considered to be one of the first operational museums open to the public, this residential equivalent puts John Soane in a unique category as the instigator of



John Soane House and Museum. Courtesy of Christine Wang; Flickr

two different categories within one institutional type. The architectural museum in his home, however, was intended to be an academic resource as a three-dimensional library for his students, open to the public only after his death. As such, it conforms to the original idea of a museum as a cabinet of curiosities located in the home of a wealthy esthete to display a collection to close friends and guests. Soane's house-museum would conform to this, except for its scale and ultimate intent of being made accessible to the public after his death. He arranged for a Board of Trustees to allow admittance to anyone into the museum portion of the house free of charge in 1833, and his wish was realized after he passed away in 1837. Number 13 Lincoln's Inn Fields has a T-shaped ground floor plan with a cross bar at the end farthest away from the park façade that slots into his studio in his first residence at No. 12. Its ground floor area is also about twice as large as that of his previous residence, and it has a basement level as part of the "upstairs-downstairs" lifestyle of the urban upper-middle class in Georgian London.

By opening up parts of the museum to the first floor as well, Soane was able to vastly increase the sense of expanded space in it and to create architectural settings that complement the entire eclectic array of elements he had collected. Moving from the street into this central section, Soane first created a layered entrance or arcade that runs the entire length of the façade of No. 13, which gives it a sense of depth. The front door on the left side of this arcade leads to a hallway splayed out alongside a rectangular salon to the right. This salon is parenthetically divided by a flanking pair of stub walls into a library and a dining room, which each have a fireplace.

A Skillful Illusionist Soane's intent in creating a layered front containing the entrance arcade was not just to facilitate circulation, however, but was meant to call attention to No. 13 as the central and most important one of what would eventually become a tripartite residence when he acquired No. 14 as well. Through a stroke of luck as well as sheer determination, the opportunity to sequentially purchase these contiguous townhouses in one of the most prestigious neighborhoods in London was, and remains, an unprecedented feat. The arcade at entry level, with its three level arched openings, is only part of an entire projecting screen wall, built in front of the original façade of No. 13, that covers all of the second and part of the third floor as well. It is made of marble to place it in sharp relief against the customary dark reddish-blue cast of the Georgian brick townhouse fronts of the other houses along the park, including the other two that he owned.

Public reaction to this alteration was not positive, however, and conservative opinions opposed to changes to a unified series of townhouse façades such as those around Lincoln's Inn Field prompted a negative response. It is ironic that Soane was able to make such substantial changes to the interiors of the three houses he eventually ended up owning without public comment, but was vehemently criticized when he changed the façade.

The internal changes to No. 13 confirm his love of layering, most famously in his design of a small breakfast room located just behind and to the right of the dining room when moving from the front of the house to the back. The ceiling of this stellar space is made of an inner plane of veneered wood improbably supported on thin pendentives at each corner, with an oculus in the middle that reveals a second

ceiling above. The effect must have been like sitting beneath a seemingly weightless tent that just happens to be made of exquisite exotic woods.

This illusion gives just an inkling of much more elaborate effects to follow, in the museum portion that occupies the entire cross bar of the “T” at the end of the house, farthest from the entrance from the street. The most spectacular of these is a square opening cut into the floor, almost 10 feet long on each side, with a railing and narrow walkway all around it. This opening is continued on the floor above and is covered by a glass dome on the roof, creating a dramatic vertical shaft of space that lets light into the depths of the basement floor below. Soane has intended that this lower level be treated differently than those above from the beginning, labeling it “the crypt” in his early designs of this museum portion of his house and attempting to use darker colonnades along the sides to evoke the feeling of a catacomb.⁵⁷ The glass dome changed that mood quite a bit. This tendency toward lightness continued by substituting columns for walls on all sides of the vertical shaft at all levels and by placing a second wall, penetrated by arched openings at each floor level between the back wall of the house and the vertical shaft, to continue the layering effect at a larger scale, used elsewhere. One intermediate section through this aesthetically defining space shows this niche-like alcove containing a miniaturized temple front, of two Doric columns supporting an architrave and pediment, complete with acroterion on the back wall at the ground floor level.⁵⁸

In its final form, the museum position of the John Soane house retains something of his original idea of a crypt-like lower floor. It has arched arcades along its side and an authentic ancient Egyptian sarcophagus of the Pharaoh Set as a centerpiece. This is indicative of the eclectic quality of Soane’s entire collection as well as the much less restrictive times in which it and other such national treasures, like the Panathenaic marbles removed from the Parthenon by Lord Elgin, could be removed almost at will for the right price or with the proper connections.

A Pedagogical Purpose Soane selected pieces for exhibition with a pedagogical purpose in mind. His taste ran the stylistic gamut from Pharaonic Egyptian and Classical Greek and Roman assemblages through Asian artifacts, to Renaissance Neo-Classical and Gothic pieces. His intention was to provide as close to an encyclopedic three-dimensional overview of the history of architecture as possible for his students, as well as a hint of the proper context for each, if possible. He sought to evoke vignettes of a somewhat nostalgically considered past, rather than providing categorically arranged settings that were strictly academically correct.

Between 1818 and 1825 he purchased renderings as well as plaster casts of architectural details and several marble statues from Neo-Classicists Robert and James Adam. Like Soane, they were also inspired by the frescos and almost completely intact architectural components they discovered at Pompeii and Herculaneum, and they also had undertaken risky trips to what were then considered to be exotic destinations. One of the most impressive of these was an expedition sponsored by the king to survey and document Diocletian’s Palace at Spaleto, which they accomplished by producing a hand-engraved, limited edition publication complete with royal seal, showing the entire complex.

Hampton Court

The spirit of Sir Thomas Wolsey haunts Hampton Court, which is widely associated with him even though it is a crown property that was opened up to the public by order of Queen Victoria in 1838. This haunting may also be quite literal, since a ghostly figure has been photographed moving between what had been separate wings of the palace by investigators of paranormal phenomenon, using an infrared camera.

Whether his ghost still occupies Hampton Court or not, Cardinal Wolsey met a tragic end there, mostly due to his desire to embellish his stature by rebuilding this grand hall. Wolsey started doing this in 1514 and lived there until 1528, until King Henry VIII seized the property and had him executed for malfeasance. But Wolsey was not the first to occupy the estate, which is located several miles from London along the northern bank of the Thames. It first served as a fortified residence for the Knights Hospitallers of St. John of Jerusalem in the fourteenth century. Documents dating from 1338 show that it was one of the most strategic holdings in their far-flung domain. It consisted of a large hall of the type introduced by Anglo-Saxon rulers into England as well as an administrative building, guest house, and chapel, strung around a central garden courtyard, surrounded by a wall with an outer moat. Recent excavations have confirmed that the great hall was made of wood and the chapel of stone. There is also evidence that the Hospitallers entertained important



Hampton Court. Courtesy of Shuttlecock

guests there, including King Edward III, who stayed in the guest house, and so they must have had a staff that was large enough to cope with the royal presence and his retinue.

Thomas Wolsey, Archbishop of York In 1492, the Hospitallers leased the estate to Sir Giles Daubeney, who was Lord Chamberlain to King Henry VIII, and the papers described a “country manor” of five buildings placed around a central courtyard, encircled with a wall. When Daubeney died in 1514, Thomas Wolsey, who was then Archbishop of York and a chief minister to King Henry VIII, acquired the lease on the property and in the following year was elevated to the station of cardinal by the Vatican and Lord Chancellor by the king. As the final authority on church policy in England and a direct liaison between the Vatican and the king, Wolsey set out to make his home an appropriate reflection of his increasing power. Hampton Court became the outward expression of his inner need for recognition.⁵⁹ Cardinal Wolsey had owned other properties prior to obtaining a lease on Hampton Court, but he was attracted to its salubrious riverside location and its distance from London, which was far enough to make him feel autonomous, but near enough by ship to still be convenient. He also suffered from rheumatism, and even though the property was close to the Thames, it was of a high enough elevation and was drained well enough to be dry most of the year, which appealed to him. Wolsey started to expand the existing house almost immediately with the help of his architect, Henry Redman, beginning with an impressive gatehouse that was the first thing visitors saw as they approached from the Thames through the formal garden. The Great Gatehouse, built on the west side of the property, was five stories high and was wider than similar Tudor structures of this type were, with rooms for guests included above. Wolsey commissioned the Italian sculptor Giovanni de Maiano to carve a series of roundels depicting the most well-known Roman emperors to be placed on the turrets of the gatehouse, presumably to establish some connection between himself and Imperial power.⁶⁰ He then added a long gallery to the gate.

More Courtyards Wolsey retained the idea of the central courtyard that was germane to the original house, but divided it into a Base Court, with its own gallery, and the Inner Court, which has matching accommodations. The Base Court was built on the west side of the house, over a part of the old moat that had been filled in, to accommodate the most prominent of Wolsey’s guests. It had a continuous internal gallery with an inner arcade facing the courtyard. The roof here, as elsewhere, was made of hammer beam trusses, which were developed during the Tudor period. These had elaborate wooden newels extending down from their eaves, called “drops,” and the term “eavesdropping” comes from the gossip that was spread by people sitting underneath them.⁶¹ The walls of both the Base and Inner Court buildings were made of brick laid in the complex patterns that were typical of the Tudor period. Wolsey also added 30 more extravagant rooms, called double lodgings because they were attached in pairs built, as well, with chimneys and *garde robes*, or bathrooms, incorporated into the plan, rather than projecting out from the rooms, as was often the case elsewhere. The *garde robes* were also plumbed with lead pipes.

The Little Court Charles V of France stayed at Hampton Court in 1522 during a visit to negotiate a treaty with England, giving an indication of the extent of

Wolsey's influence within eight years of the start of construction at the Palace. Soon afterwards he reconstructed the chapel on a much larger scale to include a cloister and extended his own apartments in what he called the Little Court. These rooms were built of a different kind of brick and were located to the southeast of the Base Court, forming a link between it and the Long Gallery, so that the two formed a continuous façade. The Little Court included a three-story tower, with two halls on each level, with fan-vault ceilings with their intersections connected by inserts that included Wolsey's heraldry.

Royal Apartments During this second phase of construction, Wolsey also added royal apartments intended for Henry VIII, Queen Catherine, since he was still married to Catherine of Aragon at the time, and the two princesses. These had high ceilings, large fireplaces, thick, wide oak doors that were richly carved, and *en suite garde robes*. They had carpeting on their stone floors, were hung with beautiful tapestries, and were well furnished.

The Chapel Wolsey was educated at Magdalen College, Oxford, and patterned the plan of the new chapel at Hampton Court after one that was built there. It featured a cross-shaped arrangement, in which a smaller "ante-chapel" was placed perpendicular to the main chapel below the location of the pews for royalty, and the chair screen was placed there as well. Wolsey had a 28-person choir of his own to sing in this chapel as part of a household staff of 600 who looked after the estate.⁶² All of these, as well as visiting dignitaries and other guests, could be accommodated in the chapel during mass. Wolsey's experience at Magdalen College was undoubtedly also the inspiration behind the new campus-like plan of Hampton Court, with its quadrangle-style courtyards and monastic cloisters, since many of the various colleges at Oxford were originally ecclesiastical compounds. Wolsey also had a courtroom-style hall built, called Westminster Hall, where cases that involved him were heard.

A Daily Routine A typical day for Cardinal Wolsey started with a private mass in his own suite of rooms at the Little Court, followed by breakfast, followed by audiences with visitors and correspondence, including letters to and from King Henry VIII, in the Great Chamber.⁶³ After lunch and an afternoon spent at the Little Court and walking through the garden, followed by an evening service in the chapel, there were dinners that ranged from several close friends to hundreds of guests at a time. Wolsey loved to entertain and was known for making grand entrances during large events at the house.

Royal Envy Wolsey's lavish lifestyle soon began to rankle within the envious nature of the king, especially after Wolsey failed to secure the support of the pope for his divorce from Catherine of Aragon. Henry VIII had begun to visit Hampton Court more and more frequently just before the pope's decree on the divorce was issued in 1528, and the king appropriated the residence in 1529. This set a pattern for him, which culminated in the seizure of all monastic holdings in England in 1536, the eventual purge of Catholic influence in retaliation for the refusal, and the establishment of the Anglican Church as a result.

Fall from Grace Wolsey, then redundant and homeless, was imprisoned and slated for execution. In a letter he wrote just prior to his death, he said quite eloquently that if he had served God as passionately as he had served his

own ego, “He would not have left me, naked and alone and at the mercy of my own enemies.”⁶⁴

London Bridge

During the Middle Ages, London Bridge not only was used as a passage across the Thames but also was filled with shophouses. Built between 1176 and 1209, it was the largest inhabited bridge in Europe.⁶⁵ There were 140 houses on the bridge, which was carried by 19 stone piers and 20 arches, as well as 100 shops, all under control of the Lord Mayor and his aldermen. Bridge wardens, based at Bridge House in Southwark, enforced their rules and regulations. There was also a staff that maintained the bridge, which in 1381–1382 was documented to include a clearer of the drawbridge, six carpenters, four masons, two sawyers, one mariner, a cook, several rent collectors, and a rat catcher.⁶⁶ In addition to its shops and houses, the bridge also carried a chapel dedicated to Saint Thomas. One of the leases for a house on the bridge granted in 1579 by the Lord Treasurer acting on behalf of Queen Elizabeth I gives insight into what they must have been like. It describes a shop and “a counting house” on the ground floor, a “hanging cellar” built below the roadway between two of the stone piers, a “hall and chamber” on the first floor, and a kitchen and three small rooms on the floor above that, covered by a gable roof with an attic space underneath.⁶⁷

After the Fire The fire that destroyed two-thirds of London in 1633 did not spare the houses on the bridge just because they were located over the river, as many on the north end were destroyed. In spite of the scale of the devastation throughout the city, the attention given to the repair of the bridge hints at its importance as an economic resource. By 1645, repairs were started on Bridge House. New houses were built between 1645 and 1651. These were different from the earlier shophouses in that they were built as one complete three-story block covering about one-third of the space left open by the fire at the north end of the bridge, near the Saint Thomas chapel.⁶⁸

An Appropriate Setting for Pageantry Essentially, London Bridge was a narrow street with shops strung out along a sidewalk on both sides and houses above them. The only thing that set it apart from other streets was that it was narrower and spanned a river. It was an excellent setting for a parade since people could hang out of the windows on the upper levels of the houses to watch it. Pageantry had been missing on the bridge since the destruction caused by the fire and the change that took place in the collective consciousness and mood when Charles I was executed in 1649. This ushered in the Commonwealth Period, from 1649 until 1660, and the leadership of Lord Cromwell, who ruled under the title of the Lord Protector, and strict sumptuary laws were enforced.

Cromwell died in 1658, and Charles II was invited to take the throne. In 1660, the Restoration began with the son of the king who had been hung with great ceremony on a scaffold erected especially for the occasion on the balcony of the Banqueting Hall at Whitehall entering London over the bridge to great acclaim. His decision to do this highlights the key difference between father and son. As one historian has described it, Charles I did not fully appreciate the value of ceremony as an expression of royal authority, but Charles II did, “within a robust setting of

theatrical extravagance.” He made sure that his return to London was accompanied by “all of the elements carefully arranged—heraldry, symbols of authority and power trumpeters, an entourage, military strength to place himself before his people.”⁶⁹

This was not a modest production. It started with the Lord Mayor symbolically crossing the bridge from the city side to meet the new king and his entourage at the Southwark end, where Nonesuch House was located. This gatehouse was three stories high with a turret at each of its four corners, with each topped by a cupola, and with projecting bay windows that decreased in size as they went to the roof. It was an architectural symbol of the control that the Lord Mayor and his Aldermen wielded over the bridge and, by extension, over the entrance into the city.

After they met, the king started across the bridge led by 700 cavaliers, followed by 72 sheriff's men, and then representatives of all of the livery companies based in the city, followed by several hundred more participants. The king was flanked by his two brothers, the Duke of York and the Duke of Gloucester first, following the cavalry through the Great Stone Gate onto the narrow street that ran through the middle of the bridge proper.⁷⁰

The Royal Pavilion, Brighton

The Regency Period in Britain was relatively brief, lasting from 1811 until 1820. It was during this period that George, Prince of Wales, son of George III and eventually to become George IV, was designated Prince Regent. George, as Prince of Wales, first visited Brighton in 1783 when he was 21 years old, accompanying his uncle, the Duke of Cumberland. They stayed at Grove House located near a park called the Steine that runs west from the sea. The duke had come to the resort to take the cure, which was popular among members of the aristocracy at that time, involving swimming as well as drinking seawater.⁷¹ People were also drawn to the various sorts of entertainment that were available in the seaside town, and this was also an attraction for the duke and his young nephew.

The prince fell in love with Brighton and bought a small house there at the end of the Steine, and in 1787 he commissioned Henry Holland to enlarge it. The result was an addition referred to as the Marine Pavilion that incorporated the original house but extended out from it, with a Neo-Classical, rotunda-like form, capped with a shallow dome and surrounded by a colonnade, flanked by wings clad in cream-colored tile. It was rather small, with only a breakfast room, dining room, and library on the ground floor and bedrooms and bathrooms above.⁷² A stable, designed by William Porden, that was larger than the pavilion was completed by 1808.

The John Nash Pavilion: 1815–1823 Four years after the Prince was designated as Regent due to his father's illness, George commissioned John Nash to redesign the Pavilion, so that it would reflect his new status. Nash had previously designed Carlton House for him, and together they had reconfigured the street system of London to a remarkable degree, in the realization of Regent Street, leading from it south to Brighton. A taste of Orientalism was in full spate at this time, leading up to the reign of Queen Victoria from 1837 until 1901, which marks the height of the British Empire. Nash was inspired by several books he had seen at Carlton



Brighton Pavillion, Nash. Courtesy of Gary Shield; Flickr

House and proposed an Indian theme for the new residence, which the Regent accepted.

The result, which took seven years to build, is a fantasy, and was finally completed in 1823. The focal point of the new design, like that of the first Marine Pavilion by Henry Holland, is a high domed space, called the Saloon, but the onion-shaped roof in this case is straight from the *Raj*. Its high curved spire is the tallest and most voluminous of a series of five others, with two each flanking the Music Room and Banqueting Room Gallery, respectively, and one covering a *porte cochere* where coaches would stop in from the entrance, called the Octagon Hall.

Visitors to the Pavilion would experience a stunning sequence of impressions, carefully calculated to convey a sense of unreality. After stepping down from their coaches, guests would enter the Octagon Hall, which has a plaster ceiling hung from its onion dome roof that has been made to look like the inside of a tent. The illusion, which is quite convincing, is aided by ridges that seem like cards holding up a large fabric covering that, along with the walls below, was painted light peach. Nash was assisted in the interior design of all of the rooms of the new Pavilion by Frederick Crace and Robert Jones. Jones was responsible for the Banqueting Room, Saloon, Red Drawing Room, and George's living quarters, and Crace designed the Banqueting Room Galleries and new Music Room, as well as the Octagon Hall.

From the Octagon Hall on the west and its extended entrance hall, guests moved through a concealed servants' corridor to arrive in the Long Gallery, which is perpendicular to the entrance axis and serves to unite all of the remaining public spaces on the east side of the house, facing the eastern lawn and the Steine. These, from left to right on the plan, which are organized in enfilade along the spine of the Long Gallery, are the Music Room, the Music Room Gallery, the Saloon, in the middle on axis with the entrance, the Banqueting Room Gallery, and the Banqueting Room itself, served by the Great Kitchen and its service spaces at the far right of their series to protect the house from fire and to remove the bustle and clatter of service from the midst of the residence.

After moving through the Entrance Hall, which was intentionally sedate, with pale green walls and a modest threshold of clerestory lights separating it from the Long Gallery, the impact of that extended horizontal core is overwhelming.

The Long Gallery The expanded corridor, which is the spine of the Brighton Pavilion, is part of a typology found in other country homes in Britain at this time, which, in addition to providing access to all of the major public rooms on the ground floor, served as a kind of elongated living room, with niches or nooks strategically placed along its length for small groups to gather. It has a fireplace in the middle, directly opposite the doorway leading into it from the entrance hall, and two others equidistant from it along its eastern side. A long flat skylight provided soft, diffused light during the day, and a large chandelier in the middle of the long hall, along with tasseled lanterns, and large windows at each end, which were lit at night by gas lamps from the outside, illuminated both the Long Gallery and stairs leading to the upstairs apartments. The *faux-bamboo* pattern of the cast-iron staircases, along with the lanterns, life-sized statues of Chinese court officials in raised niches between the fireplaces on the east wall, beech wood furniture carved to look like bamboo, and *faux-bamboo* frames around large mirrors that were strategically placed to visually expand the size of the space across its narrow dimension, along with carefully selected and placed Chinese antiques, establish the level of exoticism prevalent in the rest of the public rooms in the residence.

The Banqueting Room Of public areas, the Banqueting Room and the Great Kitchen that served it deserve special mention for both their opulence and their level of decorative and functional innovations. Guests entered the Banqueting Room from a gallery next to it, connected to the Long Gallery, intended as a space for pre-dinner drinks and conversation while the meal was prepared. This spectacular room, which is square with appendages on the north and south sides for fireplaces to keep it warm, is dominated by a high domed ceiling in the center, with an enormous chandelier suspended from its apex. Both the dome and the chandelier it supports, which is 30 feet long and weighs a ton, are a structural *tour de force* involving an intricate cage of cast-iron trusses that support the roof, repeated at a somewhat smaller scale in the Music Room and the Saloon as well. But, the dome and chandelier of the Banqueting Room are particularly stunning due to the lavish detail used in executing them. The chandelier, designed along with the rest of the room by Robert Jones, is suspended from the claws of a dragon covered in silver leaf, with six additional dragons equally spaced along an openwork collar around the crystal strands that seem to be exhaling light into lots of glass *torchieres* that

circle it. Four other, smaller chandeliers, with a similar theme light each of the four corners of the room. Individual, freestanding *torchieres*, placed around the room, reiterate this theme. Since this and the other chandeliers and lamps used throughout the Pavilion were originally fueled by oil, they smoked, and cleaning the walls and ceilings of all the rooms was a never-ending task until gas was installed in 1821. But even then, only a partial replacement was undertaken, due to the difficulty involved in converting all of the fixtures.⁷³ Electricity was introduced in 1883.

The Banqueting Room was able to comfortably seat 36 guests, with 30 being the norm. Dinners here were long, drawn-out affairs with many courses. In one instance, French chef Marie-Antoine Careme, who famously likened the art of creating cuisine to be similar to architecture, served a 60 dish dinner in this room.⁷⁴

The overall impression conveyed by this space is one of opulent, magical fantasy, abetted by the murals depicting such scenes as a Chinese bridal procession and a female lute player painted by Jones on the north, south, and west walls, with the entire eastern elevation having high windows covered by crimson swags that allow a view out of the garden beyond.

The Great Kitchen The Great Kitchen, which served this elegant space, contained the latest inventions available to facilitate feeding such large gatherings on a regular basis. George IV was proud of it and often showed it off to his guests.⁷⁵ Its high ceiling and central skylight, supported by a tall, slender column with a simulated palm frond canopy at each of its four corners, provided ample light and fresh air to prevent smoke and odor. A large fireplace on the south wall had five mechanical spits and a fan as well. A steam table in the middle of the spacious room kept prepared dishes warm until they were served.

The King's Apartment Because of the use of domes over a majority of the public rooms along the east side of the Pavilion on the ground floor, the private living area of George IV is predominantly located along the western side, concentrated in the northwest corner, overlooking the gardens and his beloved Riding House in the near distance. Because he suffered from gout in later years, his apartment was moved in John Nash's redesign of the Pavilion from the upper level to the ground floor, since he eventually preferred to move about in the equivalent of a wheelchair. The apartments designed by Robert Jones are much more stylistically restrained and sedately elegant than the public rooms, with *chinoiserie* much less used, although the occasional faux bamboo mirror frame is still in evidence. Ceiling heights are relatively low and the furnishings are formal and dignified, in keeping with the status of the occupants.

Strawberry Hill, Twickenham

Horace Walpole, who is responsible for launching the Gothic Revival movement with the renovations and additions he made to his house, Strawberry Hill, in Twickenham, was born in London in 1717. He was the son of one of the most famous prime ministers in British history, Robert Walpole, and his wife Catherine, and he grew up in a country estate designed by William Kent, which had a profound influence on his aesthetic sensibilities. Although Kent is primarily known as a Classicist, he was also interested in other design cultures, including Gothic architecture. Horace Walpole attended Eton, going on to university at King's College, Cambridge, where he studied mathematics, music, and anatomy. But he did



Strawberry Hill. Courtesy of Michael Lowder; Flickr

not complete his studies, leaving for a “Grand Tour” of the continent when he was 22. He was particularly impressed by the Gothic cathedrals he saw in France, where he acquired the habit, described in a friend’s correspondence, of “wandering among the ruins.”⁷⁶

Because of the influential political position held by his father, Walpole was a natural choice as a candidate for a member of Parliament and was elected to sit in the House of Lords. He also received income from positions that he held in both the Chancellery of the Exchequer and the Customs House and these, along with an inheritance that he received after his father’s death, provided him with a sizable income for life.⁷⁷ He never had political ambitions, however, and instead was more interested in collecting old books and spending his time writing letters and books. One of his first efforts, which is a four-volume history of art called *Anecdotes of Painting*, was written between 1761 and 1771. During this time, in 1764, he also wrote one of the first Gothic novels entitled *The Castle of Entranto*.⁷⁸

Modest Beginnings In 1747, he leased a small house in Twickenham, near Kew Gardens and Richmond. It had originally been built in 1698 as a coach house for the estate of the Earl of Branford, and was nicknamed Chopped Straw Hall by local

inhabitants, who joked that the coach man who lived there had become rich by cutting up straw as bedding for the earl's horses. The name of the property eventually was changed to Strawberry Hill.⁷⁹ Walpole was initially drawn to the bucolic beauty and seclusion that the small house offered, as well as the views of the River Thames, which flowed past it. After a good deal of legal wrangling that was required to extricate the house from a tangle of inheritance issues, he was finally able to acquire the five-acre property in 1749, and he started to renovate and enlarge it soon afterward. His first efforts went to landscaping it in ways that accentuated its natural characteristics, but he soon became determined to rebuild and extend the house so that it would become what he imagined a medieval, Gothic manor would be. He was inspired by the cathedrals and houses he had seen during his travels both in the British Isles and elsewhere, by illustrations and descriptions in the antiquarian books that he collected, as well as in his memories of growing up in a house designed by Kent, who had also made his own attempt at designing a Gothic hall, called Esher Place, close to Strawberry Hill.⁸⁰ Walpole assimilated Kent's penchant for asymmetricality of Kent's design, and his own plans for Strawberry Hill are a masterful example of that approach. He wrote of Kent's success in following "the Chinese want of symmetry in buildings as in grounds or gardens." And he said in his letters that he wanted to pursue a similar path of "charming irregularities" in his own house, which set the standard for the Gothic Revival he helped to imitate.⁸¹ But it was the interior decoration even more than the irregular plan arrangement that firmly established the profound influence that he and this house were to have.

Walpole's attention to detail at each level, from the interrelationships of the rooms and the sequence of progression from one to the other, to the smallest feature of the furnishings that were mostly custom designed and commissioned especially for each space is phenomenal. He is known to have considered the impact that moving from one room to the other in the public zone of the residence would have upon guests who were seeing it for the first time and approaching the sequencing in an almost scenographic way. That possibility, that he was arranging spaces as a self-taught amateur architect and interior designer as scenarios, is strengthened by his method. He appropriated details from various medieval buildings and adapted them in scale to fit the character and mood he wanted to convey in each room. His alterations stretched out over three phases from 1752 until his death.

There had been others before Walpole, including William Kent, Sir Roger Newdigate, and Sanderson Miller, who had attempted their own readings of a Gothic style, but their attempts were based on feeling rather than form. Walpole's work was founded on what has been described as an "archaeological" approach, which was only faulted later by perfectionists, such as Pugin, for being inaccurately adapted in both scale and materials, and being a contextual *mélange*.⁸²

The first phase of his alterations and additions to Strawberry Hill, from 1750 to 1758, included a "Great Parlor," an armory, a library, and a stairway to the first floor, which then allowed him to build a linear, two-story addition as a second phase. He assembled several friends to help him with the design of each of these spaces, as well as the exterior, whom he referred to as his "committee of taste." These included Thomas Gray, who had traveled with Walpole on his Grand Tour

in 1739, Richard Bentley, and John Chute, who also fancied himself to be an architect.⁸³ Chute helped Walpole on the exterior, contributing the idea for the crenelated parapet, gargoyle-like chimneys, double pointed windows on the ground floor, quatrefoil windows on the first floor, and a projecting bay window at the northern end originally intended to be set between the middle pair of a row of four high spires along the ramparts. He also employed a professional architect, William Robinson, who was a devotee of the work of William Kent, but relied mainly on the advice of his “committee.”

Phase One: 1750–1758 Richard Bentley, who was the son of a professor at Trinity College, played an important role in assisting in the first stage of Strawberry Hill by providing designs for both the Great Parlor and the stairway, a critically important part of the puzzle that then allowed Walpole to extend the first floor. His approach was more imaginative and intellectual than pragmatic and literal, based on a *mélange* of both published and unpublished ideas. This is clearly evident in his highly stylistic rendition of Gothic architecture in his design of the Great Parlor, built on the ground floor during phase one. The Great Parlor has a pendant frieze made of *papier mâché* and an elaborate chimney piece. It replicates a tomb screen in a flamboyant style, with tall slender pinnacles projecting up from each corner, and a series of niches between them. The walls of the Great Parlor are covered in wallpaper that has a raised pattern, and Bentley, with Walpole, also designed the furniture used in it. A pair of chairs that have survived define their approach, with their high open work, sharply pointed backs, ebony finish, and reed seats that echo the reed mat that was used on the floor, perhaps used to evoke the feeling of a medieval banqueting hall.⁸⁴ Even though the chairs were made of beech by William Hallett in London, Walpole felt that the darker, shiny black finish was more in keeping with a medieval character. This was a feeling that Augustus W. N. Pugin, who took issue with the accuracy of Walpole’s Gothic renditions, also shared.

Richard Bentley’s contribution to the first phase of the rebuilding of Strawberry Hill also spectacularly included the stairway, built between 1753 and 1754. Many of its details were adapted from an illustrated book owned by Walpole, depicting a quasi-fictional “Charity of Prince Arthur” in Worcester Cathedral. The balustrade of the stair has intricate, elongated, open quatrefoils in each panel, with additional lancets inserted into each corner of the rectangular frames. Inlaid paneling runs up to a cornice line, just above the head of the round arched doors leading into rooms on the first floor, with painted wallpaper placed in the groin vault that makes up the ceiling above that. There are also rounded quatrefoil lights in each of the quadrants of this vault with a newel drop in the center that has a lantern hanging from it that lights the stairwell that is made of Japanned tin, intentionally designed to create the appropriate amount of gloom.

Walpole turned to another member of his committee of taste, John Chute, to help him design the library, which was also completed as part of the first phase of reconstruction. It is dominated by a huge triangular, altar-like assemblage that extends up from the fireplace in the middle of one of the long sides of the high rectangular room. The peak of its sharply angular profile nearly touches the ceiling. Because it is mounted forward from the wall, in line with the front of the projecting

mantle that it covers, it creates a niche-like alcove that draws attention to a screen of vertical grillwork on the wall behind it.

This depth is repeated in a series of similarly arched openings replicated at a smaller scale in bays that line the walls, which unlike the chimneypiece have bookshelves in them. Each of these bays has a pinnacle at each corner, as well as one over the pointed arch in the middle, in an obvious attempt to create a sense of hierarchy and order in the room, which is lit by a quatrefoil window above the bays on one of the short walls. The arches in front of the bookshelves were inspired by illustrations of St. Paul's in Walpole's antiquarian book collection, while the chimneypiece was modeled after the tomb of John of Eltham, Earl of Cornwall, in Westminster Abbey.⁸⁵ The Choir of St. Paul's Cathedral, which was the basis for the bookcase arches, had been destroyed in the Great Fire of 1666, and so the illustration by Wenceslaus Hollar that John Chute used to reproduce it were a precious link to an important part of British heritage that had been tragically lost. It must have been quite exciting for Walpole to see it reappear in his home due to his industrious research.⁸⁶ The windows in the library have symbols of faith, hope, and charity rendered in medieval stained glass Walpole had recovered, which is a technique he also used elsewhere in the house. The library, which was completed in 1754, is generally considered to be one of the most assured and influential interiors at Strawberry Hill, and is certainly a more confident exercise in literal translation.

An armory, next to the library and adjacent to Bentley's staircase, is really more of an open vestibule supported by three large pointed arches. It is lit by a stained glass window with paintings of Walpole family heraldry over the entrance and in niches around the room. Two suits of armor that formerly belonged to Richard Neville, Earl of Warwick, are the centerpiece of the room, which also has many different weapons mounted on the walls. These include pikes, swords, and daggers from many different times and cultures.

Phase Two: 1758–1763 The second phase of the reinvention of Strawberry Hill from a coach house to a Gothic manor, which occupied the next five years of Walpole's life after the first stage was completed in 1758, included the addition of a wing to the west end of the house and the Gallery, which is the largest room in the house, as well as the Holbein Room, the Little Cloister, the Star Chamber, and the Tribune.

Prior to beginning the second phase, Walpole and Chute toured Kent and Sussex, primarily to see the ruins in what Walpole referred to as "This holy land of abbeys and Gothic castles."⁸⁷ They also surveyed and documented the rood screen of Rouen Cathedral and the ceiling detailed in the Queen's Dressing Room at Windsor Castle. The attitude shown in using non-British examples indicates a less chauvinistic approach to the second phase in his willingness to also refer to French precedents, as well as a general willingness to copy real medieval examples.

The Gallery dominates this second stage of construction physically as well as visually. It is 56 feet long, 13 feet wide, and 17 feet high, and its scale implies that Walpole was growing more confident. The ceiling is modeled after that of a side aisle in the Henry VIII Chapel at Westminster Abbey, with fan vaulting that is reduced in size to fit the space allowed. The canopied recesses along the north wall were inspired by the tomb of Archbishop Bouchier at Canterbury Cathedral, and

the doors were copied from those at the north end of St. Alban's. John Chute was assisted in his design of the Gallery by Thomas Pitt (Lord Camelford), who contributed an ornate door case to the room, located between fan vaults, leading to Walpole's Cabinet.⁸⁸ The ceiling of the Gallery, under the vaults, was painted to look like stone and the walls were hung with red silk. It took three years, from 1760 to 1763, to complete the room.

French influence enters in the design of the Holbein Room, which was used both as a gallery for the exhibition of copies of portraits made by Holbein and as a guest bedroom. The bed has a screen designed by Richard Bentley based on the choir screen at Roven.⁸⁹ The Star Chamber, which serves as a small anteroom leading to the Holbein Room, takes its name from gold stars painted on the green wallpaper that decorate it. Last, Walpole designed a small space called the Tribune, which he used to store and display his most precious antiques and works of art.

After the second phase was finished, Walpole liked to give newcomers and guests to the house a tour that started at the maintenance and the stairwell hall, and then proceeded through the Armory, Library, Star Chamber, Holbein Room, and Gallery, ending in the confines of the Tribune, in an alternating series of tightly compressed and grand spaces that suggest that such contrast was his intention from the start.⁹⁰

Phase Three: 1763–1772 In the third and final phase, Walpole relied more heavily on professional architects. It includes the Great North Bed Chamber, completed in 1772, and a tower.

West and Southwest Asia

BULGARIA

Rila

While technically not either a house or housing, the Rila Monastery in Bulgaria exemplifies the basic premise of this series, which is the architectural expression of social-cultural habits or a collective belief system at residential scale, and the reciprocal influence of that architecture on the people who produced it.

A Turbulent History The historical background of this mystical, fortress-like place is closely tied to that of the Bulgarian people and is equally fraught with courageous achievement as well as uncertainty and danger. In the early 600s various Slavic tribes crossed the Danube River in the Byzantine Empire, violating what the Imperial government in Constantinople believed to be its northern border. In unison with Turkic tribes that had invaded earlier and had settled around the Sea of Azov, they established fortified settlements, rebuilding many of the Byzantine towns that had been destroyed in the conflict, such as Serdica (now Sofia), Odessos (now Varna), and Philippopolis or Plovdiv. These became economically viable once more after they were fortified with huge walls. In 681, this victorious coalition united under Khan Asparuh, the first Bulgarian king, who was chosen from the earlier invaders. But the Slavs eventually prevailed as their customs and language became predominant.

The Golden Age of Bulgarian Literature The Rila Monastery was established by John of Rila in the tenth century as a cenobitic community, high in the mountains south of Sofia, on the way to Blagoevgrad. Like other monasteries in the country, Rila represents far more than a hermitic religious retreat with purely ecclesiastical associations, being tied closely to the formation of Bulgarian identity itself.¹ So, Rila, which is one of the few surviving monasteries from this early period, following the adoption of Christianity by Prince Boris (852–889) at the end of the ninth century and the founding of many new monasteries by Tsar Simeon (893–927) along with the new capital of Preslav, is a powerful symbol of national identity. Rila quickly became a repository of culture, as theologians were



Rila Monastery. Source: Ivan S. Abrams; Flickr

encouraged by the king to live there, in tandem with the nurturing by Prince Boris of the Pliska-Preslav School of Bulgaria Literature, spearheaded by disciples of Cyril and Methodius at St. Panteleimon Monastery near Preslav. The intention behind this campaign of monastic expansion was the consolidation of Slavic literary heritage by transcribing books that had been translated by Cyril and Methodius into Cyrillic, devised by Cyril and slightly modified in the Russian version of the alphabet.²

Early Universities As was the case in many other locations where monasteries thrived, such as in England prior to the reign of Henry VIII, the transition from being a purely religious institution to also being involved in education was made easier by the intellectual pursuits that were already active there. St. Panteleimon, for example, enrolled nearly 3,500 students over a seven-year period, in addition to the monks in residence there. Some examples of the impressive amount of canonical literature produced in these monasteries at the time Rila was founded are the *Assemani*, the *Zographensis* and *Marienus Cadices*, and the *Psalterium Simiticum*, which are each illuminated manuscripts.

In appearance, Rila is also characteristic of the architecture of the First Bulgarian State, dating from the reign of Khan Asparuh, the first Bulgarian king, who was crowned in A.D. 681, until the reconquest of what had previously been Byzantine territory by the army of that empire in A.D. 1018. During this time, institutional buildings and complexes such as Rila were built of either rough stone or dressed ashlar, or a combination of each, rather than alternating courses of stone and flat Roman-style brick that was typical of Byzantine construction. After the Byzantine reconquest, many monasteries were abandoned or were unable to be maintained,

falling into disrepair. But in 1185, two brothers named Asen and Petar led a rebellion against the Byzantines that started in Varna and quickly spread throughout the territory. This ushered in the Second Bulgarian State, with its capital in Tarnovo, from which expansion into the old borders was finally achieved.

However, competition for power led to internal strife and the nascent state was eventually divided into two kingdoms, which took their names from their respective capitals of Tarnovo and Vidin.

Ottoman Rule This divisive condition made these two kingdoms vulnerable to attack and conquest by the Ottomans prior to their capture of Constantinople. This may be seen as part of an overall strategy of depriving the Byzantine Empire of the hinterland it needed to survive what had begun when it lost the Battle of Manzikert in 1071, giving Turkish tribes access to Central and Western Anatolia and leading to the establishment of a Selcuk capital at Brussa (Bursa).

Rila Evolves The monastery at Rila one sees today, then, presents a layering of these various periods of Bulgarian history, and the reverence with which it is now held reflects public awareness of its role as a tangible architectural record of the past. It is located in a valley beneath snow-capped mountains, with restricted access by a long narrow winding road from a lower valley far below. This road has several small bridges that cross mountain streams fed by torrential waterfalls in the spring when the snow on the mountains begins to melt. The mountains keep a majority of the monastery perpetually in the shadows and even in summertime it is cool inside the confines of the boundary wall. In the wintertime, it is freezing and there are few fireplaces inside the individual monk's cells. The Rila River, which runs along the southern edge of the site, and the Douche Lavaca River that feeds into it on the east contribute to this frigid microclimate when the wind blows across them in winter, and the sound of the current provides a constant rushing noise in the background for those living in the monastery. Monasteries in general have been designed to be self-sufficient, much like a small village in which the inhabitants carry out specific tasks to ensure the survival of the entire community each day. The spiritual center and focal point of this particular community, as is usually the case in monasteries, is the church, which has three small domed towers marching down the nave rather than one large, more centralized dome as Byzantine churches tend to have. It also has an entrance arcade running across the front and halfway down each side of its main westward-facing elevation, which echoes one that runs around the entire perimeter of the single, wedge-shaped courtyard in which it sits. There are two gates through the massive wall, which is also where the monks' cells are located. The Samokov Gate, on the east, is close to a bend in the Dushlavica River, so that it is necessary to cross a bridge to get to it. Dushlavica Gate on the western side has a wide open area in front of it. The Samokov Gate, which is more than 20 meters high, is capped with a domed tower that echoes the form of those on top of the roof of the church, as well as with a wooden porch that continues detail used in the arcade around the perimeter of the arcade.

The Power of Repetition and Order The repetition of elements such as the arcade, towers, and porches, as well as the different materials assigned to them, creates a powerful sense of unity and security inside this monastery, which would no doubt have been reassuring to those who lived out their lives inside its walls. There is a great deal of integrity and strength conveyed by the architectural language that

has been used here that, along with the religious conviction and faith that must have been a necessary component of deciding to remain here, must have been a source of comfort, irregardless of the physical deprivation and discomfort involved. One particularly delightful detail is that of the kiosks that are irregularly located around the central courtyard as places for the monks to look out at both the heavily forested mountains and sky in the distance and down onto the activities taking place below. These kiosks, which are reminiscent of similar elements used in Ottoman architecture, build up in scale from a curbed bracket on the ground floor holding up a shallow balcony extending out from the first floor arcade above. A second longer and larger bracket then projects up from that level to support a balcony about twice as deep as the lower one, with the entire ensemble covered by a gabled tiled roof. The brackets and the structure supporting the floors of each of the two balconies, as well as the railings, columns, and roof structure, are all made of wood, offering a delicate visual foil for the heavy stone walls behind them. The cornice of these kiosks, under the overhanging eave of the roof, is curved and undulating, rather than being straight, and is decorated with a dendritic appliqué, contributing to the playful quality of these elegant towers that is so much at odds with the somber mission of the people who must have enjoyed them. This sense of joy is also found in a tower-like structure called the Magernitsa, built within the north wing, which at nearly 23 meters high competes with each of the gate towers for attention. It is built in a series of ten rows of half vaults that decrease in size as the tower ascends, tapering by section as it goes up, with light entering through small clerestory windows at its domed top.

Shouman Houses, Bulgaria

Shouman, or Shoumla, has a large number of houses dating from the Bulgarian Revival Period, from the end of the eighteenth century until the liberation in 1878. They represent a concerted attempt to create a new identity rather than follow the Ottoman model that had been prevalent in this area. The houses are typically asymmetrical and consist of a main living area, a *soba*, or heated room, and a *chaddak*, or open gallery or verandah, located in front of the main living space. The living area and the *soba* may be on the same floor or separated, with each on its own level. In addition, there may also be a *kyoshk*, which is several steps higher than the main living area, and more formal, which usually extends out from the façade of the house. The closest definition for this space in English is “porch.” Two-story houses may have a *kyoshk* at each level, and there seems to be a deliberate effort to contrast the surface treatment of the porch with the stark white exterior surface of the rest of the house. Rooms are connected internally by a *prust*, or corridor.

These earlier asymmetrical houses were built by farmers, but as the economy began to change in the mid-1800s and the region started to have many merchants and craftspeople, the plans of the houses also changed, becoming less spontaneous and natural and more axial. The elevation also followed this tendency. During this transitional phase, the *kyoshk* was joined to a central hall, recalling similar house plans that can be found in Plovdiv. From this transitional period of 1850 to 1877, the year before liberation, historians have been able to trace a direct influence from

these symmetrical Plovdiv houses, with those in Shouman being less ornate, with much simpler plan arrangements and proportional systems. During this period, the porch was pulled back so that the main façade is almost flat.

Other towns near Shouman, such as Provadia, Turgovishtë, and Rez Greed, also went through this same economic and social shift from an agricultural to a commercial and craft-based economy and also have many houses in the National Revival style, which have been preserved. But, it appears that they were influenced by the evolution of residential typologies taking place in Shouman, rather than being the result of this process themselves.³

Differences between Turkish and Bulgarian National Revival Houses Since the Turks occupied Bulgaria for an extended period of time, it would only seem rational that their house styles would have had an influence on local architecture. Shouman is a source of national pride today because just the opposite was the case there, since the houses represent a deliberate resistance to outside influence. Both the Turkish and Shouman houses show the judicious use by their builders of natural material that was readily available. Bulgarian commentators claim that these materials are used in ways that are more sympathetic to and more demonstrative of their essential characteristics in Shouman houses, in a more deliberately aesthetic way, that extends to decorative elements on the exterior walls, roof, and eave construction, including brackets that are used to support them, the carving of the columns, and the unique design of the bay windows. They argue that the National Revival houses in Shouman have a distinctly different Bulgarian image, due to the visually unified interaction of all of the various components, as opposed to what they characterize as the more eclectic impression conveyed by the exterior of the typical Ottoman house.⁴

Even more importantly, there are obvious differences in plan arrangements related to distinctly different ways of life. The Turkish house is characterized by separate reception rooms for male and female guests, with the *selamlıcu* reserved for men and *hareme* for women. Bathrooms are also more elaborate than they are in Bulgarian houses. While the Turkish population in Shouman was very high prior to the liberation, the number of Turkish houses is relatively low, leading local experts to conclude that only the wealthiest Turkish residents could afford to build, while a majority of the others lived in houses built in the local style. This disproportionate number of Turkish examples may have contributed to the resurgence of an indigenous tradition in the town.

INDIA

The Mughal Palace

The Muslim Mughal Dynasty was founded by Babur, who ruled on the strength of his defeat of the sultan of Delhi at the Battle of Panipat in 1526. He died soon afterward in 1530. His son Humayun suffered a reversal of fortune that forced him to remain in Iran for some time, and he is buried in a simple tomb in Delhi. He was succeeded by Akbar, who more than lived up to his name, which means “great,” in both his skill as an administrator and his prowess as a military leader, since he greatly expanded the Mughal Empire during his reign. He was also a

visionary in understanding how architecture and urban planning can support political power, and he used the wealth made available from his conquests as well as skillful management of the finances of his government to enhance the tectonic representation of his reign.

One of his first acts was to strengthen the fortress in Agra, where the local red sandstone was used to maximum effect in creating a location that seems to be fused to the mountain in which it is built, beginning in 1565.⁵ He also built an imperial palace there.

Fathepur Sikri Out of concern for his inability to produce a male heir to the throne, Akbar sought out the advice of a local shaikh named Salim Chishti, who lived about 40 kilometers west of Agra in a small village named Sikri. It was near Nagar, a city that grew up at the intersection of two ancient trade routes called the Agra-Ahmedahadaxis. Babur had erected several buildings there as his temporary court after the victory at Panipat.⁶ The holy man assured the emperor that he would have not one son but three, and Jahangir was born in 1569. As a result, Akbar decided to build a retreat at Sikri as a second court, which he named Fathepur, or Victory. The site for the retreat is on a ridge near the Kasi Nadi River, in the foothills of the Anawalli Mountains in a naturally defensible location. It was two days travel by horse and elephant from Agra.

Akbar had already shown an intuitive understanding of the ability of architecture to unite his disparate factions under his rule, just as other successful leaders had before him. Pericles, for example, in his directions for the construction of the Acropolis, encouraged the judicious mixture of both Doric and Ionic orders to unmistakably convey the message that Athens was the capital of an empire that spanned the Aegan and included both traditions. Alexander the Great, who had an even more grandiose imperial agenda, did the same. Akbar sought to unite the diverse factions in the vast territory that he ruled by having his builders adopt a stylistic synthesis of Hindu, Persian, and Timurid forms that would convey an equally syncretistic image.⁷ There is a theory that Akbar intended that Fathepur Sikri be more than just an alternative to his court at Delhi as a cooler retreat away from the daily demands on his time, also considering it an experimental ideal city that would serve as the model for the rest of his expanding empire. There is no support for this notion in the layout of the small community itself, which was started in 1570 and incrementally expanded over the next 14 years. First of all, there are no defensive provisions, such as the moats, crenellated bastions, and thick walls found in Agra and Delhi. It also has a feeling of openness and impermanence, of being like a petrified movable camp. But it does have a novel geometric order, in which each of its various parts are treated as a symmetrical entity, which were then connected to those that had preceded them in an unsymmetrical way. This sounds like what could also be a description of the urban layout of ancient Rome, but the difference of Fathepur Sikri is that each component, which is typically centered around a courtyard or an arcade, has very few walls and aligns exactly with the one next to it in staggered sequence.

A Comb Made of Stone A more accurate reading of Fathepur Sikri is that it was treated as a temporary facility rather than the beginning of a permanent city, and while its interlocking axial organization makes little sense in plan, it does become

comprehensible when moving through each segment. This approach is consistent with the system of government used by the Mughals, based on a semitheocratic structure called a *mansab*, which is a mixture of the organization used by a medieval nomadic society and the feudal hierarchical social order headed by an all-powerful king or ruler.

Fathepur Sikri nonetheless has all of the essential ingredients necessary for a royal court, including a monumental public entrance of 30 steps and gate, the Buland Darwaza, reminiscent of the *pishtaq* of a Timurid mosque, a Hall for Public Audience, or *Diwan-i-Amm*, where Akbar would meet his subjects, several Halls of Private Audience, a mosque, a royal palace, and *harems* and houses for his courtiers and troops, as well as stables for horses and elephants. All of these step diagonally across the high flat plateau on which the small city is located, starting from the *Naya Khangab*, or *Jami Masjid*, on the southwest, and moving toward Akbar's palace and its dependencies to the north and east. It would have been easier to orient each of the orthogonally planned clusters parallel to the slope of the plateau, and its contours that also run southwest to northeast, but the decision to line everything up with the *Jami Masjid*, or Friday Mosque, shows that religious considerations overruled conventional engineering wisdom. A second reason for going against the grain of the topography may also have been the sun since this plateau can also get very hot. In spite of its selection as a cooler alternative to Agra or Delhi, there are many days when the heat in this area is also unbearable. By placing the long sides of each of the quadrangles toward the rising and setting sun, and including arcades along all sides inside of them, the builders of Fathepur Sikri took maximum advantage of natural shade.

The exception to this sliding grid, which was determined by the axis of Makkah, is the house that Akbar had built for Salim Chishti in gratitude for his advice, as well as several more utilitarian structures. These include a *caravanseri*, or market, the stables, and the gardens, which all aligned with the gardens.

The Panch Mahal Perhaps the clearest and most elegant example of the transparency that is typical of the Royal Pavilions near Akbar's palace is the *Panch Mahal* or Wind Tower. This four-story high, rectangular anomaly steps up in platforms of increasing length until its final one, which is the roof, is nearly square. Like every other building in Fathepur Sikri, it is made of local red sandstone, including its 176 slender columns that contribute greatly to its elegance. The *Panch Mahal* has no walls, making it initially difficult to imagine how it was used. But then it becomes clear that fabric was hung from the eaves of each of the floors for privacy and shade, and that the roof was used for sleeping. Then an image of what it must have looked like begins to emerge, with the men and women of the court meeting there at sunset, and colorful silk draperies blowing in the wind, while musicians played for the assembled company.

The capacity for architectural invention that is evident throughout this royal retreat is also found in the *Diwan-i-Khass*, or Jewel House, which is a hall of private audience near the *Panch Mahal* that Akbar used for confidential conversations with his most trusted advisors. This is evident because it has one single mushroom-like column in the center that widens out to become a round platform on which he or an advisor, or several of them, could sit in complete isolation from those below or outside. This columnar platform was connected to the exterior shell by four

bridges spanning between it and the corners of the hall, where stairs are located. It effectively served as a kind of scrambler, breaking up the conversations that Akbar had there, and the bridges prevented anyone who was not welcome from joining them.

SYRIA

The Azem Palace, Damascus

The Azem Palace in Damascus, Syria, was built for the Ottoman governor, Assad al-Azem, a member of the Ottoman Dynasty in the region founded by Ismail al-Azem that ruled Damascus for 37 years.⁸ Assad al-Azem, who ruled for 14 years, ordered the palace to be built in the mid-eighteenth century. It is located along the banks of the Barada River, near the *qibla* wall of the *Umayyad* Mosque with access to it preceded by the *sug*, or market, that surrounds the Mosque. There is a school and a bathhouse, or *hammam*, in the *Suqal Khayyat* that Ismail al-Azem also had built, along with a large coffee house that can accommodate up to 500 people.

A Regional Example of a General Type Among other things, the Azem Palace is interesting as a uniquely local adaptation of the Damascene house to the norms of the Islamic Ottoman house, a perfect hybrid of the regional housing type within the overall framework of Ottoman domestic conventions. The Ottoman house in Turkey generally does not have a central courtyard, but since this feature existed in many of the areas that were later ruled by the Ottoman Empire, such as Egypt and Syria, house forms were adapted to include it. The Azem Palace, like other houses of similar size in Damascus before the Ottomans arrived, has not only one but several courtyards. These are first the *baramlik*, or the family courtyard, so-called because entry was forbidden, or *haram* to anyone outside the family. The *baramlik* takes pride of place in the Azem Palace, being located in the heart of the house. The second is the *Selamlik*, or public court, which also serves as the main entrance into the Palace, where visitors would be received. It is located to the southeast of the *baramlik* and is about half its size.

A third court, called the *khadamlik*, was reserved for service functions, such as kitchens and storage, and is located to the southeast of the *baramlik*. It is the smallest of the three.

The *baramlik* of the Azem Palace conforms to the type found in other Damascene houses of the same economic level in size and in its intention of being an earthly symbol of the heavenly paradise or *firdous* mentioned in the *Quran*. But its landscaping, along with the use of water, its paving, its surrounding walls, its orientation, and its accoutrements are all of a higher level. The marble paving is laid out in a mosaic pattern that is a reminder that this was once part of the Seleucid and then the Roman Empire, when mosaic floors were also a typical feature of the courtyard houses built here. A fountain pool in the center of this court as well as the *Selamlik* not only provided a wonderful acoustic accompaniment to all of the family activities that took place there but also cooled the breezes blowing across it. These were further cooled, and scented, by the numerous orange and lemon trees planted there as well. Exotic pets, such as huge tortoises and domesticated

desert gazelles, as well as canaries and other songbirds kept in cages, contributed to the image of a paradise on earth.⁹

An extremely important dimension of the visual impression created by the Azem Palace, and the experiences of living in it, is the appearance of the inner and outer walls and the stark contrast between them. Like the overall layout of the house, which Turkish Ottoman conventions have adapted to Damascene traditions within an overall Islamic framework, the walls also reveal an additional layer of historical influence. The exterior walls of the Azem Palace are decorated in an *ablaq* pattern of alternating red and white bricks laid horizontally, which is also found elsewhere through Damascus in houses of this size and in public buildings as well. The use of red and white bricks in alternating patterns has been traced to Byzantine architecture, which precedes Ottoman influence in Syria.¹⁰

But, more specifically, the Mamluks also held sway over this region at one point and also used *ablaq* patterns on their walls. The Mamluks, who came from the same territory as the Osmanli tribe of the Turks that eventually became the Ottomans, were brought to Cairo by Salah al Din al Ayubbi as mercenaries while he was the ruler there. Their name is derived from the Arabic word for slave. After his death, they seized power, and after conquering the Mongol army that was headed south toward Cairo at a battlefield midway between Egypt and Syria called *Ain Jalut*, their kingdom was secure. They expanded northward, along the coast of the Mediterranean, to Jerusalem and Damascus, taking their unique style of architecture with them. In Cairo, their monuments such as mosques, *madrassahs*, *wikalahs*, and *sabil-kuttubs* are distinctive in their boldness of conception, scale, and decoration. The houses built during their rule are equally identifiable with their plain, almost anonymous exteriors, bent entrances to prevent passersby from seeing inside when the front door is opened (the *magaz*), and double or triple courtyards arranged in a way that is similar to those in the Azem Palace. They had an impact on its design, over and above the application of *ablaq*.

Cooling by Convection Their use of two or more courtyards in Cairo, as in Damascus, was related to more than the separation of public and private zones in the house. They also played a substantial environmental role, and the way they were sequentially arranged, paved, and landscaped contributed to that. The Azem Palace, like other large courtyard houses of its time, shared in a heritage of traditional wisdom and knowledge of natural forces, primarily convection that can be traced back, and has been in this series, to the earliest settlements in this region. By harnessing this basic physical principle, builders in the hot, arid areas of this part of the world were able to provide their houses with ventilation that cooled them. This is also a good example of the double function served by basic design elements, which is typical of traditional architecture. The courtyards separate the family from the outside world, as well as the pragmatics of their daily life, but also serve an environmental purpose so that social requirements overlap with those of physical comfort in a harsh climate. In Damascus, as in Cairo, these courtyards were aligned with the prevailing breeze as much as possible, and the first, as well as the second, was planted to trap, hold, and filter the dust-laden breeze. This breeze is cooler in the evening and at night, and cold air drops into the garden and settles there during the night. The final courtyard in this sequence, which is the *kbadamlik* in the Azem Palace inspired, with little or no vegetation, so that, as the sun rises and warms the

masonry surface, heat will rise, pulling the cool air that has been trapped in the forecourts into it and creating a convective current. Since the *kbadamlık* of the Azem Palace served functions that required heat, such as ovens to cook food, boil water, and bake bread and furnaces to heat the water for the *hammam*, its logical position was at the end of this chain since it would accelerate this cooling process.

The Azem Palace traditionally used the *haramlık* as an outdoor dining room since it was much cooler at twilight, and because it was customary for there to be up to four wives in a Muslim family, for each wife to have several children, and for the extended family to also live in the same house, these events were sizable, including up to 80 people.¹¹ Cooking and serving a meal for this many people was also a major logistical operation. Bread was constantly being baked in the mud brick ovens in the service court; sheep were suspended upside down to be butchered. The furnaces that heated the ovens and the baths were being stoked, and the women of the house were responsible for organizing all of this activity. Unlike other women of their social status elsewhere in the city who were able to leave the confines of their houses for occasional visits to the *hammam*, those who lived in the Azem Palace had easy access to one at home. The disadvantage for them, however, was that they then had few opportunities to leave the confines of the Palace, which became their whole world.

That world, however, must have been beautiful. In keeping with the Islamic tradition of presenting a modest face to the outside world and reserving aesthetic expression for the family inside, the interior was exquisitely crafted. These have been restored and again show an overlapping of Mamluk, Ottoman, and Damascene approaches. The ceilings in many of the rooms, for example, are not plain surfaces, but have an exposed structure of poplar beams. These are painted in many colors. Mamluk influence is evident in the use of *muqarnas* in the corners of the room. *Muqarnas* are intricately carved wooden moldings that resemble the stalactites in limestone caves, but are much more refined and complex. The Ottomans broke with Islamic prohibition against the depiction of natural forms, including trees and flowers, and also decorated the walls of their houses with paintings of them, as well as well-known scenes along the Bosphorus in Istanbul, as a reminder of the source of their power and origin.

Conservation and Restoration The Azem Palace was substantially damaged when the Ottoman Empire fell and the French occupied Damascus from 1920 to 1946.¹² A great deal of the destruction occurred during a Syrian uprising against the French in 1925. A team of archaeologists and architects, led by Michel Ecochard and Shafiq al-Imam, started the process of restoration by finding buildings of the same period that were going to be demolished or renovated, and using the stones and other architectural elements from them to replace the parts of the Palace that were missing.

TURKEY

The Turkish House

On August 19, 1071, the Byzantine emperor Romanus Diogenes led an assembled army of mixed forces of Slavs, Turks, Franks, Sicilians, and others, in

addition to his own troops, to meet those of the Turkish commander Alp Aslan. The Byzantine Empire had been repeatedly invaded by Turkish tribes along its eastern frontier, and Diogenes thought of this as a corrective action that would end them once and for all. As a result of Turkish defections from his army to the other side, as well as other miscalculations, the Byzantines were defeated and their emperor was taken prisoner. This opened up the whole of Anatolia to the advance of the Seljuk tribe of Turks who had won the battle and their eventual establishment of a capital at Konya in the middle of what had previously been Byzantine territory. After this giant breach in the dam, the path was opened from many other Turkish tribes from Central Asia to cross over into Anatolia. As nomadic tribes living at subsistence level and being constantly on the move to survive, these tribes looked longingly at the fertile lands to the west as holding out the possibility of a more secure and permanent homeland, and this was their chance to take it. The roll call of the tribes who followed the Seljuks into Anatolia included the Karamanis, Harmidoghullari, Eshnefoghullari, Saruhan, Dhulgadnids, Kamazanoghullari, and the Osmanli, who, after being misnamed the Ottomans by western sources, would eventually come to dominate them all.

Nomadic Beginnings The Turks were originally a nomadic people, with various tribes based near the Tien-Tsien Mountains, prior to their epic migration across the steppes of Central Asia and Central Anatolia, culminating in the final conquest of Constantinople in 1453 by Mehmet II (the Conqueror). During this transitional period, which also involved the establishment of settlements by other tribal groups such as the Seljuks, home was a movable shelter called a *yurt*, which was excellently adapted to a nomadic lifestyle as well as the harsh conditions of the snowy, rainy, and windswept Anatolia plains. The permanent house that emerged after the Turks began to settle down is a direct translation in stone, brick, and wood of the functional patterns once confined to the singular, circular living space inside the *yurt*.

Prior to their conquest of Constantinople, the Ottomans, who took their name, or more accurately were given it, because they traced their origin back to a tribal leader named Osman, had systematically eliminated all other Turkish rivals in the various principalities that had been competing for power in Anatolia, and had just established their capital in the Byzantine capital of Brussa, taken after a long siege in 1326. Transliterated into Bursa by the Osmanli, or Ottoman Turks, this city at the foot of Vlu Dag Mountain became the testing ground for a fledgling state seeking visible legitimacy in its claim for expanding power. It did so by adopting architectural forms that they had absorbed in a process of aesthetic osmosis from the Seljuk Turks, who represented another tribal group, who in turn had expanded on the architectural advances made in other principalities by other tribal powers such as the Karahanids and the Ghaznavids. In their institutional and monumental architecture, the Ottomans quickly became aware of the symbolic effectiveness of large portals, axial symmetry, courtyards that made large processions possible, flanking *iwans*, and refined masonry techniques. They combined these elements, developed by other tribal groups with the dome, which the Byzantines had perfected and which the Ottomans subsumed as the symbol of the continuity of the classical western tradition, now in their power.

The Turkish House in an Original Amidst all of this borrowing and adaptation of institutional forms, which was a necessary adjunct to a nomadic history, lived

primarily in the open, the Turks also started to evolve a much more original house type. Even though it varies widely depending on region or materials available, it generally retains a common combination of spaces that are directly derived from nomadic life in the one-room *yurt*, or the tented camp. As Godfrey Godwin has said, in his landmark history of Ottoman architecture, “private property and the sense of home were not greatly sought after by the Ottomans or the Selcuks before them . . . the real home of the sultan was his tent; that is to say a series of day and night tents corralled in a wall of cloth.”¹³ For this reason also, he believes, houses in the villages and towns were based “on the concept of one all purpose room where beds were spread on the floor at night and kept in a chest or cupboard in the wall by day. The mattresses served as sofas and the pillow or *yastik* for armrests.”¹⁴

What is most fascinating about the Turkish vernacular house then, as a generic type, is not the influence that other residential styles have had upon it, but rather the way that its spaces echo previous living patterns demanded by a nomadic lifestyle and the way that these were adapted to a more sedentary urban existence, using stone, brick, wood, and glass.

If they have any stylistic precedent at all, it is from their own compressed architectural history as the inheritors of the Byzantine Empire, in the remaking of Constantinople into Istanbul, at the Topkapi Palace and the Cinili Kiosk, in its first court. This pavilion, sometimes also referred to as the Sise Saray, or Glass Palace, in court documents, was built about 20 years after the conquest in 1472. It is elevated above a high platform that acts as its base and has an impressive colonnade along its front façade that precedes a central court flanked by four *iwans*. The blue tiles that decorate its interior walls were brought from the far reaches of the Ottoman Empire, making it a residential representative of Turkish power. The Cinili Kiosk was the inspiration for the houses or *konak* of the wealthier Ottoman families that frequently had a dome, or at least the representation of one, over the large central area, and if not tiled, the interim walls were also often painted blue.¹⁵ Materials vary from region to region, and wood was not always used in the traditional Turkish house because it was either scarce or expensive. Where it was plentiful, in towns like Saframbolu, the results are spectacular. This town, which is on the western end of the coast of the Black Sea near Kastamanu, has remained virtually untouched by modern development, and its authenticity makes it a good case study of a rapidly disappearing part of Turkish life. The ground floor of many of the houses there is given over to the *hayat*, which creates a small zone that is set apart from the central courtyard by a perforated wooden screen. In addition, an open gallery, or *cadak*, on the first floor, runs around the entire perimeter of this open courtyard, with an *iwana* typically extending out from one side of it to allow the family to sit outside in the open air. Another characteristic of the Saframbolu houses, which is also frequently found in other traditional Turkish houses, is a wide roof overhang, with brackets supporting the deep eaves that protect the sides of the house from rain or snow. This overhang, or *cirma*, developed because of the narrow irregular streets and different sizes of the building lots in the village. The prevalence of wood in this region allowed builders to change the shape and area of the upper stories of a house while adhering to the restricted street line at the ground floor. The *cikma*,

along with the half timbering, which often includes cross bracing, and stepped profiles of the houses, which protrude in stages out over the narrow streets at the ground floor that is treated as a solid store or plastered stone podium base, make Saframbolu unique, but the basic elements of its houses are also recognizable elsewhere.

The Formalized Tent The *bayat* that is so prominent at ground level in the houses of Saframbolu is only one of the many holdovers from the nomadic life of living in a tent, or *yurt*. This circular structure had a hearth, or *ates yeri*, in the center and a raised seating platform, or *lerevit*, along one side, and an area directly across from the main entrance known as the *tör* was used for storing chests that held the mattresses and pillows that were rolled out at night for sleeping. A screen was erected around an area to the right of the main entrance, which was called the *saba* after the horsehide container used to store fermented mare's milk that was kept there.¹⁶ The separation of this area by a *çig* or woven screen set it apart as a kitchen-like space.

As this *yurt* organization was transformed into a permanent dwelling, social structure also dictated the form of the house and the arrangement of its rooms. The ability to stay in one place, along with the increased need for more labor to plant and harvest, meant that family sizes expanded, and the house provided space for the extended family, including grandfather and grandmother as well as sons- and daughters-in-law, who were once accommodated in additional tents or *yurts* clustered around the main dwelling, but were now able to be accommodated in one house.¹⁷ As in their previous living arrangement, privacy remained paramount, so rooms had only one door that gave it access to either the courtyard or *sofa* (main hall). The hierarchy of room sizes and level of decoration conformed closely to that of the family, beginning with the heads of household, as well as the segregation of the sexes in terms of social interaction with nonfamily members. The *selamlık*, or reception room, served the same function as the *majlis qa'a* in the Islamic Arabic house as a place set aside for entertaining male guests. This was connected to or sometimes was also the same as the *bas oda* or formal living room. Women had a spatial equivalent called the *barem*.

Over time, the evolution of the Turkish house mainly involved the addition of upper floors, or stories, and the top floor became the most important level. The *sofa*, as the common indoor area of the house between the rooms, also continued to evolve into more than just a corridor, into a living area for the entire family. The hearth was usually located here, and it was positioned to take maximum advantage of the view and coolness in summer in hot regions, or warmth in cold regions. Raised floors, railings, and archways were often used within the widened corridor, or *sofa*, to differentiate subsidiary spaces for sitting or for the fireplace, and the floors of these areas were carpeted to separate them from circulation paths. The arrangement of windows in the house was predicated upon privacy first of all, and then climatic factors such as natural ventilation or protection from cold wind.

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Volume 3

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1751 to the Present

James Steele

With research by Olivia Graf



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Introduction

AN AGE OF GLOBAL CHANGE

The historical period covered by this volume is tumultuous and diverse due to the rapid growth of the importance of science and technology. This resulted in the Industrial Revolution in one part of the world at its start and the continuation of other traditions that were unaffected by this cataclysm elsewhere. Vast social and economic changes occurred in the countries where this revolution started, and these expanded, like the ripples caused by throwing a stone into a pond, until they affected all other cultures throughout the world. These effects are perfectly reflected in the domestic architecture in both the developed and the developing world today.

The most obvious legacy of the Industrial Revolution has been the explosion of manufactured consumer goods that are now available to everyone and the growth of the advertising profession needed to sell them, in both electronic and print forms. In his treatise *The English House*, written in 1856, Hermann Muthesius argued that the entirety of industrial production is evident in the individual house and the way that people of different income levels fit it out. He also said that if Germany wanted to excel in manufacturing it would be beneficial for educators to study both the design and contents of the typical Arts and Crafts home in England at that time. His theory finally resulted in the establishment of modern design principles taught at the Bauhaus Universität in Weimar and Dessau.

The Industrial Revolution made possible the mass production of traditional construction materials such as brick and lumber, as well as the manufacture of new products, such as float glass, steel, and reinforced concrete. This revolutionized house design because conventional solid bearing walls could be replaced with steel or reinforced concrete columns and glass walls, allowing more flexible floor plans and light.

Introduction

The need for resources to feed the Industrial Revolution led to Colonial enterprise, which imposed foreign styles on indigenous societies. Independence movements after World War II resulted in a retranslation of vernacular traditions.

The progress of domestic architecture throughout the world then, during the period covered here, can be tied directly to the trajectory of the growth of consumerism, initiated by the Industrial Revolution at its start. A theoretical challenge to the Modern Movement, which itself was based on the idea of progress, first took place in the 1960s, just before the advent of the Information Age. While postmodernism ostensibly reflected a general social trend toward diversity, and a return to tradition, it was really just an amplification of those forces, as was the equally short-lived trend labeled “Deconstructivism,” which concentrated even more heavily on the notion of human values being overwhelmed by the growing technological imperative launched at the end of the eighteenth century.

Marshall Berman, in his landmark book *All That Is Solid Melts into Air*, captured the essence of this historical period when he said, in part, that

The maelstrom of modern life has been fed from many sources: great discoveries in the physical sciences, changing our images of the universe and our place in it; the industrialization of production, which transforms scientific knowledge into technology, creates new human environments and destroys old ones (and) speeds up the whole tempo of life. . . .

The impact that these dramatic changes had upon the domestic architecture on the countries that were most directly affected by them is difficult enough to measure, but what of those areas, in Africa, Asia, and elsewhere that were initially bypassed by them entirely? It has too often been assumed that the discoveries that Berman refers to were uniformly distributed, but consider that there is one fact that could be mentioned to show otherwise. When Newcomer’s Engine, which was a steam-powered pump used to drain water from tin and coal mines and is one reliable marker of the beginning of the Industrial Revolution, was unveiled in 1717, the Tokugawa Shogunate was only about halfway through its more than two century run. During that time, Japan was almost completely isolated from the outside world, until a military flotilla led by American Commodore Matthew C. Perry forced it to open up to trade with the West in 1861. It was not the only international instance of a country that industrialized only under duress, but it is certainly the most graphic example of the political and social upheavals that occurred throughout the

world from the eighteenth century onward. These weakened the leadership of established power bases as social diversity started to increase. This shift was evident by new forms of government that started to emerge, ranging from democratic to socialistic.

The change that Berman describes was accelerated by new or improved communication systems, as the media, fueled by commodification, made information available to everyone in the developed world, raising awareness of changing styles, including those of residential architecture. Once these styles were linked to commercial cycles, they became shorter in duration and subject to a decreasing span of consumer interest. The need for more resources to support rapid

industrialization in the developed world also fed a growing network of colonial exploitation. Throughout the British Empire, for example, which extended into countries as diverse as Egypt, India, Malaysia, and Singapore, this meant the importation of a foreign western culture, as well as its residential conventions into a number of different traditional societies, with hybridity being the result. British colonial societies typically have a tripartite organization being deliberately divided into a military zone, where soldiers lived, the civil lines, which were set aside for bureaucrats, administrators, and their families, and the preexisting city, where the indigenous population lived. Many of the homes described here come from one of these sectors, or, like the Straits Shophouse, are a result of the cultural fusion that resulted from their inevitable interaction.

Colonization, which affected much of Africa, Asia, and South America, depended on trade, which became a worldwide industry as a result, increasing social interaction, and domestic styles and trends along with it. This, in turn, provided support for international banking systems, which then became powerful autonomous institutions.

The progressive improvement of manufacturing techniques extended to building materials and systems as other residential examples described here indicate. Fordism, or the use of interchangeable parts that were mass produced using strict quality control regulations and then put together using industrial methods also had direct application to the construction trades, even though this did not happen as quickly as some architects, like those involved in the Case Study House Program in post-World War II Los Angeles, would have liked. A process for the commercial production of steel was invented by Henry Bessemer in 1850, and Josef Monier realized that the tensile qualities of steel would be a perfect marriage to the compressive strengths of cement, combining them into reinforced concrete in 1867.

These new manufacturing techniques also provided architects with larger sheets of float glass, milled timber, Portland stone, and many more new materials to select from, increasing putting traditional crafts and building methods at risk, in the process. In one sense, the delayed industrialization of the developing world has meant that many of these crafts have been preserved there, adjusting for local cultural traditions.

THE CONSEQUENCES OF INDUSTRIALIZATION

In the first stages of the first Industrial Revolution in what is now the developed world, just as we are seeing in its equivalent in the developing sector today, communally based cottage economies were replaced by factory production centered in the urban areas to take best advantage of the potential of scale and proximity to transport. Transportation, including steamships, trains, streetcars, and automobiles, and the canals, railroad tracks, and highways that they travel on, increased exponentially over the three centuries covered here. As factories were built in cities, such as London, Birmingham, Manchester, and Glasgow in the United Kingdom, or Lowell, Massachusetts, in the United States, the demographics of such countries were radically altered. Rural urban migration and the dislocation of entire community populations resulted in the disintegration of old social ties and values. Only a

few visionary architects, such as Adolf Loos fully realized the implications that this shift had on residential design, and his insights changed the direction of modern architecture.

As more people moved from the countryside to the cities in search of work that was then denied them in their existing towns and villages, slums with extremely high population densities sprawled almost overnight, with a concomitant rise in social problems such as homelessness, drug use, crime, prostitution, and disease. Long work hours in poor conditions for low wages, predominantly carried out by women and children, as well as huge discrepancies in the lifestyles and life expectancy of those who actually did the labor and those who benefited from its proceeds, in combination with the social problems mentioned earlier, resulted in a backlash. In Britain this took the form of child labor laws. The first, in 1819, prohibited employers from hiring children under nine years old and limited workers to ten and a half hours a day. Trade unions were established in England in 1871. At the same time that the Child Labor Law was being signed, the British public was enthralled by *Ivanhoe*, by Sir Walter Scott, showing their eagerness to escape to an earlier, less complicated time. In 1848, John Ruskin wrote his *Seven Lamps of Architecture*, followed in 1851 by *The Stones of Venice*, with its famous chapter “On the Nature of the Gothic.” In that chapter, which contains the seeds of what would happen in modern architecture over the next century, Ruskin set out to correct what he believed to be the misrepresentation that the Gothic style is derived from natural forms. In it, he connects architecture to moral, rather than simply technical, issues. He maintained that human imagination is necessary to prevent design from becoming a purely scientific exercise, which is relevant today, in a time of ready-made “flat pack” homes and computer-aided design as it was when he wrote it more than a century and a half ago.

Ruskin was at the leading edge, following Augustus Welby Northmore Pugin, of what would later become the Arts and Crafts Movement, which spread rapidly from Britain throughout the rest of Europe and America by the end of the twentieth century. He and William Morris, who followed him, became the social conscious of a nation that had become inured to the shocking discrepancies associated with Britain’s and, by extension, the rest of the developed world’s industrial miracle. While he finally came to understand that it was impossible to return to the world that Sir Walter Scott described in his novels or that the Pre-Raphaelite leader Dante Gabriel Rossetti fictionalized in his paintings, Morris did concur with Ruskin’s conclusion that Gothic architecture was a perfect antidote to the soul killing and backbreaking routine of assembly line production because it had a moral rather a technical basis, and sprang from an altruistic, collective, and deliberately anonymous social intention rather than an egoistic, profit-oriented, individualistic one.

Each of the houses included here, including a majority of the most contemporary examples, responds in either an active or a reflexive way, to the industrial phenomenon that dominates the period at hand. The unwilling departure of millions of people from their rural paradise, and their attempt, supported by architects and planners, to recover it, led some designers to try to ameliorate the harsh lives of those who did leave the countryside for the city. The surge of colonialism caused

by a rush for the natural resources needed to support industrial growth and the ultimate failure of such enterprise, due to exploitation. The cultural interaction that industrialization and the colonial initiatives that fled it ultimately led to, as a precursor, globalization. These are as legible in the Salinger House designed by Malaysian architect Jimmy Lim near Kuala Lumpur in the 1990s as they are in the houses built for mill workers in Lowell, Massachusetts, in 1831, or the Robie house in Chicago, built for a factory owner in 1909 by Frank Lloyd Wright, who started his career as an Arts and Crafts advocate and remained one for the rest of his life, trying to reconcile “Art” with the “Machine.”

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The Americas

NORTH AMERICA: THE EAST COAST

H. H. Richardson: The Ames Gate Lodge

For all of his famous contributions to the history of American architecture such as Trinity Church in Boston or the Marshall Field warehouse store and the Glessner House in Chicago, or even his contribution of a prototypical library design that became ubiquitous along the East Coast at the end of the nineteenth century, Henry Hobson Richardson is best known to many admirers as the architect of the Ames Gate Lodge in North Easton, Massachusetts.

A Precursor of an American Icon This rather diminutive house, which was commissioned in the early spring of 1880 and finished about a year later, has a following that far exceeds its size for several important reasons. The first of these is that it established a precedent for a more casual American domestic lifestyle. The second, which derives from the first, is that this precedent eventually evolved into the bungalow typology, which was one of the most popular house styles in the history of the United States, primarily between the First and Second World Wars.

The gate lodge was expected to play only a minor role as a guesthouse and refuge for the male members of the Ames household when it was commissioned, but has now eclipsed the main parts of the estate, designed by Snell and Gregerson in 1859 and John A. Mitchell in 1876. Richardson was a close friend of F. L. Ames, and they, along with the famous American sculptor Saint-Gaudens, had visited Sherman, Wyoming, in 1879. They were inspired by the rough-hewn ranches and hunting lodges that they saw there, but Richardson emphasized the use of boulders to an unexpected extent in his reinterpretation of the lodge he had seen in the West.

In his rendition in Massachusetts, which intentionally straddles a road entering the north side of the Ames estate as if protecting the inner sanctum of the family, Richardson has used boulders on every external surface, except for the Longmeadow brownstone used as trim around the windows, the glass of the windows

themselves, the wood used to support the roof of an entry porch and the railings around it, and the reddish orange clay tiles used on the roof.¹ The boulders are graded in size, so that the biggest are at the foundation and get smaller moving up the walls to the roof.

The exclusive use of boulders for the walls, and their decreasing size from the bottom of the exterior walls to the top, give the gatehouse a compact, massive, primitive, and elemental appearance, as if rocks that had been found in a field had been piled up and a thin roof had been hastily built over the rudimentary structure for temporary occupation. Very low eyebrow dormers on the roof, along with a thin eave line and minimal projection of a chimney, also combine to put the emphasis on the unfettered rustication below.

The interior of the lodge, which is divided into a sitting or living room and servants' quarters on the ground floor of the main house and four bedrooms and a "bachelor's hall" on the first, as well as a two-story orangery in an extended wing across the road, has intentionally been treated with a bit more sensitivity by the architect than the exterior. It is predominantly fitted out with wood paneling painted bluish green to complement the color of the stone.

There are several especially innovative features in some of the rooms. One of these is a turret-like window, with its own steeply pitched roof leaning against the formidable tapering stone tower that encloses the main stair, to provide light to the lower reaches of the run. The second is a covered corner porch connected to the upstairs "Bachelor's Hall," which has a secondary projection over a well below. This has been designed to allow water to be drawn up in a bucket to this large room. The "Hall" also has a corner fireplace, which conforms to the asymmetrical approach that Richardson has taken throughout the rest of the house.

It is the casual, almost random, layout of rooms that provides the most prescient indication of good things to come in the domestic architecture of America. As he did in this case, Richardson generally designed for wealthy clients, but the less formal, nonsymmetrical room arrangement he used in the Ames Gate Lodge was soon to become more widely accepted across the social spectrum only three short decades after this house was finished. In its own time, the Ames Gate Lodge also established a trend toward rustic getaways on a private or even public scale, while it is built of dressed ashlar rather than natural boulders. The country retreat called Wyntoon that Bernard Maybeck designed for Phoebe Hearst in 1902 is of the same genre as the Ames Gate Lodge, since, in addition to its chiseled lava rock walls, it also has a fair amount of rubble stone and local timber in sight, as well as a glazed green tile roof.

In the public realm, the Ahwahnee Lodge, in Yosemite National Park, which was built in 1927, is a monumental testimony to the enduring allure of Richardson's fantasy, which seemed to evoke rugged American individualism and pioneer spirit. There are other parallels, such as Parc Guell in Barcelona by Antoni Gaudi, completed in 1900.

Frederick Law Olmstead, who also contributed invaluable advice and planning to the Vanderbilt mansion called Biltmore, in North Carolina, described elsewhere here, provided a landscape plan for the Ames estate as well, which was carried out between 1886 and 1887.

Richard Morris Hunt and Frederick Law Olmstead: Biltmore

There are few instances in the history of architecture in which a visionary client has collaborated with a talented architect and landscape architect to good effect, without the ego of one of them getting in the way. Nero claimed to have designed the Golden House and its vast landscaped grounds in the middle of Rome, as did Cardinal Woolsey at Hampton Court. Versailles also comes to mind with a historical collaboration between King Louis XIV and Le Brun, Mansart, and Le Notre, as do various projects such as Deanery Garden by Sir Edwin Lutyens and Gertrude Jekyll, but there are few others. Biltmore, which was designed and built for George Vanderbilt by architect Richard Morris Hunt and the legendary landscape architect Frederick Law Olmstead, is one of them. Thanks to Olmstead's vision, which his client shared, Biltmore is much more than a house; it became the model for forest conservancy at a critical juncture in American history.

The Vanderbilts George Washington Vanderbilt was one of eight children of William Henry Vanderbilt. William Henry was the oldest son and heir to the fortune of Cornelius Vanderbilt, who had established it by building up a fleet of steamships. He expanded these into holdings of small railroad lines connecting New York City to his shipping lanes on the Great Lakes, and finally consolidated



The Biltmore House Source: AP / Wide World Photos

all of this into the New York Central railroad system. When he died in 1877, he left an estate worth more than \$100 million. William Henry was very conservative and when he died, only eight years after his father, he had doubled the estate. His two eldest sons, Cornelius II, and William K., received the bulk of this because they were directly involved in the management of the family's railroad interest, but George Vanderbilt received \$10 million, which was even more substantial at that time than it is now.

George visited Asheville, North Carolina, with his mother soon after his father's death because it was well established as a resort for the wealthy. While riding outside of town, on a ridge above where the Swannanoa and French Broad Rivers meet, he decided he would like to have a house there because of the beautiful view.² He bought a few acres at first, incrementally increasing his property until it reached 125,000 acres. He had worked with architect Richard Morris Hunt on several projects before this, such as a library that he had sponsored on West 13th Street in New York City and on the family estate at New Dorp on Staten Island as well as on several remodeling projects. He asked Hunt to design a modest country retreat for him on this site. He then commissioned Frederick Law Olmstead, who had designed the landscape around the family mausoleum, to consult on the grounds. Olmstead had previously designed Central Park in New York City and had been the landscape architect for the Capitol Building in Washington, D.C. He had also produced a visionary plan including a series of open spaces for Los Angeles, California, which, unfortunately, was never implemented. As a consequence, that city is one of the most impoverished in terms of public parks in the United States. Because of his training and aesthetic preferences, Hunt was in favor of a formal, French garden in the immediate area of the house, whereas Olmstead preferred a more organic approach in the English tradition, similar to the loosely structured language he had used in the Central Park design. In the end, Hunt and Olmstead reached a happy compromise, in which a more naturalistic method of organization was used along the three-mile approach from the front gate to the main house, slowly giving way to a more formal one, so that the garden directly in front of the house matches its chateau-like style.

By 1891, when the design phase began, these grounds had reached 6,000 acres, and Olmstead wisely advised that Vanderbilt begin a thorough survey of the property including an inventory of plants and trees.³ Hunt, in the meantime, had convinced Vanderbilt to expand his expectations for the house itself, convincing him that a large property should have a residence big enough to balance it. Olmstead was on site for some time before Hunt arrived for his first visit and had determined the best location and orientation for the new house, based on wind direction, view, and the best line of approach. He also determined that, because of the relatively poor quality of the soil and the number of trees in the valleys, the majority of the property should be planted as forest, as a viable commercial enterprise that would also allow the land to be preserved. Olmstead presented his idea to George Vanderbilt in terms of a self-sustaining estate that would provide a public service and be a benefit to the nation as well. Both Vanderbilt and Hunt were swayed by Olmstead's ideas. The plans that followed, which were staked out in 1889, dealt with the cold winter wind from the northwest by having a large courtyard, containing

all of the service functions in it, on that side. This made it possible to focus on the view from the southeast that had attracted George Vanderbilt to this site in the first place by placing a broad terrace there at the edge of the steep slope and the valley below. The house was subsequently moved slightly to the east because of foundation considerations, but these general conditions remained the same.

Biltmore Vanderbilt named the estate Biltmore, after the town of Bildt, in Holland, where his family had originated, along with “more,” which is an old English word meaning rolling hills.⁴ Hunt did not actually visit the site until 1890, and by that time work on the grounds was already well underway. Hunt’s background was rooted in the *Ecole des Beaux-Arts* in Paris, and he was one of the first American students to be admitted there. He was a Francophile and had designed a townhouse on Fifth Avenue in New York City for George’s older brother, William K. Vanderbilt, based on the style of Loire Valley chateaux. This house, with its white limestone façade and fine detailing, stood in sharp contrast to the rather drab brownstones next to it and started a trend for similar “chateausque” houses among the rich. Including Biltmore, Hunt designed another six houses in this French Renaissance style, but the one in Asheville, with 255 rooms, is certainly the largest of these.

While Hunt used the country houses along the Loire River in France as an inspiration, he interpreted elements from them rather than literally copying them, so that his own personality is evident in each design. Following the eclectic tendency of the time, in which historical periods were seen as stylistic phases that could be freely adopted from, Hunt also used other styles throughout the house, such as Italian Baroque and Spanish Mission.

The Chateau of Blois is the most obvious direct influence on the design of the Biltmore, and the reason is clearly the similarity of their siting. Biltmore, like Blois, has been placed at the edge of a prominent ridge, seeming to continue its vertical face, as the human-made crest of a natural precipice. The west façade of Biltmore, which overlooks the river valley, is very reminiscent of the approach elevation of its French equivalent. Blois was the favorite of Francois I, and it is here that he hosted Leonardo da Vinci, where the Italian Renaissance architect and artist actually died. Blois has a famous winding stair, which Hunt copied in mirror image on the eastern entrance elevation of Biltmore, placing it just to the left of the front door leading into a long, narrow entrance hall. This establishes a pattern throughout the remainder of the main façade of asymmetrical parts added to a basically symmetrical elevation, which enlivens it enormously. An English style conservatory, called the Winter Garden, has been placed on the opposite side of the entry, balancing the Blois-like stair to the left.

In spite of its size, Biltmore actually has only four main rooms on the ground floor of the main house. In addition to the Winter Garden, which is a square in plan with its corners clipped off to accommodate stairs up into it at each of those points and has a glass ceiling that culminates in a dome, these are a gallery that is perpendicular to the entrance hall and the library at its far, southern end, to which it connects. The fourth main room is the Banqueting Hall on the other side of the Winter Garden, to the north. There are also less grand spaces, such as a music room and a smaller dining room, which the family preferred when they were alone because it was more intimate and provided a clear view to the mountains.

The library held more than 10,000 books and reflects George Vanderbilt's inquiring intellect. He studied architecture and art, and spent a great deal of time in this room. It is rectangular, with a huge fireplace on the long wall next to the entrance from the gallery, as the north-south axis, and has two large windows overlooking the terrace and the view in that direction to the south. Bookshelves full of leather-bound treasures run up the entire height of the wall to the ceiling soaring high above. The extensive use of wood on these walls, as well as the fireplace mantle and windows, combined with oriental carpets and tapestries on the sections of wall not covered by shelves, makes this a dignified and inviting scholar's retreat, in spite of its scale.

The Banqueting Hall at the other end of the longitudinal axis that Hunt has used to organize these large spaces opens directly into the Winter Garden, which obviously served as an area to receive guests before dinner was served. It is also rectangular and is slightly larger than the library opposite to it. Unlike the library, however, the Banqueting Hall is a cavernous space, which, in spite of its wood parquet floors and fireplace, seems inhumanly large at 42 feet wide and 72 feet long, with a 70 feet high ceiling.

George Vanderbilt married Edith Stuyvesant Dresser, who was related to Peter Stuyvesant, the last Dutch governor of New York.⁵ They had a child, Cornelia, who was born at Biltmore in 1900. George died unexpectedly after surgery for a minor ailment in 1914, and his wife subsequently sold off 100,000 acres of the property. It was then made part of the public forest system of the United States, forming the center of the Pisgah National Forest. Through the foresight of Frederick Law Olmstead and the generosity of George and Edith Vanderbilt, their home in Asheville served more than just a private role, becoming a model of environmental stewardship that others may now follow.

Gwathmey Siegel Architects: The De Menil House

Francois De Menil is a member of the De Menil family, based in Houston, Texas, which is well known for its philanthropy and support of the arts. The De Menil Gallery in Houston, designed by Renzo Piano and sponsored by family matriarch Dominique De Menil, is eloquent testimony to this support. In 1978, Francois De Menil approached Gwathmey Siegel Architects and asked them to design a house for him on a site near the beach in the South Fork district of Long Island. At that point, he lived in Manhattan and wanted a house he could escape to on weekends. The house, which took four years to design and build, ended up as a three-story high, four-bedroom retreat that is 11,000 square feet in size. Mr. De Menil spent only about six years in the house, which was put up for sale in 1988 for \$12 million. He was a bachelor when he commissioned it, but subsequently married, and the couple had their first child in 1986. His intense involvement in the process of realizing the house was also instrumental in turning his interest toward architecture and, when he was 36 years old, he entered Cooper Union in New York City to get a professional degree. He then joined the firm of Kohn Pedersen Fox. Architects typically do not want to live in houses designed by other architects, no matter how special the house is, and want to design their own. That was the case with Francois De Menil and one of the reasons behind

his decision to sell the Gwathmey Siegel–designed house. It certainly was not because of a lack of space.⁶

Toad Hall In discussing his impressions of the house, which he inexplicably named Toad Hall during the relatively short time that he, and then he and his wife and son, had lived there, Mr. De Menil offered the insightful observation that a great work of architecture transcends a specific time or inhabitant. This characteristic may also be applied to each of the houses in the later historical periods that have been included in Volumes I and II of this set. This also presents the apparent paradox of a house being specifically designed for one person or family in a way that is directly related to their personal habits and lifestyle, then being sold several times over the lifetime of the dwelling to people who do not share those patterns. The number of examples that may be used to illustrate this discontinuity are legion and include Fallingwater, the Tugendhat House, and the Villa Savoye. In these cases, however, each of the houses has now been taken into trust by some organization or other and opened to the public as a museum, or three-dimensional time capsule of the cultural values that prevailed when the house was built. Assuming that to be the case with the De Menil house, it is relevant to ask: what are the values that it presents and preserves, in addition to its obvious allegiance to the excesses that seemed to identify the decade in which it was built in America?

A Regional Take on the Five Points Before he entered into partnership with Robert Siegel, Charles Gwathmey was included, along with Richard Meier, Peter Eisenman, Michael Graves, and John Hejduk, in a definitive book entitled *Five Architects*, published in 1961. The premise of the book was simply that these five designers, who did not work together, shared a recognizable affinity with the principles put forward by Le Corbusier, as specifically defined by his “Five Points of a New Architecture.” These five points, which Le Corbusier intended as a shorthand way of remembering the larger issues being addressed by the Modern Movement when he published them in the early 1920s, started with the grid, which was the most important one of the five, and generated, or determined, the rest of them. The grid was a code word for the much larger structural transformation that had taken place as a result of the new construction materials, such as steel and concrete that had been made available to architects and engineers because of the Industrial Revolution, making it possible for them to explore point loaded systems instead of the uniformly loaded bearing wall that they had been restricted to in the past. This transformation was not really all that new, since the builders of the Gothic cathedrals had done the same thing in their invention of the rib vault in the thirteenth century, which made it possible to bring structural loads from the roof and the walls down to the ground in clusters of vertical piers, or columns. This allowed them to move on from using a single massive wall as the Romanesque builders who preceded them were forced to do. The limiting factor for the Gothic builder, however, was being forced to use stone, since reinforced concrete and high strength steel were not available to them. They pushed stone to the limit of its structural capacity, but they were still limited by the spans it was capable of providing. The curtain wall that the point load system makes possible is also evident in the Gothic cathedral, in dramatic contrast to its Romanesque counterpart, which has few openings in the massive walls that are typical of that style.

The Grid Provided Freedom Reinforced concrete or steel columns, and the beams they supported, provided the engineer or architect with the opportunity of achieving longer spans, and were most effective and efficient when placed on a module, or grid. This is the designation used by Le Corbusier as his first point. His second and third points, which are the “free plan” and “free elevation,” follow on logically from the first in that, as with the example of the Gothic cathedral, both the interior space and the walls were allowed to be more open once the burden of carrying the roof was transferred to the columns and they were freed from that task. This meant, in the contemporary condition, that the interior walls of a building could be placed at will, without having to worry about their bearing capacity or structural role. They could, in fact, be treated as screens or partitions, as they are in the Tugendhat House by Ludwig Mies van der Rohe, without touching the ceiling at all.

The same freedom then applied to the use of exterior walls, which were delivered from their historical burden of having to carry the load of the roof and floors along with their own considerable weight. This led to the “free elevation” that Le Corbusier refers to. The fourth point, which is the strip window, relates to the free elevation, in that the possibility of substituting a long horizontal window that ran across the entire elevation then replaced the smaller opening used in the bearing wall, which had to be modestly sized because of the difficulty in transferring the structural load around it. The strip window as used by Le Corbusier in his design for the Villa Savoye became a proud declaration of the new opportunities offered by the structural grid. The last of the five points was the roof garden, which was representative of the possibility of using the grid, or point load system of reinforced concrete or steel columns, to lift a building off the ground entirely. This is extremely difficult to do with a bearing wall system. To celebrate this possibility, Le Corbusier recommended the replication of the ground plane that was freed up by suspending the building above it, by having a garden on the roof as well. This is less clear than the first four points, which seem to flow logically from each other.

The Five Points in South Park Charles Gwathmey and Robert Siegel differ from the other members of the so-called “New York Five” in adapting this Corbusian shorthand to the American, and specifically the East Coast, tradition of carpentry and timber construction. They have attempted to find parallels between the use of reinforced concrete and steel and this venerable heritage, in an effort to translate it into a regional language. They are not the first high profile Modernists to do so, since Walter Gropius did the same thing in the house he designed for himself and his wife, Ise, in Lincoln, Massachusetts, in 1938. In that instance, Gropius spent a considerable amount of time traveling around that region of New England and analyzing the vernacular architecture there before he conceptualized the design, and he was impressed with the ways in which earlier builders had adopted British construction techniques to local conditions.

A Processional Route Gwathmey and Siegel still used concrete and steel as well as wood in the De Menil house, but have adapted the tradition of a natural tongue and groove exterior skin to Corbusian principles. In the De Menil residence design, they have also adopted what Le Corbusier referred to as the “processional”

route in his own use of that device at the Villa Savoye. In that instance, he deliberately placed the house in the middle of a large, slightly convex site ringed with trees, so that it could best be appreciated in three dimensions as a beautifully crafted architectural object as one approached it by car, and then closed in on it, in an ever-decreasing spiral along a driveway that finally ends up beneath the house, which is raised up on columns to receive the car.

A Processional Route The processional route that the architects have used in East Hampton is less lyrical and far more formal, due to the fact that the house had to be located near the ocean and was designed as two conjoined linear bar buildings running parallel to the beach to take maximum advantage of its privileged location. The arrival sequence begins in a wooded area proceeding into the property and starts in earnest after the driveway leads through a security gate, turns at a right angle to the west, and then makes another to the south, which then puts it, and those approaching the house, on a direct access with its elongated entrance elevation. The visual experience of moving along the route is heightened after passing through a wall that is deliberately placed across it, and passing by a large pond on its left-hand side with a long single file row of Linden trees planted along its entire length on its right. There is also a uniformly wide rank of outdoor sports facilities, including a tennis court and a swimming pool, leading up to the house on the left.

There seems to have been a deliberate intention on the part of the architects to use the first of the two long, narrow façades that are placed perpendicular to this formal processional path as a barrier, to finally stop it, and to heighten the contrast with the openness of the other side of the house, which faces the ocean. Except for a glass conservatory that takes up about one-quarter of the length of the three-story entry elevation, the general impression the house gives is solidity. This is predominantly conveyed by a large expanse of the narrow vertical tongue and grooved wooden strips that have been used to sheath the exterior walls. These are treated and exposed to weather to whiten naturally in the salt sea air. There is a gap at the far right-hand side of this bar, created by a first floor bridge leading to a stair up to the roof at that end of the house. This frames a fleeting glimpse of the ocean through the scrub on the dunes beyond, but the overall effect is otherwise one of imposing grandeur. Scale is mitigated somewhat by the gabled roof of the greenhouse, which subliminally conveys a traditional image of domesticity and shelter, but on balance the mood is somber, at best.

The entry side of the house faces north, so the architects have been fortunate in having the view to the ocean coincide with an advantageous solar angle as well. They took advantage of this by extending both the north and south elevations and shortening those to the east and west to make them solid to cut down on solar gain. There is a long, thin wooden canopy placed high above the south-facing ocean front elevation to regulate the glare caused by the sun on the water from that direction and to unify the disparate parts of an elevation that extends horizontally for more than 100 feet. It is on this elevation that the Corbusian lineage of this house is most evident, since the tall vertical supports that hold up this high canopy roof march along in a regular modular order as a reminder of the important role that the grid plays as a communicative device in this adopted language. The grid on this ocean front elevation also supports numerous balconies obviously

intended to provide viewing platforms for looking out to the sea, on the first floor, above the dunes.

The greenhouse acts as both a spatial buffer between the driveway and parking lot on the entry side and the living areas of the house itself beyond, and a temperature regulator because of the plants and trees that thrive there. A fanciful, curvilinear balcony projecting out into it from the house side on the upper levels stitches it to the interior. The use of polished stone or wood on all of the interior floors, and the absence of carpets that might trap sand, as well as the generous use of glass block in the walls of the entry foyer, master bedroom, and elsewhere throughout the house give the interiors a brittle, formal, almost cold feeling that seems out of keeping with a day or weekend at the beach.

Richard Meier: The Smith House and Douglas House

Richard Meier is one of the most prominent architects in America. He came to international attention soon after he graduated from Columbia University in the mid-1960s. At that time, he made an alliance with four other architects and together they published a book called *Five Architects*. The direction they shared was the work of the French architect Le Corbusier. They each translated the work of this heroic modernist in a slightly different way, but they also had a deep respect for his groundbreaking ideas. The basic premise that they shared can be summarized in what Le Corbusier called his “Five Points.” These five points amount to a shorthand diagram of the breakthroughs that Modernism was able to make possible. They are all predicated on the point, which is what Le Corbusier called the grid. What he meant by the grid was the use of the column as opposed to the bearing wall. The column, or point load system, of architecture that was introduced during the Modern Era was made possible by industrial materials such as concrete and steel. The column differs from the bearing wall in that it allows the complete structure to be held up by a series of vertical supports rather than a continuous wall. The difference between the grid and the bearing wall then is the basis for the next four points that Le Corbusier listed.

The second of these points is the possibility of making a floor plan more flexible because the bearing walls have been eliminated. Le Corbusier referred to this as the free plan, since it provided the architect with more options in locating various areas in the house. Walls used in the free plan only served as room dividers and did not carry any structural weight. So, they could be shaped differently than walls in the past. They could curve or be angular rather than be straight.

The third criteria of the five points was what Le Corbusier called the “free elevation.” By this he meant that, because of the point load system provided by the grid of columns, the exterior wall no longer needed to support the floors or the roof of the house. And so simply because the exterior wall was like a curtain drawn across the columns and was not doing all of the structural work, this is referred to as a curtain wall.

This freedom from structural requirements led to the fourth point, which Le Corbusier referred to as the strip window because it allowed for long narrow openings to be drawn across the entire elevation of the house. In a bearing wall condition, openings must be treated carefully because the structural weight is

transferred from the roof to the ground in a uniform way. In engineering terms, this kind of loading is called homogeneous and isotropic. This uniform loading means that a window cut into the wall disrupts the uniform flow of forces and these must be dealt with by putting a horizontal lintel across the top of the window to deal with them. This is not necessary with a curtain wall, which is basically much lighter than a bearing wall and in which the architect must only deal with the weight of the material of the wall itself, rather than the structural forces caused by the roof. Openings in the curtain wall can be much larger. In his own work, Le Corbusier used long narrow horizontal windows on purpose as a way of expressing the new freedom provided by the grid.

The fifth point that Le Corbusier added to his shorthand was the roof garden. This flows less logically from the starting point of the grid than the free plan, the free elevation, and the strip window, but does have a rationale of its own. Le Corbusier felt that the innovation of the point load system provided by the column made it possible to eliminate the basement that was usually necessary because of the bearing wall structure used in the traditional house prior to the industrial revolution. To emphasize that point, he felt that putting a patio or garden on a roof of a house would be symbolic of the area that was freed up by using the grid at ground level.

The Smith House The architects that shared Le Corbusier's idea of the five points and who were featured in the publication that included Richard Meier, called *Five Architects*, became known as "the New York Five." Richard Meier's particular take on the ideas of his Modernist mentor involves a consistent attempt to expand on these five points, to stretch the boundaries of the ways in which they can be expressed.

One of the first residential examples of his method of doing this is the Smith House, which was built in Darien, Connecticut, between 1965 and 1967. The Smith House is located on a dramatic one-half acre site on the shore of the Long Island Sound. This site slopes down to the water, dropping gently at first and then more sharply as it reaches the shoreline. Meier has established a formal line of progression from the parking lot and garage across the site toward the water and has placed the house perpendicular to this line of progression. He has then established a series of layers from the entrance at the back of the house toward the front, which overlooks the water. These mark a movement from an area of privacy in the back to the public areas in the front. This sets up a series of points of discovery for the visitor to the house that are carefully choreographed by the architect to provide a sense of surprise and delight when the final view across the water is revealed.

The first stage in this sequence of discovery is finding a pathway that connects to the entrance driveway. This pathway steps gently downward, ending at a bridge that crosses over a divide between the land and the main entry, which is at the upper level of the house. The doorway of this entry then leads into a small foyer and then to a balcony with a railing that provides a view down into a three-story high space and through a large glass window to a view of the Connecticut coast and beyond. In addition to his adherence to the ideas of Le Corbusier, Meier frequently shows references to the work of architect Frank Lloyd Wright in gestures like this. Meier, like Wright, uses the idea here of bringing a visitor into a situation of doubt by having the main entrance on a blank wall followed by a small entrance

vestibule and then providing the final dramatic surprise of a spectacular view of the entire house and the water in the distance. This sequence is reminiscent of one that Frank Lloyd Wright orchestrated so carefully in the Hollyhock House described elsewhere in this volume. In that instance, Wright also begins the entry sequence at the parking lot and garage area, leading on to a thin pathway up through a long and narrow arcade to a heavy massive metal door. This door is easier to open than it looks because Wright took great care in detailing the hinges so that they would open easily, belying the appearance of weight that the door has. After negotiating the door, the person entering the house is also faced with a very small, constricted entrance vestibule and must also negotiate a sharp turn into a loggia, before being rewarded by a breathtaking view into a central courtyard and the vista of the mountains beyond. Meier magnifies that experience by placing the entrance on an upper level, thereby providing the visitor with both a view outward into the distance and downward into the house itself. This provides a clear sense of orientation into the entirety of the house. There is a stairway on the right side of the main doorway that is part of the private half of the house in the back. This is the main source of connection between all the floors. Other spaces in this private or service zone include a kitchen and master bedroom wing. This whole area is differentiated by the open, transparent volume of the living area in the front near the water by being surrounded by bearing walls. But the front elevation facing the view is the *pièce de résistance* of the residence and best describes Meier's intention, even at this early stage, to expand on Le Corbusier's five points.

The grid, which is the first point, is clearly expressed by the architect as a series of four equally spaced round columns that extend from the ground floor level all the way to the roof. The free plan, which is the second point of Le Corbusier's shorthand, is evident in the volumetric explosion of space on the inside. The strip window that was used by Le Corbusier, which is the third point, is expanded by Meier to become a series of large plate glass windows with no mullions or dividers of any kind to maximize the view outward as well as the amount of natural light coming in. Meier uses a series of horizontal bands that correspond to the floor lines of the levels behind them, which interlock to create an exciting visual counterpoint for those looking at the house from the water's edge. This counterpoint is extenuated further by the vertical element of the chimney, which balances the interlocking horizontals. Meier further utilizes this vertical element almost as a sculpture by pulling it away from the front elevation. This allows it to appear to be free-standing when it is seen by those entering the house by the back and looking at it from their high vantage point of the balcony above.

In addition to being a highly talented architect, Richard Meier is also an accomplished artist as was his mentor, Le Corbusier. He confines himself, however, to the rigorous discipline of small collages that are rarely larger than one foot square. He has continued to do collage during his long career and, like Le Corbusier, has used this medium as a way of exercising his compositional skills and testing his organizational ideas. The front elevation of the Smith House is a clear testimony to the efficacy of his collage exercises, since it is an elegant example of his ability to achieve compositional balance. In this instance, in one of his earliest works, he also shows his discipline in being able to achieve this balance within a very

constrained framework in which each element is carefully placed to achieve a final goal. An additional element in this balance is a second stairway, which leads from the living room area in the front of the house out and down to the ground level and to an outside patio beside the water.

At this early point in his career Meier also established an element of his architectural language in that the Smith House is entirely white except for the use of natural wood for the floors. This choice of an entirely white palette, which Meier has strictly adhered to with few exceptions throughout his entire career, is not a spontaneous choice, but has deep ideological significance. By doing this he aligns himself with the Modernist principle that all references to historical style should be eliminated, because such references would underscore class differences as well as be a reminder of the problematic legacy of the past. In his most famous purist houses such as the Villa Savoye and the Villa Stein, Le Corbusier also adhered to this all-white palette for similar reasons, and because of these eliminated the gable roof as well. The neutral image of the flat roof and the all-white palette, then, was intended to support a more universal, egalitarian position. Meier has supported this image most uniformly with the notable exception of the Getty Museum in Los Angeles, which he designed in the late 1990s. In that case the client required that he use natural materials on the outside of the buildings. At first Meier reluctantly turned to the use of Carrara marble but mitigated its rough characteristics by having it cut and faced in a very mechanistic way. However, as the two houses described here indicate, he enthusiastically embraced the all-white image of the Villa Savoye and has even exceeded it. An additional reason for the selection of this image is that it makes the house stand in stark contrast to its natural surroundings, setting up a paradoxical relationship between the human-made structure and nature. This image of the machine in the garden has been a compelling fantasy throughout the Modern Movement, representing the unwritten intention of architecture in opposition to nature. This intention is expressed most clearly by the fact that the windows in the front elevation of the Smith House facing the water are fixed glass. Only the doorway leading to the stairs, which provides access to the water, is operable. This begins a pattern, which can be traced throughout Meier's work, of a separation of using glass as a means of dividing the interior of the house from the natural world. These large areas of glass, however, allow natural white light to flood into the interior, creating dramatic shadows, which are constantly changing during the day as the sun moves across the sky. This is especially true near the water where reflection augments these shadows. The result is a paradox of glass being used as a means of separation between the inside and outside as well as a transmitter of light into the interior. This paradox also leads to a magical sense of almost celestial light, which plays off the abstract white surfaces of the walls and ceilings of Meier's houses.

The Douglas House The second example of Meier's virtuosity in expanding on the Modernist vocabulary of Le Corbusier is the Douglas House, which he designed in 1973. This house is in Harbor Springs on a high bluff above the shore of Lake Michigan and shares many characteristics with the Smith House, which Meier designed a decade earlier. It is much larger than the Smith House but is also entered by crossing a bridge from the back of the house, which leads through a

screen wall. In this instance it leads into a tight glass-enclosed vestibule that provides selected views out and down into a vertiginous three-story high living room space. The similarity between the Douglas House and the Smith House continues in the division of the rectangular profile placed perpendicular to the line of entry into a solid back portion, which is relegated to the private functions of the house. A glass-enclosed multistory open portion to the front is given over to the more public uses as in the Smith House, and there is also a stair to the right of the entrance connecting all of the floors of the house. In addition, there is a secondary stair leading to the waterline at the left of the public spaces in the front. The chimney here is also used as a sculptural element detached from the front wall of the house, but in this case it has a pair of circular flue stacks, which give it a more mechanistic appearance. These stacks underscore another similarity between Meier's houses and those of Le Corbusier in that they all convey the subliminal image of being an ocean liner. The story behind this image relates to Le Corbusier's love of modern means of transportation that were being developed during the early part of his career in the 1920s, such as airplanes, ocean liners, and railroad trains.

These breakthroughs at the beginning of the Modern Age fostered a cult of speed that culminated in several architectural movements such as the Futurists and the Constructivists that were dedicated to translating them into architectural form. In a book he wrote in the early 1920s called *Vers Une Architecture*, Le Corbusier cites the engineers who were then designing ocean liners, airplanes, railroads, trains, and automobiles as being more innovative than architects at that time, and of also being at the leading edge of a new age. He adopted some of the language of the ocean liner in his work, most notably in the pipe railings that he used along the ramp that leads up through the center of the Villa Savoye, the mechanical stacks that protrude from the roof, which look like the smokestacks on an ocean liner, and the thin parapet walls that are intentionally designed to look like gunwales. The use of the roof garden or deck on the top of the Villa Savoye also recalls similarities with the deck of a ship, so that the house finally has the appearance of sailing across the sea of grass, which is the site around it. Because of their sitting on fairly steep slopes near the water's edge, both the Smith and Douglas Houses do not have quite the same image as sailing off into the sunset, but the Douglas House does have the look of a ship coming through the trees toward the water. In addition to the two round vertical smokestacks at the top of the chimney, the metal railings and the exterior stairway leading down from the living room to the forest floor also help to contribute to a nautical image that recalls Le Corbusier as well.

As in the Smith House that preceded it, the Douglas House interiors are revealed to the visitor incrementally by a very carefully planned experience of procession. When approaching the house from the road at the top of the mountain on which it sits and through the woods behind it, guests first perceive it as a small one-story linear strip hidden behind the trees. They then cross a bridge and see the hillside sloping steeply away from them. Only then are they able to realize that there is a five-story structure below. The view toward Lake Michigan is still blocked at this point. The bridge leads into a screened deck, and then visitors enter into a glazed

curved conservatory and are able to see the magnificent lake in the distance. When they move down the main stairway past the bedroom floor to a mezzanine level that overlooks a double high living room space, they have an even clearer view of Lake Michigan and the tops of the evergreen trees that cover the mountains below. Moving down another level brings guests to the main living room. Beneath this living room floor are the dining room and kitchen, which also have spectacular views toward the lake. The lowest level of the house is a podium base in which the mechanical room and the basement storage rooms are hidden.

Space is a Key Component The idea of procession, which is used in both the Smith and Douglas Houses as well as in all of Meier's other projects, is a key part of his Modernist heritage. The central part of that tradition is the character of interior space and the sequence in which a person is exposed to it. All of the other factors in the building such as structure, natural light, and materials are secondary players in a drama that revolves around the major actor, which is space. This is a key element in the Modernist belief that space as an almost tangible element in the architectural experience has the power to uplift, inspire, thrill, and transform a person who is exposed to it. And so the processional sequence in both the Smith and Douglas Houses is central to the entire idea of each design, to squeeze as much emotion out of the viewer as possible. Living in this house from day to day obviously increases exposure to the interior space and is intended by the architect to be an inspiring and transformative experience.

Expanding on the Five Points In the Douglas House, Meier experimented further with the five points of Le Corbusier that he introduced in the Smith House earlier. In this instance in Michigan, he uses a tartan grid rather than a regular spacing of columns. This tartan grid of wide bay and narrow bay, which marches across the front elevation of the house, is used to emphasize the view through the central axis and the wide bay that is located there. The narrow bay corresponds to the chimney and so emphasizes its verticality. The plan arrangements of each of the two houses are relatively similar, although the Douglas House is much larger and taller. The third point of the free elevation corresponds to the first point of the tartan grid as does the fourth point of the strip window. In the Douglas House, the notion of the strip window is transformed into a checkerboard of wide and narrow spaces in each direction. The roof garden in the Douglas House becomes a screened-in viewing platform designed to heighten the anticipation and delayed surprise of people entering into it before they are provided with the opportunity to see the spectacular view of the lake that is given to them once they are inside of the house.

In other residential projects, Richard Meier also favors the method of using a ramp as a main circulation system throughout a house as his mentor Le Corbusier did in Villa Savoye. And so the Smith and Douglas Houses are exceptions in this regard. The technique of using a ramp accentuates the idea of the exposure to interior space mentioned earlier because it slows the pace of the observer down and allows one to focus on the quality of the volumes of space that are being presented by the architect. A ramp takes up far more area inside a house, and so it is a major commitment by a client to accept it as an alternative to a stairway. But the advantage of a ramp as far as a modernist like Richard Meier is concerned is that it does not require the person using it to be concerned about

looking down when they want to be sure of their step as a stairway does. The idea here is similar to one used by Japanese garden designers who use the spacing and roughness of the materials through the pathways in a garden to control when viewers look up and down. This was especially important during the Preindustrial Age in Japan when men wore long robes and women wore kimonos and stacked wooden shoes. When the garden designer wanted the people to look down and not be so aware of their surroundings, he would make the paving stones rough so they had to look carefully at the ground to negotiate them. When he wanted them to look up and be surprised by the view he created for them, he made the paving smooth so they would not have to worry about tripping or falling down. The ramp as a device in the processional ritual serves the same purpose, and Meier, like Le Corbusier, uses it to encourage people to look up and appreciate the spaces he created. The decision not to use the ramp in the Douglas House was obviously driven by the confined vertical volume of the house. In this case, he uses the stairs as a way of punctuating the progressive exposure to the view outside, allowing ample opportunity to stop at each landing to gradually introduce the progressive discovery of spaces that he is involved in creating.

Louis Kahn: The Esherick and Fisher Houses

While many of his contemporaries were caught up in the search to expand the structural possibilities inherent in lightweight industrial materials, such as steel, aluminum, and glass, architect Louis I. Kahn (1901–1974) wrestled with more substantial issues, such as historical continuity, basic human values, social relevance, and environmental appropriateness. Because he was initially unable to reconcile the basic premise of Modernism, defined by one of the movement's most prominent founders, Mies van der Rohe (1886–1969), as the expression of the technology of the times, with its poor performance and lack of popular appeal, Kahn sought a clearer mandate in a quality he described as timelessness.

A More International Background Kahn's father emigrated from Estonia, then part of Russia, to the United States in 1904, with his wife and three children, including Louis aged five, following a year later. Kahn's birth in Russia at the dawn of the new century and the dire economic circumstances his family endured during his childhood in Philadelphia have been described as both an unfortunate twist of fate and a blessing in disguise. He had just graduated from the University of Pennsylvania in the mid-1920s when Modernism was about to come to full flower in Europe. The Great Depression and subsequent onset of World War II were epic obstacles to the beginning of a promising career. However, the extreme poverty of his youth, which at one point forced his family to move 17 times in two years in the heavily industrialized Northern Liberties neighborhood in Philadelphia because they could not pay the rent, made him resilient and inventive. And his delayed rise to prominence meant that when major building commissions did finally materialize in the 1950s (when he was in his mature fifties), he was singularly qualified to redirect the antipopulist course of Modernism, write the final chapter of its heroic phase, and lay the groundwork for the diversity that he singularly helped to make possible. In sharp contrast to Frank Lloyd Wright, who was the only other American architect of sufficient intellectual stature at that time to have

effected such momentous change, Kahn had a more immediate empathy with the European birthplace of the Modern Movement, as well as a common touch. Unlike Wright, the third generation of a Welsh family from the American heartland, who began his career as a society architect in the exclusive Chicago suburb of Oak Park and became the epitome of the upper class, white Anglo-Saxon Protestant establishment architect, Kahn was an outsider, the first generation of his working-class family to be educated in the United States, with a radical set of social sensibilities. These were quite unlike the exclusive notion of democracy that Frank Lloyd Wright tried to express in what he cryptically called a “usonian” architecture, his own code word for democracy. While Kahn was also exposed to American philosophers that extolled the virtues of independence even if at the expense of social norms and the common good, the exigencies of his background would not allow him to indulge in the same flamboyant behavior that Wright did. Wright seemed to relish scandal; Kahn managed to avoid it. Even while breaching similar social constraints, he kept up the appearance of a normal family life since marriage was among the institutions that he believed should be protected.

To an extent unsurpassed in their relatively short national history, Americans have experienced an unprecedented change in lifestyle in the three decades between 1920 and 1950. The Depression followed by World War II created a pent-up demand for housing exacerbated by the baby boom that followed. Significant legislation discouraged renovation of inner-city dwellings, encouraged the construction of new single-family houses in the suburbs, and facilitated the building of a highway system to reach them, giving a new breed of property developers the opportunity to supplant the architect as the arbiter of public taste. Architects in general failed to anticipate this change and reacted with disdain when it occurred, abdicating responsibility for mass housing, the domestic future of their country, and one of the major components of the Modernist agenda as a result. At the end of his career, Frank Lloyd Wright boasted of having built houses in every state in America, but they were all custom designed reserves for the rich. Aside from his admittedly visionary Broadacre City plan, which was a utopian proposal for organizing the suburbia that he then knew was inevitable, Wright led the retreat to the Ivory Tower that many architects of his generation were proud to emulate, to their cost. Half a century later, those who continue to adhere to that model are in real danger of being professionally marginalized, while for others Kahn’s enlightened activism offers an inspiring alternative, leading the seemingly inexorable transmutation from high to popular culture, fueled by globalization. He showed the way.

An Early Concern for Housing In the 1950s, during the presidency of Dwight D. Eisenhower, the United States experienced an economic surfeit. Prosperity was accompanied by a desire for stability and a concern that his legacy be passed on to posterity. For the first time since the nation’s early history, when Neoclassicism was chosen for many buildings in Washington, D.C., because of its associations with Ancient Greek democracy and the style reverberated across the United States, there was renewed speculation about the possibility of a national style, until a gathering storm ended this reverie. Throughout his early career, Kahn attempted to have the middle class rush to the suburbs include the economically disadvantaged as well. In housing projects such as Pine Ford Acres, Pennypack Woods,

Carver Court, Stanton Road, Lincoln Highway, Willow Run, Lilly Ponds, and Mill Creek, he demonstrated early in his career that he understood the threat the demographic shift to exurbia posed to the Modernist ideal of equal access to shelter as well as the architect's role of mediator in this process. His valiant attempt to redefine that ideal, so that it might more readily conform to an inexorable urban exodus, was recognized by his peers who were then able to accept him as the architectural mediator of sociological change.

Kahn dearly loved Philadelphia because it had given him so many life-changing opportunities, and by extension he revered the institutions it had historically fostered. He also understood that the organizations that had evolved from social interrelationships in the past would have to change to adapt to new conditions, but he believed that, in spite of such changes, certain elemental aspects present in the formation of each tacit social contract should remain immutable. During this period of redefinition of what an institution should be, he was fascinated by what he called "beginnings," thinking back when designing a school, for example, to the time when people "who did not know they were students" sat under a tree listening to someone who did not use the title of teacher. In this way he sought the essential nature of education, realizing that the details made necessary by curricular shifts or technological innovations did not alter this critical relationship.

A Volatile Time Consider that from the time when Kahn's major public building, the Yale University Art Gallery, appeared in 1953 until his death in 1974 the United States experienced John F. Kennedy's version of Camelot with his space program, the Lunar Landing, and his tragic assassination in Dallas in 1963. This was followed by Lyndon Johnson's Great Society, War on Poverty, the *Civil Rights Act of 1964*, the Job Corps, Project Head Start, and the Model Cities program of 1966, largely undone by racial riots in Harlem and Philadelphia in 1964, in the Watts neighborhood of Los Angeles in 1965, and in Detroit in 1967, determined by the Kerner Commission to have been caused by the existence of "Two societies in America, one white and one black."⁷ More than anything, however, Johnson was defeated by the war in Vietnam, which had grown from an exotic incident during the Eisenhower and Kennedy administrations to an escalating quagmire that would claim more than 60,000 American lives. By this time President Richard Nixon was in office, elected in 1963 primarily on his promise to extract troops from Southeast Asia. But doing so proved more difficult than he had anticipated, and funding for the poor and the rapidly deteriorating inner cities declined accordingly. Eventually he was forced to resign because of the Watergate debacle. One important legacy of Vietnam, directly related to Kahn's contribution, was that it decisively proved that ideology is far more potent than technology; the United States with all its sophisticated weaponry and firepower could not defeat a far less "developed" nation, which essentially had a Third World economy. It has also allowed this message of the fallibility of progress to be delivered into the nation's living rooms, usually on the six o'clock news between commercial breaks, through the increasingly important medium of television. This dealt a decisive blow to what has been called the "grand narrative" of Western superiority, primarily obtained through industrial production, and to the idea that there is only one answer to any problem, as those promoting the scientific method had insisted.

The worldview that began to emerge as an alternative referred to as postmodernism is less optimistic and less certain. It stresses multivocality rather than a single Western voice, positing that there are many valid views and different perspectives in the world.

Kahn's major projects during this period of unprecedented upheaval demonstrate his anticipation of this multivocality, which has now become a global chorus, although as the last chapter on his legacy will show, his inclusion in or responsibility for the emergence of postmodernism in architecture is highly controversial.

Going It Alone The intense period of commitment to the Modernist agenda of finding a solution to the problem of housing the economically disadvantaged, which corresponded exactly with World War II, ended abruptly on March 4, 1947, when Kahn left his partnership with Oscar Stonorov and opened his own office. He and Stonorov had been unlikely partners with their diametrically opposite personalities and divergent approaches to design, but Stonorov's affable character, social skills, and political connections made it possible for Kahn to explore polemical tendencies and to express them in proposals for mass-produced shelter. The partnership with Stonorov, which had begun when Kahn's professional alliance with George Howe had been strained by Howe's consulting work in Washington, ended when Kahn felt that Stonorov unfairly took credit for a design that was not his. Anne Tyng began working at the office at this time. She was just the opposite of Louis Kahn in social status and family background. Of Boston Brahmin roots, she was born in Kuling, a small village in the Lushan Mountains of Kiangsi China in 1920, while her parents Ethel and Walworth Tyng were Episcopal missionaries there. As a result of the Communist takeover, her parents sent her to boarding school in the United States in 1933, but she returned to visit her parents in China before beginning architectural school at Harvard in 1943, after majoring in fine arts at Radcliffe. She recalls her surprise at seeing a portrait of distant relative and namesake Anne Tyng at the Boston Museum of Fine Arts by the favorite artist of high society, John Singleton Copley, which reminded her of "New England roots."⁸ She was one of the first women to study architecture at Harvard at a time when the faculty were heavily influenced by the new director, Walter Gropius, who had organized the Bauhaus in Germany, before emigrating to the United States because of World War II. The war also ensured a high female to male ratio in her class, which changed only after troops returned. Philip Johnson, now the doyenne of critics and style maker extraordinaire in his nineties, followed the notoriety he had received by curating the International Style Exhibition at the Museum of Modern Art in New York City by enrolling as a "mature student" at Harvard at the same time Tyng was there. She often invited him to review her work. Other notable students such as William Wurster, who went on to become a Bay Area legend, and I. M. Pei, who is arguably one of the leading Modernists in the world at the end of the twentieth century, added dimension to Tyng's formative experience, as did faculty member Marcel Breuer, who was on staff at Gropius's Bauhaus and had followed him to Harvard.

Anne Tyng After graduation Tyng had a series of jobs in New York City, including the architectural furniture company Knoll Design, and soon realized that there was a real barrier against female architects. Her parents had relocated to Philadelphia and she decided to join them there. Anne Tyng first met Louis Kahn in 1945,

when she visited a friend working in the office in the old Evening Bulletin Building across from City Hall that Kahn then shared with Oscar Stonorov and George Howe. Her friend, Betty Ware Carlhian, had to return to Harvard to complete her degree, and Tyng was offered her position. She was aware of the firm's reputation for designing progressive, low-cost housing projects and she readily accepted. She was pleased that, unlike her previous, restrictive experience in New York, she was involved in all aspects of office experience, but also recalls that Kahn and Stonorov seemed to be competing for her attention. She was attracted to Kahn because of a charisma that many others have mentioned, which seemed to grow as he matured, related to his physical strength, unusual facial characteristics of piercing blue eyes and scars, and his passionate belief in ideas. He was 44 and she 25 when they met, and she soon became aware that, "Louis' interest in me was unusually intense and included a powerful physical attraction that I immediately realized was mutual." She also found it "difficult to believe that he was a happily married, and at the same time, so intensely interested in another woman."⁹

When their affair began, Tyng was the slightly built, fair-haired, clear-eyed image of Main Line privilege, the area of Philadelphia suburbs that grew up along its premier railway route and took its name from it. She represented everything he was not: a long-established Anglo-Saxon lineage, from a wealthy Christian family that had provided her with the best education that money could buy. She described Kahn as being, "Extremely shy because of the scars on his face from his childhood burn," while Stonorov "was a great bluffer and quick to seize the opportunities . . . confident in this ability and charm."¹⁰ She also noticed, "How unusually broad his lightly freckled shoulders were in proportion to his slim hips, when Kahn worked shirtless"¹¹ because of the stifling heat in the small office. Their passionate, personal, and professional relationship lasted 15 years and finally became platonic at her suggestion, "because I realized he was involved with someone else."¹² As with Tyng, however, he remained married and still lived at home even though more and more time was spent at the office. Kahn's theoretical maturity during this period is intricately bound up in this affair, making it essential to clarify Tyng's part in that evolution.

The Sky Is the Limit The years immediately following World War II were a time of unbounded optimism in the United States, which suffered none of the appalling damage that bombing had caused to cities in Europe and was not experiencing the material shortages and rationing that were enforced across the Atlantic for many years after the war ended until these were alleviated by the Marshall Plan. Nonetheless, the common sense of an ominous weight being lifted from the national consciousness was literally translated into urban opportunity in Philadelphia when the huge masonry viaduct supporting the elevated railroad tracks running north and west out of the old Suburban Station was finally torn down. In the late 1940s the massive bridge known as the "Chinese wall" because of its resemblance to the Great Wall of China effectively separated the eastern and western halves of the city, which, even though still connected by streets running through arches below it, were psychologically divided.

In addition to housing, or as a corollary to it, the second great agenda of modernism was urban design, contingent on a belief in the omnipotence of the

individual designer and the possibility of one person accommodating the needs, aspirations, and secret desires of thousands in a single “master” plan. Consistent with his allegiance to the movement, Kahn not only agreed with that belief, but actively participated in proposing a plan for the area of Philadelphia left vacant by the fall of the wall. In 1946 Kahn and Stonorov were appointed by the Philadelphia Planning Commission to join a team of architects working on an area of the city called “the triangle,” founded by the diagonal axis of the Benjamin Franklin Parkway connecting the Art Museum with Logan Circle as the northeast border, the Schuylkill River on the west, and Market Street on the south. The 200-acre area had badly deteriorated but the part of the “Chinese wall” that had been removed near the river was catalyst for development. The team proposal included a new civic center, an amusement park along the riverbank, new office towers, referred to as “Philadelphia’s new business address,” and a “New Town Living Center” of slab block housing complete with raised pedestrian walkways presented in drawings by Kahn in 1947 that were prescient of the Penn Center development west of City Hall realized in the early 1950s. While still with Stonorov and Howe, Tyng and Kahn had begun collaborating on their shared interest in urban design on the Triangle Area Redevelopment Plan.

Anne Tyng accompanied Kahn in the move to a new office at 1728 Spruce Street in March 1947, made possible, in part, by the confidence he derived from having a new commission for the Philadelphia Psychiatric Hospital. The hospital, part of the Federation of Jewish Charities, came to Kahn because of his long involvement with, and hard work on behalf of, the Federation and his association with Samuel Radbill, the president of the hospital board. During the design of the hospital between 1944 and 1946, realized in 1949, Kahn was also working on alterations to the Radbill company offices and a renovation of the Radbill House in Merion. Clad in slate, the hospital is T-shaped in plan, with patients’ rooms in the cross bar and administration offices in the stem, which has a curved entry piece at its base, facing the street. A *porte cochere* under this curved façade provides convenient access to the ground floor of the facility.

The Houses From 1946 to 1950, Kahn and Tyng worked together on six houses, in addition to a renovation to the Hooper House in the suburbs of Baltimore, Maryland (1946). After his split with Oscar Stonorov, when he moved into his own office, Kahn initially relied heavily upon commissions for private houses to survive. He had some opportunities to explore this kind of highly detailed, customized design while working on low-cost housing schemes with Stonorov, but they were few. One of these was for friends Jesse and Ruth Oser for a site in Elkins Park, north of Philadelphia, in 1940. Strong formal similarities between the Oser House and a much larger residential project by his close friend George Howe for the Wasserman family in Whitmarsh Township eight years earlier are evident. Although the Osers had a restricted budget, Kahn attempted to replicate the muscular verticality of Howe’s palatial project by clustering casement windows on both the first and second floors at one corner of a square, tower-like projection to allow a vertical band to occur at the opposite side. The Oser House is simple in plan, a rectangle with a straight stair leading up to a large bedroom with an en suite bath, and three smaller bedrooms sharing a second bath on the first floor, with a partition wall parallel to the long sides of the rectangle creating a corridor to a gallery kitchen and

office clustered at one end. The thin horizontal tongue and groove wood siding used on the Oser House, which is inexpensive and paradoxically seems to increase scale because of the absence of any usual frames of references, shows up again in vertical application on the Baltimore house of Mr. and Mrs. Arthur Hooper in 1946. Unfortunately this, along with a one-story addition to the Ardmore House of Kahn's friends Lea and Arthur Finkelstein, had to be abandoned because of material shortages caused by the war.

The L-shaped plan of the Hooper addition to a two-story colonial farmhouse hints at more than just a passing familiarity with the Modernist adaptations then being attempted in Los Angeles, particularly in the Case Study House Program being sponsored by influential editor John Entenza in *Arts and Architecture* magazine. Aside from the L-shaped plan, which was favored by California architects because it served to capture outside garden space and make an external equivalent to internal rooms possible as a statement of loyalty to the modernist principle of a free flow of space interior to exterior, Kahn also replicated the structural frame and flat roof of the Western equivalent.

The Weiss House The Weiss House, completed in 1950, won a gold medal from the Philadelphia chapter of the American Institute of Architects as an indication of Kahn's rising professional visibility at the beginning of the decade. It begins to present what was soon to become his clarity of the articulation of individual spaces. Faced in rough stone, the house is arranged in two distinct blocks connected by the thin neck of a covered recessed entry passage. The block on the left of the entry, connected by a pathway to a garage behind it, contains a kitchen and dining room beside a massive stone fireplace and a living room with a "conversation pit" that was popular at the time in front with copious windows. A master bedroom with en suite bath and dressing room, as well as a maid's room and second bath, are located to the right of the main entry with deep recesses used to ensure privacy.

The Genel House Kahn's eagerness to challenge the orthodoxy of infinite space takes a second baby step forward in the Genel House in Wynnewood, in 1948 and 1951, which is even more compartmentalized than the Weiss House with a subtle hint of iconoclastic departures to come in a nonfunctional marble partition angled around a brick fireplace. Such a relatively small gesture may seem inconsequential in retrospect, and yet it is symptomatic of the restlessness that Kahn and many others were feeling about the structure that form must follow function. In Pacific Palisades near Los Angeles five years earlier, Charles and Ray Eames had fired the first visible shot across the bow of conformity in a house they designed for themselves, introducing the issue of personalizing spaces that Modernists had previously felt should be anonymous. Using the latest prefabricated steel technology as a frame, the Eames' personalized their house to express their individuality in the color schemes they chose and the personal collections they displayed in it, making it one of the first attempts at humanizing a sterile formula that literally seemed to be cast in concrete during the preceding decade. Kahn expanded on this idea and made it his own.

Anne Tyng provided Kahn with the mathematical and geometric weapons he needed to carry out his own personal campaign against Modernist sterility, which he also felt was the result of the loss of monumentality that had made historical

architecture so powerful. Kahn's affinity toward public housing, as well as his rationalist bent and functionalist technique all place him squarely in the Modernist camp, yet he had a different viewpoint, based in humanism, and social awareness.

The Norman Fisher House Kahn designed a house for Norman Fisher for a site near Hatboro, close to Philadelphia. It took more than seven years to build, from 1959 until early 1967, an indication of his perfectionism, as well as his belief that architecture was a living thing and should keep evolving during the design and even the construction process. The house is on a gently sloping, heavily wooded hill that slants downward from the entrance driveway at the main road toward a small stream at the back of the property. The house demonstrates the early exploration of what are now seen in retrospect as Kahn's essential principles: the use of geometry, the manipulation of natural light in all exterior and interior spaces, and a love of natural materials, rather than the industrial palette preferred by a majority of Modernists. The house is composed of intersecting cubes hinged together at a 45 degree angle. These are placed between existing trees to form two interconnected outdoor spaces: an entrance court in front and a patio adjacent to the kitchen, which is open and overlooks the stream in the back. The cubes are distinctively different with the one on the south being private and the northern one being public. The one on the south contains the master bedroom and bath as well as two additional bedrooms and another bath on the second floor.

The cube on the north shares the entrance lobby and contains a soaring two-story living area with a fireplace as a focal point, which separates it from a dining room and kitchen beyond. Increased window size in this cube is used by Kahn as a means of introducing more natural light, making the double-height space seem even larger than it is. In this house and in the Esherick House that followed, Kahn plays with the height, depth, and location of windows as a musician plays with sound, carefully manipulating both their placement on each wall and their depth, which varies by inches in each case. For instance, the entrance hall ends at a large window, which allows a view out and through to the lush wooded lot in the distance, on the other side of the house. Other parts of the exterior wall, such as the south façade, only have narrow slit windows, to let a minimal amount of light in and to preserve the privacy of this area. Kahn firmly believed that every room in any building he designed should have light, and he approached the issue of natural light on a spiritual level. He even called material "spent light." There is also a basement under this more public part of the house, which is positioned in such a way as to take advantage of the sloping site to open up toward the view of the stream in the back. The two cubes are placed so that they read as one house from certain angles and two separate houses from others, and this dichotomy is obviously not coincidental.

The Esherick House The Esherick House, near Fairmount Park in Philadelphia, is also the result of a strict geometric order since its main public living area is square in plan, and the private area, with kitchen and a laundry on the ground floor, and the bedroom and bathroom above are attached to it in a rectangular piece that is half the width of the square. There is a mezzanine at the bedroom level that overlooks the double-height living space. Kahn used a three-feet six-inch module; the living area is nine modules square, but deviates by one module, and the staircase, which separates the square from the private rectangular portion running along its long side, is one module wide. There is a fireplace opposite the stair on the far side

of the living room, which Kahn uses as a sculpture by detaching the tall vertical volume of the chimney, and showing it off as a tower that is visible through a long narrow window placed above the fireplace.

In the Esherick House, as in the Fisher House, windows are used very strategically, but in this instance he goes even further, by imbuing them with a pedagogical purpose. Kahn was a teacher as well as an architect, frequently using the designs as a way of pedantically making a point. And here, the point is to demonstrate that a window is more than an opening in a wall, to be used to let light into a room. In the Esherick House he stacks windows of fixed glass, which serve that purpose, over a custom-made counterpart that is a casement paired with a sliding screen, to be opened when it is necessary to have natural ventilation. Philadelphia has exaggerated seasons; that is, winters can be very cold and summers very hot and humid, so having windows that open is a good idea.

Kahn also made a point of differentiating between the front or formal and back or less formal elevations here, taking advantage of the proximity of the park behind the house by making the front very flat and almost anonymous, and the back of the living room square very open, by articulating it with these paired stacks of deep fenestration.

Mill Town Houses in Lowell, Massachusetts

The Industrial Revolution was not confined to Great Britain alone. It was launched by steam power in many other countries almost simultaneously, and America was not far behind. But the rush to industrialization was not completely driven by steam in the United States. Several entrepreneurs took advantage of the power provided by rivers and streams, which are especially abundant in New England, and located mills and factories there. If it can be argued that the Industrial Revolution started with the invention of Newcomer's Engine in 1717, which was a steam-driven pump used for removing water from coal and tin mines, it started a bit later in America, but was well underway by the mid-1800s. It was then that Francis Cabot Lowell established a town centered around his textile mills that now carries his name. It prospered for little more than 15 years, until the mills were closed because of the Civil War.¹³

An Industrial Utopia Lowell established his eponymous settlement in Massachusetts as an ideal industrial community rather than just a company town, but also as a social utopia intended to improve the lives of the workers. The majority of the laborers in these mills were young women from rural areas, and records show that a majority of them came from as far away as the neighboring states throughout New England.¹⁴ The main attraction of Lowell for them, in addition to earning more money than would have been possible in domestic service, was the promise of personal improvement offered by its founder. Lowell was not alone in his idealistic quest, since other utopian communities, such as Port Sunlight, had already been established in England before Lowell was founded.

By necessity, the layout of the town was predicated on two givens, which were the need for the mills to be near the water and the need for the workers to live near the mills. Because the factories were powered by a long driveshaft running along the ceiling, connected to the individual machines by belts, factories had to

be long and narrow. The women, who were predominantly of Irish, Scottish, German, and Polish descent, typically worked a 12-hour day, six days a week, with a break for lunch. They lived in boarding houses built by the management, which had to be located near the mills so the workers could walk back and forth from their rooms to work as quickly and easily as possible. The boarding houses, which were lined up along the main and side streets in neat rows, were each run by a landlady who acted as surrogate mother, chaperone, chief cook, and property manager. She provided her young guests with breakfast, lunch, and dinner, and they had prodigious appetites. This was not free. The women earned about \$8 a week after they became proficient, but after expenses were deducted, this was reduced to only \$2. But, this was still about twice the amount that they could make in many other jobs that were then available to them and was considered generous at the time.¹⁵

These laborers stayed in Lowell for an average of four years, and during that time actually managed to save enough money to send home to help their families. The “improvement” part of this harsh social contract, in which these women traded about 14,000 hours of their young lives in front of a machine in a textile mill in exchange for \$400, was the opportunity to attend church and the social events connected to it in the little free time that they had left.

Lowell grew, and under Kirk Boott the Merrimack Manufacturing Company became more established. Boarding houses became even more regularized. One cluster of them in particular was patterned after a traditional New England village, with each house being recognizably part of that spare vernacular vocabulary. These were built of wood, as farmhouses in that region typically are, with the exception of four houses in the middle of the row, which were built of brick to emphasize a feeling of stability. This row was echoed by another on the opposite side of a canal running between them, which was used to run a mill at the far end.¹⁶

Competition between mills started and owners became more aware of the need to brand the architecture of both the factory and the housing of the employees who worked in it in order to differentiate their company from others. In the opinion of one historian who has studied these mill towns thoroughly, the popularity of the Greek Revival style between 1835 and 1845 in this part of New England was due to a retrospective urge and the desire to recognize past accomplishments.¹⁷ To convey the impression of a well-established community based on democratic principles, builders in Lowell selected the style that the founders of the Republic had also chosen nearly a generation earlier for the same reasons, and it served both purposes well.

Michael Graves: The Benacerraf, Hanselman, and Snyderman Houses

It is fairly common to be able to follow the transformation of an individual architect’s ideas through his or her work over an extended period of time. In fact, that evolution is one of the surest signs of greatness. What is not usual is to see that transition compressed into the design of only three houses that were completed over a five-year period and that subsequently resulted in a remarkable volte-face

in a designer's entire career. This dramatic, soul-searching change of direction also contributed to a completely new trajectory in the history of architecture.

The New York Five The architect in this instance is Michael Graves, who, in the early 1960s, was included in a book entitled *Five Architects* along with Richard Meier, Charles Gwathmey, John Hedjuk, and Peter Eisenman because of their common allegiance to the Modernist principles of the Swiss-French architect Le Corbusier. These principles, related to machine production, were summarized by the protean architectural guru in his own shorthand as "the five points," made possible by industrial materials such as steel and concrete. They made it possible to move on from the traditional bearing wall, in which fewer openings for windows and doors are possible because of its structural homogeneity. So, Le Corbusier's five points begin with the "grid," which was his code word for a frame system, since it is typically laid out on a module. The second and third "points," which derive from the first, are a free plan and a free elevation, as in the free-skating sense of free. These are made possible by the point load frame system, as opposed to the uniformly loaded bearing wall. The fourth point is the strip window, which Le Corbusier felt was an especially descriptive symbol of the freedom that a structural frame provides because it expands the limited opening in a bearing wall to a horizontal slice in a curtain wall that can run across column lines at the designer's will, because it is the line of columns and not the exterior wall that is supporting the load. The fifth and final point is that the frame allows a building, or house, to be lifted up above the ground, suggesting that a garden can be planted on the roof, as well.

The Hanselman House Each of the members of the New York Five, as they began to be called after the book on their work appeared, differently approached the ideas of Le Corbusier, summarized in his five points. Perhaps because of his background in art as well as architecture, Michael Graves concentrated on his mentor's exploration of the Cubist's vision of comprehensive spatial perception, adding what Alan Colquhoun has described as "new metonymic and metaphoric interpretations of the spaces made possible by the freedom that the grid allowed."¹⁸

Although Michael Graves worked on several other projects between 1967 and 1972, he completed two houses and one addition during that time that seemed to him to exhaust the possibilities inherent in those interpretations, forcing him to reconsider his loyalty to the principles of Modernism as well. The first of these projects to be completed is the Hanselman House in Fort Wayne, Indiana, built in 1967. It was designed to accommodate a family of six, and it was located on a heavily wooded corner lot with a stream running diagonally across it. Graves positioned the house along the northernmost lot line with a driveway leading to a carport on the eastern end, beginning a linear progression toward the house to the west. The site plan is based on a 35-foot grid, perpendicular to this northern lot line, divided into five bays to establish a sense of progression toward the house, which is treated like a temple or sacred object. After the first two of these bays, used for the driveway and the carport, Graves uses the third for a step stair and screen, the fourth for a bridge to the house, and the fifth for the house itself. The house is a square in plan and a cube in volume, and it is elaborately introduced in this sequence by elements intended to provide a sense of spatial layering when

approaching it from the carport. A screen at the third grid line, echoed by another that also acts as the first, outer skin of the house, punctuates a carefully choreographed ritual of penetration that Graves sets up before reaching the front door.

Graves treats this first floor inner sanctum, which is the final goal of this procession, as a *piano nobile* in a way that is reminiscent of those found in the Italian palazzos and villas described elsewhere here, but then contradicts that simile by putting the three bedrooms for the children and the bathroom they would all share on the ground floor level, along with a playroom in their midst. Although this was obviously done for privacy and better acoustics, it contradicts the golden rule of palazzo and villa design in the past, which was to confine all service functions, such as commercial uses, servants' quarters, kitchen-related spaces, and storage to the ground floor level. This confirms, rather than denies, a Corbusian connection, however, because Le Corbusier also exploited the compromises that modern life forced an architect to make to a pure system. In his classic essay "The Mathematics of the Ideal Villa," Colin Rowe was the first to establish clear geometric parallels between the Palladian system of proportion, including the use of a podium base and *piano nobile* and the early houses of Le Corbusier, such as the Villa Stein at Garches.¹⁹ The Hanselman House, then, is intentionally a part of this tradition of the compromised Italian villa typology.

The second and third levels of the Hanselman House are consistent with this analogy, as a series of zones, rather than rooms, in an open plan. In outward appearance, they seem to pay homage in every way to their Modernist heritage down to details such as the pipe column railing, thin slatted wooden floors, and Corbusian furniture. What clearly establishes this house, and those that would soon follow it, as a radical departure from that dogma, however, is Graves's attempt to extend his commentary on Cubism by focusing on architectonic parts, such as columns and stairs as part of the process of perception, rather than just functional elements in their own right. This expansion is most obvious in his rotation of the main stair as the central component of the entrance sequence. He also uses this as a sculptural element, flipping it over at a 90 degree angle, using the triangular form as the face of a second internal stair on the front elevation as well. This play of forms may initially seem to be similar to the kind of semiotic experimentation that Robert Venturi introduced in his design of his mother's house in Chestnut Hill at the same time as the Hanselman House was being built. However, Venturi's interests were more related to mass media and the way it had subliminally invaded the public consciousness at this time as a largely unrecognized ideological force, and the place that architecture had in this process.²⁰

The Benacerraf House Addition Two years after the Hanselman House was completed, Graves designed an addition to a conventional, single-family house in Princeton, New Jersey. It was originally intended to be a freestanding pavilion in the back yard to be used as a playhouse for the children, but ended up being attached to the eastern side of the existing house, which Graves also renovated as part of the process. In its final, dependant position, it allows for close supervision of the children's area from the kitchen, adjacent to it on the ground floor, and as an open terrace next to the master bedroom and bath on the first floor. The two levels of this playhouse-deck addition are connected by an external stair, which serves as its public, street front elevation.

As in the Hanselman House, Graves started his design process with a grid, which he extended into the original house, in this instance, as an obvious gesture of continuity with the Corbusian five points. The free plan and free elevation, as the second and third components of that formula, are also obviously present, as are the strip window and roof garden, which Graves uses as a terrace. But once again, as he had in Fort Wayne, the architect ventures into perceptual explorations involving building elements such as the stair, the columns, and the wall, used as a screen primarily on the front elevation. That entire surface is treated as a three-dimensional collage of parts with the stair connecting the playroom on the ground floor with the terrace above flattened against the wall surface to exaggerate its triangular form, and the dual purpose of the screen it is attached to, as a demising wall on the ground floor and perforated partition above. A wide railing in front of the stair, which is made to look like a column that has been placed on its side, completes this tectonic collage. The result is a visually arresting three-dimensional exercise, deliberately intended to confuse perceptions of interior and exterior space. There is once again a temptation to group it with the syntactical explorations being made by Venturi at this time, but is a test of the mental process by which meaning is created.²¹

The Snyderman House Back in Fort Wayne, three years after the Benacerraf *folie*, Graves designed the third house in this historical series. This one, for the Snyderman family, is the largest of all. It is located in the middle of a 40-acre site and is surrounded by trees. Graves identified a cross-axis, created by a natural line of entrance to the site, on the one hand, and a pond and a flat plateau that form a secondary axis, on the other. In his earliest “napkin” sketches of the house, Graves graphically reacts to those two axes by drawing a square plan footprint deformed in the middle of each side by the impact of the axis that penetrates the house there. Once again, as in the Hanselman house, the form of choice is the square, which is a reminder of the fact that rationalism was a large part of the Corbusian heritage, at least in his early work. This included a love of Platonic solids, such as the square, which Graves replicated in his first sketch of his idea. But, a square was also the perfect form to reconcile the potentially conflicting requirement of the cross-axis he had identified, and so it was easily assimilated.

Because of its larger scale, bigger site, and more involved contextural conditions, the Snyderman House is complex, but much of that complexity is self-imposed by the architect. In this respect, he also reminds us of Robert Venturi, for whom complexity was the entire rationale for his departure from the Modernist fold. A description of the ground floor plan of the Snyderman House must begin at the front door, which opens in from an “entry terrace” raised up six steps on a slight podium base. The terrace is larger than most suburban houses are today. A living room, dining room, and kitchen rotate out from the front entry, in an open plan arrangement, orbiting around a large stair, placed off the center of the square to avoid the cross-axis. The master bedroom and bath are located in the northwest corner of the plan, protected by a thick, L-shaped wall that also contains the toilet, tub, and sink, if not the shower, which is freestanding.

Michael Graves himself has described his intention in determining this arrangement by saying that:

the rooms are organized both to take advantage of the appropriate exposure to the sun and to establish a progression from the entrance to the most private spaces. By its east-west alignment, (the house) is in an ideal position in relation to the sun whose path from front façade to the back traces both the course of a day's activities in the rooms and the movement from collective to more individual private spaces.

This idea of arranging the internal spaces of a house to take advantage of external environmental influences, now referred to as diurnal zoning, is nothing new, having been used for thousands of years in the traditional architecture of preindustrial societies. What is new here is its implementation by an architect who was, at this point in his career, a self-declared Corbusian Modernist, since concern for nature was not the primary consideration of his mentor. But, Graves demurred soon after that in the same statement by shifting the discussion to the idea of a machine in the garden metaphor, which is a refrain that is more familiar to the rationalist tradition. In this iteration, the house is an artificial implant into the natural environment, and so should be expressed differently, as a foil. Graves goes further by matching spaces, which refer to or touch the earth, that he describes as being characterized by “irregularity, lyricism and movement” with colors that relate to it, such as brown, and using white on the grid, which is extruded three dimensionally as a white screen around the house, representing “idealized form, geometry and stasis.”

The Walter Gropius House, Lincoln, Massachusetts

On the eve of the Second World War, late in 1936, Walter and Ise Gropius started the process of relocating from Berlin, Germany, to Cambridge, Massachusetts. Gropius had been named Director of the School of Design at Harvard, with Joseph Hudnut as its Dean. Gropius and his wife were about to undergo a degree of culture shock that neither of them could have fully anticipated.

A Founder of the Modern Movement It would be simplistic to say that Walter Gropius was single-handedly responsible for establishing the Modern Movement in architecture. There were many different stands of influence in its formulation, beginning with the Industrial Revolution in the early part of the eighteenth century. But it would be fair to say that it would not have happened at quite the same time, in quite the same way, without him. Before Gropius, there was still a lingering sense of nostalgia for the past and the wish to reconcile history with the technological breakthrough of the present and the future. Otto Wagner was one example of an architect who was trying to hold on to tradition while embracing the new, and Charles Rennie Mackintosh was another. The clearest evidence of the change in attitude that Gropius helped bring about is the stark contrast between two buildings, designed by both him and his mentor Peter Behrens at about the same time in Berlin. Behrens was the corporate architect for the *Allemagne Electricibich Gesellschaft*, or AEG, the Germany Electric Company, prior to World War II. He designed a turbine factory for it that adheres closely to the mechanistic language of the Modern Movement, or the New Architecture as it was being referred to in Europe at that time. But, as Wagner and Mackintosh had before him, Behrens attempted to make historical references in this building, as well. These are layered into both classical and rural associations that were intended to elevate the

workplace to an almost sacred space in the first instance, and to make the workers, who had mostly come to the city as a result of rural urban migration, feel more at home on the other. The temple-like, classical metaphor is conveyed in the AEG Turbine Factory, through a tripartite division of the building into a podium base, colonnaded middle, and segmental pedimented top. The rural symbolism is also conveyed by that roof, which has been compared to a barn gable elsewhere.²²

Gropius Was Not Sentimental In his own design for a shoe factory that he completed about the same time as the AEG Turbine Hall was built, Gropius clearly demonstrated just how free of similar sentiments he could be. Instead of the ennobling intention of classical associations or the rural reference of a segmented gable roof, Gropius eliminated all connections to history in the Fagus Shoe Factory by making the roof entirely flat. Instead of the columnar bay and temple-like division into base, middle, and top that Behrens has also used to elevate the workplace to a nearly sacred status, Gropius wrapped his factory entirely in glass, as if to tell the workers and the public that management was in charge and that employees would have nowhere to hide. A clock above the front door completed the image.

Gropius was a leader of a rationalistic school of thought that eventually prevailed within the New Architecture Movement, toward a more objective position. He was among the most influential members of that nonaffiliated group, and while Le Corbusier was inarguably its most dynamic and charismatic figure, Gropius had equal influence because of his role as an educator. He had been instrumental in the establishment of the *Deutsche Werkbund*, which was an institutional approach taken by the German government to ensure an improvement in the national competence in industrial design as well as in consumer culture in general. Gropius went on to refine this mission by reconfiguring the Bauhaus in Weimar, and then reestablishing that school in Dessau, prior to his departure for America. During this period he had a central role in formulating the intellectual platform of the Modern Movement.

The Gropius House in Lincoln, Massachusetts Walter and Ise Gropius arrived in Boston in the spring of 1937 with little money, having only been able to ship to their new home some household belongings, including some furniture prototypes that had been produced in the Marcel Breuer studio at the Dessau Bauhaus. Breuer followed Gropius to the United States, and the two joined together in partnership for a brief period afterward, although it ended in 1941. Through a mutual friend, the couple met Mrs. James Storrow, who offered to help them find a suitable property to build on and to financially assist them in doing so. She was unaware of the ideological position that Gropius represented, believing only that newcomers coming to America from abroad deserved a chance, and she wanted to help them get one.²³

After rejecting a suggestion by Joseph Hudnut, dean of the Graduate School of Design of Harvard University, that they look for an existing house on Beacon Hill in Boston, Walter and Ise Gropius decided to buy land and build a house of their own. They had been looking at small towns in the area around Cambridge and started to focus on the three small villages of Lexington, Concord, and Lincoln of Revolutionary war fame. They were attracted to Lincoln, in particular, because of its rural New England character and small size, as a welcome contrast to their

hectic life in Berlin. They rented a house there as a temporary measure, while their search for property continued.

Studying Vernacular Precedents Before embarking on a site search and house design, Gropius and his wife traveled throughout Massachusetts and to neighboring New Hampshire and Vermont as well, to study local, indigenous New England architecture. Mrs. Gropius remembered that her husband was impressed with the regional adaptations to an original Georgian model that he saw on these trips, and the way that the early builders had used different materials due to climactic conditions and budget restrictions. This resulted in the replacement of brick, which was the material that was favored in England and in British Colonial cities such as Boston and Philadelphia during the Georgian period, with painted wood clapboard. He also noted other environmental adaptations such as the consistent opposing placement of the front, entrance door to the Colonial house and the rear door leading to a back garden to encourage cross ventilation, which was necessary in an area where summers can get very hot and humid.

This recollection by Ise Gropius seems innocent enough until one remembers that Gropius, like the rest of the proponents of the New Architecture, has the historical reputation of being unconcerned about contextural issues, and was supposed to believe that scientific solutions could be found to any climactic



The Walter Gropius House Courtesy of Daniel Malantic; Flickr

condition. Vernacular adaptations of the kind that impressed him in New England were not supposed to be of any interest.

This is not the only surprise provided by the design process behind the Gropius House, which shatters several other stereotypes that have been attached to the Modern Movement as well. The couple ended up choosing a 5-1/2-acre site very close to the house they were renting at Sandy Pond that attracted them for several unexpected reasons. The first of these was that it was located on a low hill, surrounded by an apple orchard with nearly 100 trees. The second point of interest for them was the view that the house at the top of this hill would have of Mount Wachusett, nearby. The third reason, which reveals an even more romantic streak in someone who was reportedly an unrecalcitrant pragmatist, was the fact that the site was within walking distance of Walden Pond. In his writing about that pond, Henry David Thoreau praised its simple, primeval beauty, revealing that Gropius had a soft spot for nature after all.

The house that he designed on Baker Bridge Road at the top of a low hill demonstrates how well he absorbed the lessons he had learned from the local vernacular architecture, as well as how thoroughly he understood natural forces. But, in keeping with the Rationalistic, functionalist tendencies ascribed to him, he also decided to use the construction of the house as a test case in mass production techniques, to demonstrate how products that were readily available on the market in America could be used to produce a modern house. He succeeded in doing this, with only the curved railing of the one main staircase being custom-made.

Efficiency Combined with Tradition In spite of the deference that Gropius paid to local tradition in siting and in using local materials for the fieldstone foundation, brick chimney, and white painted vertical wood strips for siding, the house as finally built is very reminiscent of others that Gropius and Breuer had designed for faculty members on the grounds of the Dessau Bauhaus. It is sleek and box-like with long strip windows and a flat roof. Its rectilinear forms are relieved only by an angled covered entry leading in from a circular driveway on the north side and a spiral stairway that goes up to a roof deck farther back on the same elevation.

Gropius was working within a tight budget, which, in addition to prompting his interest in readily available, off the shelf parts, also resulted in minimal room sizes. The bathrooms are stacked above each other in the two-story plan to save on plumbing, and with the exception of the roof deck, which takes up about 30 percent of the upper floor, other spaces are fairly tight. There is also a sizable screened-in porch on the ground floor, which projects out at a 45 degree angle from the long southern side of the rectangular house, and these exterior living spaces must have seemed luxurious indeed to the former urbanites from Berlin.

Landscape a Major Factor The extremes of climate in this part of New England, of extremely cold winters and hot, humid summers were another factor behind the decision to make the house as compact as possible. Climate also contributed to the need for a tree planting program around the house to protect it from cold winter wind and hot summer sun. Even though there was an abundant apple orchard at the bottom of the hilly site, the top was devoid of trees, and so a selection process of the right species to use as well as a planting program took equal priority with the construction of the house itself. The entire field of landscape architecture that

would complement its Modernist equivalent was then in its infancy, and Harvard led the way in this area, producing designers such as Garrett Eckbo, Dan Kiley, and James Rose during the Gropius years.²⁴ In addition to a purely functional purpose of environmental mitigation, the trees around the Gropius house were strategically placed to help blur the boundaries between inside and out, and to break down the severe angularity of the rectilinear surfaces of the house.

The House The jauntily angled marquee that connects the circular entrance driveway to the front door to protect people from rain or snow leads into a modest entrance hall at the core of the rectangular plan, containing an open alcove for coats and the main stair. A long narrow galley kitchen perpendicular to this hall separates it from the screened-in porch, of the same width as the entry space, which projects out, in line with it, toward the back garden. This was a deliberate decision proudly described by Ise Gropius as the desire to make “the design of the house totally asymmetrical, showing no conventional façade and departing from all accepted rules of that time by extending the screened porch at right angles to the rear of the house.”²⁵ The ceiling height of the lower floor, however, is fairly conventional being just over eight feet high, while that of the upper level is seven inches less. Gropius covered some of the walls in vertical clapboard, also painted white, as a deliberate twist on the regional tradition of using it on the exterior of a house in a horizontal configuration.

The master bedroom and bathroom suite is located at the far end of the upper level, opposite the roof deck, on one side. The bedroom and bath suite for the couple’s daughter is located at the other, and a guest room is placed in between, closest to the stairway.

Using the Bauhaus furniture that they had brought with them from Germany was another important consideration for Walter and Ise Gropius as they planned their house, with spaces kept as open as possible to accommodate all of it.

All of the other rooms on the ground floor spin outward from the entrance hall, which is slightly left of center, such as a study, living room, and dining room to the right of it, and a maid’s bedroom and bath, accessible through the long galley kitchen, at the left. The upstairs was retained as a private zone, with all rooms except the roof deck at the western end also being directly accessible from the central hall.

The Philip Johnson Glass House

Philip Johnson, who died in 2005 at the age of 98, was almost single-handedly responsible for introducing the architectural aesthetic of High Modernism into the American context. Johnson wielded enormous influence as a tastemaker in the early part of his career in his role as a curator in the architectural section of the Museum of Modern Art in New York City in the early 1930s. Even after he left that post, he continued to exercise that self-designated authority throughout the rest of his long career.

Johnson traveled throughout Europe just prior to World War II, with a specific focus on Germany. While he was there, he met with many of the leaders of the Modern Movement just before they emigrated to the United States. Several of these were closely associated with the Bauhaus, which was closed because of

political pressure. While he was visiting Germany, he was able to identify a consistent set of architectural principles, resulting in a formal tectonic position that he and historian Henry-Russell Hitchcock would later refer to as “The International Style.” They grouped these together and presented them in an exhibition they had organized at the Museum of Modern Art after Johnson’s return to New York. This exhibition had a profound impact that, in retrospect, may now be seen to be directly proportional to the growing influence of the media at that time and its ability to shape public opinion.

Universal Applications Johnson and Hitchcock chose the name “International Style” for the collection of projects that they included in their groundbreaking exhibition because each of them conformed to the basic Modernist belief in the need for a contextualism and a historicism, as well as because of the fact that the selection included countries other than Germany. The basic idea that all of the work conveyed, however, was that of uniformity, pragmatism, standardization, and interchangeability, centered in the idea that technology can level out all environmental extremes. Different architectural strategies were not felt to be necessary to do this.

Ludwig Mies van der Rohe was one of the most prominent and doctrinaire members of this movement in Germany, and he became Johnson’s mentor. The young curator, who was the scion of one of the wealthiest families in America, facilitated the German master’s decision to emigrate to America, where he became the head of the architectural program at the Illinois Institute of Technology. In turn, Mies van der Rohe was instrumental in convincing Johnson to get an architectural degree, and he enrolled at Harvard, where Walter Gropius was the director, just prior to the war.

After he graduated, Johnson collaborated with Mies van der Rohe on the design of the Seagram Building in New York City, which in retrospect represents the apogee of the public representation of the style in America. The Lever House tower by Gordon Bunshaft, at Skidmore, Owings, and Merrill, completed in 1951, illustrates the virtues of the Seagram Building by comparison, since it replaces the custom-made technology utilized by Mies van der Rohe and Johnson, with the more standardized approach that would then become the norm in corporate buildings in America for the next decade.

Johnson helped Mies van der Rohe assemble a collection of Mies van der Rohe’s work for exhibition at the Museum of Modern Art between 1946 and 1947, and this was to have seismic reverberations throughout the architectural community in America as well. Coinciding as it did with the end of the war and the crest of optimism and joy that this caused, the Mies van der Rohe exhibition held out the promise of a minimal, efficient, and technological future, free of the stuffiness and burdens of the past. Charles and Ray Eames, for example, who were soon to produce their own estimable contribution to the movement toward Modernism in America in their design of a house and office for themselves in Pacific Palisades that is now considered a classic in its own right and is discussed elsewhere here, changed their original concept after attending the exhibition. They were concerned that it coincidentally seemed similar to one that Mies van der Rohe had included in the show, and they did not want to be seen to be derivative.²⁶

Farnsworth House During the preparation for that exhibition, Johnson saw the drawings for a house that Mies van der Rohe was designing for Edith Farnsworth in Plano, Illinois, not far from the IIT campus where Mies van der Rohe had begun to hold court. The Farnsworth house consists of two side-by-side, shifted rectangles, which are each raised up above the ground by steel columns. The first of these, which is just a flat, open platform, is used as an entrance deck and is offset from the main house, which it is joined to. The house, as the second rectangle, is raised even farther off the ground, and it is sheathed entirely in glass between the columns from the flat floor to the flat roof of the long, thin, one-story structure. This design is a severe rationalization of the Tugendhat House in Brno, Czechoslovakia, which is more compartmentalized as befits the needs of a larger family with servants. The Farnsworth house was designed for a single woman, and a modest one at that, and so it created a great deal of controversy when it was built because of its lack of privacy.

The Glass House In 1949, Philip Johnson built a 1,728 square foot glass pavilion of his own at the edge of a ridge near the middle of a 47-acre estate he owned in New Canaan, Connecticut. Although it is similar to Mies van der Rohe's Farnsworth House in its almost complete glass wrapper and flat roof, it differs from it in several important respects.

The first difference is that unlike the Farnsworth House, which is elevated above the ground on steel columns that then continue upward to support both the floor and the roof, and which also has a separate adjacent platform that Mies van der Rohe used as an entry deck, the Johnson House is a single rectangular volume that sits on a brick pad, directly on the ground. The reason for the difference relates to the site conditions in each case. The Farnsworth House is located in a low-lying field near a stream, and so it had to be raised to be above the flood plain. The Johnson House is located at the edge of a ridge overlooking a park-like setting below, with a stand of oak and maple trees around it. While both houses are built of structural steel, the Farnsworth House is painted white, and the New Canaan pavilion is painted black. The choice of color in each instance reveals a deeper attitude toward nature. The Farnsworth House has the appearance of an elegant yacht sailing across a sea of grass, surrounded by a forest. Following that metaphor, nature becomes the background to a fantasy of escape from the real world into a private realm, and is not meant to be engaged. The platform in front of the house is an intermediated zone between nature and the rarefied world inside the glass walls of the house, but unlike the Japanese *engawa*, which is used as a seating area from which to contemplate the beauty of the garden just beyond the final step down to ground level, the platform of the Farnsworth house is little more than a glorified, open foyer.

Johnson's Glass House, on the other hand, is literally grounded in nature and is a viewing platform from which to appreciate the verdant beauty of the wooded estate around and below it. Its brick floor is a processed version of the earth on which it rests, eloquently mitigating between technology and the environment. The glass panels that enclose the house are fixed, and so there is no doubt that the house is also a hermetically sealed capsule, in the same way that its Miesian precedent is, but Johnson obviously did share the particularly American sensibility of having a love of the outdoors.

Robert Venturi: The Vanna Venturi House

The Vanna Venturi House is one of the most important works of architecture from the twentieth century. In order to fully appreciate its significance, it is necessary to describe the role that its architect, Robert Venturi, and his partner, Denise Scott Brown, played in challenging the prevailing attitudes of the time, and the way in which the house reflects that apostasy.

Robert Venturi is as well known as a theoretician as he has been for the buildings he has designed. He has been somewhat of an anomaly throughout his distinguished career, consistently outdistancing even the most original thinkers in the architectural avant-garde with the freshness of his ideas. Venturi and Scott Brown continue to personify and perpetuate the original spirit that began in Philadelphia in the late 1950s and early 1960s. If the attentions of an increasingly fashion-conscious profession and the public that followed it may now have focused elsewhere, something very substantial took place in Philadelphia during a period that lasted roughly from 1955 to 1974, with architectural repercussions that continue to surface in surprising and unexpected ways today. The University of Pennsylvania, under the leadership of Dean G. Holmes Perkins, then began to be the focal point of a daunting array of talent at that time. Louis I. Kahn was unquestionably the spiritual leader of the school, and others, such as Aldo Giurgola and Ian McHarg, had, and still continue to have, considerable influence. But the work that Robert Venturi was doing there in the early 1960s unquestionably generated great excitement, and he developed a sizable following.

Complexity and Contradiction Venturi's book *Complexity and Contradiction in Architecture*, which was first released in 1966, had received an extensive preview in the Yale journal *Perspecta* one year earlier. The issue soon spread quickly through the studios of schools throughout the country.

The book itself began as personal footnotes to a course in architectural theory that Venturi taught at Penn, with more than 350 small examples used as a series of lecture slides to incrementally establish an irrefutable thesis that has now been widely recognized as having totally changed the direction of architecture. Rather than simply being an attack on the Modern Movement, *Complexity and Contradiction* was a plea for a more interesting and humane alternative.

The thesis of the book is simply that buildings that have several complex design criteria are far more interesting than those that do not, and that less, rather than being more, as leading Modernist Mies van der Rohe famously said, is simply a bore. As the architectural equivalent of a child's recognition of a king's nakedness in the fable about the emperor's new clothes, Venturi's book eventually served to expose the weaknesses of the Modern Movement and was a critical factor in its decline. As a member of what author Tom Wolfe has called the "academic compound" himself, Venturi was able to put forward arguments that others outside of it had not dared to formulate. He knew how to structure those arguments most effectively. Since *Complexity and Contradiction* is organized in a lecture format, with points emphasized with images, there is a real, cumulative sense of an irrefutable position being established, and of a limiting intellectual barrier being dismantled piece by piece. As such, the book is a legitimate antidote to *Vers Une Architecture*, which was written to proclaim the beginning of the Modern Movement more than

four decades earlier, serving as a self-proclaimed “Gentle Manifesto” set in opposition to that more strident call by Le Corbusier. The proposals put forward by Venturi for an architecture that was complex rather than simple, related to history and context rather than being dismissive of it, symbolic and ornamental rather than intentionally codeless, and humorous rather than deadly serious, were all part of what he called the circumstantial and ordinary aspects of everyday life. His recognition of the important place of all of these elements in the significant architecture of the past, as well as in meaningful direction in the future, elicited an eager response, and eventually served as one of the main building blocks of the Postmodern Movement that followed.

Venturi’s “Gentle Manifesto” also shared space with Louis Kahn’s latest projects in that prescient 1965 issue of *Perspecta*, the journal of the Yale School of Architecture, reflecting the symbiotic as well as competitive relationship that existed between them. In briefly comparing the two, it should first be noted that each had a firm basis in Modernist theory. As Robert Venturi himself has said: “I have never intended to totally reject Modern architecture in words or work because I do, and I think our architecture should, in important ways, evolve out of it, not revolt against it. Its masterpieces hold their own with those of any age.”²⁷ But, what are those “important ways”? For Kahn the answer has much to do with buildings such as the Richards Medical Laboratory and the Dacca Assembly Hall, which are examples of a kind of historical abstraction that was considered to be acceptable by the Modernists. In this abstraction, specific monuments from the past were deemed suitable for inspiration, but not direct quotation, leading Kahn to include Scottish castles, the towers of San Gimignano, and the temples at Paestum among his sources. For Venturi and Scott Brown this kind of abstraction has also been consistently present, but because a more comprehensive, and virtually encyclopedic, recollection of architectural history lies behind the selection of the references, they tend to be overlaid upon each other in ways that are frequently unintelligible to those who are less knowledgeable.

The Vanna Venturi House, which will be examined here, was designed for the architect’s mother and is one of the first instances of this kind of overlay; Michelangelo’s Porta Pia, Le Corbusier’s Villa Stein de Monzie at Garches, and Palladio’s Villa Barbaro at Maser, as well as the fundamental generic symbol for a Classical pediment are all present, just for a start. Such multiple references can be identified in virtually every design that the firm has produced, paradoxically becoming one of the ways that it makes a commentary on Modernism.

Venturi and Kahn may have shared a penchant for historical abstraction to varying degrees, based on the differences in their awareness of sources, but they most certainly parted company over a strong emphasis on structuralism that was promoted by Kahn’s engineer, August Kommendant, as well as on the concepts of “existence will” and “served” and “servant” spaces, which Kahn used as further refinements of Functionalism. While *Complexity and Contradiction* may have shocked purists who still believed that less was more, its historicism was still understandable and acceptable. With the publication of *Learning from Las Vegas* in 1972, however, a definite schism was opened between the two. Aside from the obvious heresy of proposing that such a crassly commercial example as Las Vegas could help teach architects how to synthesize irrefutable aspects of popular culture and

the built environment and to communicate them more effectively to others, the final formalization of Venturi's ideas of the "duck" and "the decorated shed" make this book just as significant. As *Complexity and Contradiction* Kahn's "wrapping ruins" around the unbuilt meeting place of the Salk Institute and the exterior zone of the Dacca Assembly, which many feel had been inspired by Venturi's first use of layering at the North Penn Visiting Nurse Association Building in Ambler in 1961, show a flirtation with the separation of form and function, but falls far short of the divorce from Modernist doctrine represented by *Learning from Las Vegas*.

Denise Scott Brown Robert Venturi's collaboration with Denise Scott Brown started in 1964, just before the Vanna Venturi house appeared. It added an entirely new and much more humanistic dimension to the firm, leavening it with social consciousness as a more inclusive and wide-ranging agenda of concerns began to emerge.

Denise Scott Brown entered the Architectural Association in London as a fourth-year student in 1952, and soon became interested in the work of Alison and Peter Smithson, who were part of the Independent Group at the Institute of Contemporary Art. She, with a small number of students from the AA, sought them out before they became well known in the profession, and their ideas had a lasting influence on her.

"As I understood the Smithson phrase 'active socio-plastics,'" she has said, "it meant that architects should design for the real life of the street and for the way communities actually work, even if the results are not conventionally pleasing. There was, I think, an unspoken desire to derive, from a community life that was not immediately beautiful, a deeper beauty, and an intention not to abandon architecture but to make it socially relevant."²⁸

Following this, she went to the University of Pennsylvania in 1958, where she was taught by the urban sociologist Herbert Gans, who reinforced the Smithsons' idea that processes and patterns could be discovered and built upon if approached with an open mind.

Learning from Las Vegas; a Second Manifesto Finding and expressing those patterns, as well as the significance behind social norms, has been one of the main goals of the firm since Scott Brown has become involved with it. That determination is certainly evident in *Learning from Las Vegas*, which is unequivocal in its expression of support for variety over uniformity. For evidence of this view, it is only necessary to read the chapter in it entitled, "Theory of Ugly and Ordinary and Related and Contrary Theories," which presents one of the clearest and most perceptive criticisms of the Modern Movement that has ever been written. This analysis has lost none of its polemic pertinence. As a plea to architects to look at the world as "what it is" rather than "what it ought to be," the "Theory of Ugly and Ordinary" is a statement of disbelief in the prevailing attitude of exclusivity that was an essential part of the Modern Movement at the time. While representing a natural extension of the ideas first put forward in *Complexity and Contradiction*, *Learning from Las Vegas* presents them in a more empirical and less historically referential way. In expanding upon the innovative work by Donald Appleyard, Kevin Lynch, and John Myer in *The View from the Road*, for example, Venturi, Scott

Brown, and Steven Izenour have added a qualitative dimension to this underestimated but important field of study, and they confirm a reality that has yet to be acknowledged by architects today.

An Enduring Contribution The contribution that Venturi and Scott Brown have made to the diverse architectural scene today as well as the revolution they started, and the rancor that surrounded it, has largely been forgotten today, which provides a poignant reminder of the selective public memory that has become symptomatic of the Information Age. In the relatively short period of time since the Vanna Venturi house appeared and *Complexity and Contradiction* and *Learning from Las Vegas* were written, a social cycle, at least in the Western world, has been completed. The consequence of too much information and too little time to absorb it, this condition has not only been accompanied by collective amnesia but also by a baffling proliferation of literary allusions that go far beyond the original intention of Venturi and Scott Brown to use words in order to prompt linguistic associations with architecture. As a consequence, words have become an indispensable aegis of authority for all aspiring architects and books have become shields to hide behind rather than sources of fresh ideas. Where it may once have been necessary to do professional battle in order to establish the fact that architecture, like language, has semiological components that can be effectively utilized to send signals to those experiencing it, words are now seen as being substitutes for, rather than analogous to, built reality. Architecture is no longer considered to be like a text, but has become the text itself, and, as a result, each new movement is considered to be illegitimate without a titular sage to give it literary credibility.

A Continuing Tendency toward Exclusivity The tendency toward exclusivity, which has plagued the profession since architects began to think of themselves as individual creative agents, now seems to have been magnified. Architects in the developed world, at least, still appear to be closed off, and architecture remains a highly ritualized profession with an elaborate initiation procedure. The double-edged literary sword that Venturi and Scott Brown introduced so effectively in their books is now being used to attack their basic premise.

Venturi, in both a lecture entitled, "Diversity, Relevance and Representation in Historicism, or *Plus ça Change*," delivered in 1982, and a joint presentation with Denise Scott Brown called "Architecture as Shelter, City as Decon" given ten years later in London, has stated that postmodernism, in spite of all the convoluted theorizing of its advocates, turned out to be just as restrictive as its exclusive Modernist predecessor. In "Diversity, Relevance and Representation in Historicism or *Plus ça change*," which was also published in *Architectural Record* nearly 20 years after *Complexity and Contradiction* appeared, Venturi described how postmodernism had used different images than Modernism, but had retained the same exclusivity and rigidity of principles. As such, it had become nothing more than a lockstep sequel to the ideology it had sought to democratize, and had even failed in the relatively simple task of contextual fit that it had set for itself. It once again developed into a conversation between architects, replete with in jokes, rather than the dialogue between architects and the public that it was originally intended to be.

From Exclusivity to Plurality In his own work, Venturi has consistently sought to do otherwise, and in the process has managed to convince several generations of architects that the commonplace and everyday built environment cannot be

willed out of existence, and is “almost alright.” The mere thought of using conventional elements in a building at first shocked many practitioners, but Venturi’s own deft handling eventually convinced even the most reluctant of them that the ordinary could become extraordinary in the right circumstances. Where the Modernists had felt it was necessary to educate and elevate public taste, Venturi and Scott Brown have instead been able to convince architects to accept and improve upon it.

The Vanna Venturi House As expressed in his architecture, his original thesis in *Complexity and Contradiction* constantly surfaces as a struggle between the interior requirements of a building and those of its exterior envelope. This, in turn, typically leads to conflict, ending in the separation and eventual divorce of the two. In one of his most well-known designs, for Venturi’s mother’s house in Chestnut Hill near Philadelphia, this struggle is acted out between the topographical requirements of a formal, front entry and the main interior stair. The most obvious example of this deliberate conflict is the clash between the main entrance and the central hearth, which is deliberately placed in the path of entry to provide privacy for the interior. This battle is further complicated by the insertion of a stair between the entry and the hearth, which is distorted by the demands of each. As in a project simply called the Beach House in New Jersey that preceded it, this intentional dichotomy, once accepted, eventually seems to give the entire plan a focus. As Venturi has described it:

This house has a central core containing fireplace, chimney, and stair, as well as entrance. This is not a Classical configuration, because Classical plans usually contain



The house that Robert Venturi designed for his mother Vanna, which is located in Chestnut Hill, north of Philadelphia, Pennsylvania, has historical significance far beyond its modest scale. *Source:* Venturi; Scott Brown Associates

space at the center; but the core generates axial symmetry. The symmetry disintegrates however at the edge, to accommodate particular requirements of the plan. We think setting up an order and then breaking it is in the Mannerist tradition of Classical architecture.²⁹

The axiality and the violation of it that he speaks of begins in the siting of the house, slightly off-center of a long, gently angled driveway, only lined with trees along its southern edge. The façade facing this quasi-formal approach, which has now become as iconic in the history of contemporary architecture as that of the Villa Savoye or Fallingwater, which keep it company at that exalted level, is testimony to Venturi's idea of the decorated shed, put forward in *Complexity and Contradiction*. It is intended to send both conscious and subliminal messages rather than being an expression of form follows function in the conventional Modernist sense. The use of various parts of this house as a built syntax with which to speak to observers and those who live in it paralleled a growing interest in semiotics and linguistic theory at the time the Vanna Venturi house appeared, as a way of literally communicating more effectively with the public. In the instance of the Venturi house façade, the level of that communication is nuanced. It begins with the scale, which is much larger than it has to be to convey the intention that the front elevation is a sign, or billboard announcing its purpose, rather than a literal description of its function. The top of the sign is angled to recall a gabled roof and, more essentially, the idea of shelter. The gable, however, is split at the top, which implies a fissure, in reference to the growing stress on the conventional family of America in the early 1960s when this house was built and to the rising divorce rate that tracked that shift. A wide vertical shaft behind the rift, which looks like a chimney and initially conveys the image of hearth and home associated with a fireplace, is actually much wider than it needs to be. This only becomes apparent when viewing the house from the park behind, when the small flues of the real fireplace become visible. Once again, the metaphorical message is that the image of domesticity conveyed by the chimney-like element on the front is not what it seems. This kind of distortion continues with the door, the windows, and an oversized dado on the front elevation. The front door, or what appears to be the main entrance, is really just an oversized covered opening, which is still outside, leading to a pair of doors that are hidden from direct view, inside on the right. Windows are used in symbolic ways, as well, most notably a large square one on the far left side of the façade. Here Venturi wanted to return the window to its traditional role of being what he described as "a hole in the wall," in contrast to the Modernist idea of the wall being an integral surface that should not be violated. "In Modern architecture," he said, "the ideal was not a hole in the wall, which negated the integrity of the wall, but an interruption of wall, an absence of wall, which promoted flowing space and abrogated enclosed space."³⁰ His large square window, divided by mullions into four equal parts is intended to be reminiscent of traditional windows, even though those in vernacular residential American history were never of this scale or configuration.

Lastly, the stylized overscaled dado that Venturi uses on the exterior of the front wall reiterates his theme of domestic tranquility being threatened by social forces as yet unseen in America, first hinted at in the splitting of the gable and the false

solidity of the chimney. The dado was typically used in houses in the past on the inside, in heavily used rooms where chair backs, pushed against a plaster wall could cause damage. It disappeared, except when used as a conceit, in contemporary houses, because drywall or plasterboard is used extensively now, and if it is dented it can be easily repaired using spackle and paint. By placing an overscaled replica of a dado on the entrance façade, Venturi seems to be implying that domestic values have now been turned inside out.

Distorted Symmetry as a Concept Such symmetrical considerations are also prevalent in another house in Greenwich, Connecticut, of 1970, which in spite of its apparent disregard for balance, conforms to a grid similar to that used by Palladio at the Villa Thiene at Cicogna. This provides a tantalizing hint that Rowe's *The Mathematics of the Ideal Villa* might profitably be extended in this direction as well. While its siting at the crest of a trimmed greensward, as well as the unbuilt English manor house that was later proposed as an addition, would seem to argue for the predominance of a romantic aesthetic here, repetition of the "broken order" seen in the Vanna Venturi house as well as an inverted bow fronted "Palladian" façade tend to prevail.

A similar kind of duality is evident in the Trubeck and Wislocki Houses built in the same year on Nantucket. In this case, however, a local Wauwinet cottage type contends with the Classical influence, which is only subliminally present in the pedimented temple forms of both houses, as well as their inflected conversational orientation toward the sea, which intentionally recalls the positions of Temples E and F at Selinunte. Rather than being organized along a longitudinal grid, each of these cottages related to a cross-axis, with the Trubeck House stair breaking the symmetry more obviously than any such disruption in the plan of its diminutive partner.

A Local Prototype A similar local prototype also governed in the planning of the house in Delaware built in 1978, which is reminiscent of the barns that are common to the area. Like the house in Connecticut, it also commands a large green, tree-lined site, and the bucolic, farm-like image that it conveys is further amplified with small details, such as a stylized garden trellis/pergola that acts as a gateway between the driveway and the woods beyond. Two overscaled lunettes, however, layered over the east and west elevations of the house, compete with this image, to superimpose a separate meaning of their own. While only the lunette on the western elevation uses an exaggerated, flat Doric colonnade for support, both arches are combined with a pedimented gable to evoke primal, basilican forms that might seem totally extraneous to the rural idyll as first perceived.

While contradictory at first sight, the flattened Doric colonnade of this house, which initially looks like a caricature of the Order it mimics, actually answers to a nearby wood that comes close to the house at this point. In this way it is similar to the monumental order of the Temple of Poseidon at Paestum or the Heraion at Olympia, which both clearly show the evolution of Greek construction from timber to stone and relate to their own natural surroundings. In a discussion of the relations between the column and the tree trunk, which was its original form, Demetri Porphyrios has used a comparison between David Humes's analyses of entasis in *A Treatise on Human Nature* with Le Corbusier's geometric view of the same relationship. As a conclusion to this, Porphyrios has said:

Both Hume and Le Corbusier speak of the way in which the column imitates the tree. Neither of the two speaks of actually reproducing a tree. Hume discovers in nature's workings an anthropomorphic image. Le Corbusier, on the other hand, discovers in nature a geometricity, which is made pertinent by his admiration for the precision and exactitude of the machine. The Classical imagination looks at the tree trunk and sees in it an image of stability which it commemorates in the form of the entasis of the column.³¹

In the exaggeration of the entasis then, the essence of the natural beginning of the column is isolated here. The columns were originally designed to be round, but were later made flat, so that they become a caricature of a Classical column, serving as a signifier rather than a literal copy of the original.

In this sense, this arcade also recalls a particularly Albertian attitude toward the colonnade as ornament, rather than structure, as it was in antiquity. Whether it was determined to be this way through an intentional revision of Classical archetypes, as some would have it, or was the result of ease of access to late Hellenistic and Roman examples, the fact remains that Alberti did not view the column as an independent element, but as the load-bearing part of a solid wall, and the linear equivalent of a vertical line of force. The multivalency presented by this one part of the house in Delaware, where a single colonnade represents the exaggerated, vernacularized shadow of nearby trees, an Albertian translation of an ornamental absence of wall, and the formal echo of the nostalgically rural typology embodied in the house itself, is indicative of the level of sophistication present in the exploration of these two themes.

As incongruous as the connection may seem, Venturi himself has stated that he sees his work as an extension of Modernism rather than the antithesis of it, and as such, his fascination with these themes places him within the tradition of German Romantic Classicism on the Miesian side of the movement rather than in sympathy with the machine aesthetic of Le Corbusier. In his sympathetic alignment with Schiller and Schinkel, rather than Chandigarh, Venturi extends the sympathetic humanistic strain of Modernism that is frequently forgotten today, and while Mies van der Rohe has now been faulted for his cold, antisocial minimalism in glass and steel, it should be remembered that the Carolingian Cathedral in his hometown of Aachen remained a frequently quoted source in his early work, and he saw the New National Gallery in Berlin, which was one of his last buildings, as the contemporary parallel to the Neoclassicism of the Altes Museum.

Complexity and Confrontation An unequivocal attitude toward the importance of the wall, as well as to the house as a shelter, rather than the Modernist glazed pavilion exposed to public view, is especially evident in the early plans of the Wike and D'Agostino projects, as well as in the roof forms of Vanna Venturi, the Tucker House, and the ski lodge at Vail. This feeling for the protectiveness of the wall, in particular, has had a singular influence upon many architects today, who have generally tended to mistake introspection for living under siege. The consistent theme of conflict in each of these houses comes from the discrepancies that are frequently discovered between form and function in both plan and elevation, and are always consistent with Venturi's thesis of *Complexity and Contradiction*.

If these conflicts seem disconcerting and possibly avoidable, they begin to take on certain logic with familiarity, as is the case in the house in Tuckers Town, Bermuda, completed in 1975. The “broken order” first mentioned by Venturi in reference to the Vanna Venturi house is repeated here, most noticeably in the shifted axis of the main entrance. In this case, the front door slides across the façade to accommodate the hierarchical claims of the library on one hand and the guesthouse on the other, which both share a vestibule with the main reception rooms in the center. The angular contortions and intersections that result from this tripartite need also produce a house that is delightfully comfortable on its hillside overlooking the sea.

Two subsequent houses, on Long Island and in Maine, are even more gracious, in the best Shingle Style tradition, and are reminiscent of the mansions designed by Peabody and Stern, William H. Dabney Jr., or McKim, Mead, and White just before the turn of the century. Rather than being stiff, formal exercises in this genre, these houses evoke a genuine sense of nostalgia for an idyllic time in America’s past, recalling straw hats and white linen, as well as long hot summer nights spent sipping lemonade on a veranda overlooking a vast expanse of green lawn. This is a dignified, rather than introspective or antisocial, architecture, which is particularly noteworthy in that it comes from the same office that first charted the course through the collapse of idealism for many in the past. While they have now taught generations of architects how to cope with this age of diminished expectations, Venturi and Scott Brown have shown in these last houses that it is also possible, against all odds, to discover ideals once again, and the reasons for doing so defy the referential analysis that has typically been used to attempt to explain their intentions. The latest houses go far beyond the artificial creation of a heritage that has been so common in a comparatively young country that has always had such a craving for history of its own. They mark a turning point at which America needs to be reminded that it is now in danger of losing the traditions that it has, and they point toward the future by effectively reinterpreting the past.

The White House

The White House in Washington, D.C., has become such a ubiquitous national symbol that few Americans ever give a second thought about its origins, let alone the fact that it is actually a house. As for its sources, it can have no more valid historical authority than it has, having been initiated, planned, approved, and staked out by none other than George Washington himself, just before and during the start of his tenure as the first President of the United States of America.

A Basic Contradiction The need for a house for the presidential family was not a foregone conclusion in America after the Revolutionary War had been won. It was as much in question as the idea of a capital city itself to a group of leaders and a nation that had just freed itself from the domination of a world power. It was Washington who promoted the idea of a federal capital, and he wanted it, and the presidential residence within it, to be the equal of anything in Europe. An area called Columbia, with obvious reference to the discovery of America by Christopher Columbus, was set aside as a separate district on land ceded to the new federal government by the States of Maryland and Virginia. The plan for the new city was

designed by French urbanist Pierre Charles L'Enfant and is a brilliant solution to problems posed by difficult topographical conditions, accommodating a low-lying wedge-shaped piece of land at the intersection of the Potomac River basin. L'Enfant's plan is essentially a gridiron layout, but it is crisscrossed with a series of diagonal avenues that roughly conform to the divergent angles of the two branches of the Potomac that make up the southern border of the city. These diagonals provide sweeping vistas in a way that a gridiron plan cannot, regardless of the width of the streets used in it, and they encourage monumental landmarks at their intersections.

The President's House was intended to be one of these landmarks and was originally planned at a scale felt to be large enough to hold its own in that category. A Residence Act, passed by Congress, finally gave official governmental approval for the house in 1790, setting a mandatory date of 1800 for its completion. As the construction of the infrastructure for the new capital city on the Potomac advanced, a basement was dug for it, based on preliminary estimates of its size, and the search for an appropriate design was then underway.

Thomas Jefferson as a Contender It is ironic that Thomas Jefferson, who was Washington's Secretary of State at the time, was available for consultation on the design of the President's House but was not selected to do so. He was certainly capable of giving it, since he was an exceptionally talented, self-taught architect, who had designed his own residence, called Monticello, in nearby Virginia and had consulted on the layout of the University of Virginia as well. And yet, there was a sense of competition in this area between the two since Washington was confident of his own abilities in this area because he had planned his own private residence of Mount Vernon as well and was probably too proud to ask Jefferson for advice. Instead, Washington agreed to open up the search to a national competition, while searching privately for a likely candidate to design and build the house. Jefferson was forced to resort to the humiliating subterfuge of having a surrogate submit his design, which looks remarkably like *La Rotunda*, or the Villa Capra, by Andrea Palladio, complete with its four distinctive temple fronts and dome.³²

James Hoban to the Rescue Henry Laurens, who was a friend of Washington's and who lived in Charleston, South Carolina, recommended an Irish-American architect and builder named James Hoban to the President. Hoban was young, energetic, and accommodating, and Washington liked him.³³ He started by surveying the foundation that had already been built and based his design on a residence, called Leinster House, that he had come to know while he was a student at the Drawing School of the Royal Dublin Society. Washington knew the family that lived there, especially Edward Fitzgerald, who had fought on the American side during the war, and had been held in Charleston as a prisoner of war by the British.³⁴ Hoban had been apprenticed to an architect who was an advocate of Neoclassicism, and so would have been well versed in the Palladian Revival then taking place during the Georgian Period in London. Washington officially selected James Hoban as architect on July 16, 1792.

Hoban had difficulty accommodating the dimensions of the existing basement to the scale of Leinster House, but quickly made the adjustments necessary to each to make his design work. It was a three-story high Palladian mansion, about one-

fourth the size of the house Washington and L'Enfant had anticipated, but still much larger than any public residence that Americans had seen before. Several pretenders had been built by city authorities in New York and Philadelphia during the 1790s, in the hope that both the federal capitol and the President's House that had been planned for the District of Columbia would not materialize, and that Congress and the president, would turn to them as an alternative. Each of the houses that were built to lure Washington to them were similar in some ways to Hoban's design, with the one built in New York being closest in intent. It also has a raised podium base and projecting temple front, but is not even close to the scale of the residence that was finally completed in Washington, D.C., in 1798.

Washington had been a surveyor before his service in the French and Indian War. He was the one who finally settled the debate about where his house should be sited. He selected the northern edge of the larger rectangular basement that had been prepared for it and in doing so, pulled it back from Pennsylvania Avenue toward a park to the north. This denied L'Enfant's original intention of having the house terminate a vista along the avenue and of having it and the United States Capitol Building at the other end act as visual anchors for the wide thoroughfare.

But, this adjustment did allow for the house to more easily accommodate its difficult, double function as both a national institution and a private home, with the north side, facing Pennsylvania Avenue becoming the public side, and the south side, facing a park that has now been reduced to the South Lawn, serving as the presidential residence. A cornice, which wraps around the entire rectangular perimeter, unites the front and back, but their elevations are different. The rusticated podium base, which is evident on the south side, is missing on the north, where a prominent temple front, that once intended to act as a *porte cochere*, projects out, pulling visual emphasis on the main entrance.

The front, as it exists, has a pediment supported by Ionic columns, over a pair of doors that serve as the main entrance, covered by a fan lunette. It is flanked by five windows on each side, crowned by alternating arched and angled pediments in the manner favored by Michelangelo, in such projects as his vestibule for the Laurentian Library in Florence. These windows have very low sill heights, giving them a long elegant profile, while those on the third story directly above them, which have no pediments, are shorter. Both the longer, lower rank and the shorter, upper one have supporting brackets under each ledge, which, while modest, reinforces the connection between this presidential residence and its Palladian heritage, as well as between that reinterpretation of Renaissance principles, and its origins, in the work of Michelangelo, who was the greatest Renaissance architect of all.

Remarkable Stonework Perhaps the fourth major surprise to a layperson with little knowledge of the history of the White House, following the revelations that Jefferson surreptitiously entered the competition to design it, and that Washington not only skirted the competition process to find a designer that he liked, but also drove the stakes for his house himself, is that it is made of stone. Its anonymous white shell hides its substructure so well that it is difficult to tell what it is made of. But, the White House, as it came to be called because of its thick coating of paint over the whitewash necessary to seal its Agua Creek sandstone walls because of their porosity, is decidedly a masonry building. Scottish masons from Edinburgh

were brought over to cut the stone, build the wall, and carve the rustication, the quoins, and other decorative elements to a level of excellence rarely seen before or since.³⁵ Their skill is most evident on the south side, looking up from the South Lawn. When the building received a major cleaning and repainting in 1990, and layers of covering were removed, the individual marks of the original stone masons were exposed, showing that the crew followed a custom dating back to the building of the pyramids in which each mason was paid at the end of the day according to the number of his “banker” marks cut into the stones that he had completed, rather than being paid an hourly wage.³⁶ More than 30 professional masons built the White House, according to the different marks that have been found. As soon as it was completed, however, the house was covered with whitewash to seal the stone, which was pale grey, and the whitewash was mixed following a unique recipe that included salt, glue, and ground rice, as well as the usual mixture of lime and water, that allowed it to be applied like paint.³⁷

A Tragic Loss Washington managed to serve out his entire presidency, from 1789 until 1797, while living in the house that he had played such a formative role in having designed and built, but the British were not through with America just yet. The War of 1812, based mostly on the economic competition that the young nation was beginning to present to Britain, acted out mainly through naval clashes on the trade routes across the Atlantic and in the Caribbean, led to British invasion. They marched on Washington in the late summer of 1814, and, after setting fire to the Capitol and helping themselves to food that Dolley Madison had set out for guests before fleeing for her life, they torched the White House.³⁸

After the British were defeated by Andrew Jackson at the Battle of New Orleans in January 1815, the rebuilding of the house that had soon become one of the most potent symbols of American identity became a national priority, quite unlike the hesitation that had plagued its construction in the first place. President James Madison helped to ensure that, as it was rebuilt, the White House was as close to the original as possible.

THE SOUTH

The Shotgun House

The shotgun house type has been traced back to New Orleans in the early 1800s, when a group of Haitians, who had left the island after a slave rebellion against the French had settled there, built a community of the houses that started the form. From that point, it has been tracked further to the Yoruba compounds of West Africa, which is where a majority of slaves came from.³⁹ At the Yoruba source, houses are placed in a cluster around a central space. The emphasis is on the group, or the tribe, rather than the individual, and the family and its extended members were more important than any single member of it. This focus included the recognition of deceased ancestors as well.

Like the Yoruba houses, the dwellings in New Orleans also had one room, and they were built in rows on both sides of a block so that the backs of the long narrow units faced onto a common open space between them, like an elongated open

courtyard. This court served as a combination social space, cooking area, playground for children, place to wash laundry and hang it out to dry, and area for entertainment.

After slavery was abolished in the United States, African Americans adopted the shotgun house as their own, and it has since come to be identified with their history and cultural traditions.⁴⁰ The name of the house comes from the fact that the circulation of the long narrow plan runs continuously along one side from front to back, so that a gunshot fired through the front door could go straight out the back door without hitting anything.

As the house evolved and became even more closely associated with a collective identity, slight refinements were made to improve on its already abundant climactic and social advantages. The single-story units, which rarely exceed 600 to 700 square feet in area, started to become the beneficiary of the same mass production techniques that were used on the bungalow, which became extremely popular in America in the decades just before World War I. Like the shotgun, the bungalow is also raised up off the ground to allow cross ventilation to flow underneath, but the so-called "crawl space" beneath it is actually high enough to allow someone to get under it, for whatever reason. The main living floor of the shotgun is typically only three steps, or little more than two feet above grade, which is enough for air movement, but not for access. The two types both started to use clapboard siding, which was run up in great quantities after the turn of the twentieth century, as well as air vents right below the roof ridge to allow for the heat that would build up at the top of the attic space to escape. The bungalow typically also has a front porch, but it is much larger than that provided on the shotgun, which is recessed and concentrated only where the front door is located, on one side. Precast concrete steps started to be used on each type of house as well, to save construction time and cost. The shotgun is also identifiable by one square wooden column holding up the roof above the porch.

The differences between the two residential forms have much to do with variations in social patterns. The front porch of the bungalow, facing the sidewalk and the street, was initially used as a social space, from which residents could greet and converse with neighbors, so it typically extends the full width of the house. There is usually no back porch, however, although some types did have that option. The shotgun, on the other hand, presents a relatively blank façade to the street for security or protective reasons perhaps, and the porch, which occupies a little under one-third of the entire front elevation and is called out by a small pent roof above it, is not wide enough to be a social space, being primarily intended as an entrance portico. Six to eight feet separate the front step from the front door, recessed far behind the pent roof. The real social space for the residents of a shotgun house was a porch that projected out into the common courtyard in the back. Old photographs show people sitting on these porches or washing clothes there on metal washboards placed in metal or clay pots of water.

Unlike the shingle-roofed bungalows, tin sheeting was the material of choice for the shotgun houses, and they also had lower window sills that allowed more light and air into the small, sequential rooms lined up along the circulation spine along the side.

The Stretto House

The Stretto House, which was designed by Steven Holl in 1989 and completed in 1992, is located near Dallas, Texas. The clients had originally intended to build on a site they had purchased near the Turtle Creek section of that city, but were dissuaded from doing so by the architect because he felt that it was too small. Holl helped them find a new property, which also has a stream running through it. As it crosses the property, this stream is divided into three sections by dams that form ponds behind them.⁴¹ During his first visit to the site, Holl noticed that the water falling over each of the dams created a murmuring overlapping sound. This inspired him to consider that the beginning concept of the house might be based on the idea of musical layering. Discussions with a friend, who is a pianist, led him to focus on the fugue stretto form, in which each note is echoed before it is completed.⁴² He then found a classical example of this form in the “Music for Strings, Percussion and Celeste” by Béla Bartók. He recalls that he concentrated on the fact that the piece is divided into four movements and “has distinct divisions between heavy (percussion) and light (strings).”⁴³

Four Sections To establish a metaphysical connection between the house and this musical form that replicates the sound of the stream, Holl divided it into four distinct zones, each having heavy and light materials that correspond to the percussion and strings of the stretto. For the heavy section he has used masonry with



Stretto House. © Paul Warchol Photography

metal roofing acting as the lighter foil for its mass. These four sections extend in a syncopated line along the back edge of the site, beginning with the entry on the south and ending at the bank of the stream that crosses the property along its northern boundary. The house is anchored by a separate pavilion in which the guest quarters and a small library are located, placed on the far side of a square parking lot at the end of the driveway. This pavilion, which is a major effort in its own right, is more introspective and solid in appearance than the residence across the drive, with a minimum of openings to protect the books and artwork inside it from the hot Texas sun, as well as the privacy of the guests living there. The walls are made of tilt-up concrete slabs with a moss green admixture used to soften the harsh whiteness of the cement. The main entrance to the main residence, located across the bluestone gravel motor court from this pavilion, is indirect, preceded by a raised porch covered by the first and the lowest of a playful series of canopy-like curved metal roofs that echo the vernacular form buildings of this region. After moving under this open canopy and through the protected and deeply inset front door, passage through the house is then modulated by a series of four 10 feet wide and 45 feet deep service blocks, spaced 35 feet apart, with the last of these partially planted in the stream.

Served and Servant Zones These zones, which appear as vertical towers on the main street facing eastern evaluation, establish a regular visual order that evokes musical transcription on a scale, especially since the curving metal roofs move so lyrically up and down between them. The first of these service bars, which are also reminiscent of a similar method of modulation used by Morphosis in the Crawford House in Montecito, California, discussed elsewhere here, contains a stairway as well as the majority of the chimney behind a fireplace facing into a large living area adjacent to it. This servant-served relationship continues through a second, more open band, to a third that contains the kitchen. To alleviate the narrowness that the 10 feet width of the masonry service bar imposes, Holl projects a U-shaped section of a kitchen counter out from it into the dining space that it faces. The fourth and final bar, which spans, or delicately mitigates between land and water, also appropriately serves as the termination of a long, narrow swimming pool, placed in an open court, also covered by a curved metal canopy. The entire house is a fascinating study in scale, rhythmical movement, and balance, between solid and void, open and closed, curved and straight, so that the carefully choreographed passage through it becomes a journey of discovery.

THE CENTRAL REGION

The American Townhouse

In America, the townhouse is now taken for granted as a residential type, but it is really a relatively recent innovation with a rather turbulent European lineage. A townhouse may be defined as a subgroup of the row house, being attached to similar houses on each side, with several stories, a long narrow, rectangular plan, and windows only on the narrow front and back ends.⁴⁴ It differs from the row house in that it is usually associated with a higher economic level of ownership.

Its European heritage may be traced first to both Britain and France, beginning in 1612 in the *Place Royale*, which was instituted by King Henry IV. This *place*, or urban square in Paris, which later became the *Place des Vosges* after the Revolution, was formulated by the king as a commune that was intended to develop and promote the French silk-making industry. He visualized the square as being surrounded by identical, attached houses that would have shops for the artisans at street level and living quarters for them above. At that time, during the Renaissance, Italian artisans dominated the market and Henry IV successfully persuaded several of them to set up shop in the *Place Royale* so that local craftspeople could learn from them. The houses that were built there, which are described in detail in Volume II of this series, were rather rustic and wide by contemporary townhouse standards, with a steeply angled, overhanging gable roof that was intended to keep the rain from penetrating the half-timbered wattle and daub façade. The king wanted to emphasize royal support for the enterprise by having a townhouse built for himself on the square, but, instead, unwittingly doomed it to failure by doing so. His association with the project and sporadic presence there encouraged courtiers to follow him, and they eventually displaced the original occupants. They also changed the construction type from wood to brick and stone giving the *Place des Royale*, renamed the *Place des Vosges* after the Revolution, the elite appearance and constituency it has today. This contributed to the aura of social exclusivity that the townhouse has as well.

Covent Garden Under the patronage of Charles I, the Earl of Bedford developed a similar kind of combined commercial and residential endeavor in London at Covent Garden in 1630. This area was already being used as a farmer's market, and the Earl's architect, Inigo Jones, simply placed a row of shophouses on each long side of the rectangular plaza and designed a small church, named St. Paul's, for one of its short sides. Unlike the elegant townhouses that now line all sides of the *Places des Vosges*, those on the Covent Garden plaza have not survived, but we know that Jones was converted to Neoclassicism during his prolonged stay in Rome, resulting in the transplantation of Palladian principles from Italy to England when he returned in the early 1600s. King Charles I was also responsible for encouraging a similar kind of urban form at both Great Queen Street and Lincoln's Inn Fields, which have evolved from their original form, setting a standard for townhouse clusters that followed. As a result of the fire of 1666, wood was replaced by masonry. George Dance, who was the mentor of Sir John Soane, who created one of the most famous townhouse groups of all in the Lincoln's Inn Fields cluster, was then instrumental, along with Sir Robert Taylor, of further codifying the townhouse into four categories, in the Building Act of 1774.⁴⁵ London was in the midst of a building boom at that time as a result of the Industrial Revolution, and those who benefited from that economic surge created a demand for a house type that suited their newly acquired social position.

The Royal Circus and Crescent in Bath Somewhat unexpectedly, because it occurred in a smaller setting, the next biggest advance in the evolution of the townhouse type occurred in Bath, west of London. This was due to the growing popularity of the resort among the upper middle class and the aristocracy, who prospered from the wealth that was generated by the Industrial Revolution. A father and son team, referred to at the time as John Wood the Elder and Younger

felt that the Classical style was most appropriate for a series of projects they completed in Bath between 1754 and 1775. The small city has natural hot springs that once attracted Roman visitors when they occupied Britain in the past, and these builders decided to capitalize on this Classical connection. John Wood the Elder designed a three-story high, circular group of houses called the Royal Circus based on the Coliseum in Rome. Like its progenitor, the Circus also has column styles that progress from Doric at the ground floor to Ionic in the middle and Corinthian at the top of the inner façade. The ground and second stories also have floor to ceiling windows that fill the entire wall between these colonnades, in which the columns are arranged in pairs and span from cornice to cornice. The top floor, which was typically reserved for servants, had a smaller window, and this occupied about half the wall surface between these column pairs, and was placed in the middle of it. This composition resulted in an elegant, restrained image of dignified privilege that had an enormous influence on later designers.

The Royal Crescent, begun in 1767 by John Wood the Younger, follows the same prototype, but is laid out in a wide arc at the crest of a slope, open to the view of the rolling landscape, just beyond the bottom of the hill on which it is sited.

Robert and James Adam Scottish brothers Robert and James Adam were responsible for the next iteration of the townhouse type in their speculative design of Adelphi Terrace in London. This helped to solidify the reputation of the townhouse as a precinct of the upper classes because the brothers raised the attached units up onto a plinth base. They differentiated between the ends and the middle of the complex so that it resembled a large royal palace, rather than a series of individual houses. John Nash followed their lead in his design for townhouses, also known as terrace houses, in Regent's Park, elevating the contributions of the Wood and Adam families to a new level of urbanism by using the townhouse to define a new street pattern carved through the northern part of London.

Transplanted in America The townhouse was introduced to America by the British during the Colonial Period, appearing first in the most strategically important East Coast settlements at that time, such as New York, Boston, Philadelphia, and Savannah. Several architects adopted the typology and adapted it to regional conditions, since the early settlements were far less organized than London or Bath, and far more crowded. In 1794, Charles Bulfinch, who had studied architecture in London, designed the Tontine Crescent in Boston, which borrows heavily from both its semicircular antecedent in Bath and the Adelphi Terrace in London. Like them, it is also Neo-Classical, opens up to a park and is raised up on a stately base, with larger units, like bookends, on both sides to complete the series. These larger units are more ornately detailed than the three-story attached houses in the middle of the graceful curve, but the tripartite division of the floors as well as the window pattern used by John Wood the Elder and Younger have been maintained.

A Symbol of Democracy It is ironic that the townhouse, which is now viewed as a symbol of social prestige and refinement, was originally considered to be just the opposite when its popularity began to spread in the United States. Soon after the American Revolution, the image of similar, tall, narrow houses joined together in a row may have conjured up images of Continental soldiers marching into battle. They also mirrored the democratic aspirations of the new nation perfectly at that

time of their own uniformity and clusters of this new type of housing started to appear in many of the major cities along the East Coast. Those urban areas with the strongest strain of British influence, which played the most central role in the struggle for independence, have the oldest and most influential examples. New York, Boston, Philadelphia, Baltimore, and Annapolis each have an equal share of this heritage.

Benjamin Henry Latrobe, who was born in Britain in 1764 and is perhaps best known for his design of the U.S. Capitol in Washington, D.C., applied his thorough knowledge of Classicism to several townhouse projects in Philadelphia and elsewhere. He built a number of these with fellow Neoclassicist advocate Thomas Carstairs in central Philadelphia in the early 1800s, with red brick façades that helped them to match their Georgian prototypes, which were built in that city several decades before.⁴⁶ Several of his disciples, such as Robert Mills, followed Latrobe's lead. Mills designed Franklin Row in Philadelphia in 1809, which is generally considered to be one of the finest examples of townhouse planning during the early years of the Republic.

Charles Bulfinch, who was based in Boston, rivaled Latrobe in his knowledge of British Neoclassicism. He complemented this with travels throughout the United Kingdom, during which he surveyed the best examples of the style. Bulfinch tended to focus more loosely on Palladian principles and excelled at adapting them to the unusual urban patterns that started to emerge in America as the country continued to mature. Tontine Crescent, which Bulfinch built in Boston in 1794 as a speculative venture, demonstrates his high level of skill at translating a style that had become so closely identified with England into a different national dialect. The growth of print media in America at the same time provided a conduit for Neoclassical style in general, and the idea of townhouses lining a residential urban square specifically, to reach the mass market, and builders, developers, and contractors with far less aesthetic judgment and skill than Latrobe or Bulfinch started to adapt designs published in pattern books into speculative developments.⁴⁷ In less talented hands, at a lower budget, and as intended for a less discerning clientele, these became the row house.

The Greek Revival After the War of 1812 with Britain, the Palladian style lost its appeal because of its association with the enemy that had invaded Washington, D.C., burned the White House, and was finally routed by American forces led by General Andrew Jackson at the Battle of New Orleans. Architects turned to Greek Classicism instead, with its allusion to democracy and philosophy. By the 1840s, the Greek Revival style had all but replaced British Palladianism and was prevalent in both the townhouse and row house permutations. It held sway for about a decade. All that had really changed were the details, which were finer in proportion, with Ionic and Doric columns, dentils, broken architraves, and thinner pediments being the defining features. New York City, which was then in the process of becoming one of the most important cities in the country and experienced a sevenfold expansion of its population between 1825 and 1867, was replete with Greek Revival townhouse clusters. These include LaGrange Terrace, also known as Colonnade Row, which was located at Lafayette Place, designed by Seth Greer, built in 1833. It is unusual because of a row of 12 two-story high columns rising up from a projecting, rusticated ground floor to a continuous cornice above. The

second and third floor façade is recessed behind this row, which gives the unit its name and provides a distinct image of unity and elegance to it.

The Brownstone The Greek Revival was then displaced in mid-century by the brownstone, which has come to be synonymous with the townhouse. This is especially the case in New York City, where many of the best examples still remain. There is some debate about exactly what a brownstone is, but there is little dissent about the key role that this type of townhouse has played in helping to establish the image of upscale urbanity in the consciousness of the general public. This is partly because of the large number of them that were built due to their popularity, leading to their ubiquitous presence as the background for stories, films, and plays about city life. This acceptance by both builders and buyers has been explained as being the result of three key factors. From the perspective of the builder, sandstone was easy to carve and detail, saving on construction costs. Second, the deep reveals that this carving produced set the façade of the brownstone distinctly apart from the wooden profiles of the Greek Revival townhouses that had preceded them, making them memorable, seemingly more durable, and ultimately more desirable to an increasingly wealthy middle and upper middle class clientele. The third factor was that of the color of the sandstone, especially the light mocha shade quarried in Little Falls and Passaic Heights in New Jersey, used in New York City. It matched the color range of furniture materials and wall coverings that were popular in the post-Civil War period.⁴⁸

The brownstone townhouse not only changed the visual character of New York City and the other major American cities where it was built, but altered the essential structure of these urban areas as well. As one historian of this housing type has described this shift:

Brownstones redefined older American cities in two ways. First, rows of them dominated the streets of all of the larger cities that grew dramatically in the decades around the Civil War. Second, they were used by developers in the way that earlier row houses had been used, that is, to define the boundaries of parks and squares that served as oases in the densely built cities.⁴⁹

Queen Anne Brown sandstone was not as feasible in earthquake country, however, and a highly ornate version of the Queen Anne style that had swept Britain by storm decades earlier became extremely popular on the West Coast of America, especially in San Francisco. The wooden houses built along the hilly streets of the city by the bay, which are generally referred to as “Victorian Gingerbread,” are more accurately Queen Anne style, but not a particularly authentic version of it.

By the time of the devastating fire that destroyed huge areas of San Francisco and led to fire codes that discouraged wooden construction, the townhouse typology was well established in the United States. It continued to evolve through several more iterations from that point forward, but its essential function as urban anchor and catalyst was well established.

Bruce Goff: The Bavinger House

Bruce Goff was born in Alton, Kansas, in 1904. He started his architectural career as an apprentice with Endacott and Rush in Tulsa, Oklahoma, just before

World War I. Because of a shortage of books on architecture at that time, Goff voraciously read every periodical he could find, including an issue of *Architectural Record* that was dedicated to the work of Frank Lloyd Wright. The issue had a profound influence on Goff, who wrote to Wright for more information about his work. Wright sent him a copy of the Wasmuth portfolio by return mail. This portfolio, which had already caused a sensation in Europe among the leaders of the Modern Movement there, became the inspiration for the direction that Goff was soon to take. In addition, Goff was also influenced by the graphic designs of Beardsley, Erté, and Klimt, as well as the architecture of Mendelsohn and Taut, indicating his decidedly expressionistic tastes.

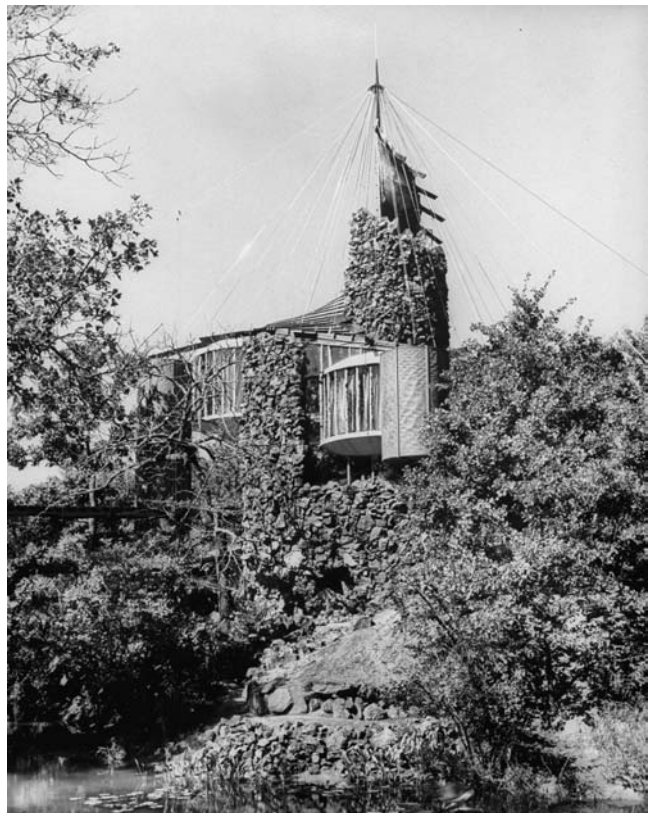
While with Endacott and Rush, Goff designed the Boston Avenue Methodist Church in Tulsa in 1926, but it is one of the rare examples of his nonresidential work. In 1936, Goff began to work for Libby Owens Ford Glass Company because that was the only work available to him during the Depression. This turned out to be a beneficial experience and was of great value to him in his design work.

After serving in the Seabees during World War II, Goff joined the University of Oklahoma at Norman in 1947, which opened up a new, academic phase of his career. But, his residential work also increased during this time.

The Bavinger House The Bavinger House, built near Norman, Oklahoma, in 1950, repeats these themes in an even more primitivistic way. The plan of the house is a spiral, like that of a chambered nautilus, which continues upward at its core to become a tower. The roof is attached to this increasingly smaller coil in the center like a sail that is then also connected to the base, giving the entire house the image of being a temporary encampment by shipwreck survivors on a desert island.

The Farnsworth House by Ludwig Mies van der Rohe is located very close to it, and Mies van der Rohe visited it while supervising work on his own house. It is difficult to imagine two more diametrically different approaches to architecture than those represented by these two architects, since Goff seemed to exemplify the naturalistic and antinatural side of Frank Lloyd Wright's approach.

Goff left the University of Oklahoma in 1956 and serendipitously set up his office in the Price Tower in Bartlesville, nearby, designed by Frank Lloyd Wright. After the Bavinger House, his



Bavinger House. Source: A. Y. Owen/Time & Life Pictures / Getty Images

work became even more *ad hoc*, as can be seen in the Gutman, Gryder, Dace, and Nicol Houses that were built between 1958 and 1964. Each of these focuses on centrally located, stepped, and carpeted “conversation pits,” extreme geometric forms, and a novel use of color. The Price House of 1956, which was commissioned by the same client that built the tower in Bartlesville, typifies the extent of Goff’s stylistic approach.

Between 1970 and 1978, Goff returned to the circular and spiraling themes that he had used earlier in residential projects such as the Bavinger House. He has come to represent an identifiable school of Frank Lloyd Wright followers that share his middle American background, expressionistic tendencies, and theory of an organic architecture that complements natural systems.

Frank Lloyd Wright: The Oak Park, Robie, Hollyhock, Jacobs, and Fallingwater Houses

Of all of the architects in the relatively brief history of the United States, Frank Lloyd Wright is certainly the most well known and the most prolific. He boasted of having completed at least one building in every state in the Union, and the majority of these are houses. It is difficult to select those that would present a truly representative sample of his work because he was constantly reinventing himself, and during his long career he went through five distinct phases. But, any survey would of necessity begin with the residence he built for himself and his family in Oak Park near Chicago when he started his own practice there. It was a labor of love and was added to several times as his family grew, also serving as a personal laboratory for ideas he was developing at the time. These were related to Arts and Crafts theory and the beginning of the Prairie House style, inspired by Japanese traditional architecture that evolved over the years he remained in Oak Park.

The next residence that must obviously be included then is the Robie house, which represents the culmination of the Prairie House style and was among the last projects that Wright completed before beginning a new chapter in his life in Los Angeles. Aline Barnsdall was the catalyst for this change, since she brought Wright to California to oversee the construction of his design for her residence, called Hollyhock House, at the intersection of Vermont Avenue and Sunset Boulevard in Hollywood. This was the beginning of another line of thinking for Wright, related to the idea that Mayan tradition rather than its Japanese equivalent was the real precursor of a true indigenous American heritage. The “textile block” houses, such as the Millard, Storer, Ennis-Brown, and Freeman residences that he realized in Los Angeles, represent an effort by this talented architect to finally integrate industrial materials and techniques with natural processes, in true Arts and Crafts tradition.

Wright was also far ahead of the ecological, or sustainable, movement that now holds sway in contemporary architecture, as his first house for the Jacobs family clearly demonstrates. It is built almost entirely of material gleaned on or near the site. It is also half buried in a hill that blocks the cold wind from the north and opens up to receive passive solar gain from the south. This keeps it cool in the summer and warm in the winter, without predominantly relying upon mechanical systems to do so.

Wright was prone to contracting pneumonia in his later years, and his physician advised him to move to a warm, dry climate to avoid the problem. He, along with his wife, Olgivanna, decided to found a school for architects near Phoenix, Arizona, which Wright named Taliesin West, in honor of his homestead, Taliesin, in Spring Green, Wisconsin. Without a great deal of financial backing, Wright devised an inexpensive means of construction that prospective students could manage to use to build the school, involving local stone placed in rudimentary formwork and then surrounded by a concrete admixture that was poured in to hold the boulders together. Wood taken from the site was used for roof beams, and canvas was used for roofing, since rain in the region is sparse.

Wright's most memorable house, however, is undoubtedly Fallingwater, which was his *riposte* to the Modern Movement, then gaining strength in pre-World War II Europe, and to the *Ville Savoye* by Le Corbusier, in particular. In the Fallingwater design, Wright has demonstrated his belief that nature and industry, in the form of stone quarried from the site, used in combination with concrete, steel, and glass, must work together, and not to the exclusion of each other.

The Oak Park Studio and Home Frank Lloyd Wright had strong Welsh roots on his mother's side. The Lloyd-Jones family had emigrated from Wales in 1844, just 20 years before he was born. The patriarch of the clan was Richard Jones,



Oak Park House and Studio. *Source:* Dongjin Sah; Flickr

whom Wright described in his autobiography as “an impassioned, unpopular Unitarian.”⁵⁰ He married Mary Lloyd in Wales and changed the family name to Lloyd-Jones. They settled in Ixonia, Wisconsin, on a farm in what they referred to as “the valley.” Richard Lloyd-Jones appropriated a Druidic symbol, resembling a three-pronged fork turned upside down, as the family symbol. It means “Truth Against the World.”⁵¹

Maternal Encouragement Richard Lloyd-Jones was Frank Lloyd Wright’s grandfather. His mother, Anna, was the fourth child of Richard and Mary Lloyd-Jones. She became a teacher and married a Methodist minister named William Russell Carey Wright, from Hartford, Connecticut, whom she met while he was preaching in Lone Rock, Wisconsin. He was also an accomplished musician, especially on the piano and organ, and when Frank was born, the family lived in Richard Center, Wisconsin, since his father was a minister in a church there. Frank Lloyd Wright’s mother doted on him to the extent that it caused the couple to argue and drove them apart. For some reason, she was determined that he would be an architect, framing pictures of English Gothic cathedrals that she had taken from periodicals and hanging them on the walls of her son’s bedroom. She also gave him a set of wooden Froebel building blocks that she had found out about at the Philadelphia Centennial, which had a profound effect on Wright’s understanding of three-dimensional, geometrical relationships.

The family moved to Waymouth, a suburb of Boston, when Frank was three years old, so that his father could take up a position at a church there. He was later sent back to the Lloyd-Jones farm in Wisconsin to work there during the summer. This connection to nature, combined with his exposure to Transcendentalism in New England and the Unitarianism on the Lloyd-Jones side of the family tree, were also important formative influences on Wright’s character. The anti-rationalistic thrust of Transcendental theory, which gives priority to intuition rather than empiricism, continued to set Wright apart from his European counterparts throughout his career as an architect. He was especially influenced by Emerson and Thoreau.

After moving back to Wisconsin once again, to Lake Mendota, near Madison, family life became strained by poverty and his father left home. His mother took him to be interviewed by Allen D. Conover, the dean of engineering at the University of Wisconsin, and he was admitted into the program. He continued to live at home and walked several miles to class each day. He liked mathematics, which he compared to his love of music, seeing the similarity between the two. He also took English composition and French, stereotomy, graphic statics, analytical and descriptive geometry, and drafting. He particularly liked drafting, taught by Professor Conover, and his frustration with his progress in English composition prompted him to organize his own course of self-study by reading as much as he could. The authors that interested him most, which should not be surprising given his Celtic background and Transcendental foundation, were the Arts and Crafts theoreticians: Thomas Carlyle, John Ruskin, and William Morris. He also read Goethe, William Blake, and Viollet-le-Duc. Wright did not thrive at the University of Wisconsin, chafing from the need to compete and the rules and regulations, which he characterized as “doctrine.”⁵²

He left the University of Wisconsin halfway through his senior year for Chicago, to find work in an architecture office there, in 1887. He had \$7 in his pocket after paying for his train fare, which he had gotten by pawning his father's books and a mink collar taken off his overcoat. He had no prospects and no place to stay when he arrived at Wells Street Station, and he got a cheap room in a boarding house on Randolph Street. With his \$7 down to \$3, he chose architects' names out of a city directory, including the firm of J. L. Silsbee, since he had designed a church that Wright knew of. But he wanted to try better firms first, such as the office of William Le Baron Jenney, where he was turned down because he had no examples of his work. After more refusals, moving to an even cheaper room, and foregoing food for four days, he finally went to Silsbee's office and not only discovered a sympathetic interviewer named Cecil Corwin but also found they had something in common in both being minister's sons. He liked the warm and friendly atmosphere in the office. He changed boarding houses, moving to one that was more upscale. He began to socialize at Cecil Corwin's church called All Soul's and met a young woman named Catherine Tobin. She was 16 at the time and he was 19. They were married two years later in 1889. In the meantime, he asked J. L. Silsbee for a raise, and when he was turned down, moved to a firm called Beers, Clay, and Dutton. After deciding he had nothing to learn there, he quit after a few weeks and asked Silsbee to take him back. Silsbee was astonished that he had quit without any assurance of being able to return, and admired his honesty and confidence. He hired him back, with the raise he wanted in the first place.

After a year at J. L. Silsbee's office, he encouraged his mother to sell the house in Lake Mendota and come to Chicago, and they both moved in with a family friend who lived on Forest Avenue in Oak Park. Wright was repelled by what he later described as the "Eastlake mimicry" evident in a "suburban house parade" there.⁵³ In the same year, he heard about an opening at the office of Adler and Sullivan, doing work drawing details of ornament for the Auditorium Building. He had been fascinated with Owen Jones's *Grammar of Ornament* and had traced all of the details from it. He showed these, as well as some drawings he had done in Silsbee's office, to Louis Sullivan and was hired at \$100.00 a month, which was quite a high salary at that time.

A Master-Student Relationship Wright and Louis Sullivan got along well, and because Sullivan favored him, Wright had a difficult time at the start. He literally had to fight to retain his place there, and he ended up getting stabbed in the back with a drafting knife. He later wrote that "then and there, I made up my mind to stay in that office till I could fire every one of the gang" that had tormented him.⁵⁴ Sullivan had attended the *Ecole des Beaux Arts* in Paris, as had Henry Hobson Richardson, whom Sullivan admired and who had an equally important role in what came to be called the "Chicago School" of architecture. This involved a radically new approach to technology in relationship to traditional principles. Wright, with his midwestern background and incomplete education, came from a different world and was in awe of Sullivan, who he always referred to as "the Master." They shared an appreciation of the poetry of Walt Whitman, and Sullivan introduced Wright to the work of Herbert Spencer. Wright said he became "like a pencil in the Master's hand."⁵⁵

After his marriage, Wright approached Sullivan with the proposal of a five-year contract in exchange for an advance on his salary large enough to buy a lot in Oak Park and build a home for himself, his wife, and the family they anticipated. Sullivan agreed and even went to see the property that his apprentice had in mind at the corner of Forest and Chicago Avenues. At this point, Wright recalls, he was the highest paid draftsman in Chicago. Frank Lloyd Wright and Catherine Tobin eventually had six children.

Even though his salary was high, his rapidly expanding family stretched Wright's finances. He had been earning overtime pay by working on houses for important clients of Adler and Sullivan at home, and then he began accepting clients of his own, which was not allowed in the contract he had negotiated with Sullivan. It also stipulated that his employer would retain the deed to Wright's house and property until the money they had loaned him had been paid in full. The debt had been paid, but Louis Sullivan was so offended by what he saw as his apprentice's disloyalty that he refused to release the deed. Wright asked Dankman Adler to intervene, but Sullivan was adamant, so Wright quit, having then spent six formative years in that office. He did not speak to Louis Sullivan for 12 years after that, until he visited Sullivan on his deathbed, and the deed, signed by Dankman Adler, then followed.

The Oak Park House Grows When Wright left Adler and Sullivan, he rented an office in the Schiller Building and asked Cecil Corwin to join him in the new firm, Frank Lloyd Wright, Architect. His house in Oak Park, as first designed in 1889, was straightforward, due to the limited amount of money available. It was a modest two-story house with a direct entry into a stairwell, living room, kitchen, pantry, and dining room downstairs and a master bedroom and bath, nursery, and studio above. It had a large fireplace and gabled roof because Wright saw these as being symbolic of domesticity, and there were wooden benches built into the wall on either side of the hearth to underscore this point, even though the family's initial budget was tight. But the pressures of a growing family forced the young architect to add on to the original plan. In 1895, a study replaced the dining room, which was flipped over to where the kitchen had been and lengthened to accommodate a growing number of children, and a new kitchen wing was added, along with a maid's room and a second stairway on the ground floor, leading up to a large playroom above. The master bedroom remained where it was, but Wright's studio space was converted and divided to make two more rooms for the children, and the nursery was extended to make an additional, larger bedroom on the south side of the house. Three years later, in a third phase of addition and renovation that continued until his departure from Oak Park in 1909, a separate entrance for the maid was carved out of the space between the servant's room and the kitchen, and a loft was added as a mezzanine space above the playroom where a piano was installed.

A New Studio More substantially, however, Wright decided to reclaim the private territory he had lost when his studio was converted to bedrooms for his growing family by building an entire office along the north edge of the property, with its own separate entrance. This office component, which is as large as the house it is conveniently attached to by a small connecting passageway and stair, is articulated

into clearly differentiated parts that counterbalance the house itself in their form. In addition to the reception area at the center and Wright's office, which is separated from the entrance by a wall, these are an octagonal library, which projects out to the right of the reception area, and a square drafting area to the left. There was also a vault attached to this square room as a separate form between the office and the house, in a secure location at the end of the connecting passage between the two to hold the steadily accumulating amount of money that Wright was making. The library could be used as a private conference room, as a place to meet with clients or employees.

An Arts and Crafts Aesthetic The feeling throughout the Oak Park house and studio is one of warmth and security, due to the large amount of wood that Wright used for the floors, stairs, railings, trim, and furniture, which were all designed by him. This, along with the earth tones used for carpets, stained glass, and paint all coordinate to create a very comfortable domestic environment.

The Winslow House Wright had remained in the Schiller Building office for more than three years until the new home-office was complete, which was intended to save him time and money. His wife, Catherine, used the playroom as a space for her private kindergarten, and so husband and wife each had his/her own realm, coming together at the end of the day for meals with all of the children.

Soon after Wright left Adler and Sullivan and opened his first office in the Schiller Building, he was visited by his first client, William H. Winslow, who asked for a house to be designed for a lot in River Forest. Wright responded with a scheme that was highly unusual for its time due to its minimal profile, low gable roof with wide overhanging eaves, and lack of ornament, except, perhaps, for a horizontal vegetal frieze that is reminiscent of Louis Sullivan's organic detailing, which takes up the top third of the elevation under the eaves. By using a plain surface for the relatively solid massive walls of the bottom two-thirds of the house and this highly rendered band for the top third, which is slightly inset from the base, Wright creates a telescoping effect that makes the house seem to rise. Square window openings, cut into the base, contribute to this effect since they make the wider, lower band seem more solid, with the longer, rectangular windows above them, which cover the entire distance between the sill and the soffit of the wide eave, to extend the visual effect.

The Winslow House was to be the first of an astonishing list of 125 projects, most of which were houses, completed in 11 years at both the Schiller Building and in his Oak Park Studio in Chicago after leaving Adler and Sullivan. This represents a quarter of the projects he completed over his entire long and productive career.

The Robie House Frederick C. Robie came to Frank Lloyd Wright in 1906 with an unusual site for the house that he wanted to build for him and his family. It was a narrow lot sold off the front of a neighboring property, with the obligation that the new house cost at least \$20,000 to build so that it would fit into the wealthy neighborhood at 58th and Woodlawn Avenue in Chicago's Hyde Park. Frederick Robie and his wife, Lora, were the beneficiaries of a successful family business of manufacturing bicycles and motorcycles, and Frederick anticipated expanding into the production of automobiles, which were just starting to be used at that time. He presented Wright with a rough sketch of what he wanted, as well as a list of

requirements. Prior to World War I, servants were commonplace in the homes of wealthier families, and so this list included two rooms for maids as well as a separate dining room for them. In addition, the requirements included a living and dining room, a kitchen, a master bedroom and bath, two bedrooms for the children, and a guest room. It also included a playroom for the children, a billiard room, and a three-car garage that was a novelty at the time.

Wright met the challenge of accommodating such an ambitious program on an unusual site by splitting the plan into two long narrow bars that slip past each other on the east-west axis, creating an entry level hall in the open area that this creates on the east end, and a walled-in courtyard and a garage for the cars on the west. He also pushed the house as far forward on the site as possible, going against a neighborhood convention of maintaining a 38 feet setback from Woodlawn Avenue in doing so. As in his other Prairie style houses that precede this later, and many would say finest, example of the style, Wright used no basement level here, even though this would have gained him preciously needed space. Instead, he divided the house into three vertical layers of increasing privacy, bringing functions that might otherwise be associated with a basement, such as a billiard room, children's playroom, laundry room, and mechanical room, up to the ground floor. The pinwheel *parti* begins with the offsetting of the two long bars, which are each about 20 feet wide, and is completed by a bedroom block on the third floor that acts as a fulcrum in the middle of the plan.

Wright treats the ground floor like the lower level on an Italian villa, as a service level supporting the *piano nobile* and private domain that superimposes it, above. And, this makes sense as the place for a playroom for the children since it would have been acoustically segregated from the social spaces on the first floor and the bedrooms on the second. That playroom has access to the motor court around the garage, which was probably not the most salubrious place for them to play outside, but the restriction on open space presented by the small site left Wright with few options.

Through the use of a wall running the length of the house along the south elevation, at grade, combined with a long balcony above it that spans between the living rooms above, Wright does manage to make this entrance level suite of rooms seem to visually regress as part of a powerful podium base. The wall and balcony almost conceal the long line of windows that light the suite of rooms at entry level.

A Complex Processional Sequence There are two entrances into the Robie house. The first is from the west side, along a low wall that leads into an entry hall, and the second is from the garage at the east end of the house, which reaches the same point after crossing a hallway that is open to the children's playroom. In each case, the only option then available, other than service stairs that are hidden from view and intended for the hired help, is a scissor stair with runs that are 4 feet wide each that starts in the midst of a large masonry pier that also includes the hearth. It returns on its upward trajectory into a corridor directly above the entry hall at the midpoint between the living and dining rooms, which are each still mostly hidden from view. There is no real reception area on this main floor of the house, so this 8 feet wide by 24 feet long intermediate space performs a double function as both a secondary entry and a wide corridor. It is open at both ends to allow access to

two of the most important rooms in the house as well as a second family stair, which also has a double run leading up to the bedrooms on the second floor.

The Symbolism of the Hearth As he completed the Robie House, Wright's own version of domestic bliss fell apart due to his affair with a client, Mamah Borthwick Cheney. He had completed a house for her and her husband, Edwin H. Cheney, in Oak Park in 1903, three years before the Robie House was realized, and he gave up his practice and left his family to travel throughout Europe with Mamah in 1909. So the Robie House, as well as the Avery Coonley residence of 1907–1908 in Riverside, Illinois, was completed at a time when his own carefully constructed world was disintegrating. There are many other projects on the office ledger during the six-year period between the time that he met Mamah and decided to start an entirely new life with her. There are many public works, such as Unity Temple and the Larkin Company Building among the more than 50 buildings he designed during that time. But the Robie and Coonley Houses present two of the clearest examples of a shift that would soon take place in his sensibilities. In each case the hearth, which is an elemental symbol of family and home, is central to the plan, serving as a centerpiece of the large living room that dominated the Avery Coonley home, and as an even more obvious metaphor in the Robie House, since you literally have to walk through it to get from the ground floor to the first. However, that would soon change and the hearth would begin to move farther away from the center toward the periphery.



Robie House. © Steve Skjold / Alamy

Free Flow of Space Much has been made about the freedom of the Robie House plan with claims often made for a new approach to domestic space being made there due to its openness. It is different to be sure, but the interior of the house has been changed a great deal since Robie sold it in 1910, due to a crisis in the family business and the subsequent breakup of his own marriage as well. Photographs taken soon after completion convey an entirely different impression, which is unconventional to be sure, but open in a much different way than the house is today.

Wright believed in the Arts and Crafts idea of the total work of art, in which the architect designed not only the house but everything within it, such as furniture, lighting fixtures, windows, carpets, and even silverware, to provide a complete aesthetic experience for the occupants. All of these are integrated to an extensive degree in all of his houses, but because of the lightness caused by the unusual site restrictions related to the Robie House, furniture design and groupings were even more important to him. Rather than just having a conventional railing, the hearth stair connecting the ground level with the living-dining floor above was wrapped in a screen of closely spaced wooden slats that extends up to 60 percent of the height of the room. This was stabilized by a large square pillar at the corner and had narrow sideboards built into it, facing the dining room on one side, with a long corridor running the entire length of the southern street edge of the house on the other. The dining table and chairs were custom designed for their 20 feet by 20 feet space, on axis with a second, longer console built into the wall separating the dining room from the kitchen to the north. Rather than having legs, in the usual sense, the table was supported by square piers that were similar in proportion to those that supported the screen around the entry stair, and had metal vases intended for flowers on top to solve the problem of arrangements in the middle of the table that block conversation and view. The six chairs that Wright designed for this rectangular table, with one at each end and two on each side, had no arms. They also had high, just slightly curving uprights that went from the floor to about three feet above the leather seats, with open slatted backs supported by solid horizontal top and bottom rails. These backs echoed the slatted screen around the entry stair, just as the posts that supported it did the solid corners of that layered wooden veil, creating a room within a room in which the family members, once seated for dinner, were united and secure. Wright continued to use this tactic even after his departure from Oak Park, but often for different reasons. In the Hollyhock House in Los Angeles, for example, which he designed nearly 17 years after the Robie House, he did the same thing in a living room grouping for Aline Barnsdall and her young daughter. But in that case the intention seems to have been the provision of a smaller scaled enclosure, closer to the size of the diminutive occupants of the house that would make them feel more comfortable within the large expanse of its most important social space.

Wright created intimacy in the living and dining rooms of the Robie House in other ways as well, most notably in the repetitive placement of custom-designed built-in light fixtures, which project from the soffits that run down each side of the living-dining level. These are connected pair by pair across the room, with stripes of color between pairs of wooden strips that visually slice the long

continuous space up into narrow bits. These are related to the 15 columns that support the window wall along the south-facing street elevation of the house, and the pairs of doors between them that lead out to the extended balcony along that side. The lights and the strips on the ceiling that connect them have remained, although they are now completely out of context. The carpet that Wright designed for this floor was intended to convey a sense of cozy domesticity, but here especially so, to offset the hardness of the wood screens and brick hearth. It was wall-to-wall carpet in a consistent pattern that unified the large area.

One of the Last Examples of a Type Wright never referred to any of the houses that he designed during his Oak Park years as being “Prairie style.” His followers, who became known as the Prairie School, did so later, based on his conversations, lectures, and writings about his love of the American Midwest, and the need to evolve a new house type that would respond to the prairie.

The Robie House is not the last of Wright’s Prairie houses, but it is the most memorable because of its distinctive form, and Wright did all he could to ensure that it would be so. The seed of the idea for the Prairie house type was planted when Wright went to the World’s Columbian Exposition held in Chicago in 1893. He was impressed by the *Ho-o-den* Temple there, which was part of a Japanese pavilion that was based on vernacular principles rather than the Classical style required of most of the other participants by the Exposition planner Daniel Burnham. The horizontal, tripartite organization of that grouping into the characteristic columnar base, raised platform middle, and large overhanging roof on top defines traditional Japanese religious and residential structures. Wright also responded to the sensitive use of natural materials that had a far greater impact on him than the classical orders, columns, entablatures, pediments, and domes used elsewhere in an exhibition that Burnham hoped would result in a mandate for a national style for America.

The alternative Prairie style evolved relatively quickly in Wright’s imagination and was fully formed by the time the commission for the Robie House came along. Like its Japanese predecessor, the key element for the Prairie House was horizontality, to help it blend in with flatness of the grasslands around it and the horizon in the distance. Wright exaggerated that characteristic by having the balcony along the street appear to span 40 plus feet above the windows on the ground floor level, by the extraordinarily wide overhanging eaves that stretch out along the long, east-west axis of the site, and by having the masons only strike the horizontal joints of the brick walls, leaving the vertical joints flush.

The Barnsdall or Hollyhock House Frank Lloyd Wright’s Barnsdall commissions in Los Angeles, including the Hollyhock House, are the most conspicuous, followed by the Robie House. Wright was introduced to Aline Barnsdall in 1914 while she was a co-director of the Players Production Company at the Fine Arts Building in Chicago. She originally came from Pennsylvania, and when Wright met her, she was due to inherit the fortune accumulated by her father, Theodore, following his discovery of oil near Bradford after the Civil War. Wright was then involved in the design of the interior of the Fine Arts Building, where he had sporadically occupied an office between 1908 and 1911 due to his problems at home. He had recently gone through the burning of Taliesin, which had resulted in the death of Mamah Borthwick Cheney and her children in the summer of 1914. This

was a tragic end to a relationship that had caused him to be ostracized from the Oak Park community where he had lived with his family from 1889 to 1909.

Aline Barnsdall was extremely interested in the idea of small theatres that would be more accessible to the public and especially to children. She was introduced to Wright by Henry Blackman Sell with the specific idea that he would design a small theatre for her, and the heiress first considered building a theatre of this kind in Chicago. This was intended to take advantage of the organization that already existed there. She changed her mind after returning from a trip to Los Angeles.⁵⁶ She then asked Wright to design an entire complex for a site that she wanted to put there.

Aline Barnsdall moved her Players Production Company to California in 1916, but was unable to go ahead with plans for a theatre there due to the death of her father the following year. Wright subsequently became deeply involved in the Imperial Hotel project in Tokyo in 1916, and for the next three years, until Olive Hill in 1919, Barnsdall and the architect communicated by letter or telegram.

Olive Hill The 36-acre tract of land that Aline Barnsdall purchased between Sunset and Hollywood Boulevards, and Edgemont Street and Vermont Avenue in North Hollywood is special in many ways. Olive Hill was named after an olive orchard that existed there for nearly 30 years before the purchase. This was very unusual in California in the early 1900s.

The relatively flat area below the site has now been completely urbanized, but Olive Hill still retains the same insular, almost sacred quality that it had when Barnsdall and Wright first saw it. It gradually rises up to nearly 500 feet above sea level, providing dramatic views in all directions and giving it the quality of a unique place. Both architect and client thought of it as a lush acropolis, covered with pines and eucalyptus along with the olive trees and hollyhocks that were already growing there. It is the ideal location for a private house, but they also saw it as the start of a self-sufficient, creative community that would be supported by commercial activity on the northern edge of the property.

Their ambitious plan, which appeared in the press in July 1919, included a theatre and roof garden for 1,250 people on Vermont Avenue and eight pairs of stores combined with terrace apartments to house actors, artists, and musicians. These shops were lined up along Hollywood Boulevard and ended at a movie theatre at its intersection with Edgemont Street. The site plan also included an apartment house, called the “Actors Abode,” as well as housing for the artistic director of the theatre and two other houses, now known as Residences A and B, with Aline Barnsdall’s house, named “Hollyhock” after her favorite flower, in the middle.

Siting the house at the top of the hill was an exception for Wright. He had previously always selected a site below the brow of the hill as he did in his own residence at Taliesin, Wisconsin. The reason for his decision not to do so here becomes apparent when one stands near the house. It addresses cardinal reference points. Wright established the sun path as the primary axis, instead of choosing either the quality of the natural light or the best views toward the San Bernardino Mountains to the east and the Pacific Ocean to the west. The cross axis, which is longer on the north to relate the line of entrance, serves as a compass that leads into the heart of the house. It ends in a glass-enclosed loggia overlooking a central

garden court. Wright had used such a device before but the absence of the fireplace that normally occupies this intersection in earlier Prairie House plans is new here. Perhaps this had something to do with his own change in marital status and his evolving attitude about hearth and home.

The beginning of the entry axis is marked by a thin, rhythmical line of paired columns supporting a thin cantilevered roof. It also has a thin niche recalling the *Tokomoma* of a Japanese house. Wright's role as a dealer in Japanese artifacts has only recently become more well known, and he sold objects he had purchased in Japan to clients such as Aline Barnsdall.

The entrance into Hollyhock House is quite narrow as it is in many of Wright's houses. This intentionally evokes primal memories of shelter. It also makes the controlled views into the large interior and garden court in the middle of the house even more dramatic. This contrast is heightened by the raised level of the entrance, which constricts the height of the ceiling even more, and by the imposing double doors that end the entrance processional.

These doors are made of precast concrete, and each leaf weighs more than 300 pounds. An ingenious hinge detail allows them to give the impression of weight that Wright wanted to convey, while still allowing them to open quite effortlessly. This is all part of the carefully planned experience of entrance.

While higher than the roof of the entry canopy, the foyer directly inside these doors is still lower than the conventional ceiling height used in most homes today. Only in the loggia, where procession from exterior to interior ends, does the vertical scale begin to increase. This technique of collapsing spatial volume at an entrance is made more memorable here by the extremes of darkness and light provided by a deeply recessed doorway and the brightness of the interior garden revealed by the wide glass doors of the loggia.

From this final, central vantage point inside the house, the relationship of each of the individual segments that flank the four sides of its central courtyard become clear. The living area, which is the first social space of the house, serves as an anchor for two longer wings that project out from it to the east. The central part of this base is the living room itself, which is rectangular, with a longitudinal axis running from east to west.

A Dislocated Hearth A fireplace dominates the south wall of the room, and it is the first thing that comes into view when one turns into it from the loggia. It offers several important clues to Wright's basic intentions for the house. First, it is not placed symmetrically in the middle of the space, as was his habit in his earlier houses, where the centrality of the hearth was purposely intended to symbolize domestic stability.

The symbolism used on the hearth can be accurately interpreted. It is pictographic to an extent that is unusual for Wright. The fireplace, which is built of randomly sized, smoothly dressed stone blocks, is divided between base, middle, and top. It is dominated by a rectilinear panel that projects from the mantelpiece. The left side of the composition is filled with a tightly organized group of interlocking circles, with the smallest, near the center, suggesting a head. A vertical line running through all of the circles is similar to the hollyhock motif used extensively on the outside of the house.

Each of these symbols makes specific associations with Aline Barnsdall and the location of the house perfectly clear. Vertical striations running across the entire top of the frame represent the sky, and horizontal lines represent water, which terminate in a group of diamond-shaped forms at the bottom to complete the picture. In addition to being a cosmological symbol, this ideogram is also an abstract reference to the use of water in the house, and it shows Wright's facility in three-dimensional visualization, which other drawings on the fireplace confirm. One of these carries an elevational detail of a brass fire screen on into a plan in which a cast iron grate continues the theme begun in the panel. The pictogram, according to the architect's son Lloyd Wright, is meant to show Aline Barnsdall as an Indian princess, sitting on a throne, looking out over a desert to mesas in the distance.⁵⁷

The Four Elements The theme of the four elements of earth, air, fire, and water, shown in the panel, is physically continued on the mantelpiece, as well as with the intricate skylight above it and the moat partially surrounding the apron on which the logs are placed. The water that surfaces to fill this moat completes its axial line across the site in a square pool that comes right up to the front of the living room on the west. From here, it runs under the foundations to the pool at the hearth, going underground again until it reaches a circular pond in front of the rows of auditorium seating that close off the atrium court, which is its source.

This channel originally continued onto the crest of this side of Olive Hill, coming out of the ground again as a small waterfall that filled a long, rectilinear pool behind the main theatre below and an organically shaped lake that was intended to serve as a visual buffer between the arts complex and Vermont Avenue, along one entire edge of the site. The pool in front of the hearth, which was dry for many years, has now been restored to its original condition. Small gold mosaic squares cover the bottom and form a single course at the water line, while concrete is used on all other surfaces. The bottom of this container had to be raised by six inches, due to safety regulations related to swimming pools that were enacted in Los Angeles in the 1970s, in order to avoid having to surround it with an unsightly protective railing, so the desired impression of depth has now been slightly changed. The level of consideration that Wright gave to the way in which water is symbolically used in the Hollyhock House demonstrates his capacity for thoroughness.

Photographs taken shortly after construction, as well as visitors' verbal descriptions, indicate that the water here did serve as a mirror for sunlight as well as the moon and stars just as Wright had intended. But he misunderstood the level of glare during the day in Los Angeles, which made the installation of a thick velvet curtain a necessity. Eventually, this also required that a shed roof be built over the skylight, cutting off the direct connection with the sky, which had been such an important part of Wright's whole composition.

The purpose of this grouping is also implicit in the built-in furniture designed for the living room. There are two long banquettes flanking the hearth. These are located on either side of its central axis. They were built at the same angle as the fireplace upon projecting into the pool, demonstrating the permanent connection that Wright wanted to establish between the furnishings and the offset fireplace. Tall, built-in *torcheres* connected to the end of each banquette underscore this relationship. This furniture had been removed during several renovations over

the years, but was replaced, in the spring of 1990, with reproductions built according to survey drawings by Roderick Grant. Olive Hill was originally intended to serve a social as well as residential function, but that left little private space for Miss Barnsdall and her young daughter. To bring down the scale of the living room, Wright designed two couches with high backs and sides to provide a sense of protection for them.

The Dining Room The dining room in Hollyhock House, like the hearth, is off-axis from the entrance. This effectively makes the music room more prominent, as part of the plan to have the house be an entertainment center as well. This location had the added advantage of allowing Wright to extend the necessary service functions of the kitchen and the servants' quarters along the northern edge of the garden court, placing that area so that it did not interfere with the main entry into the house. A short flight of stairs from the entry level up into the dining room makes this separation clearer. While the dining room is square, the entrance into it from the foyer and from the kitchen is located on one side of the space. This makes half of the space for circulation, so that the rectangular area that is left along the northern wall is the only logical place for a table to be located. Windows along this wall relate to the landscaping in the garden outside, and the dropped ceiling in this half of the space reinforces the impression of a space reserved for the family.

A Tree House for Sugar Top A hexagonal table and tall, hollyhock-shaped chairs that were custom designed for the dining area have now been restored to their original positions, but the division between circulation and dining areas that was once underlined by a Persian rug covering this part of the wooden floor has now been eliminated by the addition of a wall-to-wall carpet. In general, however, the entire dining room seems very small in scale for a house designed around the concept of entertainment. This also underscores the idea that Wright made a concerted effort to humanize the spaces that Aline Barnsdall and her daughter used on a daily basis.

A guest wing, across the courtyard from the dining and kitchen wing, had a long, glazed gallery. This served as an intermediary sun space between these rooms and the central court. Both guest rooms, which were of equal size, looked out to the south onto a patio surrounded by a high wall to protect it from prevailing winds. Beyond this wall there is a lower garden formed by a semicircular retaining wall, which holds back this slope of the hill. The glass-enclosed pergola to the guest rooms also served as a wide corridor leading to the bedroom of Miss Barnsdall's daughter, Aline Elizabeth, whom she nicknamed "Sugar Top." This room turns on axis to effectively terminate the line of the spaces beside it. With an extended alcove on one end, a nurse's room at the other, and a deep bay window, projecting out into the garden from a dressing and sleeping area in the center, this suite gives the impression of a self-sufficient house of its own. A winding path, leading from the bedroom down to the garden portion of the semicircular amphitheatre at the end of the central garden court adds to the sense of privacy of this wing. This was intended to provide Sugar Top with an enclosed, protected place to play.

This miniature house has hard materials and open, interlocking spaces, and it is difficult to imagine it being used as a nursery. The only move toward intimacy is a finely detailed wooden partition wall, with a hinged doorway that separates the dressing area from the rest of the space. A stairway located between the nurse's

room and Sugar Top's bedroom connects it with Aline Barnsdall's suite, on the floor above. This congruity extends to the location of a fireplace, which is located above that in the nursery, in order to group the flues together, as well as to the bay window, which is carried up to the second story to become a glassed-in sleeping alcove in the trees.

Wright's working drawings show that he originally intended this long alcove, which has a sunken floor that causes a dropping ceiling in the corresponding space in the bedroom below it, to be separated from the rest of the space by a thin wooden screen connected to both the floor and the ceiling to ensure privacy. The construction documents also show a bed built into steps leading down to the alcove. It is clear that the intention was that this bed and the skylight above it should be aligned. These details confirm his view of this part of the residence as a tree house in the forest, open to the sky. A bridge across the garden court, held up by two "I" beams that represent the only significant use of steel in the house, connects the Barnsdall suite with another guest room on the north side of the second floor.

Flight of Fancy Wright mentions the Hollyhock House in his autobiography. He begins his description with a musical metaphor by saying: "As I have since learned, music is the language—beyond all words—of the human heart . . . I now felt Architecture not only might be but ought to be as symphonic in character: the same in mind." He compares the house to a romanza, which he describes by saying that

A musician's sense of proportion is all that governs him in the Romanza: the mysterious remaining just haunting enough in a whole so organic as to lose all evidence of how it was made. Now translate "sounds and the ear" to "form and the eye," romanza seems reasonable enough to Architecture? In California or anywhere else.⁵⁸

Wright's decision to embark on an uncharacteristically romantic adventure here is clearly expressed in the materials and construction techniques used in the residence. The surface of the Hollyhock is often mistaken for poured concrete. However, the wall system that Wright actually used starts with a poured concrete footing and concrete block stem wall foundation below grade. This supports a hollow tile wall covered with stucco above, and a timber trussed roof. The only place that poured concrete is used in the house itself is in the massive front doors, in the mantle over the fireplace, and in columns and sills.

Wright's brief description of the house in his autobiography ends in a far more negative way, however, as he describes the ways in which his working relationship with Aline Barnsdall began to deteriorate. He agrees that this was probably caused by his long absences from the site, since he was in Japan for the construction of the Imperial Hotel during a majority of the time Hollyhock House was being built. Cost overruns and misunderstandings with the contractor who had difficulty in interpreting an unusual set of plans contributed to Wright's difficulties.

Aline Barnsdall had a circle of close friends who convinced her to stop construction at one point. Wright's response to this setback is instructive, because he basically dismissed it as Aline Barnsdall's ignorance of what he saw as her responsibility

as a guardian of a work of art that she was paying for, but did not truly own, since Wright saw it as belonging to posterity

After identifying the “agonizing triangle” of owner, architect, and contractor as what he considered to be the basic cause behind this and all other difficulties related to building, Wright resolved to have his own way regardless of the effect this had on the architect-client relationship so that the house could be built according to his original concept.

As an immediate result of these difficulties, Rudolph Schindler was appointed as project architect. He had been working for Wright at Taliesin. He initiated a series of small changes that were his influence but became more substantial as time went on. Schindler arrived in Los Angeles in December 1920, and building permits totaling nearly \$40,000 were taken out for Residences A and B in that same month. He appears to have restored the client’s confidence and so Wright’s strategy worked. Construction on Hollyhock House had reached the upper level at this stage, and so Schindler’s main contribution to the interior was in the completion of Miss Barnsdall’s bedroom and the detailing of the ceiling and the sleeping alcove. He was also involved in the detailing of the escutcheon plates on the front doors, the location and installation of lighting throughout the house, and the design of a pergola and wading pool near the perimeter.

In 1921, however, Aline Barnsdall’s disenchantment with the entire process increased, since newspaper accounts described her intention to scale down the size of the theatre on Olive Hill and to offer it to a local repertory company. The commercial spaces that Wright had designed along Hollywood Boulevard, originally meant for actors, artists, and musicians-in-residence, were also redesigned as more upscale shops, signifying a shift in her ideas for the project. She commissioned another house in Beverly Hills in 1923, which is a sign of her restored faith in Wright, but it was never realized, and her intentions to live elsewhere show her increasing disinterest in Hollyhock House and her unwillingness to stay there. In 1926, after the Beverly Hills commission, Aline Barnsdall decided to dedicate 11.4 of the 36 acres of the Olive Hill tract and all buildings except Residence B to the Department of Recreation and Parks of the City of Los Angeles. This ended her plans for an experimental creative community in California. Following the completion of Hollyhock House, Frank Lloyd Wright continued to show a personal liking for the project. He lived in Oleanders, or Residence B, at 1600 Edgemont Street on the northwest side of the site for a period of about a year while he retained a studio on Harper Avenue.

Residence B is located on a steep slope and was designed to align with the contours of the hill. Its walls are battered to an even more dramatic angle than those of Hollyhock House and have horizontal banding to accentuate unity with the landscape. This angled outline is topped by an extended cornice line that is a reminder of earlier Prairie School designs, but several details give it an identity of its own.

It would seem that such a generous bequest would be quickly accepted by the City of Los Angeles, but the conditions that Aline Barnsdall attached to the gift ended in protracted negotiations that delayed transfer until January 1927. Aline Barnsdall and her daughter continued living in the house during this time. From

its completion late in 1921 until it was taken over by Los Angeles, she had been in temporary residence there for less than six years.

One of the stipulations she placed on the transfer was that the California Art Club would have use of the house for 15 years. It was officially designated as their headquarters on August 13, 1927. A monthly bulletin produced by the club has proved to be an invaluable source of information about the original condition of the house.

At the time of the turnover the wall color of the living room was described as “unevenly tarnished gold” with beige drapes combined with “gold and wisteria silks.” Earlier sources, however, had called the ceiling gray-green, which corresponds with Wright’s term for the color of the olive trees that gave the site its name, and Nile green mixed with bronze. These colors also match the palette used in a large Japanese screen that Aline Barnsdall bought from Wright. The main colors in this screen are dark green on a gold background.⁵⁹

Sources and Significance There was a complex set of influences behind Hollyhock House as it was built. However, various layered sources can be traced. The first of these is Wright’s interest in Japanese architecture, especially since Wright described his love for Japan in his autobiography and was also involved in the design of the Imperial Hotel there while working at Olive Hill.

Wright’s first awareness of this culture prior to his initial visit to Japan in 1905 came during a visit to the Chicago World’s Fair of 1893. This occurred at the same time that he rented an office in the Schiller Building. He criticized the Fair as an example of *Beaux-Arts* Classicism, and the *Ho-o-den* Temple, Nippon Tea House, and Exhibition of Japanese Art that he saw there must have been an exciting contrast to it. Soon afterwards, he started using a similar division of platform, skeleton-framed walls, and wide-eaved, steeply gabled roofs that he saw on these Japanese buildings as the basis of his new “Prairie” architecture. Individually confined rooms were replaced by the free flow of space usually associated with the traditional Japanese house.

Wright’s self-described “breaking of the box,” as seen in the Darwin Martin, Robie, and Avery Coonley Houses of the following years can be traced as the beginning of the spatial relationships used in the living area of the Hollyhock House. This relocation of the fireplace is the only notable exception to this evolution.

The central courtyard is Wright’s essential concession to the idea of a California typology, clearly expressed in his belief that the design should be as much open as closed. There were other precedents for this type of openness before the Hollyhock House, such as the Midway Gardens project, completed in 1913.

The square, open, central space of the Gardens was surrounded by two wings that projected out from a covered, stepped pavilion. This is reminiscent of the arrangement used in reverse order at Hollyhock House, where the roof over the loggia was used as a stage for those seated in the amphitheatre across the courtyard.

Concentric arrangements of the type used in the Hollyhock House appear several times in Wright’s early work, for example, in his scheme for a resort on Wolf Lake in Indiana, designed ten years before Olive Hill. In that scheme, which Wright chose to include in the Wasmuth portfolio, projecting arms also

appear on either side of an axis, and a bridge between them forms a key part of the composition.

Modular layering of the type seen in the Midway Gardens pavilion and Hollyhock House elevation also appears in the Kehl Dance Academy, designed for an urban site in Madison, Wisconsin. In addition to its symmetrical plan, this theatre-like building has a richly ornamented façade and flat roof. The Kehl project mirrors the exterior appearance of the Barnsdall residence in other details such as Wright's use of a hollyhock motif on lamps on exterior terraces.

The Imperial Hotel in Tokyo was the second major precedent in which Wright used a central court. As in the Midway Gardens, it was also organized along a central axis with guest room wings extending out from a central lobby to protect landscaping and pools inside. The Imperial House looked like a fortress built against the natural threats that it was meant to withstand, such as the earthquake it eventually survived.

Wright's pride at having created an earthquake-proof building is well known, and while he was living in Residence B on Olive Hill, he received the telegram from Baron Okura telling him that it had prevailed. He produced several other projects in Japan while he lived there, but several of these, such as his scheme for a large hotel in Odawara in 1917 or his projects for the Immu, Inouye, Goto, and Mihara Houses of 1918, were never realized.

The Tazemon Yamamura House in Ashiya was built and provides many insights into houses he was designing in Los Angeles at the same time. While the absence of any drawings of the Yakamura House in the Taliesin archives indicates that Wright may have delegated it to his assistant Arata Endo, it is still recognizable as Wright's design.

The Yamamura House does not have a large courtyard, but steps down a steeply sloping site in three distinct stages. Oya stone, alternating with plaster walls, is used to designate changes in level. In spite of this difference, its angled walls and distinctive use of ornaments make comparison clear to the Hollyhock House, as does its roof, which is also used as an outdoor terrace. Tall chimneys projecting up through a thick pine forest give the profile of this house a different, more vertical emphasis than Olive Hill, however.

Mesoamerica Sources Replace Japan There has been a great deal of speculation about the influence of Mayan architecture on Hollyhock House. Lloyd Wright confirmed that his father wanted to convey the image of a pueblo.

But a Mayan influence is very clear. At the same Chicago Exposition of 1893 where Wright saw the *Ho-o-den* Temple, several Mayan ruins were reproduced by Edward H. Thompson, who had served as the American Consul at Merida in the Yucatan from 1885 to 1910. These included parts of the Nunnery at Uxmal and the corbelled arch at Labna, which were surrounded by a simulated jungle overgrowth to add to their exotic appeal. Wright also produced two designs, for the A. D. German Warehouse at Richland Centre, Wisconsin, in 1915 and the F. C. Bork House in Milwaukee in 1915, which owe obvious allegiance to Mayan prototypes, and each of these also had roof terraces.

Before the World's Fair Wright may have had other exposure to Mayan architecture, since important studies on Mesoamerica had begun to appear while he was a student. Sir Alfred Maudslay had been one of the first to undertake a

complete archeological survey of British Honduras, Guatemala, parts of Campeche, and Chiapas between 1880 and 1894. He published his findings in a five-volume set.

Desiré Charney, who traveled extensively throughout Central America between 1858 and 1860, also published photographs of the expeditions in *Cities et Ruines Américains* in 1863. A second expedition in 1880, which was partially financed by Pierre Lorillard of Tuxedo Park, New York, resulted in a second book entitled *Les Anciennes Villes du Nouveau Monde*, which appeared in English in 1887. Wright was 19 years old at that time and had just arrived in Chicago after leaving the University of Wisconsin.

Wright read widely from a broad variety of sources. Historian Vincent Scully has pointed out similarities between Wright's Oak Park studio-house and two residences for Bruce Price in Tuxedo Park, making it possible that he also knew Lorillard.⁶⁰

Specific similarities occur in the platform base, tripartite ordering of elongated windows, unbroken band of ornament, and high truncated roof used on the predominant, western elevation of Hollyhock House and Temple 33 in Yaxchilan, on the Mexican side of Usumacinta River, near Guatemala. These features are used in almost identical proportion in the Mayan example, also recorded in reconstructed drawings in Maudslay's studies, since Temple 33, and it is doubtful that was the model since it had yet to be restored and is still covered in undergrowth.

Temple 33 was built on a terrace 200 feet above the main plaza of the city, as many Mayan temples were. Wright has said,

I remember how, as a boy, primitive American architecture, Toltec, Aztec, Mayan and Inca—stirred my wonder, excited my wishful admiration. I wished I might someday . . . join in excavating those long slumbering remains of lost cultures; mighty, primitive abstractions of man's nature. Those great American abstractions were all earth architecture: gigantic masses of masonry raised up on great stone paved terrain, all planned as on a mountain, one vast plateau lying there and made into the great mountain ranges themselves; those vast areas of paved earth walled in by stone construction. They were human creations, cosmic as sun, moon and stars.⁶¹

In many of the preliminary sketches that Wright made of Hollyhock House, the western elevation as seen from Edgemont Street is treated as the most important. This is also the position that acts as a gateway between the slope that leads up to the house and the snow-capped mountains in the distance. The earliest of these sketches show his gradual assimilation of the rare, primal quality of the hillside. In it two large vertical piers are clearly visible. They are part of a familiar, Prairie School language, and emerge in the final design of the house.

In another sketch, this profile is replaced with a triangular form, like a tepee, over the living room, and a deeper pitch over each of the projecting wings. A tall chimney also adds to the vertical thrust of the massing. A final elevation shows that this vertically has been replaced by a *talud* and *tablero* profile. Considering the pictogram that he has used to present Aline Barnsdall on the mantle of the living room fireplace, in which she is depicted as an "Indian princess," his rejection of a steep-sided, triangular roof symbolic of Plains Indians in favor of a Mesoamerican form

may seem curious. The teepee form does emerge again in projects like a resort on Lake Tahoe in 1922, the Nakoma Country Club in Madison, Wisconsin, in 1924, the Steel Cathedral in 1926, and Beth Shalom Synagogue in Elkins Park in 1959, however.

Wright's decision not to use it at Olive Hill may be explained by his relative unfamiliarity with West Coast culture at that time and doubts about the ability of this sharp profile to stand up against the visual power of the mountains that he consistently drew as a background in each sketch. Wright relied on the modular grid in the plan of this and many others of his houses, and the extension of Cartesian coordinates up onto this final one also implies that regulatory considerations were as responsible as any historical prototype for the visual layering that finally resulted. Wright's intention to use one native American style or another, however, never changed due to his self-image as the champion of a democratic ideal. Debate continues on his sources but there is no argument that the Barnsdall house sparked a Mayan revival in the United States. It reached its apogee in the interpretive work of Robert Stacy-Judd in Los Angeles just before World War II. The Hollyhock House played an important role in Wright's career. Personal calamity occurred in his life with almost Biblical predictability, marking phases that have a definite beginning and end. His Prairie School years, beginning with the Willets House of 1902 and ending with the Robie House seven years later, changed architecture in America and abroad, encouraging designers to follow Wright's lead in "breaking the box," and opening up room plans.

Wright's decision to leave Chicago because of the breakup of his first marriage was irrevocable, and the destruction of Taliesin by fire soon afterwards provided tragic confirmation that the first chapter of his life had ended. The Barnsdall commissions, and Hollyhock House in particular, gave him the chance to make a fresh start in totally different circumstances and to express what he found in them in a new way.

No place in the United States could be more different from the flat grasslands of the midwestern prairie than Los Angeles, where heavily forested snow-capped mountain ranges come up to the edge of the Pacific, and earthquakes, torrential rains, mudslides, and violent windstorms intermittently interrupt the illusion of paradise. These natural extremes must have been even more obvious to an architect of Wright's sensibilities, since he had such empathy with the land. He once described the appearance and smell of each of the trees surrounding his beloved Taliesin as they began to bloom in the spring. As Vincent Scully commented on this aspect of his talent, saying that Wright:

built almost everywhere on the North American continent without relinquishing his attempt to celebrate in architectural form the specific landscapes with which he happened to be involved . . . that is he tried, though in abstract form, to echo the shapes and dominant rhythms of the landscapes in which his buildings were set.⁶²

Hollyhock House, as well as the Tazemon Yamamura residence that is its spiritual counterpart across the Pacific, is the result of an emotional response to context. It represents a victory of nature and art over technology and the Modernist prerogatives of honesty of structural expression.



Taliesin East. Courtesy of Scott Beveridge; Flickr

Wright succeeded in establishing a California typology here, which he continued to elaborate upon in the Ennis, Freeman, and Millard Houses that followed. This served as a point of departure for many influential architects soon afterward. Because of worsening economic conditions leading up to the Depression in the decade following Wright's Los Angeles hiatus, he was not given the same opportunity to express the natural beauty of a site until 1936, when he designed Fallingwater for the Kaufmann family in Ohiopyle, Pennsylvania. This is the project most frequently associated in the public consciousness with his ability to link architecture with nature.⁶³

Except for the house within a house containing the Aline and Aline Elizabeth Barnsdall suites on the southwestern corner of the central court, which has a distinctive image of its own, the sense of a public forum remains alive on Olive Hill. This fits easily with the personality of a client who initially wanted everything there to be imbued with the possibility of performance. She commissioned Hollyhock House, but Wright never intended it to belong to her alone, and so the public role that it plays as a gallery for artists and a background for musical and dramatic performances, as well as being the centerpiece of public attention, was intended by its architect from the start.

The Jacobs Houses In 1937, Wright made a second attempt to create a truly American style, following the completion of his Prairie House series, his departure from Oak Park in 1909, and the Olive Hill experience. In the midst of the lead up to World War II, he launched what he called the Usonian house with his design of a residence for the Jacobs family in Madison, Wisconsin. He wanted this house

to be the prototype for an efficient low-cost residence for the average, middle class American family that would be easy to build and could be customized, within limits, to fit any site in the country. He had just experienced the success of Fallingwater in Bear Run, Pennsylvania, which was certainly far from average and middle class. It had brought him international recognition, followed by the commission to design the headquarters building for the Johnson Wax Company in Racine, Wisconsin. His long career had been reborn, yet again, and he was in a much stronger position to put forward an ambitious idea of this kind than he would have been a decade earlier. But, there are many elements in the first Jacobs house that he had used earlier in what he referred to as his “board and batten cottages.”⁶⁴ Like the Usonian prototype, it also had a modular plan, flat roof with cantilevered eaves, continuous south-facing windows, and horizontal wood cladding, and it had only one level. Like the Prairie house, the Usonian house was also intended to express the American spirit of independence and freedom of expression, as well as a “can do” spirit of innovation and entrepreneurial invention.

The first Jacobs house is relatively modest in size at 1,500 square feet, but seems much larger because of the lack of conventional room divisions and its relationship to a garden on the inner, protected side of an L-shaped plan. Wright used this plan shape to best advantage to segregate public and private zones inside, in conjunction with the garden. He provided two entrances for the same reason, with the first leading into the more public end, where the living room is located, and the second providing access from the bedrooms to the garden. The service spaces, such as the kitchen and the bathrooms, act as transition spaces between the two zones at the middle of the “L.” Wright also used different materials to draw attention to the different areas, blending brick with wood siding in the more public end of the house.

The Garden Consistent with his notion of independence, the garden was not simply intended to replicate nature, but to be planted with vegetables and herbs so that the family could be partially self-sufficient in their food needs. The Usonian house was meant to integrate architecture and agriculture as a true symbol of American life.

A First Attempt The first Usonian house was built for Herbert and Catherine Jacobs in Madison, Wisconsin, in 1936. At 1,500 square feet (150 square meters), it was relatively small and cost approximately \$5,500. Shortly afterward, the Jacobs family moved to a 52-acre farm in Middleton, Wisconsin, and asked Wright to design another home for them there. While his first house was rectilinear, the topography of this more wide-open site suggested a curvilinear or semicircular plan, the first of a series of houses that Wright built with curved plans. By early 1944 he had produced a house that was unlike anything he, or anyone else up until that time, had done and that is now seen as a pioneering attempt at passive solar design. The house is a half circle with its rear, north wall protected from the cold winter wind by a berm that rises to the top of it. The entire south façade has large windows and glass doors covered by the deep eave of a flat overhanging roof to let the low winter sun in and to block the higher summer solar angle. This is in response to a midwest, northeast temperate zone where temperature can range from subzero to more than 86 °F (30 °C) and where summers can be very humid.

In this humid zone, which has higher temperatures than are typical in the Midwest, Wright realized it was especially important to open up to cooling breezes, and so these large doors on the south side open wide to connect the long, narrow interior space to a sunken, outdoor garden protected by the hill and the curved form of the house. The interior is basically one large room, 17 feet (5 meters) wide and 80 feet (17 meters) long, with a kitchen and bathroom kept apart in a masonry core. There are bedrooms on an upper level, reached by a narrow stair in a circular stone core; but to keep the lower level open, this floor is suspended from the roof beams by steel rods. These beams, which are relatively small, radiate out from the buried berm wall on the north and are doubled up to embrace the mullion posts of the glazed south wall, to which they are bolted on either side.

A Lesson, Ahead of Its Time The second Jacobs house is in perfect harmony with its surroundings and is a model of passive solar design, which was not to become popular for another 30 years. It integrates a relationship to its particular context with strategies for natural energy and spatial organization in many important ways. Burying the back of the house in the earth protects it from the prevailing wind and keeps it warmer because of thermal mass, and the limestone walls and floor serve the same purpose. Rather than being coincidental, the curved shape derives from the structural requirements of this earth berm, which is very heavy. The orientation toward the south/southeast is ideal for passive solar gain, captured by clever use of glazing.

The curved shape of this façade is also the most efficient in increasing solar gain. The large roof eave protects the interior from direct solar radiation in the summer and allows it to come in during the winter when the sun is lower on the horizon. The irregularly laid limestone bricks, rather than being a stylistic gesture, also increase the surface area of material used for thermal storage, soaking up heat during the day and reradiating it into the interior at night. The suspended second floor, recessed 4 feet (1.2 meters) back from the south window wall, allows heat to rise from the lower level to heat the upper floor during the winter. During the summer, the wall on the north as well as the windows on the south have openings that allow the house to be cross ventilated, and this natural ventilation, combined with the thermal inertia created by the stone walls and floor, contribute to a cool interior environment. The Jacobs Hemicycle was followed, in rapid succession, by the Martin House in Akron, Ohio (1947), Meyer House in Galesburg, Michigan (1948), Laurent House in Rockford, Illinois (1949), and Pearce House in Bradbury, California (1950), as well as similarly shaped houses for his sons David, in Phoenix, Arizona (1950), and Robert Llewellyn, in Bethesda, Maryland (1953). None of these, however, has the direct simplicity of their pioneering predecessor.

Taliesin West Just before the second Jacobs house was built, Wright was also consulting on the Arizona Biltmore Hotel, designed by a former employee at the Oak Park Studio, Alfred Chase McArthur. Wright stayed in Phoenix for four months and, while he was there, also received a commission for another hotel, San Marcos, in the desert. Escaping the cold Wisconsin winters, in 1929 he established a site, which he called Ocatilla, at Salt River Mountain as a studio and living quarters for 15 people who came from Taliesin. It was built of readily available,

inexpensive materials appropriate to its temporary status: wood and canvas units laid out in an angular geometrical plan that echoed the mountain peaks nearby. The rooms were grouped around an internal courtyard, which offered some protection from the harsh desert landscape.

The San Marcos project was sidetracked by the stock market crash, but the brief experience at Ocatilla, and a bout of pneumonia, planted the idea of establishing a permanent studio there. In January 1938 Wright bought 800 acres, 26 miles northwest of Phoenix in Paradise Valley, and the entire Wisconsin studio traveled there to help construct Taliesin West. It is angular, like Ocatilla, in reference to the McDowell Mountains, which form a 4,000 feet (1,300 meters) high backdrop on the north side of the site.

The materials used in the construction of Taliesin West were also mostly taken from the site, as they were for the Ocatilla Camp, but the more permanent volcanic stones at hand were placed in rough wooden forms and concrete was poured in around them to hold them together without using steel reinforcing bars. Heavy redwood truss frames were placed at intervals along these walls. These hold up a sliding canvas panel roof between them, creating the feeling of a sophisticated tented camp that is in perfect harmony with the desert landscape.

Brendan Gill broke the unofficial and unspoken code of silence that surrounded Wright for years after his death in 1959. This was imposed by his inner circle, especially his wife, Olgivanna Labovich, who was very protective of his image and reputation. Gill has written about Wright's paradoxical character, especially his ability to endure great hardships for the sake of his work and his equivalent love of luxury. Taliesin West is an enduring symbol of that ambivalence.

After the first phase was completed in 1941, the permanent composite included a residence for the Wrights, a drafting room and workshop, but also a "teaching theatre" for performances and films, where Wright and his wife were the center of attention. There was also a communal kitchen, consistent with Wright's idea of a fellowship in which people lived and worked together. Wright's wife had been a Gurdjieff disciple at his Institute for the Harmonious Development of Man, so her involvement in the formation of Taliesin West introduced a spiritual component into Wright's idea of an organic architecture, taking his notion of unity with nature to an almost mystical level, as a way of enhancing human perception.

After Phase I was completed, there was an annual western migration from Wisconsin to Arizona until Wright died. Photographs and films taken during the early days at Taliesin West show the contrasts best: one indelible image is of Wright and his wife in a Cherokee Red Lincoln Continental Cabriolet, in front of their elemental rock, wood, and canvas commune.

Fallingwater Fallingwater, which has consistently been chosen by design professionals in annual polls taken by several leading journals as one of the most influential works of architecture ever produced in America, is all the more significant because of the special circumstances behind its creation.

An overview of Frank Lloyd Wright's entire career shows that the period immediately preceding the design of this house was one of his least productive in terms of actual work built. This inactivity as mentioned eventually led both him and his wife Olgivanna to conceive the school at Taliesin as a means of sheer professional and financial survival. Edgar Kaufmann Jr. was one of the first students



An exterior view of Fallingwater. © Mark Hiser, <http://MarkHiserPhotography.com>. Used with permission.

at Taliesin, and he was so impressed with what he saw that he suggested to his father that Wright be the architect of a new vacation house that the family was then considering on a large plot of land at Bear Run, near Ohiopyle, Pennsylvania. The site, which had been used as a family campground for many years, is dominated by Bear Run Creek and is surrounded by gently rolling hills, dense woods, and the ever-present pink mountain laurel that is also the state flower. This area is typical glacial moraine with rocks and boulders from its geological past strewn everywhere.

On his first site visit with Edgar Kaufmann Sr., Wright characteristically took in far more than the area immediately surrounding the primitive log cabin that the family had built on a high bluff overlooking the rushing stream below. Kaufmann had automatically assumed that this would be the logical position for his new home. Several stories that have come down from his apprentices, and may be partially apocryphal, tell of an impatient call from Kaufman after months of waiting for word from Wright and a preliminary design accomplished in a single night, all following a long period of reflection after this single site visit. This frenetic burst of creative activity produced a set of sketches on yellow tracing paper that Wright asked his students to draft up for the client visit that day, a design that stayed appreciably the same throughout the construction process. The design revealed in those sketches presented Kaufmann with a totally unexpected vision. It showed a living environment distributed among several horizontal levels and

dramatically projected out over the large waterfall in the middle of Bear Run that the family had admired from a distance for so many years. What Wright had gleaned from his short visit to the ravine with a rushing stream running through it was that a waterfall and the rock ledge it fell over was the epicenter of the site. He had determined very quickly and quietly during his short visit that he wanted to project the house over that point so that it would participate in the natural cycle that was constantly unfolding there.⁶⁵ He echoed the rock ledges that caused the cascade by building vertical towers, enclosing stairs made of stone taken from the site, and in cantilevered concrete slabs; nature and “the machine,” as he referred to non-natural materials, are placed in perfect balance. He later wrote that he really disliked concrete because it is inert and nonorganic, but nothing else could have achieved his goal of cantilevering slabs out 30 feet over the waterfall to make nature and architecture seem to blend together.

As he had in his Prairie houses in Chicago, Wright used an emphasis on the horizontal to help to visually tie the house to the ground.⁶⁶ In Fallingwater, however, that tactic takes on additional symbolism due to his use of concrete and stone. Industrially produced material extends out to connect to its surroundings, while the stone from the earth on which the house sits seems to shoot upward, providing an anchor for the composition. This balance continues between the amount of indoor and outdoor space in the house. Wright often used the strategy of a small entrance leading to a progressively larger series of spaces, as previously seen in the Hollyhock House. He does that in the Kaufmann house as well, making the doorway, which is hidden between vertical stone piers, seem like the entrance into a cave. The surprise that awaits is the view out over the stream to the opposite side of the ravine beyond. It is covered in dark green mountain laurel, which has pink blossoms in the spring, creating a seemingly unobstructed vision of a natural paradise just beyond the glass wall of the living room. The living room has no walls to allow as much of an open vista as possible. The secondary focal point, after this external view, is a massive fireplace, located to the right, and a boulder projecting up through the floor in front of it. Wright identified this on his site visit as the structural fulcrum on which he would balance the intricate cantilever system he has used. A vertical stone tower projects upward from this point, containing stairs, mechanical flues, and electrical chases to the floors above. It counteracts the interlocking concrete cantilevers that project outward in alternating directions above the stream. Each of these projecting floors has a grillage of concrete beams as its support structure, covered by a slate floor that unites the outside decks with the interior space. Wright later admitted to having many sleepless nights worrying about the weight that these slate slabs added to the cantilevers. Later events would seem to bear out his concern, since the floors eventually deflected enough to cause the house to be supported by scaffolding in the late 1990s. Further investigation later revealed that the deflection was not caused by the slate, but by inadequate reinforcing in the grillages themselves. Wright had calculated the reinforcing correctly, but the contractor had put in only half of the bars to increase his profit.

Aside from the living room, which is the main space of the house with its dual focus on both the outside terrace and the hearth, there is a small kitchen and dining area that is a reminder that this was just a vacation house and not a permanent

residence. This balance between indoor and outdoor space, of each room having its own terrace, continues with the bedrooms on the floor above, which are treated the same way.

Independent engineering studies, commissioned by Kaufmann without Wright's knowledge when construction started, cast immediate doubt on the structural stability of the house. The cantilever system that the architect was proposing was unfamiliar, and engineers doubted the wisdom of choosing a single boulder in the middle of the stream as the fulcrum of that cantilever.⁶⁷

This study, when presented to Wright, prompted the first of several confrontations between architect and client that came to characterize the progress of the house. Upon receiving word of the study and its conclusions, Wright fired back a cable to Kaufmann, telling him, in essence, that he "did not deserve the house" and requesting the return of all working drawings. Temporarily reassured, Kaufmann apologized but continued to commission further studies. Perpetual doubts eventually prompted the client to surreptitiously arrange for a brick wall to be built in the dark shadow beneath the longest cantilever of the first floor to prevent what he and his engineers felt was sure to be imminent collapse. Wright, who had purposely chosen both an inexperienced project manager and contractor so that he might better control each of them, happened to be in the area giving a lecture at the University of Pennsylvania in Philadelphia at the time, just as the wall was being built and decided to make an unannounced visit to the site to check the progress of the work. He was infuriated when he saw the wall but asked the contractor to continue building it, except for the final closing course. He wanted it to appear to be complete, but have it give no structural support to the cantilever.

On the day of the opening dedication, when the house, which had already been proclaimed as "the beginning of a new era" on the cover of *Time* magazine, was complete, Kaufmann sheepishly told Wright about the wall, which he thought he had not seen hidden in the darkness amongst the rocks. After Wright told him that he had known about the tactic as well as about the missing last course, both agreed that the entire stack of engineering reports should be buried under the hearthstone, which was the last piece to be put in place, as a testimony to Wright's innate structural instincts. More than any other of Frank Lloyd Wright's projects, Fallingwater has come to symbolize his strong principles and his key philosophy of uniting architecture with its natural surroundings. The vertical towers of stone quarried on the site visually and structurally counteract the horizontal planes of the cantilevers, and are in turn softened by having each course laid up rough, so that the ledges once again unite the building with the ground. This kind of sensitivity abounds throughout the house, revealing an organic relationship between the natural and the man-made as the core of the architect's concern. The entry sequence into Fallingwater today also shows the architect's skill in the manipulation of scale, the contrast between open and closed, and the element of surprise, which is found so rarely on the contemporary scene.

Fallingwater is Wright's *riposte* to Modernists such as Le Corbusier, who were getting so much attention at the time he designed this house. He demonstrated that industrial materials and nature need not be mutually exclusive, but can coexist.⁶⁸

THE WEST

Buff and Hensman: The Bass House

Like many avant-garde members of their generation in and around Los Angeles, Conrad Buff and Donald Hensman tried to oppose the stultifying introspection typical in prewar housing and accommodate the radical shift in lifestyle brought about by the end of World War II, a less formal, more casual approach demanding freedom and openness in living arrangements.

The modern architectural language, notably flat roofs to avoid historical reference; white surfaces to obliterate class distinctions; material limitations to exclude nonindustrial products; a predominance of glass associated with political transparency, generic spirituality, and reliance on functionality; all evolved in Europe, primarily Germany, from the turn of the twentieth century to the outbreak of World War II. This language was introduced to the United States by the media, by Philip Johnson, curator of the International Style Exhibition at the Museum of Modern Art, and a group of émigrés: Walter Gropius, Ludwig Mies van der Rohe, and Marcel Breuer, who fled to America to avoid the National American converts such as John Entenza, who promoted it in his restructured *Arts and Architecture* magazine.

Eager to use newly developed technology, the United States heralded the arrival of European Modernism as an opportunity to experiment. Many architects adopted forms without understanding their meaning and cultural attitudes without grasping their significance. Such doctrinaire positions extended to clients; architects often felt clients needed educating rather than serving. Buff and Hensman sought to accommodate rather than dictate, but retained the aesthetic principles of the Modern Movement. Their attitude and the lack of hubris that it requires are a constant theme, as is the aesthetic sensibility that guided the following projects. Such a delicate balance takes confidence and certainty, remarkable in architects of their age, especially considering peer pressure to treat clients otherwise.

Case Study Innovation There is a mystique surrounding the Case Study House Program that is difficult to unravel, but any attempt to do so must begin with the founder, John Entenza. Charismatic by all accounts, he was also determined to convert the entire nation to Modernism through the vehicle of *Arts and Architecture* magazine and the Case Study houses he featured in it. His concept was brilliant in its simplicity, allowing all concerned to benefit. Clients with land to build on got a new house free of charge, as long as they gave Entenza and the architect he selected free aesthetic rein. The architects involved were asked to waive the fee, but since many of these were in the early stages of their careers, they welcomed the publicity and exposure that *Arts and Architecture* gave them. Contractors and suppliers were asked to contribute building services and material in return for free advertising in Entenza's magazine, thus making the circle complete.⁶⁹

This revolutionary experiment in media promotion brought a new generation of California designers, as well as some who were not so new, into the national spotlight, putting many promising careers on a fast track to fame. Entenza had an unerring eye for talent; he was especially adept at identifying young people who were just about to break through the barrier of anonymity, with or without his

help. Conrad Buff and Donald Hensman were selected to this illustrious company because of a sensibility they shared with Entenza—an acute appreciation of space, elegant and honest expression in the best contemporary California tradition—and because John Entenza had the prescience to realize the potential that these two young architects possessed.

Bass Residence, Case Study House No. 20 Altadena, California, 1958–1960 This residence for Ruth and Saul Bass had several factors determining the primary concepts of the project. As architect Donald Hensman recalls it:

Initially, we recognized the unique qualities and limitations of the site and considered a structural frame that would enclose it entirely. Second, consideration of the client's specific needs and budget led to our placing particular emphasis on the structural and spatial aspects of our architecture rather than the use of excessively refined and costly techniques, equipment, and materials. Finally, we saw the necessity for organized space in major areas devoted to specific needs, functions, and age groups, to be separated by courts and open spaces. This would then segregate the parents' private living areas, children's rooms, social and dining facilities, and studio work areas. We thought this kind of zoning, with its direct and orderly circulation, would help to create a harmonious and satisfying environment, conducive to the happiness of all members of the family in response to nature.

Case Study House No. 20 was unique in that it was based upon the experimental use of several prefabricated Douglas fir plywood products as part of the structure concept. This system consists of a series of continuous plywood box beams, stress-skin plywood panels, and hollow-core plywood vaults, all fabricated by the Berkeley Plywood Company. The component parts, fabricated in northern California, were trucked to the site and handled by forklift hoist, making for rapid construction. The plywood walls in the central area of the house were positioned and initially secured in less than two hours. These walls, the stress-skin panels spanning the 8-foot base, and the flat roof area of the house are composed of two layers of Douglas fir plywood, the top one being 1/2-inch thick and the bottom 3/4-inch thick. These were spaced by 1-1/8-inch by 1-3/8-inch ribs, and the central void area was filled with fiberglass insulation. The panels were bent and pressure glued into the required forms, thus achieving lightweight modular layers.

The primary exterior surface is the same material that is used as the structural skin over the light wood framing members: 3/8-inch Douglas fir plywood with a medium density overlay face. This material requires extreme rigidity to resist horizontal loads and makes an excellent surface for subsequent painting. The 4 feet by 8 feet panel size directly integrated with the 8 feet structural module vertically and horizontally, eliminating the necessity for job cutting each panel. The joints between panels were treated directly with a slender applied lathe, which covers structural nailing, provides weather strip closures, and echoes the modular rhythm of the building. In contrast to the smooth paneling, the remainder of the exterior walls were clad with 5/8-inch surface groove structure 111 Douglas fir and plywood. The house and garden plans are unified through the use of a spline quarry tile that links the entry court, the main dining areas, and all the major

garden terraces adjacent to the swimming pool. All major rooms open directly into a garden court and deck by means of full height (8 feet by 8 feet) sliding steel doors with adjustable glass and stainless steel louvers that provide natural ventilation. Glazing of the public approach was done with a new type of glass manufactured by the Mississippi Glass Company. Aluminum framed, plastic, heat-reflecting skylights were used in the interior as well as service areas. Lighting is provided mainly by fiberglass soffits that create diffused, continuous planes of soft light throughout the house. Cove lighting at the base of the vaults emphasizes their form as well as providing general illumination in the living and dining areas.

Landscape development by Eckbo, Modine, and Williams complemented the architectural space organization as well as the existing trees and undergrowth. We designed an unusual swimming pool to make a central focus for the rear garden, its form subtly echoing the curvilinear nature of other elements of the design.

This project has substantiated our conviction concerning the use of factory, processed, prefabricated wood products. In particular, the success of the roof installation offers encouragement for further exploration in the development of structural panel systems. Lamination, pressure gluing, and plastic impregnation give new significance to this traditional material, indicating another direction for its rational use as part of a contemporary vocabulary of structural techniques.

Morphosis: The Crawford House

The Crawford House is located on a 2-acre parcel of land that slopes away from a street on one side of the site, favoring the view toward the Pacific Ocean, which is about one-half mile away. It was designed and built between 1987 and 1991 while Thom Mayne and Michael Rotondi were still partners in the firm Morphosis. They have since split up, with Mayne keeping the name of the firm and Michael Rotondi creating a new one, called RoTo, with Clark Stevens. The house is large, with its 8,000 square feet arranged in linear formation along a north-south axis. It carves into the site so that it only appears to have a long low profile from the street, looking like a one-story structure, with a multicar garage on the right-hand, north end of the elevation, and a guesthouse, which is broken off the left-hand, southern end, located farther down the hill.

This strategy, of siting the house as far back on the property as possible, allows the majority of it to be on the oceanside. Mayne, who was the designer, began with the concept of a circular boundary wall, which becomes a retaining wall on the entrance side near the street, with a gap to indicate the pathway to the front door. This circular enclosure begins to fragment on the western oceanside, protecting and enfolding the southern edge of the guesthouse at that edge, and only emerging as a small segment on the north to serve as a reminder of its presence, before disappearing completely on the horizon at the bottom of the hill, to the west. One of Mayne's first, if not *the* first, concept sketches shows the idea clearly. It indicates a crescent-shaped enclosure that embraces the main central portion of the long, linear house that runs across and eventually bisects it, with a gap, drawn as an arrow and eventually, built that way, in the middle to provide access to the front door, and the guesthouse attached to the left-hand arm of the crescent, on the west. In that same concept sketch the house itself is shown as a series of repetitive structural

bays, simply drawn as grid lines, to provide a sense of hierarchy and order to it. In addition to becoming the main column bays, these would later emerge as a rank of seven rectangular light monitors on the roof syncopating the extended elevation along the street and giving it momentum and life. The final embryonic part of that initial concept diagram is a cross-shaped piece extending from the front entrance on the street side to the east down and out of the house toward the west. The long upright shaft of the cross is perpendicular to the predominant, north-south axis of the house, while the crossbar, which is parallel to the residence, is much thinner and shorter. This initial cursive drawing has very few lines but contains all of the information necessary to understand the architect's design intent. It falls into that wonderful tradition of the napkin sketch that turns out to be the final scheme when drawn by a talented designer, which is becoming very rare as the computer revolution continues to reshape the architectural profession, and the skill of sketching, which has been a part of architecture since the Renaissance, is being forgotten.

The three elements in the sketch, the semicircular wall, the elongated bisecting row of grid lines running parallel to the street, and the cross-shaped blob on the central east-west axis of the crescent that is perpendicular to that, are the essence of the house. At the time he designed it, Mayne described these three elements as first, "the mercator," which is the semicircular wall; second, "a series of linear progressions perpendicular to the axis of the major view orientation," which are the grid lines, providing order; and third, "a deserted center," which is the open entry axis, allowing views through the house, across the cross-shaped swimming pool in an open garden in the back, to the Pacific Ocean in the distance.⁷⁰

This central view axis that cuts through the middle of the house, from the front door to the pool and then the ocean, literally begins with an arrow-shaped space that points toward the view. This is a reminder that Mayne belongs to a growing cadre of younger architects who have been actively engaged in redefining Modernism. They have taken it out of the dustbin of history to which it had been relegated in the mid-1960s and early 1970s, have begun to reexamine its basic principles, and have found them to be sound. They have been dedicated to improving only those parts of that language that caused it to be questioned by an increasingly disillusioned public in the first place, such as lack of environmental and contextural sensitivity, a shortage of interior softness and comfort, a dearth of legibility, in terms of being able to find front doors, stairs, elevators, and bathrooms, and a disconnection with the past.

A New Modern House The designer of the Crawford House obviously took these criticisms to heart. It falls within the modernist canon because of the emphasis that Mayne has placed on making forms adhere to function, the use of a strictly hierarchical order, the sense of progression through a carefully calculated series of interior and exterior spatial experiences, and his use of an industrial palette of materials, most notably in the exposed steel used for the steel columns and vaulted steel beams that predominate in the main living spaces. There is also a concerted attempt to zone the house into what Louis Kahn defined as both "served" and "servant" spaces, that is, the main living areas and those that service them, including mechanical rooms, bathrooms, storage areas, and circulation. This zoning in the Crawford House involves a complex layering of zoning, beginning with a linear

spine that is visible on the roof as a counterpoint to the light monitors behind it. This is a three-dimensional expression of a long thin zone that runs the length of the house, almost as a corridor that provides access to both the enclosed and the open spaces on either side of it. Conceptually, this is a very effective way to organize circulation and is reminiscent of a similar method used in the Brighton Pavilion design by John Nash, built for the Prince Regent. This is a reminder also that good ideas do indeed resurface, in spite of the differences in historical period, culture, and lifestyle, to deal with a complicated circulation pattern. In the Royal Pavilion at Brighton a long gallery leads straight from the entrance to this circulation spine, placed at right angles to it. The spaces are then distributed from right to left in increasingly private order, ending with the Prince's apartment on the far left. In the Crawford House this distribution moves counterclockwise along the arc or crescent, which Mayne has used as an additional counterpoint to the spine, from the guesthouse halfway down the arc on the left, through to the bedroom zone, then the living room and dining room area, ending with an artist's studio on the far right of the main spine, which is also perpendicular to the entrance axis. A further complication, or layer of meaning, that Mayne has introduced to this mix is his ingenious use of the sloping site to shield spaces on the street side, but also to expose them, as the ground falls away, to the oceanside. There are bedrooms in their own private zone stacked on both the upper and lower levels. The living room, dining room, and kitchen are on the entrance level with a maid's room, directly accessible by a stair in the service spine below. The family garage, which is by necessity on the street level, is above the artist's studio, which opens onto the courtyard below.

The Mercator The arc, or fragmented circle, which is also the retaining wall that makes this flip from upper to lower and front to back possible, has been referred to as a "mercator" by Mayne, raising the question of any additional symbolic intention he had in mind for this part of the plan. This is not the first time that Morphosis has used a circular or partially circular element such as this in their design vocabulary, and have referred to it in the same way, most notably in the Kate Mantellini Restaurant on Wilshire Boulevard in Los Angeles where an ocular-style light well elevates a self-described high-level diner to cosmological status. This is a distinct advantage in a city that bills itself as the global epicenter of entertainment and the home of the stars.

The Japanese Connection The explanation of possible reasons behind the use of this conceit in Montecito, however, is a bit more involved, combining an American fantasy of the frontier, a duality of identity, and a rapidly contracting world. The buzzword "globalization" is used frequently these days, but few understand its myriad implications. These were first felt in America as early as the establishment of the British colonial outpost at Jamestown, Virginia, when foreign capital was responsible for the introduction of alien cultural systems, including both agricultural and financial structures that revolutionized this new unexpectedly positive vulnerable context in both positive and devastatingly negative ways.

One of the most important foreign exchanges after that, as far as the history of architecture in California is concerned, took place in the opposite direction, when flotilla that was part of the United States Navy under the command of Commodore Matthew Perry sailed into Yokohama Harbor in 1852, demanding that the

Tokugawa Shogunate open Japan up to international trade. The loss of face that this brought about for the ruling regime, which had been in place for more than 200 years, had far-reaching repercussions for the future of Japan, but the aesthetic earthquake that this unleashed is of more relevance here. This had a substantial impact on the Arts and Crafts Movement on Britain, and subsequently on its most dedicated followers in America, such as Frank Lloyd Wright and the Greene brothers, based in California. The results of this exposure on Wright are now well known. The effects on Charles and Henry Greene, as well as a spate of Los Angeles architects that followed after them, ranging from the Bay Area School to Rudolph Schindler and Charles Eames, still requires definitive research.

That influence would surely include Frank Gehry, who greatly admires Wright, and whose early work honors him. Gehry was once referred to as the headmaster of the Los Angeles School of Architects, which in the late 1900s when the Crawford House was built was contrived to be a loosely affiliated group of architects that included Eric Owen Moss in addition to Morphosis. In his eclectic Norton House in Venice Beach, also realized during this ecumenical period in the history of Los Angeles before he achieved global superstar status with his Bilbao Museum, Gehry made homage to the special relationship that his city on the western edge of the Pacific has with Japan to the east. A primitive *torii* gate, made of amputated parts of telephone poles, are used as a shade structure there serving as a rough-hewn canopy over the sliding doors of a quest flat facing onto the Venice boardwalk and the beach.

Although the existence of the Los Angeles School was largely a myth invented to sell magazines, there was a noticeable similarity of awareness that was shattered among the people who were alleged to share that curriculum, and one of these was a growing awareness of the rising importance of Asia. Los Angeles is like Athens during the Classical Age, which Socrates famously described as being in the center of a frog pond, in which one member of the Hellenic league could easily call out to others, across the water. Los Angeles is now purported to be one of the capitals of the Pacific Rim, and as such is increasingly cited as a paradigmatic city of the future. Mayne, in the Crawford House in the late 1980s, was attempting to connect his project to that network.

Charles and Ray Eames: The Eames House

The Eames House has had a profound impact on the history of contemporary architecture in the developed world, having inspired several generations of architects who have been thrilled by its mixture of high technology and humanism. It is part of the Case Study House Program, which was instituted by the publisher and architect John Entenza just before the end of World War II in Los Angeles. Entenza's idea was to promote modern architecture through the vehicle of a magazine he had purchased called *California Arts and Architecture*. He simplified the name, making it just *Arts and Architecture* in order to appeal to a wider national and international audience. His strategy, which in retrospect was a brilliant one, was to approach young architects who would be willing to design a prototypical modern house for no fee, for clients who would also be willing to build such a house. His inducement to each of them was that the houses would be published

in his magazine as part of a Case Study series. He then approached contractors and material suppliers as well as kitchen suppliers, and offered them free advertising in his magazine if they would contribute their labor and products to this process. By doing this, he was able to promote modern architecture by having these houses built at no cost to himself. This program lasted for almost 20 years and was remarkably successful. Entenza's hidden intention was to produce a prototype that could be repeated in other contexts throughout the country, and in later years, this led to the use of steel as a building material by Case Study architects such as Pierre Koenig. Koenig's work, which is described elsewhere here, was predicated upon the idea of mass production, in which a steel house could be manufactured in much the same way as an automobile on an assembly line from prefabricated parts. Noted architectural critic Reyner Banham in his classic book entitled, *Los Angeles: The Four Ecologies*, referred to the Case Study House Program as "the style that nearly."⁷¹ The unspoken part of this sentence might be "revolutionize house building in the United States," but, for various reasons, this style did not catch on at the time. One of these reasons is the fact that the unions in the United States involved in home construction resisted the idea. A second hurdle was the resistance of manufacturers to the process that the Case Study architects proposed to them. Another difficulty was that the American public at that time was not ready to unanimously adopt the idea of living in a steel house. The Case Study House Program is now seen as being prophetic, and many of the principles that it promoted are now being adopted by the architectural avant-garde. The general public is still far away from accepting the idea of a mass-produced, prefabricated standardized house built mostly of steel and glass.

Charles and Ray Eames The Eames House was the eighth entry in the Case Study House Program. It was built by architects and industrial designers Charles and Ray Eames. Charles Eames came from St. Louis, Missouri, where he was born in 1907. His early interests included amateur photography, and he was passionate about it to the extent of building his own cameras. In his early teens, he worked at the Laclede Steele Mill in Venice, Illinois, and then also worked on a construction crew involved in making concrete formwork. After graduating from high school, he was offered a scholarship in architecture at Washington University in St. Louis, and he entered that program in 1925. Soon after he entered, he also started working in the office of Trueblood and Graf. He left Washington University at the end of his second year to open his own office with partners, Walter E. Pauley and Charles M. Gray. His timing could not have been worse because the Depression started soon afterwards. The partners closed their office in 1934. Charles Eames then worked for the Public Works Administration as part of the Historic American Buildings Survey, after which he returned to St. Louis and opened a new firm called Eames and Walsh. Among other notable buildings, this firm designed St. Mary's Catholic Church in Helena, Arkansas, which was completed in 1936. The church was published in *Architectural Forum*, which brought him to the attention of Eliel Saarinen. He offered him a fellowship to study architecture at the Cranbrook Academy of Art, in Cranbrook, Michigan. He entered the academy in 1938 along with other members of that illustrious class that included Edmund Bacon, Harry Weese, Harry Bertolia, and Ralph Rapson. He became the head of the Department of Industrial Design at Cranbrook in 1940 while also

working part time in the office of Eliel Saarinen. In that year, he also visited California for the first time and through a mutual friend was asked to design a film studio in Hollywood for Irene Rich. This project was never realized, but through it Charles Eames became interested in relocating to Los Angeles.

The year 1940 was important in other respects as well, since he also entered the “Organic Design in Home Furnishings” competition organized by the Museum of Modern Art in New York City, along with Eero Saarinen.⁷² One of the conditions of the competition was that the winners would allow their entry to be manufactured. The Eames-Saarinen entry was based on new manufacturing techniques involving the pressure molding of wood into compound curves and the combination of rubber and wood. The production of the furniture that they designed was restricted by the shortage of materials caused by the Second World War. But techniques that were introduced in the Organic Design Competition formed the principles for the furniture that Charles Eames was to design in the future. This competition was also important to him on a much more personal level because it resulted in his meeting Ray Kaiser who helped him prepare the models and drawings for this competition. They were married in the spring of 1941. Ray was also a student at Cranbrook, beginning her studies there in 1940. She was born in Sacramento, California, and was instrumental in convincing Charles that they should move to Los Angeles, which they did soon after they were married. Charles Eames struck up a friendship with John Entenza, who helped the young couple find an apartment in the Strathmore Avenue Building in Westwood, designed by Richard Neutra. Charles Eames was hired by Metro-Goldwyn-Mayer and worked in their studio in Culver City designing and building movie sets. In the meantime, he and Ray continued experimenting with molded plywood, continuing ideas introduced in the Organic Design submission. Their intention was to develop a series of furniture prototypes that could be made on the assembly line and would need no additional upholstery. They soon expanded to the point that they were forced to move into a separate studio, off Santa Monica Boulevard, in 1942, as well as to open a production factory at 555 Rose Avenue. They used the production factory as an architectural office as well.

In 1943, Charles Eames became involved with the Case Study House Program portion of *Arts and Architecture* magazine especially in advising on graphic design. In that year John Entenza announced a competition in the magazine called “Designs for Post-War Living,” and he included the winning entries in an issue published in 1944. This was an introduction to the Case Study House Program, since this issue was used to promote ideas of mass production and prefabrication applied to residential design. This issue also included an article by Charles Eames and John Entenza entitled, “What Is a House?” In this article, they argued for the conversion of the industrial technologies developed for wartime production to solve the problem of the housing shortage in the postwar period.

The Case Study House Program was officially introduced in an issue of *Arts and Architecture* magazine published in January 1945. John Entenza selected eight architects who were instructed to redefine the American lifestyle to conform to the desire of people returning from the war for more carefree and casual ways of living. The architects that were chosen for that issue were Thornton Abell, J. R.

Davidson, Charles Eames and Eero Saarinen, Richard Neutra, Ralph Rapson, Whitney Smith, Spaulding and Rex, and Wurster and Bernardi.

The Eames House The house that the Eameses built for themselves was Case Study House No. 8. It is located on a three-acre site on a 150 feet high cliff in Pacific Palisades. It overlooks the ocean, which is visible through a line of Eucalyptus trees that run in front of it. John Entenza had originally purchased five acres here from the Will Rogers estate, selling off three acres to the Eames and keeping two acres for himself. The first design that the Eameses produced for their house was in the shape of an “L” with the living area jutting out from a steep embankment at the northeast side of the site so that the occupants could have an unobstructed view of the ocean and the privacy of the Entenza House to the south would not be compromised. The Eameses, along with their structural engineer, Edgardo Contini, arrived at the idea of using a bridge-like form to deal with a slope beginning at the embankment, and continuing down to the center of the site. The Eameses referred to this as their bridge house, and they intentionally designed it to work in conjunction with the Entenza house, which was Case Study House No. 9 and is square in plan. The Eameses conceived their house as being a place where they could not only live but also work, so in a sense, it was also a design laboratory. Soon after the preliminary design was complete, Charles Eames attended an exhibition of the work of Mies van der Rohe at the Museum of Modern Art in New York City. He was already aware of the work of Mies van der Rohe. In 1929, he had visited Europe with the express intention of visiting all of the major buildings of the architects of the Modern Movement, which along with Mies van der Rohe included Le Corbusier, Walter Gropius, and Henry Van de Velde. According to Ray Eames, this trip to New York in 1947 had a formative impact on her husband. The materials for their house had already been delivered to the site, including the steel. But Charles decided to adapt them to a new plan, feeling that the existing bridge house was too similar to a sketch that he had seen in the Museum of Modern Art exhibition.

The new design of the Eames house, which appeared in the May 1949 issue of *Arts and Architecture* magazine, was completely different from the first scheme. In the original rectangular one, the living portion of the house had been extended like the long leg of an “L” from the studio portion and was placed perpendicular to a steep slope to the north. In the second it was pulled back in line with the studio, so that they both formed a linear wall against the embankment separated by a patio between them. This change simplified the plan in one respect, but complicated it in another. The change required the construction of a long retaining wall that had only been necessary as part of the studio in the first plan. This now was extended to run along the entire length of the hill, effectively becoming the majority of the ground floor wall on that side of the house. The second major impact that this change in orientation had was that it affected the view toward the Pacific, which was one of the major reasons behind placing the living portion of the house perpendicular to the slope on the northern side of the site in the first place. Another consequence was that the Entenza House, Case Study House No. 9, was now completely visible from the Eames House above it. To provide privacy, the Eameses planted a row of Eucalyptus trees along the fronts of both the house and the studio as a way of providing privacy and shade. Now that the Eucalyptus trees



Eames House. © Tim Street-Portwer / Esto

have grown, they have become an integral part of the front of the house. In each case, in both the first bridge house scheme and the second linear one, the residences have been divided into a series of equal bays. The living portion of the house, as it now exists, has eight bays with an additional one added to the western end to support an open overhang, which provides shade on that side of the house. The central courtyard between the living and working portions of the house is four bays wide and the studio has five bays. The steel frame that has been used to construct these bays is minimal. The “I” columns are only 4 inches wide and 12 inches deep, and they support open web steel joists that have been used for roof support. Exposed corrugated metal decking has been used as a ceiling throughout the house and studio.

The Eames House, which was one of the first projects built in the Case Study House Program, compellingly fulfills the original intentions of its founder John Entenza in that it is the image of a prefabricated, standardized steel residence using all of the latest industrialized products and materials in its construction. In addition to the concrete used for the extended retaining wall, the steel used for the columns, joists, and roof deck, and the glass used for the windows, the Eameses also applied Celotex insulation board on plywood, Cemesto, asbestos, and pylon, which is a translucent laminate similar to fiberglass. Descriptions written by the architect-owners after the house was completed clearly express their intention to provide a stark contrast with nature rather than using materials that would bring the house

into harmony with it. Although the relationship to nature is not created by a use of telluric materials, there is a more subtle intention at work here.

A Film Used as a Metaphor for the House Charles and Ray Eames produced many films during their long collaboration, and one of these is called *House After Five Years of Living*. It becomes clear after watching this film, which has no narration, that the intention of the architects was to use the house as a device for refracting its natural context, using it as a *camera obscura* through which to view the microcosm of the world around them. A great deal of the film is dedicated to patterns and the shifting range of colors coming through the long horizontal window frames. It also focuses on distant views through the Eucalyptus trees to the Pacific Ocean. The film is relatively short, being only a little over ten minutes long and includes images photographed by the Eameses between 1949 and 1955. The impression it leaves is one of segmental and fragmentary views rather than that of a continuous narrative. This technique is echoed in the house itself. For example, there are several seemingly randomly placed panels on the exterior wall of the front elevation. These are painted in primary colors of red, yellow, and blue, and there are some white panels included as well. They contribute to this refracted scheme by blocking views in some sections and emphasizing or framing other views through the transparent glass windows around and between them. This technique is reminiscent of that used in traditional Japanese houses in which selected views are framed by translucent rice paper screens beside them. In each case, a staccato impression is conveyed to the viewer, which heightens a sense of connection with nature.

The entry sequence into the house begins at the driveway. After parking, a pathway leads to the main entrance of the residential part of the house, which is 1,500 square feet in area. There is a spiral stairway, which is the only way to get up to the first floor, directly opposite the entrance, which immediately underscores the mechanistic impression that the house conveys. It appears to be like a vertical steel sculpture made up of steel beams welded onto a central pipe column with plywood treads. The dining room, kitchen, and utility zone is located to the right of the main entrance with a view out to the central courtyard, which divides the living area of the house from the studio and office. There is a similar service zone in the office across the way, which echoes the one in the house. By grouping the service cores of both the house and the studio along opposite edges of the court, it was possible to set up open spaces on either side of the servant spaces. These open spaces are the major volumes of both the house and the studio, and in each case are double height; the bedroom and bath are located in a mezzanine above the service core in the house. In the original design, the central core was originally shown to have a steel arcade on the open side opposite to the retaining wall. Windows on the retaining wall side in both the house and the studio must, by necessity, be high on the wall with their bottom edges resting on the concrete.

This contrapuntal treatment of space is amplified by the position of the windows, which are used like apertures. This recalls Charles Eames's intense interest in photography and cameras. The windows are placed in deliberate conjunction with or opposition to others across the main space of both the house and the studio. This deliberate visual game is not immediately evident and becomes apparent only after repeated visits to the house. Their film *House After Five Years of Living* is a clue to the architect's intention to emphasize the impact of the diurnal cycle of

the sun as it moves diagonally across the extended length of the residence by capturing and projecting as much light and shadow as possible into the interior.

The Machine in the Garden Is Humanized One of the most important legacies of the Eames House is the impact that it had in its own time as well as on subsequent generations of young architects from all over the world who have visited it. It was intended to be a prototype of a concept that Le Corbusier had called “The House as a Machine for Living.” In many ways, it is a paradigm for it. For the Eameses, however, their work was an important part of their lifestyle, and the studio part of this house was the epicenter of their professional life at the beginning of their residency in Pacific Palisades. The studio was able to accommodate their needs as a home office, but they decided to move this part of their activity to 910 Washington Boulevard in Venice, California, in 1958 when the Herman Miller Furniture Company vacated that space. Both the house and the studio during the time between the completion of construction and the relocation of their home office in 1958 were like a living museum in which the various collections accumulated during their private and professional lives were on constant display. Unlike the Purist and Minimalist interiors of the Modernist houses designed by leading architects of that movement in both Europe and America, the Eames House is not only a screen on which the natural environment around it is reflected but also an exhibition space. By layering over the mechanistic aesthetic of the early Rationalistic phase of the Modern Movement, with their own penchant for exhibition, the Eameses provided a new model of a personalized house that stood in sharp contrast to the sterile images seen elsewhere. It demonstrated to other architects at the time, and to others since, that it was possible to follow the principles of Modernism without depriving people of their right to express themselves.

Mies van der Rohe, whom Charles Eames had admired so much, and who was the catalyst for the final configuration of the house, is the opposite example of this position. His Farnsworth House in Plano, Illinois, which he completed soon after arriving in America, is almost monastic in its carefully prescribed restrictiveness. This house was designed for a single woman who simply wanted the quiet retreat of countryside. What Mies van der Rohe provided was a long linear glass and steel pavilion elevated above its site on steel columns both to solve the problem of potential flooding from a nearby stream and, more importantly, to convey the unmistakable image of a detachment from nature. As part of his commission, Mies van der Rohe requested that he be able to advise the client on the selection of the furniture that would be used in the house. The majority of the pieces selected were of his own design, which is famously spare. His theory of interior design was derived almost directly from that developed by Adolph Loos, who proposed that the exterior shell of a house should be an anonymous mask, but that the interior should be made of luxurious materials to provide comfort for the inhabitants and to elevate their mood. Mies van der Rohe refined this theory, utilizing luxurious materials to offset the severe restraint of the furniture he designed. He followed this pattern in the Farnsworth House, which is a testimony to his single-minded adherence to high modern theory. Whether or not this suited the needs of the client does not seem to have been a factor in this case.

A Singular Achievement While Charles Eames famously adhered to this idea of using luxurious materials in his furniture designs, most notably in his well-known armchair and footrest combination, he certainly did not ascribe to the same attitude about Minimalism throughout the interior of the house that he and Ray shared. After Case Study House No. 8 was finished, Charles and Ray Eames had an opportunity to design a house for the Hollywood director Billy Wilder as well as another that was intended to be a prototype that would be produced by a major corporation located in Anaheim, California, called the “Kwikset House.” They approached these two projects in the same way that they had conceived the design of their own house, as a prefabricated exercise that could be built quickly from components that were readily available. They did, however, introduce plywood in a more consistent way in both laminated beams and roof sections. Both projects were not realized, and as a result the Eames redirected their focus toward industrial and furniture design as well as the production of films and exhibitions.

For this reason, the Eames House, or Case Study No. 8, is a singular example of their design genius and as such it is even more significant in the history of contemporary architecture.

Charles and Henry Greene: The Gamble House

As the Arts and Crafts Movement became more well established in the United Kingdom at the end of the nineteenth century, several American entrepreneurs, such as Gustav Stickley and Charles Eastlake, started cooperatives that were similar to those that William Morris had founded in Hammersmith and Oxford. These were primarily intended for the production of furniture and interior fittings for residential use. It remained to architects, such as Frank Lloyd Wright in the Midwest and Charles and Henry Greene on the West Coast, to formulate an American version of the Arts and Crafts ethic, and they completely assimilated the ideals of their British counterparts, such as Charles Rennie Mackintosh, C. A. Voysey, and Norman Shaw. The early work of Wright, for example, has uncanny similarity to that of Mackintosh even though it is not believed that the two men ever



Charles and Henry Greene designed many Arts and Crafts homes throughout California, but the Gamble and Blacker Houses are considered their best. *Source:* James Steele

met. Each of them also shared a deep admiration of and affinity for the Japanese aesthetic that had just become known to the outside world when each of these architects were starting out, because of an American naval mission led by Admiral Perry that sailed into Yokohama Harbor in the mid-1860s and demanded that the Tokugawa Shogunate open that country up to trade with the West. Japanese sensibilities, which stressed a reverence for the environment and the judicious use of natural materials in a handcrafted architecture that was at one with its surroundings, fit well with Arts and Crafts principles of human involvement in the production process. Charles Robert Ashbee, who had been instrumental in institutionalizing Morris's idealistic position into the Guild of Handicraft, which was based in the Cotswolds and which was the first formalization of the Arts and Crafts identity, visited America in the late 1800s. He later wrote that he found Frank Lloyd Wright and the Greene brothers to be among those who were most clearly dedicated to Arts and Crafts ideals, and even ranked the Greenes higher than Wright in their attention to detail.⁷³

Charles and Henry Greene were born in Ohio and both attended the Manual Training School at Washington University. Their curriculum included wood- and metalworking and machine tool making, and through the director of the school, they were introduced to the writings of John Ruskin. They went on to attend the Massachusetts Institute of Technology before opening up their own firm in Pasadena, California, in 1894. It took some time for them to develop their own distinctive approach to the British Arts and Crafts model, adapted to a Japanese aesthetic as well as the benign environment of California. In the interim, publications such as *The Craftsman* by Gustav Stickley were awakening American interest in this direction, and prefabricated kits of parts for houses, referred to as bungalows, began to appear in the catalogs of mail order companies such as Sears and Roebuck, among others. The bungalow-type house, which is described in detail elsewhere in this set, was perfectly attuned to the semitropical climate of California, having been adapted from a colonial residence that was used by the British in India and Southeast Asia, in response to the high level of heat and humidity there. Ironically, the colonial bungalow named after an indigenous Indian housing type called a *bangla* did not transplant well in England because of climatic differences. But it was firmly established in the public consciousness with exotic locales and escapism and was translated into a house called a cottage in Britain, usually associated with holiday accommodation. The defining elements of the bungalow as it evolved in its colonial adaptation are a raised ground floor to allow air to circulate through a crawl space underneath a wide front porch, which sometimes also extended around the sides and back as the conversion of the colonial verandah, wide, overhanging eaves to protect the porch and the windows from sun, a limitation to one story, or the addition of a sizable attic at most, and a fairly open but modest floor plan typically divided between public spaces, such as the entry, living room, dining room, and kitchen to one side and the private areas, including the bedrooms and bathrooms, to the other.

The Bungalow Embodied Arts and Crafts Ideals The bungalow proved to be a commercial success in the period between the turn of the century and the beginning of World War I because it captured the popular imagination as the

embodiment of the anti-Industrial Arts and Crafts ethic of handicraft. This image belied its mass-produced origins, but even though it was standardized and prefabricated each of the craftspeople involved in its construction did have some leeway in how each house was built and was able to contribute his or her own personal skills to it. Mass production made the bungalow inexpensive and an attractive choice for property developers, especially in and around Los Angeles, which was attracting new residents from the middle of America and growing so rapidly at this time.

Greene and Greene Perfected the Bungalow Charles and Henry Greene essentially refined the bungalow, upgrading it from a home for the masses to a country retreat for the rich by dramatically increasing its plot size and scale, as well as the extent and the quality of the craftsmanship in it. Between 1907 and 1909 they produced seven of these highly sophisticated bungalows, all involving handcrafted parts custom-made in their own workshops. This period of frenetic activity pushed the limits of their own ability to oversee and control the quality of production. It also led them to increase their costs to the point where they priced themselves out of even the privileged market that they operated in.

The Gamble and Blacker Houses A house that the Greene brothers designed and built for David B. Gamble and his family in Pasadena, in the spring of 1908, is generally considered to be one of the best examples of their rarefied version of the California bungalow. It was designed and built at exactly the same time as another similar residence nearby for Mr. and Mrs. Robert R. Blacker, with which it invites careful comparison. David Gamble and his wife, Mary, originated from Cincinnati, Ohio, where David was involved in the family company, Proctor and Gamble. They had come to know Pasadena fairly well after spending the winter there for several years and bought land on Westmoreland Place near North Orange Grove Boulevard in 1907. They commissioned the Greene brothers to design their house and, after working through three distinctly different concepts, went into working drawings that were submitted for approval by the local building department on March 9, 1908.⁷⁴ Work on the interiors of the Blacker house started little more than a month later. Both houses were substantially complete in September of that year.

The Blacker House, which occupies a 5-1/2-acre site, was positioned near the entrance to an exclusive subdivision that was being developed at that time. Robert Blacker had originally commissioned Myron Hunt and Elmer Grey as his architects, but dismissed them following the San Francisco earthquake on April 18, 1906, because they were unable to satisfactorily describe how their design would survive a similar event. The Greens, in a characteristically empathetic move, relocated the house to the northeast corner of its site, near the intersection of Hillcrest and Wentworth Avenues, creating an elongated L-shaped scheme, with each leg of the "L" running parallel to one of these streets. This left the majority of the property, behind the house, open for landscaping, and they had a small lake dug; to the east, they brought an entry in from the intersection to a circular driveway leading under a *porte cochere*, which had an extension parallel to Wentworth Avenue to a garage and caretaker's cottage beyond. This 12,000 square foot house was the largest the Greene brothers had ever designed, and yet their sensitive positioning of the house along the slight ridge that they created along the northern edge of the site



Blacker House. © Wayne Andrews / Esto

made it possible to make it seem to nestle into and become one with the land. The slope provided by this gentle shaping of the landscape made it possible to expose a lower story on the south side, near the lake, so that the house seems to gradually emerge from the ground. A brick foundation, which acts as a base for the wood-framed shingle-clad structure above, contributes to this impression, as do the wide, overhanging eaves of the roof.

The first Gamble House design was based on this approach, with separate wings protecting a higher knoll near the middle of the site.⁷⁵ The second scheme was straight, but set at an angle to Westmoreland Place to facilitate cross ventilation. In their third scheme, the architecture made the house parallel to the street. It is zoned on entry into a wide, dark hall that extends from the front of the house to the back, into hallway, stair, living room, and office to the right, and dining room and kitchen to the left on the ground floor. Paid live-in help was typical in the wealthier households of prewar America, and the Greenes positioned the dining room to be a buffer between the activity in the kitchen and pantry and family and guests waiting in the living room while meals were prepared. There was also a secondary circulation system, almost hidden from public view, for employee use only. This division on either side of a wide central hall continues on the first floor with the bedrooms and bathrooms for Mr. and Mrs. Gamble on one side, and a suite for Mrs. Gamble's sister, Julia Huggins, as well as a guest room and bath on the

other. Wide porches on the upper level of the house, covered only with gently sloping roofs, were intended for sleeping out in the open air during the summer.

A Total Work of Art The Gamble House, like all other Greene and Greene houses, was approached as a complete artistic statement, with much of the carpentry and craft, including doorways, windows, stairs, furniture, lighting, and other fittings, produced in the architects' own workshop. The front door and main stairway of this house are especially noteworthy as examples of their skill, with wooden dowels, rather than nails, being used in a construction technique similar to that used in traditional Japanese building.

Julia Morgan: Hearst Castle

Hearst Castle, or more accurately *La Cuesta Encantada* or the "Enchanted Hill," was designed for press baron William Randolph Hearst by San Francisco architect Julia Morgan right after the end of World War II, but it still remained unfurnished at the time of Hearst's death in 1951 at the age of 88. When the project started, Hearst was 56 years old and Julia Morgan was 47. Each was then at the height of his/her powers. Hearst was born in San Francisco and was an only child. His parents, George and Phoebe Hearst, had been patrons of talented Bay Area architects, such as Bernard Maybeck, who had designed for them a country estate on the McCloud River near Mount Shasta, in northern California, called Wyntoon. It is described elsewhere in this volume. Like *La Cuesta Encantada*, Wyntoon was an overscaled fantasy based on the romanticized style of another age. George Hearst had become wealthy in the California silver mines in 1859, and he increased the money he had made there by investing in other mining operations as well as in real estate. Some of the land he bought had previously been part of the Mexican *rancho* holdings in California, including the haciendas of San Simeon, Piedra Blanca, and Santa Rosa.⁷⁶ When he was young, William Randolph and his mother made the Grand Tour of Europe, and her love of art, and collecting it, later inspired her son to do the same.

Hearst attended Harvard, and during breaks he liked to stay at the San Simeon ranch, as well as at Wyntoon. After George Hearst died, Phoebe became involved in philanthropy, and the University of California at Berkeley was a frequent beneficiary of her wealth. It was through this connection that she met Julia Morgan, who received a degree in civil engineering at Berkeley in 1894 and was working with Bernard Maybeck while he was designing Wyntoon. She was the first woman to be accepted into the *Ecole des Beaux Arts* in Paris and enrolled there in 1898, after several restrictions to her admission, which was breaking with precedent, were overcome. She graduated in 1902 as the first woman, and one of the first Americans, to do so. Phoebe Hearst commissioned Morgan to design a hacienda-style house for her at Pleasanton. Morgan also became heavily involved in commissions for women's colleges, sororities, and clubs.⁷⁷

William Randolph Hearst did not complete his studies at Harvard, becoming an editor at the San Francisco *Examiner*, instead, at the age of 23. He invested family money into what was then a moribund newspaper, using techniques similar to those used by Rupert Murdoch, such as sensationalism and an appeal to popular taste, to turn the paper around. He succeeded and then went on to create a publishing empire by buying up newspapers in many major cities throughout the United

States. He either started or bought many popular magazines as well, so that by 1913 his empire was well established. He then ventured into film, establishing Cosmopolitan Productions in the early 1920s. He moved this production company to Los Angeles in 1924 and joined it with Metro-Goldwyn-Mayer. At its height, Hearst's media empire included 29 newspapers, 15 magazines, 8 radio stations, and 4 film companies, leading to his being immortalized as the evil press baron in *Citizen Kane*, played by Orson Welles.

San Simeon George Hearst started purchasing land in the Santa Lucia Mountains near the California coast, halfway between Los Angeles and San Francisco as early as 1891, building a ranch on 85,000 acres, near the site where Hearst Castle now stands. William Randolph also visited this ranch many times as a boy. The young Hearst received the ranch as a bequest in his mother's will, and he decided to build another house on a 1,465 feet high mountain nearby called Camp Hill.⁷⁸

And so in 1918 with a history of a love of architecture inherited from his mother, a connection to the Bay Area School and Julia Morgan, an existing connection to the Spanish Mediterranean tradition through his father's real estate holdings, and multistory warehouses in New York and California full of art and architectural artifacts, such as the entire contents of a castle in Scotland, William Randolph Hearst decided to embark on a residential adventure that would occupy both him and his architect, Julia Morgan, for the rest of his life.

He started by visiting Morgan's office in San Francisco and going through many scrapbooks showing different historical styles that she had there. The thought that architectural history was simply a repository of different styles that could be selected out of source books and mixed and matched at will, with a little Spanish here, a little Gothic there, and a touch of Italian Renaissance in between, was one of the reasons why the Modern Movement abandoned the idea of historical reference altogether. Morgan's willingness and eagerness to entertain such an eclectic historical palette undoubtedly derived from her experience at the *Ecole des Beaux Arts*, where precedents from all historical periods were entertained interchangeably, and the pedagogical emphasis was on uncovering the typological lesson behind each precedent, and if it was appropriate and the architect decided to use it, it should be executed in a way that was faithful to the original. Hearst had originally wanted a bungalow on the property and it is not clear how that simple request escalated into a megalomaniacal domestic extravaganza on par with Nero's Golden House in Rome or Versailles.

The Spanish Mediterranean tradition that eventually inspired both client and architect to embark on a hacienda-like mansion on Camp Hill, instead of a simple bungalow, at least has strong roots in the history of California, through Mexican homesteads in the region. The *haciendas* that were built there, following the model of those built in Mexico itself, which are discussed in detail in Volume II of this set, were organized around a large house, or *casa grande*, where the owner and his family lived. This was separated from the rest of its dependencies by a series of courtyards, and the entire complex was surrounded by a wall. The only other building that came close to the scale of the *casa grande* in the *hacienda* was the chapel. The Churrigueresque style, which the Spanish evolved in the Americas, is characterized by ornate doorways, surrounds, window frames, cornices, and towers contrasted

against plain exterior walls for maximum impact. The Pan-California International Exposition, which had been planned by architect Bertram Goodhue in San Diego in 1915, had popularized the Spanish Colonial, Churrigueresque, and Spanish Mission style, adding impetus to Hearst's decision to use it as the basis for the residence he wanted Julia Morgan to design for Camp Hill. Hearst had seen and admired the Cathedral of Santa Maria la Mayor in Ronda, Spain, which he saw in one of Morgan's source books and later went to visit when he traveled to Seville.

The Church and the Steeple The bell tower at the Cathedral of Santa Maria la Mayor in Ronda is a clear reminder of the Islamic presence in that region for hundreds of years, since many churches were converted to mosques during that time and single minarets were added to them. The minaret was used by a *muezzin* who sang out the call to prayer to the faithful from the top at each of the five prescribed prayer times during the day. In other cases, mosques and their minarets were adapted after the *Reconquista* of Muslim territory in Spain to become Christian cathedrals, and the minarets were converted to bell towers. The bell tower of Santa Maria la Mayor has a classic tripartite minaret shape, telescoping upward from a high square tower that occupies more than half of its height, to an octagonal center with high arched openings on each of its eight sides, and then capped with a smaller ornate cornice that is like an octagonal band, with pointed spires at each juncture, making it look like a crown. Morgan adapted this bell tower, using a pair of them to flank the central doorway to Hearst's main house or *Casa Grande* at *La Cuesta Encantada*. In this case then, the chapel, which was always the second largest building in the Mexican *hacienda*, next to the *Casa Grande*, has become the *Casa Grande*, and the subject of veneration is Hearst himself

A Village of Its Own Julia Morgan created a very skillful site plan that occupies the entire top of Camp Hill, following the natural contours and using them and the orientation toward the Pacific Ocean, which is less than a mile away, to best advantage. In addition to the *Casa Grande*, there are three guesthouses, creating a courtyard called the Main Terrace by circling around behind the large house. With similar romantic allusion these are called *Casa del Mar* (House of the Sea), *Casa del Monte* (House of the Mountains), and *Casa del Sol* (House of the Sun). A fourth guesthouse was planned to be located between *Casa del Monte* and the *Casa Grande*, but it was never completed. Hearst loved to have guests visit him at *La Cuesta Encantada*, and the guest list of those who did during the time that he lived there reads like a "Who's Who" of Hollywood, of Washington, D.C., as well as of foreign dignitaries during the height of Hearst's power.

The plan of the *Casa Grande* itself has an unfortunate and obviously unintentional resemblance to a lobster, spread out on a kitchen counter. The main entrance with its two flanking towers is located at the tail end and a long hallway connected it to the main part of the house, which is a U-shaped part, like the head and the claws at the other end, where a rear courtyard is located. Hearst and Morgan had also planned a "Great Hall" on this portion of the site that would have closed off the "U," enclosed the second courtyard, and eliminated the crustacean analogy, but Hearst had finally overspent and nearly went bankrupt until World War II and the accompanying need for news and newsreels that went with it rescued him.

Hearst had his own study called the “Gothic Suite” on the third floor, which occupied the entire level. It includes a sitting room, study, and bedroom and is accessible by several sets of stairs as well as by an elevator. Hearst liked to greet his guests in the “Assembly Room” on the first floor, above the main entrance, where the two towers are joined together into one long rectangular space, for pre-dinner drinks, before leading them into the “Refectory” or dining room directly above the main hall on the entrance level for dinner. There is also a theatre on this level where guests might gather after dinner to watch a movie. Hearst reportedly arranged for an exclusive advanced screening of *Gone With the Wind* here for his friends.⁷⁹ During the day they could amuse themselves by choosing between two swimming pools: the outdoor Neptune Pool or the indoor Roman version in its own recreation building sited at an angle to the main house and some distance away from it. They could also visit Hearst’s private zoo, which included lions, tigers, leopards, panthers, cheetahs, bears, elephants, monkeys, and rare birds.⁸⁰

An Architect’s Nightmare Julia Morgan had a thriving architectural practice in place when she accepted the commission to design *La Cuesta Encantada*. Because of her busy schedule, she typically went down to the site on a Friday night and remained there over the weekend, returning to San Francisco on Monday morning. During the time it was in construction the area was initially inaccessible, and heavy construction materials including the cement and the reinforcing bars for the concrete, from which a majority of the substructure of houses is made, had to be transported by ship. The project, which involved a small army of laborers that varied from 50 to 150 a day, lasted more than 20 years. Hearst had not only collected works of art during his extensive travels but historical furniture, fixtures, and entire period ensembles as well, described by one source as “the contents of Hamilton castle in Scotland, an entire Spanish cloister, 50 entire Gothic rooms, enormous carved ceilings, paneling by the roomful, staircases, doorways, windows, fireplaces, mantels and corbels,” and the list goes on to include every kind of furniture, furnishing, and interior design object imaginable.⁸¹ Morgan had to design a specific space to accommodate each of these items, surveying each of them in the process. Hearst was also a perfectionist, constantly changing his mind about decisions he and Morgan had already made, frequently doing so after a space was already complete. He was also often slow to pay the workers and suppliers, and with such a complicated construction schedule to maintain, one lapse caused by lack of payment created a chain reaction of delay.⁸² Because of the lack of accommodation, the plan was to complete one of the guesthouses first, and for Morgan to use that as a construction office and living quarters during her weekend trips to the site. California does get cold and wet during the winter, especially at elevations as high as Camp Hill, which is also subject to high winds from both the mountains and the Pacific Ocean. *Casa del Mar* was the residence of choice to be used as a headquarters, but Morgan had to use it even before it was enclosed.⁸³ Hearst himself said that the house should be made more livable and if it was not the houses would have to be renamed: “Pneumonia House, Diphtheria House and Influenza Bungalow.”

Her patience against such daunting odds paid off, and Hearst’s fantasy is now a reality. After his financial troubles eased, in 1943 Hearst returned to his

mountaintop retreat and wanted Morgan to resume work on the parts of the plan, like the Great Hall, that were still unfinished. But she had retired and offered to have her assistant complete the work. A heart condition and his physician's orders forced Hearst to leave the hill for the last time in 1947, and he died four years later.

Irving Gill: The Dodge House and Horatio West Court, Los Angeles

The conventional wisdom is that Modernism in the United States started in California, with the construction of the second Lovell House, designed by Richard Neutra, in 1927. Frank Lloyd Wright was active in that city at the time, but it would be several years before his scheme for Fallingwater, which is the ultimate *riposte* to European Modernists such as Walter Gropius and Le Corbusier, was to be built near Pittsburgh in the early 1930s. During the time Wright was in Los Angeles, he was still wrestling with the issue of the place of tradition in an architecture that would accurately reflect the Industrial Age. The so-called “textile block” houses that he produced during that period, which are made of preformed concrete panels inserted into a steel reinforcing bar frame, were his attempt at reconciling the use of concrete with handwork, in the Arts and Crafts sense, since the blocks or panels were perforated in various ways and formed in a mold.

Rudolph Schindler, who was one of Wright's most gifted disciples and Neutra's childhood friend, was too steeped in German Romanticism to really qualify as an arch Modernist, even though his political views undoubtedly were aligned with a large number of the most prominent members of that movement. The Greene brothers were purely Arts and Crafts advocates, and although it is possible to make a strong case for that sensibility being the foundation of Modernist principles, as Peter Davey has managed to do with great skill and pervasiveness, the Gamble and Blacker Houses in Pasadena, as well as other residential projects that this creative and prolific duo have left behind in California, are a long way from the minimalist language of the Weissenhofseidlung, discussed elsewhere here.

Irving Gill Only the work of Irving Gill, whose career crested well before the second Lovell house was even conceived, deserves consideration as being one of the first examples of true proto-Modernism in the region of Southern California. There are a remarkable series of overlaps between his early career and that of Frank Lloyd Wright. Each architect worked for Joseph Silsbee in Chicago, although not at the same time. Silsbee's practice was primarily focused on large single-family residential projects for wealthy clients in suburban Chicago, and he was



Horatio West Court. Courtesy of Andrew B. Hurvitz; Flickr

known as a slick, sophisticated salesman with a distinctive, historically based style. Frank Lloyd Wright moved to the office of Adler and Sullivan in 1887, and was well established there as chief draftsman by the time Irving Gill also joined the firm four years later. Gill was supervised by Wright, and together they worked on Louis Sullivan's convention-breaking Transportation Building, which was a centerpiece of an otherwise exclusively Classical World's Columbian Exposition.

The Move to San Diego Irving Gill did not thrive in Chicago, as Wright did, and in 1893 he decided to move to San Diego in search of a better physical and psychological climate in which to pursue his career.⁸⁴ When Gill arrived on the West Coast, things were just starting to happen. San Diego was well situated for growth, since it has a major port, and the California Southern Railroad, linking it to the East Coast of America, was completed in 1885. At the time he arrived, the local population was little more than 20,000 but would soon start to grow. Boosterism, which was intended to attract people from all across the United States to both San Diego and Los Angeles, would soon be at its height, and the housing market, and industrial growth, was about to explode. Boosters, in the form of local Chambers of Commerce, promoted an exotic image of Southern California as the land of Spanish missions, orange trees, swaying palms, and ocean breezes. A novel called *Ramona*, by Helen Hunt Jackson, which appeared in 1884 and used the *Casa de Estudillo* as a backdrop, became enormously popular in America and directed national attention to the region.

Irving Gill, as a partner in his new firm of Hebbard and Gill, started to prosper, being primarily involved in residential design in and around San Diego during the last decade of the nineteenth century. The first portland cement plant was built in Pennsylvania in 1875, and Gill started on his own quest to reconcile past and present by attempting to simplify the Mission tradition of the region and render it in concrete, to make it modern. He was inspired by historical examples of the style locally, such as the San Diego Mission, which had been restored soon after he arrived in the region.⁸⁵ His direction, to express regional history in a stripped down, concrete language, was set.

Rejection To celebrate the opening of the Panama Canal, and to use the strategic location of the city as the first port that ships would encounter after leaving it as a marketing strategy to help the local economy, San Diego boosters decided to hold an event that would promote civic history. Irving Gill seemed to be the local choice to direct what was billed as the Panama California Exposition of 1915 to be held in Balboa Park. Bertram Goodhue was selected instead, however, because he favored a more ornate version of the Mission style, which had become a popular symbol of the area, based on Spanish Baroque. Gill was considered to be too modern.⁸⁶

The Dodge House This displacement indicates that the general perception of Irving Gill was one of an architect who did not fit in. He encouraged that image by experimenting with new ways to build with concrete, which was his material of choice, such as the tilt-up slab method. This technique was not entirely new, but was considered untested, even when Rudolph Schindler and Clyde Chace used it to build their house on Kings Road in Los Angeles in 1922. The idea behind tilt-slab construction, at least in the beginning, was to eliminate the need for expensive formwork by using a shallow depression in the ground dug as deep as the thickness

of the slab needed, placing the wet concrete in it, and then hoisting or “tilting” it up onto a grade beam or the top of a foundation wall after it had dried. Gill hoped to make concrete as commonplace as stone construction by using such expedients, to lower its cost and make it easier to use.⁸⁷

One of the largest and most effective applications of his principles took place in Los Angeles in 1915, after his rejection by the Panama California Exposition had prompted him to look further north for support. During this period just after the beginning of the First World War, the bungalow was beginning to become increasingly popular as the choice for people moving into the region, and for the developers and real estate speculators who courted them. The bungalow, because of its origins in the British colonial enterprise in India, became associated with exotic locales and a leisurely life in the tropics, which was especially appealing to refugees from the snowy cold winters of the Midwest. Gill had his work cut out for him in trying to introduce another option to a public that was then being bombarded by such images in the press, in pattern books, and by agents trying to sell them property. Gill, like other notable architects of the time, such as Wright, found his major source of support among wealthy independently minded patrons, who were above the stylistic fray and liked the idea of promoting something new and different. A rich industrialist named Walter Dodge and his wife, Winnie, who had made their fortune in the Midwest in patent medicines and had come to Los Angeles to retire, were such clients.⁸⁸

Gill responded by giving them what many regard as his best residential design, which was uncharacteristically expansive for an architect known for compact plans. The Dodge House, like many important buildings in the region, has unfortunately been torn down, but when complete, it stretched horizontally across its lushly planted site like a palace. The 6,500 square foot house started at a *porte cochere* facing the street followed by a compartmentalized entrance foyer placed slightly off-axis with a garden court, visible through a large window and a pair of French doors on its opposite side. This foyer, with an L-shaped stair leading up to a second floor, was in the midst of a larger, more public wing, with a living room and game room on its western edge. Each of these had fireplaces on the external, western wall, increasing their sense of formality. A dining room on the east side of the entry served as a transition space through a kitchen and breakfast room, into a bedroom wing that extended out across the property, and was oriented to take best advantage of natural light from both the north and the south. Three of the four bedrooms in this wing are located along the south wall for this reason, and this orientation, along with the view out over the generously landscaped manicured lawn, must have made waking up in one of them a pleasant experience. To provide a sense of privacy for the largest bedroom in this sequence, which was adjacent to the breakfast room, Gil extended an arcaded wall out from the main entry block, wrapped it around these rooms as if to shield them from view, and placed an open patio between the wall and the house.

The Dodge house had massive 8-inch thick concrete walls, and all of the windows and door frames, as well as the window mullions themselves, were made of steel. The main street-facing arch of the *porte cochere*, as well as the smaller arches of the screening wall around the breakfast room and its adjacent bathroom,

contrasted with the rectilinear windows used on the rest of the house, seeming to be an intentional attempt by Gill to remind everyone of his commitment to regionalism.

In 1919, Gill designed the Horatio West Court in the Ocean Park district of Santa Monica, which has survived. It consists of four freestanding two-story units clustered around shared courtyards and surrounded by an enclosure that also extends upward to become the external wall of each unit as it passes them. The Horatio West Court units are unlike the Dodge house in that they are compact and vertical rather than opulently horizontal, conveying an impression of strength and privacy. Arches are also used in this complex as a way to separate the personal territory of each house and to demarcate points of entrance.

Influence Irving Gill was clearly a visionary, ahead of his time in his insistence on using new materials and technologies in his contemporary interpretation of a popular regional historical style. Richard Neutra, who would finally receive recognition as a leader of the Modern Movement in Southern California in a more accepting time, recognized Gill in his book *Amerika*, published in Germany in 1930, and also paid homage to him in his own designs, such as his Strathmore Apartments in Los Angeles, built in 1937, which is clearly inspired by his inventive predecessor.⁸⁹

Rudolph Schindler: The How House

James Eads How, the client for what is arguably one of the best houses that Rudolph Schindler ever designed, was a complicated and unconventional man. He was the scion of a wealthy family and had a great deal to live up to, but chose to do just the opposite. His father, James Buchanan Eads, the son of the Colonel Thomas Clark and Ann Eads of St. Louis, Missouri, was a paradigmatic American inventor in the best tradition of the Wright Brothers or Thomas Alva Edison, a self-educated engineer who began his career as a clerk aboard the steamship *Knickerbocker*.

He invented a diving bell to assist in the recovery of the vessel and its contents when it sank in the Mississippi in 1839. This led to the formation of a highly profitable salvage company that he ran until the outbreak of the Civil War in the spring of 1861. He consequently proposed plans for an ironclad gunboat to the attorney general of the United States, which was approved by President Abraham Lincoln's Cabinet. Seven ships built to his design were instrumental in the eventual defeat of Confederate naval forces, but by 1864 he was completely exhausted from overwork and, following the advice of his doctor, he retired.

The Eads House on Compton Hill overlooked the Mississippi, and he was aware of the need for a bridge over the river, owing to the westward expansion of the railroad after the Civil War. Railroad cargo was then being unloaded in East St. Louis, loaded onto ferries for the trip across the river, and then loaded onto a second train on the other side. Eads's active mind recognized the opportunity presented by this situation and, in spite of bitter infighting, he entered the fray, becoming engineer in chief in 1867. His plan for the St. Louis Bridge was approved, and excavation on the abutments began in the same year. His highly controversial scheme for an arch bridge contradicted the contemporary preference for heavy truss sections



Rudolf Schindler has only recently become more well known by a wider audience of admirers who have come to appreciate his unique approach to space and form. *Source:* Julius Schulman

and medium spans; the public supported Eads and the engineering establishment uniformly opposed him.

Against formidable odds, Eads saw the project through, leading to Congressional approval and complete construction of the 158.5 meters span, which was 70 meters longer than any previous arch bridge. In addition to many other innovations, such as the first use of a steel superstructure in a bridge in the United States, the east abutment—which is 41.5 meters below the mean low watermark—is still the deepest pneumatic caisson foundation in the world, inspiring the Roebeling design of the Brooklyn Bridge that followed it. Andrew Carnegie, who was a business partner with one of Eads’s engineering advisors on the St. Louis Bridge, described its designer as “an original genius minus scientific knowledge to guide his erratic ideas of thing mechanical.” In spite of his lack of formal education, James B. Eads had a significant impact on both the course of American history and engineering theory through his designs.

Because a definitive biography of James Buchanan Eads has yet to be written, subsequent details of both himself and his family remain sketchy, but his son surfaced in the media soon after the turn of the century when he graduated from Harvard Medical School. James attempted to donate his million dollar inheritance to the National Socialist Party, but was prevented from doing so by a court order brought by his relatives. He closely identified with the poor and the homeless and started riding freight cars in trains, eventually crossing every state in America, possibly also traversing the bridge that his famous father had built. Like nearly 60,000 of these homeless, he also gravitated to Chicago just before World War I and organized the International Brotherhood Association where free lodging and meals

were on offer. This Association was different from similar organizations run by religious institutions, where food and a bed came at the cost of attempted conversion. Eads also offered alcohol, which some believe resulted in his pseudonym since, unlike the Salvation Army, he knew “how” to treat hobos, who took cold comfort from the religious service required before soup and clean sheets would be dispensed elsewhere.⁹⁰ Eads How, along with a group of other men including Irving St. John Tucker, then opened Hobo College on Congress Street in Chicago in 1913, which graduated its first class of 100 four years later. Their diplomas read in part:

Be it known to all the world that a hobo has been a student at the Hobo College, in a desire to get an education, and build a world that will be free of unemployment, poverty, war, prostitution, ignorance and injustice.⁹¹

The circumstances that brought Dr. James Eads How to Los Angeles in the early 1920s are still as unclear as his motives for commissioning Rudolph Schindler to design a detached house for himself and his family in the Silver Lake section of the city in 1925, especially considering his strongly held political views against wealth and privilege. At the time it was commissioned, Schindler had only recently arrived in the city himself, and a brief review of the events directly preceding his arrival is pertinent to the way in which he approached the design as well as its realization. Schindler was a product of the Otto Wagner Studio at the Imperial Academy of Fine Arts in Vienna, moving from there to Chicago to work as a draftsman in the office of Ottenheimer, Stern, and Reichert in 1914. Four years later, he was able to secure a position with Frank Lloyd Wright at his Oak Park studio.

In 1920, Schindler went to Taliesin with his wife, Sophie, whom he had met and married in Chicago. He was overwhelmed by the natural beauty of Wisconsin, in the heartland of America, as well as by Wright’s conception of living in harmony with the environment. As an extension of the separate yet equal status accorded to living and working in Oak Park, Taliesin blended them together even more, which appealed to Schindler’s personal worldview that was rooted in the German Romantic movement. This view was based in the idea of sacrifice for idealistic goals, and the relentless pursuit of perfection through work. Historian Kathryn Smith has touched upon the significance of the timing of Schindler’s arrival in America, in terms of the perpetuation of that view here, rather than the darker Nietzschean antithesis that soon followed. It is important to remember that Schindler left Austria and never returned. His departure was only a few months before the beginning of World War I, 1914. His timing was coincidental, not intentional, and he did not arrive in America as a refugee. But the fact that he did not experience the war in the same way as other Modernist architects of his generation did mean that he was able to retain a part of the Romantic tradition, which was destroyed by the violence of the conflict for others. He remained an idealist, still unconvinced of the need for technological predominance.⁹²

This important historical coincidence partially explains Schindler’s disdain for the functionalists whom he characterized as the enemies of the artistic basis of architecture, and his wish to be excluded from the International style in general.

His position on the meaning of Modernism was philosophically more closely related to the views put forward to Otto Wagner in *Moderne Architektur* in 1896. This included a theoretical marriage between the classical lineage of the *Schinkel-schulen* and the pragmatic necessity of recognizing the advantages of the new materials made available by industrialization. His concept of the relationship between architecture and nature was correspondingly different from that of the Modernists, as was his notion of space, which was such a loaded word for the entire movement. Schindler is vehement and passionately eloquent on this subject in his writing, referring to a revelation that he had while sitting in a stone cottage in the Austrian countryside, shortly before his departure to the United States. "A sudden realization of the meaning of space in architecture came to me," he said. The house had

Heavy walls built of the stone of the mountain . . . in feeling and material and nothing, but an artificial reproduction of one of the many caverns of the mountainside. I saw that essentially all architecture of the past, whether Egyptian or Roman, was nothing but the work of a sculptor dealing with abstract forms.

Later, after going through the doorway, he said, "I looked up into the sunny sky. Here I saw the real medium of architecture space. A new medium as far as human history goes."⁹³

Soon after their arrival in Taliesin, Schindler and his wife moved on to Los Angeles in late November 1920. Frank Lloyd Wright had asked him to take over as the project manager on the Barnsdall House, which was then under construction. Wright's commission for the Imperial Hotel in Tokyo was requiring more of his time and presence in Japan, and Aline Barnsdall was becoming increasingly agitated by his absence. Mounting costs far above Wright's original estimate contributed to her anger. Wright's hunch that Schindler's charm would placate his nervous client was correct, and through most of 1921 Schindler oversaw construction.

Wright's design approach on Olive Hill corresponds completely with Schindler's view of the need for a continuous flow of space interchange between inside and outside. The central courtyard of the Barnsdall house was the embodiment of the freedom that the idea of architectural space had come to represent to him. One year after arriving in Los Angeles, the Schindlers bought land of their own on Kings Road in Hollywood, with the intention of building "a cooperative dwelling" on it with their friends Clyde and Marian Chace. This was to become the testing ground for Schindler, the opportunity to implement the growing stock of ideas he had been nurturing since his years with Otto Wagner.

Schindler's Kings Road House as a Model As the repository of his principles, as well as the studio in which he was to design the How House that immediately followed it, the Kings Road house serves as a point of departure for the analysis of Schindler's How House in Silver Lake and a valid basis for comparison because of the evolution of ideas it engendered. Inspired by Schindler's recent experience in Wisconsin, as well as a camping trip to Yosemite and the Grand Canyon in the fall of 1921, the Kings Road house was minimal and casual, reaching out to the rectilinear site. It is a double square, 30.5 meters wide by 61 meters long, with three L-shaped arms radiating out in a spiral from a fireplace at the core. Two of these

three angled arms were designated as living areas, given over to the Schindlers and the Chaces, respectively, with each bracketing a patio garden that is shielded by that arm. The third “L” was reserved for services, such as the kitchen, laundry, and garage, as well as a guest room, with the tacit understanding that each member of the “cooperative” would share in the cooking, cleaning, and washing up. Each wing was designed to be self-contained, with each leg of each “L” assigned to one person, and the bathrooms located at the juncture. Beds were placed in “sleeping baskets” on the roof, located separately above each wing and positioned adroitly for maximum privacy, with canvas curtains for inclement weather. The final and perhaps most important innovation was the relationship that Schindler introduced between each wing and the garden that it surrounded, establishing an equal balance between inside and outside space. Fireplaces, which anchored the end of each “L” turned to face the outside as well, confirming the architect’s view of the garden as an external room, the ideal embodiment of his romantic notion of nature.

The Kings Road house invites comparisons with an early brick country house design of Ludwig Mies van der Rohe, executed the year after the design of Schindler’s home. The critical difference was the thin glass line that separates the internal and external worlds that Mies claims to have united in the “free flow of space” he attempted. Schindler described California as a paradise on earth, and it seemed sacrilegious to him to place even the thinnest glass barrier between this Eden and the new architecture he wanted to create, especially in a house he was designing for himself. Sliding wood and canvas panels, reminiscent of Japanese *shoji* screens, provide the only closure between the bilateral gardens and the sheltered rooms facing onto them, and these are placed deep inside an intermediary zone that intentionally blurs the modernistic distinction between outside and inside. These screens extend the connection with nature that Schindler had seen at both Taliesin and Hollyhock House, as does the successive depression of the ground plane as it recedes from the foundation of the house. The effect is immediate and startling to western sensibilities, a sense of freedom and connection where a line of demarcation is normally found, and spaces inside that seem to levitate. Close inspection reveals that the reason for this impression is a radically different structural system promoted by the architect as the “Schindler Frame” without much media or popular success after the Kings Road house was completed.

Schindler decided to make a major change in the conventional wood platform system by cutting off all studs throughout the house at door height to create a continuous visual and structural horizontal line. With this startling departure from construction norms, Schindler was refining the *Raumplan* or “Plan of Volumes” initiated by Adolf Loos, which was to be misunderstood by key proponents of the Modern Movement, such as Le Corbusier. There are obvious surface comparisons between Loos’s residential projects, although few in number, which were executed between 1900 and the beginning of World War I, and Le Corbusier’s more publicized attempts, such as the Maison Citrohan of 1920, the Pessac Housing estate of 1926, and the Villa de Monzie in Garches of 1927. While Le Corbusier affected the stripped down, unornamental surfaces that Loos proposed and polemically defended in his influential tract “Ornament and Crime,” he concentrated primarily

on the columnar structure on which floor plates were supported, rather than the more intricate concept of Loosian space.

By contrast, in his *Raumplan*, which few, except Schindler, truly grasped and appreciated, Loos attempted to redefine traditional concepts of space without shattering them completely. He sought historical continuity with classical precedents reinforced by Schinkel, Semper, and others in combination with a frank recognition of the undeniable changes taking place in the capacity of building materials. His architecture was one of walls interacting in the third dimension, using the same floor slabs that Le Corbusier pierced with columns in his *Dom-i-no* system as basis for his “five points” and the grid they began with. By shifting volumes up and down, and penetrating them with deep openings rather than strip windows, Loos infused internal space with layered interrelationships that plans alone fail to convey. His houses seem to be based on conventional room arrangements at first sight. A proper study of a Loos house design requires numerous planer cuts, not only at the standard position above the floor, but every few meters after that, to suitably describe the spaces

At a time when Loos, who had a significant impression on Schindler, made these determinations, Vienna was an unparalleled crucible of exploration into the bifurcations that Modernism was causing in contemporary life. These were occurring in all the arts, through the work of Mahler and Schoenberg in music, by Munch, Klimt, and Kokoschka in art, and through Freud in psychology. The reasons behind the concentration on what was to be a central issue in the century to follow, specifically in this place at this time, have yet to be completely determined, but the implications for architecture were profound. Loos’s description of a house was that it “doesn’t have anything to tell the exterior, instead all its richness must be manifest in the interior.”⁹⁴

Beatriz Colomina has perceptively identified Loos’s insight as

the need for a mask. To be uprooted Loos believed, there was nothing to be ashamed of, it was part of the modern condition. The silence that he prescribed is no more than the recognition of our schizophrenia; the inside has nothing to tell the outside because our intimate being has split from our social being. We are divided between what we think and what we do. Loos had realized that modern life was proceeding on two irreconcilable levels, the one of our experience as individuals, the other of our existence as society.⁹⁵

Loos believed that the interior, protected by the limiting walls that defined these various levels between existence and experience, is the repository of culture, in the sense that the distillation of the best of a society takes place there. The inside of a home is the one hope for retaining, interpreting, and translating identity, and the exterior represents the intractable process that threatens it.

Channeling Loos in the How House While this realization rendered Loos a virtual exile in his own city because he designed houses with blank façades, the underlying conditions that prompted it made Schindler a real exile in Los Angeles, since it is a city that has come to symbolize modern displacement. The dichotomy Schindler tried to reconcile in the How House, as a direct extension of its expression in his own Kings Road residence, was how to respect Loos’s implicit recognition.

He wanted to do so while still allowing his own enthusiasm for what he had found in California to be expressed freely. Los Angeles is certainly not Vienna, and many other expatriates, such as Reyner Banham, Berthod Brecht, and Theodor Adorno, have been initially liberated there. Inevitably, however, *ennui* sets in, and the temporal land of the lotus eaters takes its toll. Schindler's discipline, in retrospect, seems to have lasted longer than most, due to the structural and spatial system he established, which found its prime expression in the How House.

In the How House Schindler made maximum use of the steeply sloping hillside site, designing it to appear to be only one story high, with a raised central part, when seen from the street. It actually has a second level made possible by retaining walls that are visible only on a private approach to the garage, and especially from the ravine below.

Using a technique reminiscent of Frank Lloyd Wright, Schindler deliberately made the entry tight, with one doorway leading straight into Dr. How's study, giving him the separate entrance he requested. Another entrance, further over to the right, goes past a stairway to the lower level, giving access to the living room itself. From that vantage point, the Wrightian maneuver of offering up a breathtaking view in distinct contrast to the previous experience of a restricted and frequently dark entry, is replicated, but highly refined. It lifts this house to an entirely different level of experience. This is achieved by a sophisticated layering of space and plane in both the horizontal and vertical dimensions by modular proportioning. An overview of the plans shows them to be symmetrical, in the central section, if not in the kitchen and entrance appendages, with a diagonal axis running through the living room and outdoor patio portions of the house. This, along with clerestory light provided by the roof raised above an upper gallery, helps to convey a prismatic impression, of primarily glass walls moving inward below the mezzanine, and outward above it, refracting light and amplifying space in a powerfully dynamic way. The symmetry of the How House, as past owner and Schindler scholar Lionel March explains, is "Not the conventional symmetry of classicism. This is an example of the transformation of classical symmetry (orthogonal bilateral) to another kind of symmetry (diagonal bilateral)." ⁹⁶ March has further explained that Schindler has built Classicism anew, transforming the tradition in ways that Loos and Wagner might have appreciated. At one level the How living room mimics Loos. What Wagner and Loos thought about in Vienna happened in Los Angeles with Schindler.

The primary vehicle in this transfer is the proportional system that Schindler adopted. He used a 1.2 meter module as a basic unit. This choice is related to human use. Schindler used the Vitruvian ideal of human height at 1.8 meters as one-and-a-half units, the industrial standards of door height at 2 meters as one-and-two-thirds units, and a room height of 2.4 meters as two units. He felt that this unit system contained all the necessary dimensions for building within it, subdividing it into one-quarter (30.5 centimeters), one-third (40.6 centimeters), and one-half (61 centimeters) to provide a unit system that an architect can easily remember without resorting to fractional calculations that have no human connection. The How House is laid out on a 1.2 meter grid. Vertical dimensions are given in a measurement above sea level, the low point being 178.6 meters. There is a vertical

drop of 6.1 meters from the front to the back of the house, which becomes evident inside from the position of a square light well that also mitigates between inside and outside space, or by going down the stair to the lower level. Where the entry level is glass and wood refracting transparency and light, with the only impressions of solidity being concrete in the fireplace core in the kitchen and dining area, or in the study, the lower level is just the opposite, which is appropriate to its function as a private zone. The bedrooms and one bath are located here, including one for a housekeeper located near the hall entrance to the garage.

Consequently, the central spatial experience of the house is forward and upward, from the living room across the patio toward the mountains and valley in the distance. This is the first “outlook” that Schindler mentions in his own description. The second impression is in the opposite direction of the diagonal axis, toward the raised garden terrace that separates the house from the street. This was intended to be Schindler’s recognition of the “outdoor life” similar to that experimentally introduced at Kings Road. This experience, at such a condensed scale, remains intellectually and emotionally memorable not only because of the architect’s sensitivity in siting the house but also because of the infinitely varied, integral geometries he introduces. Schindler’s realization of a spatial system of planes, which are transparent and refractory as well as protective and solid, is a vindication of Loos’s insight about walls. But, it has been expanded here in ways that are consistent with the optimism that was once endemic to Los Angeles. Instead of adopting bilateral symmetry that is static, his proportional system is dynamic, transforming Loos’s *Raumplan* into a medium that is far more appropriate to a positive view of the future. In that way it is a microcosm of the American aspirations that Los Angeles once represented.

Pierre Koenig Case Study Houses No. 21 and No. 22

Case Study House No. 21 by Pierre Koenig was commissioned in 1957 and was completed two years later. It was built for Walter and Mary Bailey on a level lot in the Hollywood Hills above Los Angeles. Koenig had only recently graduated from the University of Southern California School of Architecture in 1952, which he attended on the GI Bill after serving in World War II. He was precocious, having designed and built a steel and glass house for himself while still in school. It brought him national attention and caused consternation among his instructors, who were not yet sympathetic to his choice of materials.

A Visionary Ally Koenig’s deliberate affinity for an industrial palette integrated with prefabricated interior components brought him to the attention of John Entenza, who had acquired a moribund regional magazine named *California Art and Architecture* in the mid-1940s. He revamped it, dropping the state name to give a wider appeal, so that he might use it to proselytize for Modernism. Entenza and Koenig were both men in a hurry, driven by a vision that encompassed nothing less than revolutionizing the way Americans lived. Entenza intended to do this through a brilliantly conceived initiative he called the Case Study House Program. It was a win-win idea in which potential clients who were amenable to living in a modern house were matched up with architects who shared the ideals of the Modern Movement and were eager to design one with little or no compensation except for the recognition they would receive in print. Entenza offered contractors, material

suppliers, and manufacturers a similar incentive. As a result, he was able to present 36 houses in *Arts and Architecture* magazine over a period of nearly two decades. A few of the designs were never realized, but the impact their publication had was incalculable.

A Historical Coincidence The full extent of Pierre Koenig's achievement becomes apparent only when viewed against the background of the dramatic developments taking place in America at that time. Modernism had only recently been introduced into the country by messianic émigrés Walter Gropius and Ludwig Mies van der Rohe. Gropius had relocated from Germany to become chairman of the Graduate School of Design at Harvard in 1937, and he remained there until 1952. His house in Lincoln, Massachusetts, is discussed elsewhere here. During that time he completely revamped the curriculum to conform to a more ahistorical, antithetical educational model based in Modernist theory. His compatriot, Mies van der Rohe, accepted an equally influential post at the Armour Institute, later IIT, in Illinois in 1938, remaining until 1958. He had a parallel influence on IIT graduates of that time, and there is no question that Gropius and Mies van der Rohe subsequently redirected the course of American architecture.

The Basis of Modernism It is important to remember, relative to Koenig's Case Study House No. 21, that the Modernist credo that Gropius, Mies van der Rohe, and other disciples brought with them to America was heavily freighted with nationalistic implications. It had a clear social agenda, initially formulated in the mid-nineteenth century, as both a patriotic and an economically motivated response to the technological advances made by other European nations at that time. It was specifically instigated by the manufacturing prowess of the United Kingdom in the nineteenth century and a competitive desire to surpass it. A powerful faction in the German government believed that this would best be achieved by emulating the principles of the Arts and Crafts Movement, which they had concluded to be responsible for British manufacturing success. German envoy Herman Muthesius maintained that Arts and Crafts architects such as Charles Rennie Mackintosh had synthesized the reflexive and humanistic ethos of the movement. This ethos was formulated in response to the social ills caused by rapid industrialization, by Victorian intellectuals such as A. W. N. Pugin, Thomas Carlyle, John Ruskin, and William Morris. They maintained that the physiological well-being of the worker was paramount and that to ensure it handcraft must play a central part in the production process, so that the laborer would not be made redundant.

Gropius, along with Muthesius and others, was instrumental in launching an institutional prototype called the Werkbund in Germany just prior to World War I to test the efficacy of applying Arts and Crafts principles to industrial production. This demonstrates a national will to excel, to be systematically implemented through education, so that eventually every citizen would either be involved in some aspect of industrial design or become knowledgeable enough to be an informed consumer.

The architecture that Gropius conceived to house the Werkbund was symbolically anonymous, deliberately free of any historical clues that might relate to style. The moralistic implications inherent in the Arts and Crafts position became more crystallized in this iteration; their transformation into Modernist principles

involved metaphorical neutrality to erase signs of social status. Rather than being fondly regarded as a tangible record of cultural tradition, historical style was disdainfully seen as the irrefutable evidence of the exploitation of the poor by the rich, since, Modernists argued, only the upper class could afford to build durable monuments that would survive the ravages of time and remain as a historical record of the past.

Industrial materials were believed to offer a neutral means of architectural expression, appropriate for a bright, new egalitarian future that would be free of stratified economic associations. Telluric materials, such as timber, brick, and stone were shunned because they were reminders of the past. Glass was singled out as being especially symbolic of the Modernist ideal of equality and social well-being because of its transparency.

Immediately after World War I, in which both Gropius and Mies van der Rohe fought, the Werkbund experiment was reconfigured into the Bauhaus, which was first based in Weimar in 1919 and then moved to Dessau. Walter Gropius was its founder and first director, and his mission, now more focused than before the war, was to use this institution as an engine with which to help rebuild his defeated nation through industrial development and design excellence. As he said in its first catalog: "Together let us desire, conceive and create a new structure of the future, which will embrace architecture and sculpture and painting in one unity and which will one day rise toward heaven from the hands of a million workers like the crystal symbols of a new faith."

The Appeal of Minimalism, Without Ideology The structure Gropius was referring to, of course, was political, and modern architecture was to be the phalanx in the epic struggle to build it. This ideological implication was not readily apparent to many of the American architects who so readily adopted the physical aspect of Modernism, however, or to the students who were faced with a new educational doctrine that quickly replaced existing *Beaux Arts* curricula. Many were attracted to the freedom that Modernism represented. Its minimal simplicity was a welcome relief from prewar social conventions and the traditional architectural forms and materials that represented and sustained them. The cataclysmic events that returning veterans, like Pierre Koenig, had witnessed abroad and the sacrifice, anxiety, deprivation, and tragedy experienced by those who had remained behind fed a national desire for change.

Those who fought in the war, for better or worse, were also exposed to new cultures, quite different from their own. They returned to America with a broader, less parochial worldview. In retrospect, the seismic shift in social patterns that followed was inevitable. It included major technological advances prompted by wartime necessity, greater mobility due to better automobiles and the new interstate highway system of the Eisenhower years. This time is now viewed by many as the most optimistic period in American history, and the height of its international prestige. Industrialization made possible an expanding middle class and the end of the prewar prevalence of domestic help. One result was a mass migration away from the city to the suburbs and a more casual lifestyle.

A New Way of Living Recognizing the vast social changes that were taking place, suburban developers like William Levitt, Joseph Eichler, Henry Wright, and Clarence S. Stein provided single-family houses with attached garages. These

were centrally positioned on small lots to allow a sizable lawn in front and yard behind, where children could play and be easily supervised from the kitchen. Without domestic help, and before women's liberation, the kitchen became the domain of the housewife, and manufacturers clambered to provide the labor-saving devices necessary to make her life easier. Levittown, built in 1947, was vaguely based on an easily recognizable historical style and was still divided into rooms with clearly designated functions in mind, as in the past.

Like these suburban developers, John Entenza also had the foresight to predict the pent-up demographic demand of the baby boomer generation for a new and different kind of housing. But, unlike them, his goal was to use the most advanced industrial processes and the latest technological developments and material available to provide housing at a price everyone could afford. He envisioned the residential equivalent of the Model T Ford.

A Legend among Legends Entenza and the architects he enlisted to help him realize this goal are now legends, but Pierre Koenig is among those who arguably understood the mission behind the Case Study House Program best. This is because he was able to resolve many of the ideas that were only partially explored by others before him and to bring them to realization in a new medium and a more fully resolved way. Many of the other Case Study contributors, for example, designed wood frame houses. While they may have included many design innovations and have used new materials and appliances, they did not do so in a comprehensive way that would allow their houses to become prototypes, suitable for production. Many others also employed skillful site planning strategies, but these also were not systematically thought through. Pierre Koenig implemented a series of generic siting principles that could be replicated elsewhere, if local microclimatic conditions were taken into account.

History, of course, is never as simple as the previous discussion about Modernism implies. There was a much simpler earlier homegrown variant in the United States that developed as part of the race, primarily between architects and engineers in New York and Chicago, to find a practical way to fireproof cast iron and steel at the end of the nineteenth century. It started with the modular building systems by James Bogardus in Manhattan in the 1840s and evolved through William Le Baron Jenney's steel frame First and Second Leiter Buildings in Chicago between 1879 and 1891. It then culminated in the Reliance Building by Burnham and Root in 1895 and the Carson Pirie Scott Department Store by Louis Sullivan in 1899. These Midwestern achievements are the basis of the Chicago School, which also produced Sullivan's apprentice and protégé, Frank Lloyd Wright. His Fallingwater near Pittsburgh, Pennsylvania, completed in 1934, just before the arrival of the Bauhaus missionaries, is generally considered the apotheosis of the early phase of modern architecture in America. Richard Neutra, however, is credited with designing the first modern steel house in the nation for Philip and Jean Lovell in Los Angeles in the same year.

Modernism but Not Necessarily Modernist As Case Study House No. 21 clearly demonstrates, Pierre Koenig personified this earlier American spirit. He was the essence of the Yankee "can do" inventor, working diligently away in his home office to devise ever more efficient steel joints to lower the cost and increase the

likelihood of the production of a prototype house, eventually reducing them to only two. He wanted to produce a desirable and marketable alternative to the generic suburban house that was then spreading out around American cities by showing what could be done on a far less conventional site. Instead of the predictable approach of placing the house and its attached garage across the middle of the lot to create a front and backyard, he extended an open carport perpendicular to the main rectangular residence to create an L-shaped plan. Rather than focusing on curb appeal as the developers in suburbia did, Koenig's pragmatic move puts the convenience of his client first.

It recognizes the important role that the automobile was beginning to play in American, and especially Angeleno, culture. It also provided the Baileys with a protective open arcade to shield them from the sun or rain and lead them from their car to the main entrance. This arrangement also shows off the front elevation of the house to good advantage, against the backdrop of the surrounding mountains, but it is a private, not a public, view.

The message that this opening move sends is that it is people and not image alone that matters to this designer. This sets him apart from Modernist architects, who were trying to attract converts through form. This message is reinforced repeatedly from that point on, showing comfort and convenience to be his first priority. The *porte cochere* leads directly into the kitchen, which is treated as the center of domestic activity as it is in suburban house plans at that time, but here it is far more open, with virtually no separation between it and the living area except a kitchen counter with high cabinets supported with an open steel frame. A central service core, which includes two bathrooms, a mechanical room, and a small open courtyard, separates this more public side of the house from the bedroom and office side. This again shows preference for the owners' needs by giving them privacy. Koenig's approach here stands in stark contrast to that taken by Mies van der Rohe in the Farnsworth house in Plano, Illinois, in 1950, in which the sensibilities of its single female owner were subordinated to the architect's desire for transparency, or the Glass House of his American follower, Philip Johnson, in New Canaan, Connecticut, which preceded it in 1948, and is equally open to outside view.

Reality versus Fantasy In contrast to this abstract approach, the space planning of the Bailey House shows a heightened awareness of a new modern lifestyle in which social rules have irrevocably changed, but in which basic requirements of common human decency remain intact. It goes beyond Modernism, which for all of its professed concern about social good and the welfare of the worker, finally failed to demonstrate a real understanding of peoples' needs. Modernists seemed to prefer to determine what they should be, to conform to the ideal world that they imagined, rather than what they really were.

Modernism was called the International style because it was intended to work everywhere, regardless of climate, culture, or topography. When Ian McHarg came forward with the notion that architecture should respond to its specific environmental context instead, Modernists considered him an iconoclast. McHarg's book *Design with Nature* was released at the same time the Bailey house was being designed, and Pierre Koenig is in the same contrarian category. Case Study House No. 21 is testimony to his belief that technology is an extension of human intellect

rather than a replacement for it. He believed architecture should reconnect us to our surroundings rather than separate us from them behind fixed sheets of glass with nature on display at a distance. Koenig was far ahead of his time in his sensitive approach to integration with the environment, and contemporary advocates of ecological architecture have a great deal to learn from him.

British historian Reyner Banham, in his classic study of Los Angeles architecture famously referred to the Case Study House Program as “the Style that Nearly . . .” because it failed to achieve its mission of revolutionizing house construction in the United States. Recent publications related to the design professions indicate that the time for prefabrication has now arrived, and it is in the forefront of the public consciousness. “The Style that Nearly” is now the style of preference and Koenig was way ahead of that curve too. His vision of prefabricated, mass-produced houses that can be available to all, it now seems, will finally become a reality.

Case Study House No. 22 Three years after the Bailey commission, Pierre Koenig received a second opportunity to design another Case Study house for the Stahl family high in the Hollywood Hills. Case Study House No. 22 in tandem with the Eames House, which was Case Study No. 8, has come to epitomize the goals that John Entenza established for the program when he established it, just before the end of the Second World War. It also represents the boundless optimism and belief in progress in postwar America that seemed to have concentrated in Los Angeles. The West Coast was the symbol of the future, unfettered by the restrictions of an extended national history, and Case Study House No. 22 was especially evocative of that spirit. By 1960, when the house was realized, the emphasis of the Case Study House Program had shifted even more decisively toward the principle of creating an industrial prototype that would solve the problem of housing shortages brought on by the postwar baby boom. This idea had admittedly been present from the beginning as the mechanistic image of the Eames House proves, but other participants in the program, such as Conrad Buff and Donald Hensman, had emphasized timber construction in their submissions rather than steel. This friendly competition, between those like Eames and Koenig, as well as Edward Killingsworth and Raphael Soriano, who believed that residential development should be mechanized in steel and standardized to approximate the assembly line production of automobiles, and others like Buff and Hensman, who felt this process should be tempered by the use of natural materials to cater to popular sensibilities, tilted in favor of the machine when Case Study No. 22 was finished.

A Breathtaking View Koenig was faced with the challenge of what might euphemistically be called an unbuildable site. He made a virtue of necessity by creating an L-shaped plan with its outward edge facing the street and a pool in the protected inward part of the right angle. One leg of the “L” cantilevers out over a portion of the cliff, making it seem like the living area in that portion is suspended out in space. By using this kind of plan, Koenig made it possible for the inhabitants to have an unobstructed, 270 degree view of Los Angeles in the valley far below, with its lights twinkling like stars in the seemingly infinite horizon. By the 1960s, when the house appeared, the freeway system that started to encircle the city as part of the Interstate Highway System promoted by President Eisenhower in the late 1950s was beginning to generate the smog for which Los Angeles has now become

infamous. With actual stars no longer visible in the sky because of a perpetual blanket of haze, the electric lights that now replace them have become a perfect symbol of the replacement of nature by technology that Case Study House No. 22 also represents.

Pierre Koenig used massive concrete floor beams and 300 millimeter deep steel beams on a 6 meter grid, topped with exposed corrugated steel decking for the roof, as well as floor to ceiling glass panels both to deal with the difficult topography of the site and to create a minimal, mechanistic design vocabulary. The combination of a relatively solid side of the house facing the street and a glazed side providing unobstructed views out over the pool to the city in the distance emphasizes the feeling of delight and surprise one feels when entering the house. There are two bedrooms and two bathrooms, as well as a kitchen, dining room, and living room inside, but because of the minimal amount of structure, and the liberal use of glass, there is no impression of compressed space. The roof extends out past the wall line to create a shaded sitting area around the pool, as well as for the area of the living room at the edge of the cliff.

John Lautner: The Sheats House, Los Angeles

Generations of young people in America were inspired by the example of Frank Lloyd Wright to become architects, and John Lautner was one of them. Many, like Lautner, were drawn to the cult of individuality that Wright personified and actively encouraged. This emphasis on personality was typical of the architects in the Modern Movement as well, who could hardly be accused of being shy, but Wright added a new dimension, of disdain and pride, to this egotistical tendency. He feigned indifference to the New Architecture that was beginning to emerge in Europe at the turn of the century, but privately held it in contempt, thinking it to be devoid of any connection to nature or human emotion. He was proud, instead, of the American tradition of freedom and individuality protected by the Bill of Rights. So, there was a defiant aspect to his attitude, running as an unspoken, but consistent, theme through each of his many projects.

John Lautner as Wrightian Disciple John Lautner was born in Marquette, Michigan, in 1911, and grew up in the North Woods along the shore of Lake Superior. Both of his parents taught at Marquette University, prior to its becoming North Michigan University, which Lautner also attended, graduating with a Bachelor of Arts and a major in English. His mother, Viola, brought the autobiography of Frank Lloyd Wright to Lautner's attention soon after it was published in 1932, and he decided to attend Taliesin West, which is Wright's architectural school in Scottsdale, Arizona. This school was, and still remains, unconventional. At the time that Lautner attended in the mid-1930s, it was entirely focused on the personality of its founder. Wright had just come to the forefront of public consciousness once again because of the stunning success of his design of a house in southwestern Pennsylvania for the Kauffman family in Pittsburgh called Fallingwater. It represented Wright's clear response to the rational abstraction favored by Modernists, such as Le Corbusier, because, rather than being detached and aloof from nature as the Swiss-French architect's well-known Villa Savoye was, Fallingwater was literally fused to its hillside site, connected to a huge boulder on a cliff so that it could hover effortlessly over a raging stream below it. The two approaches could hardly



John Lautner was a student of American master Frank Lloyd Wright, and the influence of his teacher is evident in the way that this architect integrates his houses with their sites.

be more dissimilar, and in that difference lies the story of one of the most epic issues revolving around Modernism, with important implications for the Lautner design being discussed here.

Expressionism In 1933, the same year that Fallingwater made the cover of *Time* magazine, the *Congrès Internationaux d'Architecture Moderne*, or CIAM, was holding its fourth meeting on the *Patris II*, a boat sailing from Marseilles to Athens. The International Congress for Modern Architecture had been founded in La Sarraz, Switzerland, in 1928, as an offshoot of an international competition held in Geneva to design the Palace of the League of Nations there. The competition jury was equally split between Modernists and non-Modernists, and the outcome served as a catalyst for the foundation of the CIAM, for the good of “social progress.”⁹⁷ In its statutes, the Congress was described as being dedicated to the “representation of the modern architecture idea.” In its first and subsequent meetings, the Congress focused on “The dwelling,” constantly discussing the theme of “A Modern Form of Habitation.”⁹⁸ There are many familiar names on the CIAM membership role, from every country in the developed world at that time, including Gerrit Rietveld and Cornelius van Eesteren from Holland, Gino Pollini and Piero Bottoni from Italy, Jose Luis Sert from Spain, Richard Neutra from America, and Alvar Aalto from Finland. But Le Corbusier is the most consistent and obviously galvanizing presence. His major preoccupation at the time that he helped establish the Congress, along with Helene de Mandrot, Siegfried Gideon, and Walter Gropius, was economic and political issues rather than historical styles, primarily related to the rationalization and standardization of the means of production.⁹⁹

From this international platform, Le Corbusier basically declared war on other competing schools of thought, such as those that might propose a subjective, rather than an objective, approach to design, defined as *Sachlichkeit* at the time. In spite of its association with disciplined judgment, *Sachlichkeit* implied that irrational criteria could coexist beside, or even outweigh, empirical data in the design process and was therefore unscientific. Through his own national heritage, Le Corbusier belonged to the French Rationalist tradition, beginning with the Enlightenment, and so he adhered closely to it. Any subjective approach to design was considered to be flawed by emotionalism. Through his influence, and the rising power of the CIAM, Le Corbusier almost single-handedly marginalized Expressionistic tendencies in the Modern Movement, which were just as strong as the Rationalistic Purist point of view that he promoted.

Frank Lloyd Wright, on the other hand, was guided as much by emotion as he was by reason in his work, often responding intuitively to a particular site condition, as he did at Fallingwater. His inspiration there was to cantilever the entire house above a rushing stream. His trust in his own intuitive powers extended to his inherent love of and empathy with nature. He wrote extensively about his search for an organic architecture that was at one with the environment, in which natural and industrial materials played an equal role. This was certainly the case at Fallingwater, where he balanced his use of local stone, which makes up all of the vertical parts of the house, with reinforced concrete. It was used on the horizontal, structural decks because of the extensive cantilevers involved. Wright categorized his own personal struggle, which was by extension the same one that bedeviled the entire Arts and Crafts Movement, as “Art Against the Machine.” Art, in this equation, meant spontaneous creativity, handicraft, and the introduction of intuitive, human intervention into the production process, which was “the machine.”

A Dedicated Group of Followers In addition to John Lautner, Frank Lloyd Wright had many other followers, such as Bart Prince and Bruce Goff, who shared in his belief in the need for an organic alternative to mechanization and prefabrication. They also tried to balance the use of natural materials with industrially produced alternatives. Bruce Goff, for example, in his somewhat notorious Bavinger House, which is also discussed in this volume, used local stone for its spiraling core, but steel cables for the roof of what is essentially a sophisticated tent.

The Sheats House by John Lautner All of this is an introduction to what must certainly be one of the most extraordinary houses of contemporary times: the Sheats-Goldstein House by John Lautner in Los Angeles, California. It was originally built for Mr. and Mrs. Paul Sheats in 1963 and was subsequently remodeled for James Goldstein in 1989.

After serving his apprenticeship at Taliesin West, John Lautner moved to Los Angeles to establish his office during World War II. He remembered that the garish sprawl of the city was repulsive to him. Work was difficult to find during that time, and the best he could do in the mid-1940s was to become the architect for a franchise called Googie’s Coffee Shop in Los Angeles. He introduced a design language of steeply pitched roofs, large expanses of sheet glass, and high ceilings that has subsequently been used to define an entire genre in that city that continued on throughout the postwar period. “Googie architecture” now connotes Lautner’s

daring structural approach, as well as his bold use of open space, but is also a bit pejorative, since it was at odds with the Modernist principles that started to have such a strong influence in America, and particularly in Los Angeles, at that time.

Because of the proselytizing power of publisher John Entenza through his widely read *Arts and Architecture* magazine, as well as the CIAM connection made by local architect Richard Neutra, Modernism had gained a solid foothold in Southern California by the time that Lautner arrived. The University of Southern California School of Architecture, which was founded in 1924 by the local chapter of the American Institute of Architects, had many iconoclasts on its faculty who were leaders in the new movement. They looked down on Lautner because the Taliesin Fellowship did not have an accredited degree at that time and because his “Googie” style was not consistent with the production-based rules that Modernism had established.

Lautner, on the other hand, had contempt for what he called “facilities” buildings based on Functionalism alone, calling instead for a “free, beautiful, architecture for individuals, for people, to daily increase the joy of life,” as well as houses that were “alive, fresh, exhilarating, yet solid and enduring.”¹⁰⁰

The Sheats House Mr. and Mrs. Sheats asked for a rather large residence with six bedrooms and six bathrooms for themselves, their parents, their children, and a maid, in addition to a guest room, office space, living and dining room, and a kitchen. The site is located on a steep slope above Beverly Hills, with a clear view out and down over Century City below. The plan of the house is simplicity itself, as an elongated “X” stretched out along the edge of the slope, so that the edge of one of the triangles that is formed by the “X” projects out over the edge of the cliff. Lautner used one of the cross bars of this stretched “X” as a circulation spine leading from a garage in one of the triangles to the living room and fireplace where the legs cross, and finally to a stairway down to the master bedroom suite, tucked under the pool deck. It is under a projecting, cantilevered corner to take advantage of a dip in the topography there. Lautner compounded this fairly simple geometry, however, by placing a second high angled roof, shaped like a parallelogram and made out of triangular concrete coffers, at an angle to the high side of the slope, above the living area and part of the swimming pool at the heart of the house. Because of the long spans involved, this high angled concrete canopy has a deep edge beam and massive buttress supports where it meets the ground. The family and guest bedrooms, other than the master bedroom suite, are all located in the first half of the “X,” near the garage and the entrance, separated from the living area by the intersection in the middle. The ceiling in this area is low and faced with wood planks, so that the overall impression is elemental and angular. The space beneath the high-coffered parallelogram has been variously described as primeval and cave-like, and the complete openness around the perimeter, with immediate views out to the wooded slope next to the house, contributes to this feeling. Lautner had originally intended that there be no enclosure along the perimeter at all, with just an air curtain providing warmth during the winter. But large silicone jointed glass sheets have since been added. These are virtually invisible, so the sense of being under a huge sheltering canopy remains. Lautner had 750 glasses inserted into holes cut through the slab, between the triangular coffers, that flood

the living room with rays of light during the day, in a contemporary rendition of the *omriyyad* used in the dome of a Turkish *hammam*. The floors in the public spaces are covered with carpeting, and Lautner also designed all of the furniture. Its sharp angles and concrete and glass palette matches the rest of the house, so that it contributes to a sense of continuity and unity. Strategically placed lighting along the slope and the water areas, combined with the openness of the edges and massive scale of the supporting structure, also blur the lines of demarcation between inside and outside. Even though Lautner has predominantly used concrete and glass in this house, this connection to nature clearly reveals his allegiance to his mentor, Frank Lloyd Wright.

Eric Moss: The Lawson-Westen House

Eric Owen Moss has primarily been involved in partnership with Frederick Norton Smith in the regeneration of a large portion of Culver City, California, in an area located south of the Santa Monica Freeway, west of Los Angeles. Frederick Smith inherited a great deal of land there, and he has been redeveloping a series of movie studios that were located on it into office spaces primarily for people involved in recording, entertainment, and IT industries. The number of renovations that Smith and Moss have been involved in to date have encouraged Smith to name this area Conjunction Points in reference to the idea of a new prototype of urban development. Smith has even negotiated the air rights for the zone over the railroad running through the area so that he and Moss could design an elevated conglomeration, which they called Spar City. This has left little time or opportunity for Eric Moss to design private residences, so when he does take on such a project, the results are invariably exciting and novel. In the projects he has done in Culver City with Frederick Smith, he has primarily focused on creating internalized environments, which allow employees who are primarily using computer technologies to do so in comfortable surroundings. In those designs, however, the final clients were often unknown to him because these were speculative office projects and may change hands many times after construction. He has, however, used each opportunity to make an insightful commentary about some aspect of the urban condition in Los Angeles, in his correct assumption that architects will increasingly be involved in designing and building in the urban environment in the future. In the early part of the twenty-first century, approximately 60 percent of the world's population live in cities but as the century progresses that percentage will climb dramatically. Moss has been one of the few architects to understand this sea change that is now underway and to tackle the difficult problem of how to cope with the residue of the industrial past. In the Samitaur Building, for example, which is part of the Conjunction Points complex, he has seized the opportunity of the right of way running through the site for a road that was located there to use the building as a prototype for one that might be built over a freeway. There are differences in scale, since the road beneath the Samitaur Building is much narrower than the freeway, but the comparison is valid. Moss has used massive structural elements to support a linear building above it, which could conceivably be extruded outward at each end to run along the length of a freeway. In the Stealth Building nearby, he tackles the problem of the brownfield site. Frederick Smith and Moss discovered the condition of the site when excavation was begun and they undertook the

necessary clean-up precautions. The Stealth Building hovers lightly above this site on thin metal columns as a symbolic gesture of the previous condition of the ground. And there are many more examples of Moss's use of this opportunity to build in Conjunctive Points using buildings as pedagogical models for others to follow.

Commentary on the Contemporary Condition It should come as no surprise, then, that when he does take on a residential commission, Moss uses each chance as a way of making a similar commentary on contemporary life. He is not the first architect to do so in Southern California. Greene and Greene in their design of the Gamble House in Pasadena, which is described elsewhere here, used the commission as a way of making a commentary on the influence that Japan was then having on American architecture as well as the impact that the influence would have on a new and more casual way of life that was more sensitively attuned to nature. Frank Lloyd Wright in the various houses he did in the region expanded on this theme by focusing on the balance between industrial development and the environment that he felt was an essential issue of the time in which the houses were built. Rudolph Schindler, who was a disciple of Wright, was also concerned about the conflict between industrialization and nature. The house he built for himself on Kings Road in Los Angeles is a cogent commentary on the need to avoid it since it is as much interior as exterior in the living spaces that are provided in it. The Case Study House Program that was instituted by John Entenza and lasted from the end of World War II up through the mid-1960s was also an attempt to try to revolutionize the involvement of industry into the area of residential development as a paragon for the future.

Eric Moss as a Prophet of Change One of Eric Moss's first forays into the grand tradition of innovation in the residential area is the Petal House, which he designed in 1982. It is located in West Los Angeles in a typical suburban neighborhood, and Moss decided to use the house as a commentary on this context to challenge conventional ideas of what a home should look like. There has been a great deal of controversy surrounding the role that architects should have taken in the housing boom that followed World War II. Many believe that they abdicated their responsibility in becoming involved in that market because of hesitations about the moral compromises that would be involved in something that was basically a commercial activity. Moss's use of the same materials and forms on the houses surrounding the site of his projects to provoke debate about this lost opportunity is a central part of this design.

Lawson-Westen House The Lawson-Westen House commission, which followed that of the Petal House, offered Moss an opportunity to continue his intention of social commentary. This larger project was begun in 1988 and is located on a long and narrow flat site on Westgate Avenue between Sunset Boulevard and San Vicente on the north and south and Barrington Avenue and Bundy Avenue on the east and west sides. This area is one of the wealthier neighborhoods in Los Angeles. The clients in this instance took an active part in formulating the program for their house. A series of letters between the clients and the architect were transformed into a list of the functional requirements needed. These letters and the notes and sketches that they inspired can now be read as a progressive design process in

which Moss translated the clients' wishes into reality. In their letters, the clients referred to houses they had owned in the past and the parts of those houses that they wanted to replicate. They were especially interested in the vertical scale of the rooms and the need for large spaces. They requested a living room with a high ceiling and skylights that would let in natural light. In the architect's hand this became a central soaring space that is the most prominent part of the scheme of open spaces instead of a group of smaller ones. The challenge in designing such a space is to balance the request for openness and height with the need to feel comfortable and to provide intimate scale. The clients had an extensive art collection and loved listening to music, as well as cooking and entertaining a large number of people. This led Moss to connect the large living area with a high ceiling to an open kitchen that serves a dining room nearby.

In their written comments to the architect about the relationship they wished to have between the inside and outside of the house, they specifically referred to the Glass House by Philip Johnson in New Canaan, Connecticut. This initially seemed to be an incongruous example because the Glass House is located in the middle of an enormous heavily wooded site and is able to maintain its privacy only because of its seclusion. The site for the Lawson-Westen House is 70 feet wide by 180 feet long and so is much more restricted in area than Johnson's property in New Canaan. To reconcile the difference between the two projects, Moss adopted the idea of a "Garden Home in the middle of a city." In initial sketches there is a notion of a layered house consisting of circular forms made out of glass in the interior surrounded by solid bearing walls to provide privacy with a garden in between. The extensive use of glass in the inner walls was reduced in the final design, but by mid-November of 1988 Moss had arrived at this basic organizational element as the basis for his design. As finally realized, this initial idea resulted in a rectangular house running parallel to the lawn at the northern boundary of the site and being closer to Westgate Avenue on the east. By pulling the house toward one corner of the rectangle, Moss was able to provide as much garden as possible in the rest of the site. He also used a circle with a 30-foot diameter, which intersects the rectangular plan as the fulcrum for the entire layout. This circle contains the kitchen, and the rest of the structure appears to be walls that spin out from it.

The main entrance is different for both the owners and the guests. For guests there is a heavy gate in the middle of a concrete block wall that greets them at the Westgate Avenue entrance. Once the gate is open, they walk along the southeast edge of the house protected by an overhanging part of a guest bedroom wing to a front door that is about one-quarter of the way down the side of the building. Moss delights in reinventing conventional elements of his houses such as doors and windows and in making them works of art in their own right. This front door is no exception. It consists of two large glass panels, which meet at a right angle with thick strips of wood at the base and then at doorknob level. These continue at head height and wrap around the corner as well. These are connected by equally thick vertical members, which provide structural stability and have heavy black metal hinges at the intersections between the horizontal and vertical pieces. The door opens inward toward the corner after which guests or visitors step into a relatively small vestibule area. From this entrance vestibule, they discover a circular space that is the highlight of the plan. It is gradually revealed through a sequence of

experiences rather than all at once. This allows the architect to develop a series of views, which build the anticipation of those entering the house as they move into it. The owners, on the other hand, have a second, more private entrance from the garage, which they access through a double gate in the same concrete block wall at the boundary of the site. Once they enter their two-car garage, a second door leads them into a series of rooms that contain functional elements such as the laundry room and storage areas as well as a back stair to the upper level. As the architect himself describes the duality of the entrance experience,

There is a split in the house between limited and limitless, known and unknown. I tried very hard to build that into the experience of the building . . . You could consider the front door as experimental in a small way; its combining pieces of wood door and glass door give you aspects of both; it gives you something else. The door is not a Venturi joke, it raises the possibility that things can be understood in a different way.¹⁰¹

The entire front elevation of the house, however, *is* very much a continuation of a Venturi joke. When Robert Venturi designed a house for his mother in Chestnut Hill in the early 1960s, he made a point of using windows on the exterior wall facing the street as symbols that would send subliminal messages about the changing role of the house in the life of the American family. He deliberately intended that the windows on that elevation read as holes in the wall rather than the strip window that was so much a part of the Le Corbusier dogma. As Venturi said, “In modern architecture, the ideal was not a hole in the wall which negated the integrity of the wall, but an interruption of wall, and absence of wall which promoted flowing space and abrogated enclosed space.”¹⁰²

Venturi went to great pains to design a window that would represent the traditional windows of the past using horizontal and vertical dividers in the middle of the square frame and to divide it into four equal glass panes. He oversized this one major square window to emphasize this point of difference with the modern movement. Other devices used on the front elevation of the Vanna Venturi House continue this iconoclastic approach toward references to the changing state of architectural principles at that time. These include a large-scale gable front, split at the apex, as well as a wide vertical mass that appears to be a chimney between them and a dado that runs horizontally along the entire length of the house that aligns with the central cross bar of the square window. In retrospect, what Venturi was doing was creating the profile of a child’s drawing of a house complete with gable roof, chimney, and welcoming doorway. By splitting the gable in half, he was making a comment on the growing insecurity then felt by the American family and the rising divorce rate in the United States that started two decades after the end of World War II. He was continuing this illusion by placing a dado, which is typically used on the walls on the inside of the house to prevent them from being damaged by chairs, which might otherwise hit the wall. The dado was especially important before the advent of plasterboard and drywall, which is fairly easy to repair if it is damaged. Plaster walls that preceded the invention of drywall were much more difficult to repair. By placing the dado on the outside of his mother’s house, Robert Venturi was literally turning it inside out. The symbols he uses, then, of the oversized window divided to look like a traditional “hole in the wall,”

the split gable, the faux oversized chimney, and the dado, all send a subliminal image of the diminution of the core element of the American dream.

Eric Moss in the front elevation of the Lawson-Westen House continues this dialogue about the changing nature of the nuclear family. There are two Venturi style windows on that elevation, the first on the right-hand side provides light into the bedroom at that end of the house and the second is a partial version of the first placed at an angle to the left in a wall that is in front of the first one. This entire elevation is cast in concrete with a different surface treatment than the steel troweled stucco used on the rest of the house. This front wall is detailed to appear almost like a portal frame, which has a one-dimensional feel to it. This dual window treatment in which the second partial opening appears to crank away from the first at an angle, combined with the harshness of the concrete portal frame, and the heaviness of the other walls in the house and the hard rusticated texture of the boundary wall as well as the metal gates leading through it, all combine to convey a sense of insecurity and agoraphobia. The message the architect seems to be sending is similar to one put forward by the Los Angeles-based author Mike Davis, in his book *Ecology of Fear*, that regardless of how accurate the perception of public insecurity is, that perception prevails in Los Angeles.

Once visitors can negotiate this graphic description of the state of public realm of Los Angeles today and enter the house, they are aware of a beautiful inner world, which stands in stark contrast to the hard carapace outside. In many ways, this approach is similar to the one that Moss consistently uses in his renovations and reinventions of the office buildings he designs in Culver City for Frederick Smith in which the inner world is treated in a much different way than the exterior.

The kitchen of the Lawson-Westen House, which is circumscribed in a circle that bisects the southern wall, comes into view after entering the two-story living room. The kitchen is a home chef's dream with more than ample counter space and preparation area. It has direct access to the dining room, which is on the northern side of the house on direct axis with it. It is only separated from the kitchen by a pair of doors to make serving easier. This large circular kitchen acknowledges the tendency in many contemporary houses for guests to gather in this space while dinner is being prepared, since it is almost equal in floor area to the living room diagonal to it. This space has a cone-shaped roof, which is the second most prominent feature of the exterior of the house after the disjunctive organization of the front elevation. A fireplace in the living room contributes to a welcoming sense of domesticity in this space. It is made of steel and soars up for the full two stories of the living room wall, being as much a sculptural object as a functioning fireplace. It is yet another example of Moss's love of reinventing conventional elements. Here he was assisted by metal worker Tom Farrage, who also contributed all of the other innovative metal work in the house. This metallic theme is first announced by the wide galvanized sheet metal gates on the Westgate edge of the property that separates the walkway to the house from the street. It continues in the truss-like struts that diagonally brace the end of a glulam beam that supports the vaulted living room roof. It continues inside in the structural frame of the bifurcated drum that spirals upward from the circular kitchen that is really the social center of the house. This conical tower was originally intended to be made of cast-in-place concrete but in its final form is framed with metal and

wood and has two large concentric rings of steel. The first of these is 6 inches deep and the second is 3 inches wider. Together, these form the top of the cone. Parts of these rings are exposed in both the inside and outside of the house, as are portions of the metal columns that support them. This metallic language continues Moss's use of deep steel sections that span across these columns and also act as bracing struts. Diamond plate steel is used as flooring in some portions of the house as well as on the upper reaches of the stairs, and this along with the pipe railings that are used throughout the house all combined to convey an impression of toughness. There is a sense of concealed energy trying to burst through other surfaces that are conventionally covered with gypsum wallboard.

The Carceri d' Invenzione by Piranesi In a previous analysis of this house written in 1995, I compared the impression conveyed by the metal work and the effect that has upon the circular spaces of the house to the drawings of the Renaissance artist Piranesi. This is especially true in the case of the encircling stair that spirals upward inside the cone-shaped space above the kitchen. When walking up the stairway there are many different perspectives in all directions that evoke comparisons with images in Piranesi's drawings, although these may not have been intended by the architect. One of the most obvious comparisons is a series that the artist produced in 1760 called *Carceri d' Invenzione* or imaginary prisons. This prison series was not intended for wide distribution and consists of only 14 sketches in which the artist uses illusion, multiple perspectives, and dramatic lighting to experiment with new forms of architectural expression. Piranesi deliberately distorts optical conventions to increase visual excitement, which paradoxically results in both pleasant and unpleasant sensations. The artist challenges the newly developing science of perspective that was being constructed during the Renaissance in Italy when he was producing this series. By doing so, he offered a new way of seeing that was not continued until the Cubist period in nineteenth-century France. Moss, like Piranesi in this *Carceri* series, seems to be launching an attack on the restrictions imposed by convention. In each case, the weapons used are unexpected monumentality and excessive scale, sharp contrast between light and dark, theatricality, and the malevolent image of a metallic structure expressed in flying bridges, precarious galleries, and staircases that extend into space without seeming to end.

The stair leading to the first floor juts out slightly into the living room to give a subtle clue of its location along the inside wall of the circular kitchen form. One side of the stair conforms exactly to the curved wall, while the outside rail is straight. It is also treated as a sculptural element rising upward in a series of switchbacks that lead to a corridor above. This corridor that runs along the southeastern wall of the house, is actually a balcony above the living room and joins the master bedroom at the back of the site to two other bedrooms in the front. The intention of this split is to give privacy to the master bedroom, which has a curving wall at the back of the space. The bedroom is part of the extensive master suite at the end of the bridge that spans across the two-story-high living room space. This suite is a private world that is wrapped in the arm of the long sweeping western wall of the house against which a custom-made double bed with a large wooden headboard is located. The curve of the wall puts the bed on a direct axis with the fireplace, which is notched into the wall of the central cone opposite to it. This fireplace

has a built-in wood storage bin located next to it. The roof of the bedroom angles up sharply from the curving wall behind the bed, making it seem almost like a tent, and a long clerestory window located at the juncture of this angled roof and the curved bedroom wall supports this impression. This long window continues from the bedroom to the master bathroom as a source of daylight and moonlight to both. This custom-made clerestory window is typical of the kind of fenestration that Moss uses throughout this house, including the highly symbolic translation of the Venturi window that he has designed facing the street. He typically uses conventional stock and redesigns it in unusual combinations to create these retranslations of window forms. This is obvious in the long clerestory window he uses in the bedroom as well as three windows that bend around the upper edge of the central cone of the house. Moss prefers to use natural light as a way to extenuate changes in dimension from vertical to horizontal. Placing windows at strategic locations as a way of emphasizing the three dimensionality of the space and to break down conventional ideas about joints between walls, ceilings, and roofs. In the Lawson-Westen House, the challenge that the architect set out for himself was to balance areas of large scale and the need to provide a sense of intimacy, and the natural light provided by these windows is one of the means he has used to do this. He has clearly distinguished between natural light that comes through the wall from that which comes through the ceiling.

There is a stairway leading from the master bedroom down to a jacuzzi, which is on an outside deck attached to the cylinder of the kitchen and positioned in such a way that it has complete privacy. There is a spiral staircase attached to the balcony on which the jacuzzi sits that then allows the owners to go down to the garden below without going through the entire length of the house to get outside.

The Significance of the Lawson-Westen House For the reasons just described, as well as many others, the Lawson-Westen House is one of the most unconventional residences during the contemporary period in American architecture. But its significance goes beyond its mere unconventionality. It continues in its attempt to extend the social commentary started by Robert Venturi nearly three decades before, described here. These two houses, the Vanna Venturi house in Chestnut Hill, Pennsylvania, and the Lawson-Westen House in Los Angeles, are 30 years and 2,000 miles apart; however, they both provide a profound commentary on the change that has taken place in the idea of “home” in America. The Vanna Venturi house was built at a time in which the belief in progress and moral certitude had just ended in the United States. The postwar period from 1946 until the early 1960s has been widely described as a time of happiness, economic prosperity, and unquestioned power in America. Those happy years were followed by a series of tragic events that came in rapid succession. These included race riots, nuclear confrontation in Cuba, the assassination of President John F. Kennedy, the Vietnam War, humiliation in Iran, and a difficult shift from an industrial economy to the information-based society. These events and many others have led to a questioning of authority and the institutions that support them, including government, the courts, the church, and corporations. The sociological changes that started in the late 1950s and increased during the following decades can be traced through this lack of trust in institutions as well as the painful transfer from an industrial to an

information economy. These have led to the reduction in the middle class, a widening gap between the rich and poor, decreasing salaries, and diminished expectations. Additional symptoms of this change have been a radical change in the idea of what a family is, accompanied by increasingly larger divorce rates.

Moss has courageously chosen to update the commentary on these fundamental changes in a house that exaggerates them even further.

Bernard Maybeck: Wyntoon

Born in Greenwich Village, New York City, in 1862, Bernard Maybeck was the son of German émigrés who had arrived in America little more than a decade earlier. His father was a cabinetmaker and Bernard became his apprentice, learning mechanical drawing, geometry, and an appreciation of the rewards to be derived from a painstaking attention to details. Travel to France in 1881, on business related to his work with his father, brought him into contact with the *Ecole des Beaux Arts*. His subsequent interest in the school led to his entering and passing the difficult entrance examination the following year. Lectures by Henry Lemmonier on Gothic architecture, the free classicism of his tutor Jules-Louis Andre, the legacy of structural determinism left by Viollet-le-Duc, and exhaustive surveys of French and German Romanesque and Gothic churches all had a lasting influence on Maybeck and may be traced in varying degrees in all of the work that he later produced.

After arriving back in New York in 1884, Maybeck joined several other recent graduates from the *Ecole* in establishing an architectural practice, but his unpretentious emphasis on pragmatic craftsmanship, rather than on establishing the social connections necessary to thrive in Manhattan, prompted him to move west in 1889 to Kansas City to seek a more substantial basis for his career. Friends made there, in turn, encouraged him to move on to California, and he traveled to San Francisco in November 1890.

San Francisco was in the midst of a building boom, a frontier city growing rapidly as a result of new railroad connections to the Midwest and the frenzy created by the gold rush. He and his wife settled in Oakland, and he found work with the Charles M. Plum Company as a designer of custom-made furniture and interiors, before an offer from A. Page Brown made it possible for him to focus on architecture once again in the following year.

His subsequent involvement in the design of an entry for the World's Columbian Exposition in 1893 led to his being sent to Chicago to supervise construction of the "California Building" that his firm had submitted. Its eclectic display of quasi-Spanish elements was similar to those used on the Ponce de Leon Hotel in St. Augustine, Florida, which he had worked on shortly after leaving the *Ecole*. Like a surprising number of other influential architects of the time, such as Louis Sullivan, Adolf Loos, and Frank Lloyd Wright, Maybeck was greatly impressed by the Columbia Exposition, which Daniel Burnham had intended to use as a platform from which to launch Classicism as the ideal civil and national style. Maybeck's Palace of Fine Arts, for the Panama-Pacific International Exposition that followed in San Francisco in 1913, shows the extent to which he was influenced by his brief stay in Chicago and by

the argument that Burnham had put forward, rather than by the exceptions to Classicism, such as the *Ho-o-den* Temple, which were sought out by Wright and Sullivan.

Shortly after returning from Chicago, Maybeck moved to Berkeley to a neighborhood close to the University of California, which in 1892 was surrounded by oak forests and green fields. His proximity to the university and the social contacts he made there led to his appointment as a graphic arts instructor in 1894. This course developed over time into a full architectural curriculum. He was also appointed director of the Architectural Section of the Mark Hopkins Institute of Art in 1893, and these two initiatives, along with his increasing involvement in the university community, encouraged the architect, who was then 33 years old, to begin private practice.

A remodeled one-story cottage at Grove and Berryman Streets in Berkeley, which Maybeck extended in 1892, served as his studio, and shortly afterwards he received his first major commission referred to him by the university president, Martin Kellogg. The client, Phoebe Hearst, wanted to erect a memorial to her late husband, George Hearst, on the campus and responded enthusiastically to the preliminary scheme that Maybeck presented.

This meeting of Hearst and Maybeck was also instrumental in putting Maybeck in charge of administering and establishing a competition for a master plan for the future growth of the University of California. A reception hall was also to be designed by Maybeck in which Mrs. Hearst could participate in the formal ceremonies related to the competition.

Early in 1897 Maybeck traveled to Europe to enlist international entrants, especially at the *Ecole des Beaux Arts*, and to interview possible jurors, such as Norman Shaw, whom he and his wife visited in Hampstead.

There are intriguing similarities between Shaw's Holy Trinity Church on Latimer Road in West London, completed in 1886, and Maybeck's final design for what is now known as Hearst Hall. Primarily this is apparent in the form of the central vaulted nave, but rather than using steel girders to frame the steeply pitched painted arches of the Hall, as Shaw had done, Maybeck has used laminated wooden girders, making the angle of the sides steeper to avoid the cross ties seen in Holy Trinity Church.

Possible parallels between these two buildings continue, as Maybeck also visited Robert Sandilands, a classmate at the *Ecole*, in Glasgow, at the same time that Queen's Cross Church by Charles Rennie Mackintosh was being built. This has a nave that was also undoubtedly derived from Shaw's Holy Trinity Church. Shaw appears to have been Maybeck's main connection to the English Arts and Crafts Movement, but unlike its more progressive practitioners, such as Mackintosh, who sought a synthesis between industrial materials and craftsmanship in order to derive a contemporary architecture based in tradition, Maybeck adopted a reductive stance, similar to that of William Morris, best described in lectures such as "Art and the Beauty of Life" delivered to the Birmingham Society of Arts in 1880, "Gothic Architecture," printed by Kelmscott Press in 1893, and "Art and Industry in the Fourteenth Century," in which Morris extolled the virtues of handicraft, particularly as practiced in the Middle Ages.



Bernard Maybeck House. Photo by Allan R. Ferguson. © Allan R. Ferguson; Flickr

Maybeck's medievalism is patently apparent in his second project for Phoebe Hearst, a residence that was executed after his return to California, called Wyntoon. This fanciful castle, rendered in lava rock, rubble stone, and local timber with a green glazed tile roof, displays many of the same eccentricities that can be found in country houses of the same period, such as Cragside and Grim's Dyke, by Norman Shaw, and also has affinities with estates designed by H. H. Richardson in both massiveness of scale and in attempting to blend with rugged and natural surroundings.

The 67,000 acres deep in the forest must have resonated with Maybeck because of his German background and its similarity to Bavaria. He created a five-story high tower for the main part of the house, made out of reinforced concrete faced with local stone, which is connected by an angled hall to a second portion next to it. The house burned down in 1929, after Phoebe Hearst had died, and Julia Morgan, who had been a protégée of Maybeck's and had been the first woman, and one of few Americans, to graduate from the *Ecole des Beaux Arts* in Paris, was commissioned to replace it. Rather than a fanciful, castle-like house, Morgan decided on the theme of a Bavarian village instead, breaking the single volume down into three separate parts.

William Randolph Hearst had also commissioned Julia Morgan to design another house for him near another family property called San Simeon, near the Pacific Ocean, halfway between Los Angeles and San Francisco, called *La Cuesta Encantada*, or the Enchanted Hill. It is a stylized *hacienda* in a quasi-Churrigueresque style, influenced by the Mission style architecture that was made popular at the beginning of the First World War by the Panama-California

Exposition held in San Diego in 1915, which was planned by Bertram Goodhue. Between 1937 and 1942, Hearst nearly went bankrupt, and he moved from San Simeon to the new Wyntoon as an economy measure. But it was too isolated for him and he returned to the Enchanted Hill as soon as the hunger for newspapers during the war years helped his finances to improve.

Richard Neutra: The Lovell Health, VDL Research, and Kaufmann Palm Springs Houses

Richard Neutra was born in Vienna, Austria, in 1892, and attended the Vienna Technical University along with Rudolph Schindler, who was to become his close friend. Schindler emigrated to America prior to World War I, while Neutra stayed behind, leaving in 1933. This gap was to create a crucial difference in the worldview of each architect, with Schindler retaining a more romantic attitude toward technological developments at that time, and Neutra being more rationalistic because he had witnessed the devastation that technology could also cause.

Schindler had apprenticed with Frank Lloyd Wright in Wisconsin, and he had also been instrumental in bringing the young Austrian architect to Los Angeles to assist in overseeing the construction of the Barnsdall house in the early 1920s. Schindler and his wife, Sophie Gibling, along with another couple, built a house on Kings Road in West Los Angeles that was to subsequently serve as the model for the Case Study House architects of the post-World War II period. After the Chaces moved out of the house, Richard Neutra and his family joined the Schindlers there, until he could get established in the city. Schindler had designed a house for Philip and Leah Lovell in Newport Beach, California, that was unlike any of his other projects in several important ways. Philip Lovell, who was a physician from New York City, had relocated to Los Angeles along with his wife in search of a healthier lifestyle and became well known in the region because of articles he wrote on fitness for the *Los Angeles Times*.

Schindler's Newport Beach house is made of a series of reinforced concrete portal frames lined up parallel to the beach, so that the first floor slab where all the living functions were located, as well as the flat roof that they support, is perpendicular to the ocean and the view toward it. The structure, which effectively lifts the main portion of the house above street level to provide those inside with a better view, and to allow parking beneath, is massive. But the actual interior area that it supports is relatively small and introspective for a couple who liked to live large, wearing as few clothes as possible to get maximum benefit from what were then thought to be the health-giving rays of the sun.

When the Lovells chose to build a second home in the Hollywood Hills of West Los Angeles, they turned to Richard Neutra instead, who took an entirely different approach in his design. The personal story behind the Lovell's decision to change architects and the strain that this caused on the Schindler-Neutra friendship reads like an architectural soap opera, but the important thing, in this instance, is that Richard Neutra produced a masterpiece for the Lovells that has been called the first truly modern house in America. It was completed in 1929.

The Lovell House in Los Angeles Commonly referred to as the Health House because of Lovell's reputation as a fitness guru, the Neutra-designed residence in North Hollywood is framed entirely in light gauge steel, with each piece

prefabricated in a factory. The thin vertical columns are left exposed where necessary to also serve as dividers for the windows and are located with center-to-center distances that allow for the use of standard steel frames. The walls are made of concrete holed onto metal mesh and trowelled smooth, which later became a technique also used to build swimming pools. The house is three stories high, with projecting decks that have high solid parapet railings to prevent neighbors from seeing the Lovells while they were sunbathing. Using innovative structural techniques, Neutra was able to make various parts of the façade, facing the downhill side of the steep slope on which it is built, appear to float in space.

The main entrance to the Lovell Health House is on the top floor, where the bedrooms are also located, to take maximum advantage of city views to the south and Griffith Park in the opposite direction. A large stairway leads down to the main living, sitting, and dining areas, which flow seamlessly into one another.

The VDL Research House By 1931, Neutra and his family were living in Los Angeles, with a house and office in the Echo Park section of Silver Lake. He had by then earned an international reputation, on his way to becoming well established on the strength of the Lovell Health House project.

The Lovell Health House also helped establish Richard Neutra's international reputation as an avant-garde Modernist, even though it was the source of a great deal of controversy locally. After completing the Jardinette Apartment complex soon afterward, he received a visit from a Dutch industrialist named Cornelius Van der Leeuw, who was impressed by Neutra's accomplishments and wanted to become his patron. At the time, Neutra and his family were living in a small rented house and office in the Echo Park section of Silver Lake, and Van der Leeuw offered to loan Neutra enough money to build more spacious quarters. Neutra was reluctant to request too much money, and so asked for only \$3,000. He found a 60-foot wide by 70-foot long building site near the Silver Lake Reservoir and started designing what he referred to as the Van der Leeuw, or VDL, Research House in 1931. Including the cost of land, it ended up totaling \$8,000, and Neutra raised the additional money from private sources.¹⁰³

In typical Modernist fashion, Neutra felt obliged to use this opportunity for the greater good of society rather than just the welfare of his own family. He imagined the house as a living laboratory in which to test the latest materials and technological innovations available, as a prototype for the future. Because of the restricted size of the site and the need to take advantage of possible views toward the reservoir and San Gabriel Mountains to the north, Neutra chose to build as close to the site lines as he could and to go up to two stories high, with a basement, to maximize space. He located his studio office on the ground floor and the more private family area on the second, as well as a "solarium" on the roof.

Because of cost restrictions, Neutra was forced to use wood rather than steel as a structural material, choosing the balloon-frame method for efficiency. In the early days of American carpentry, when forests were being cut for the first time and trees were tall and straight, timber framing ran vertically all the way from the ground floor slab to the roof, with floor joists hung from the inside of these tall external members. With the onset of clear cutting and less long timber, external walls now support each floor, which is called a platform frame. Rather than running up

the entire side of the house as the balloon-frame timbers did, timbers only go as far as the underside of the floor they support with new timbers added on top of the floor or platform to support the next one. By using the balloon frame, Neutra was opting for the most efficient solution to the problem as well as paying homage to a time-honored carpentry tradition, but did not necessarily select the most realistic approach. He used 4-inch by 4-inch wood posts that were laid out on a module that would allow them to accommodate standard industrial sash.

The research component of the VDL House divides into three distinct categories. The first of these is what Richard Neutra referred to as “biorealism,” which he characterized as the physiological and psychological responses that a person has to the natural environment and the subsequent ways in which those reactions can be recorded and translated into architectural form. The second category, which is closely related to the first and is a logical extension of it, is Gestalt theory, which was just becoming known at the time Neutra was designing his Silver Lake house. This theory stresses the importance of being open to the immediacy of experience. Neutra hoped to combine biorealism and Gestalt theory to alter people’s perception of reality, especially in situations where it was necessary to make spaces seem larger, as was the case in the VDL House. The third category of research involved finding ways to more closely integrate interior and exterior space to connect architecture to the outdoors. For Neutra, as for Schindler, there are inevitable comparisons between the closed, urban world they had come from in Vienna, with its cold, dark winters, and the nearly paradisiacal climate of Los Angeles, where spending a great deal of time outside is not only possible but preferable. Neutra used reflection, transparency, and water to accentuate this experience.

Water, Glass, and Mirrors Neutra used a design strategy based on reflection, transparency, and water to achieve these goals at the VDL House, positioning mirrors, water, and glass walls in strategic locations to increase a sense of spaciousness and to alter perceptions of depth. Doors were transformed into windows and glass windows were expanded to become entire walls. One of these glass walls faces into an open courtyard in the center of the house, and another has been used as the entire side of the living room on the second floor, which looks out onto a sleeping terrace, blurring the line between inside and outside space. The original VDL House burned down, but was rebuilt as VDL II in 1966 with a substantial assist from Richard Neutra’s son Dion, who is also an architect.

The Kaufmann House in Palm Springs Edgar Kaufmann, who was the client who commissioned Frank Lloyd Wright to design Fallingwater in Ohiopyle, Pennsylvania, turned to Richard Neutra to design a winter residence near Palm Springs in 1946. This was surprising at the time, and still seems so in retrospect, given the positive public response to Wright’s masterpiece near Pittsburgh, and its critical historical role as a counterpoint to European Modernism at the time it was built. And so it happened that the same man who had designed the second house for a client of his best friend did the same with one of the most important patrons of his mentor and previous supporter, Frank Lloyd Wright. The Kaufmann House near Palm Springs is entirely different in character from either Fallingwater or Taliesin West, however. Perhaps the mercantile entrepreneur from

Pittsburgh had had enough of organic architecture, after the completion of the daring structural experiment at Bear Run more than a decade earlier.

A Modernist Pueblo In 1927, prior to his arrival in the United States, Richard Neutra had written a book entitled *Wie Bout Amerika*, in which he admiringly described the ingenuity of the Anasazi, who built the pueblos in New Mexico and Arizona. He especially praised their sensitive use of masonry, rooftop terraces, and climactic awareness. Neutra tried to replicate their design intelligence in steel and glass, as well as wood and sandstone, without the use of air conditioning, in one of the hottest and most arid regions in America. He used a floor plan that looks something like a pinwheel, similar to a concept that Wright often used in his early work. This ensured the privacy and cross ventilation of the rooms at the end of each of the legs, and flat roofs with long overhangs provided the glass walls with shade. Kaufmann had intended that he and his family and their guests would use the house only during the winter, when the heat, which can reach 120 degrees Fahrenheit in the summer, abated.

Neutra's design did not include air conditioning, but it did incorporate radiant heating in the floors for the wintertime. Different owners, throughout the years, added closets, air conditioning units, and ventilation pipes that cluttered the roof, destroying the clean lines of the design. The flooring was changed and the overall square footage of the residence changed from 3,200 to 5,100 square feet.

Brent and Beth Harris had seen a classic picture by famous architectural photographer Julius Shulman and said that, at first, they barely recognized the house as it had appeared in the photograph. After buying the residence in 1992, they decided to restore it back to the original Neutra design.

They commissioned the Santa Monica-based architectural firm Marmol and Radziner, who had restored Neutra's 1950 Kun House in the Hollywood Hills, to bring the house back to its past glory. The architects used original materials to convert the house to year-round use. It had been altered to such an extent that the biggest challenge was to find out what it was like when built in 1947. Ron Radziner and Leo Marmol found the original drawings in the UCLA Research Library Special Collections Branch. Their investigation extended to interviews with Albert Frey, the architect who designed the house next door to Kaufmann's. Julius Shulman's photographs provided key clues about exterior surface materials, but the most interesting discovery was that the house became an archaeological dig as walls were torn down and wall color names were discovered between the plaster and paint.¹⁰⁴ Neutra had used innovative materials in his design. A mixture of plaster was used to cover the walls, which allow the flecks to reflect sunlight and reduce heat gain. Marmol and Radzinger followed Neutra's intent and located the mineral that matched. They reproduced the recipe and devised a technique for application. The cabinet woodwork was replicated with precision and matched perfectly. New insulation techniques were also used to make the house more durable and prevent water damage in shower areas.

One of the biggest challenges the architects faced was the integration of a cooling and heating system that would not clutter the spaces or destroy the clean exterior profile of the house. The amount of crawl space was limited, so the architects had to devise a way to not aesthetically disrupt space. They concealed

vents and ductwork in built-in furniture. In addition to a new air conditioning and heating system, new drains were hidden inside the flat roof. The architect's skill and perseverance paid off, since the house now appears to be just as Neutra intended it.

The Pugh Scarpa Residence, Venice, California

In spite of its relatively brief history, compared to other American counterparts and certainly to many European cities, Los Angeles does have many well-established architectural traditions. Many of these are a result of the multiethnic background of the region and its distinctive climate as well as a steady stream of perceptive visitors, who have each interpreted these factors in his own way. Frank Lloyd Wright, for example, was probably inspired by the numerous Spanish missions in Southern California, which led him to use a central courtyard in the Hollyhock House, which was his first commission in the region. This, in turn, may have influenced his follower, Rudolph Schindler, to elaborate on the central courtyard concept in the design of his own house on Kings Road soon afterward. Rather than concentrating the open space in the middle of the residence, however, he refined it by breaking it down into pieces of green area that each relate directly to interior spaces. In an obvious gesture to Japanese traditional architecture, Schindler used sliding canvas panels that allow interior and exterior space to be joined whenever possible, which is quite often in sunny Los Angeles, with an *engawa*-like ledge mitigating between the two.

Since the Hollyhock and Schindler Kings Road houses were completed, however, many new building regulations have been passed that have presented more complex challenges to an architect's creativity. These require design professionals to be fully aware of a plethora of laws related to use, materials that can be used in a given area, setbacks, and height restrictions, among many other considerations, before they even begin to develop a working concept for their project. Familiarity with and skillful manipulation of these building codes and zoning regulations can mean success, but the opposite can mean misery. A renovation of an existing house poses even more problems for an architect, but one of the best solutions to emerge in a long time in Los Angeles, on a number of levels, has been achieved by the husband and wife team of Angela Brooks and Lawrence Scarpa, based in Venice, California. They bought a single-story 650 square foot, 1920s stucco bungalow in 1997 with the intention of living in it until they designed a modern enhancement to it. The 41-foot by 100-foot property is called a "through-lot" because it spans between Woodlawn and Boccaccio Avenues, and it allowed them some latitude in repositioning various parts of the renovation to take better advantage of sunlight, provide a better entrance and parking, and generally add the square footage they needed. They flipped the front elevation, which had been on the northern side of the site, to the south, which gave it much better solar exposure, and built an L-shaped second floor, with one of its equal legs crossing the short dimension of the site at approximately the middle. This effectively divided the project into a formal open, public courtyard garden in the front, to the north, and the covered private side of the house behind it, to the south. The courtyard, which has a variegated water feature stretched out along its western edge, is in the best tradition of Wright and Schindler and their Japanese precepts in its direct connection

to the main living space, which opens up to it through sliding glass panels that fold into pockets.

These glass doors are not the standard issue hardware store variety of a pair of rectangular glass panels in thin aluminum frames that slide past each other in a recessed track, but a highly sophisticated, frameless wall of thin glass strips that run from the floor to the soffit of a balcony above and are completely transparent. This removes any sense of division between the garden and the living room adjacent to it. The feeling of complete transparency that this slick, streamlined wall sets up continues throughout the remainder of the house, in which the conventional lines between the interior and the exterior are blurred.

The Umbrella House, Reinvented Angela Brooks and Lawrence Scarpa were inspired by the Umbrella House, designed by architect Paul Rudolph in Lido Shores, near Sarasota, Florida, in 1953. Rudolph, who is perhaps best known for the hyperformal and excessively brutal late Modernist language of the Art and Architecture Building, completed between 1958 and 1964 at Yale University in New Haven, Connecticut, is not usually associated with environmental sensitivity, but the Umbrella House demonstrates his awareness of a difference in regional contexts. This may not seem to be that significant, now that critical regionalism is something of a commonplace among architects, but in 1953 there was a different expectation in place, of using technology, such as air conditioning, to solve the problem of heat gain and humidity in such conditions. This first Umbrella House is undoubtedly still a part of the International style because the main part of it is glass, and Rudolph did rely on air conditioning to cool it. But the glazed portion of the residence is covered by a second, pergola-like shade structure above it, held up by a thin steel structure of columns of beams. The pergola has a rectangular opening in it to allow natural light to shine unhindered into the garden court in front of the house, but otherwise covers the entire site.

It was not until six years later that Louis Kahn proposed a similar second roof solution to the problem of overheating in a U.S. Consulate that he designed for Luanda, Angola, reiterating a growing awareness of the environment that was soon to emerge full-blown in the ecological movement, characterized by leaders such as Barry Commoner and Ian McHarg in the late 1960s and early 1970s.

Brooks and Scarpa have taken that sensibility to an entirely new level by using a canopy rather than a higher louvered pergola as Rudolph did. This is significant because of the rather lackluster three decades, with a jump-start after the oil shocks of 1973 and 1976, that lost momentum as oil prices leveled out. The conventional wisdom among the uninformed in the design professions has been that photovoltaic technology is too expensive for practical application, but Brooks and Scarpa did more thorough research and discovered that there are really options in that field, with varying levels of cost and effectiveness to choose from. These are crystalline, polycrystalline, and amorphous cells. The last of these, more accurately referred to as thin film amorphous silicone solar technology, involves putting a thin layer of silicone on a suitable surface, such as glass, in an assembly line process in which labor costs have been greatly reduced. One of the many advantages that this system has other than the crystalline and polycrystalline options is that it can replace part of the building envelope, rather than simply being added to it,

reducing costs even further. The first two options also lose effectiveness over time as direct sunlight causes them to deteriorate. But, amorphous silicone is less efficient in converting solar rays to electrical power, requiring more area of exposure to produce an equivalent amount of output. These results led the architect owners to use the panels as both a canopy roof and a second wall on the western side of the house. This led to a different profile than that of the original Umbrella House in Florida. While the Rudolph covering seems to float above the glass house like a thin steel cloud, the silicone scrimmed glass panels above the Brooks and Scarpa version in California is in a tighter horizontal formation, but then folds over the side as a shield against the hot afternoon sun. Rather than being supported by equal ranks of tall thin square steel columns that Paul Rudolph used, the Venice-based architects have chosen to use a series of wide, vertical tilt-up concrete panels that seem to spiral around the house, with the flat side presented to the entrance, in the first entrance, and only the edge of the second one, extended into an entire wall on the east side, as the second. The syncopation that this sets up is continued in a minor note by two metal-sheathed pylons that extend up from the first floor to the silicone-sheathed umbrella above, with the flat side of one facing forward and the second one next to it, turned at a right angle to its left. This interplay between concrete and metal, combined with the seamless wall of glass in front of the living room, create an image of Modernist materials used in delicate balance, creating a dynamic composition that is in harmony with natural forces, rather than in competition with them. The cold-rolled steel facing used as a surface material for the smaller vertical members is recycled, and the tilt-up system used for their concrete equivalents requires much less wood formwork than conventional poured-in-place systems.

The choice of this tilt-up construction system was probably also dictated by financial logic, since pouring concrete in shallow depressions dug out of the site and lined with reinforcing bars that then become the form eliminates all the vertical framing, including plywood and two by four or six supports necessary to hold the wet concrete placed in them by a crane-held hose.

Recalling a California Classic The choice of a concrete tilt-up procedure by Brooks and Scarpa also evokes memories of Rudolph Schindler's Kings Road house, mentioned earlier here in reference to the similar use of an inside-outside sense of continuity in each of these houses. Schindler chose the tilt-up slab system for similar economic reasons, since he and his wife had borrowed the money to build from his wife's parents and they were on an extremely tight budget. But, as in the Brooks and Scarpa house, it also conformed well with an overall minimalist ethos and a desire to be as efficient in the use of available resources as possible. Because of these overlaps, the Brooks Scarpa house is now part of a well-established, but increasingly ignored, regional tradition of sensitivity to nature, indoor-outdoor living, and technological innovation.

A. Quincy Jones

Archibald Quincy Jones came from the heartland of America. He was born in Kansas City, Missouri, in 1913 and attended the University of Washington in Seattle, where he received a Bachelor of Architecture degree in 1936. He is now

closely associated with the progressive phase of the Modern Movement in Los Angeles from the end of World War II until the late 1970s, but his values and beliefs were as mainstream as those of his hero, Frank Lloyd Wright. Although he never worked for Wright as other important Los Angeles Modernists such as Rudolph Schindler and Richard Neutra had, he assimilated the transcendental philosophy of his protean American mentor.

Consistent Principles A. Quincy Jones channeled Wright's principles into an approach to design that sustained him throughout his abbreviated career, until his death in Los Angeles in 1979. These began with a love of his country and the democratic ideals it represents, made legible in unrestricted floor plans and innovative structures that celebrate individuality and freedom of expression. They continue in his nearly spiritual reverence for the Earth, since he sought to have his buildings interact with and take shelter in the site they were built on, letting the shape of the ground, rather than functional requirements alone, dictate his generation in California since they, with the exception of Schindler, were more concerned with internal, rather than external, space.

Although Wright was in his fifties when the Depression struck, rather than his teens as Jones was, this catastrophe imbued each with an immutable sense of social responsibility, making people and their needs the most important part of their work. For Jones this meant using new industrial processes for the greater good, rather than being suspicious of them. He wanted to provide an attainable common denominator that would make the American dream of owning a single-family home possible for all.

While Jones's early projects in Los Angeles have obvious Wrightian precedents, such as the bold cantilever and patterned concrete piers of his Mutual Housing Association Site Office in 1948, or the central roman brick hearth and horizontal shiplap siding used in the first Nordlinger House in 1949, the two architects part company over the issue of what Wright almost derisively referred to as "the Machine," or the manufacturing of materials. With his Romantic, Arts and Crafts background, Wright considered industrial production to be a threat to human ingenuity and integrity, rather than a source of liberation and prosperity. Jones eagerly anticipated and adapted new materials and systems, using them in startlingly innovative ways.

Esther McCoy, who was one of the first to document the dramatic changes taking place in California, described this difference more succinctly by saying: "Architects who matured in the 30's were dedicated to the ideal of architecture as a social art. Wright was dandy, but the true path was through standardization."¹⁰⁵

Seizing an Opportunity A. Quincy Jones helped to reinvent the American residential typology to accommodate the extensive social changes that took place after the war, such as the shift from hired help to a housewife-centered domestic universe before feminism took hold. This resulted in a formal transformation from a double to a single story to make housework easier and an open kitchen with clear views to all parts of the house and garden so children could be supervised.

The Interstate Highway System of the Eisenhower era opened up just as the Pacific Electric Rail or "Red Car" line had reached the limit of its effectiveness. The Pasadena Parkway, which was built in 1939, was followed in quick succession

by a network of freeways that were not as picturesque or contextually sensitive. Federal, state, and local laws passed in favor of the automobile pushed the urban edge of Los Angeles out in all directions beyond the first tiers of suburbs around the downtown core, creating an unprecedented demand for new housing.

Frank Lloyd Wright had anticipated this growth in his Broadacre City Plan of 1936, but in spite of his example, modernists reacted in a disdainful way to the opportunities that this second suburban revolution offered. They were put off by the fact that “the merchant builders” such as William Levitt and Joseph Eichler, who had already seized the initiative, seemed to be driven by economic rather than idealistic motives and felt that the market would corrupt their ideals. In retrospect, this willful abdication was misguided and cost the profession dearly by alienating it from the popular audience it once sought.

Jones, on the other hand, saw no such conflict of values, believing that the principles he had evolved in his custom designed single-family homes would be adopted more quickly if they were implemented at a large scale. After organizing the Mutual Housing Association with Whitney S. Smith and Edgardo Contini in 1946, which involved the cooperative development of 500 lots in the Santa Monica mountains, scaled down to eight different types built on 100 lots, Jones designed an exhibition house for local developer H. C. Hvistendahl, which received an AIA First Honor Award as “Builders House of the Year” in 1950 and was published in *Architectural Forum* magazine. This brought Jones to the attention of Joseph L. Eichler, who was recognized as the builder of the “subdivision of the year” in the same issue.

A Quiet Domestic Revolution Jones and Emmons subsequently collaborated with Eichler in redefining how the family in postwar America could live, proposing new ideas that transformed the tract house into a more personal custom residence. Jones did a close analysis of the generic developer product, introducing quality whenever possible in ways that did not drastically alter the bottom line. Jones and Emmons introduced the notion of complete living, including community centers, parks, and pools that made a new neighborhood model more feasible. Through incremental improvements, such as the addition of a second bathroom, a breakfast “bar” that allowed the family to share meals at the heart of the house, and a gable roof to introduce more light into the interior, as well as by using a marginally higher grade of materials, the architect and the developer converted a commodity into a domestic paragon.

In the more than 5,000 homes they designed and built together from their first meeting in 1950 until 1974, Jones, Emmons, and Eichler followed a set of consistent principles that allow for flexibility and efficient construction, such as the post and beam system, modules based on material sizes, and mass production that made small luxuries, such as fireplaces, plate glass windows, and sliding glass doors possible. This approach, which Jones referred to as “a controlled business process,” is clearly evident in the Eichler Steel House X-100, built in San Mateo in 1956, intended as a prototype that would revolutionize future developments, because it could be largely fabricated and included built-in furniture. The project was discontinued when the price of steel soared during the Korean War, but it typifies Jones’s innovative approach to new structural possibilities.

A Green Pioneer Jones has been referred to as a pioneer of “green” architecture. His advocacy of higher density subdivision design at the beginning of the suburban revolution to protect the land from sprawl alone justifies this title. The community centers that he promoted in them, which included recreation halls, swimming pools, social clubs, nursery schools, day care facilities, and green common areas, anticipated and even promoted the social changes that would soon alter the gender profile of the American economy and are consistent with the collective rather than singular ideals of sustainable design.

His entry into the Case Study House Program in 1961 is also a good example of his environmental sensibilities. It was audacious and would still be considered so if it were proposed today.

The Case Study Experiment The Case Study House Program as conceived by John Entenza was consistent with the high-risk, experimental attitude of the time as a collaborative endeavor that benefited all concerned. He bought a moribund magazine, *California Arts and Architecture*, and dropped the state name to give it wider appeal as a way to proselytize for modernism across the country. Entenza understood the burgeoning postwar need for housing and a more casual lifestyle and believed he could fulfill this desire. He bought a 5-acre parcel in Pacific Palisades and identified several young architects who shared his point of view to design houses for it, for no fee, including one for himself. He also made arrangements with contractors and furniture and material suppliers to participate at reduced cost, all in return for having their names mentioned when the houses were opened up for public visits and published in his magazine.

Public response to the first six homes that were built surprised everyone, as 368,554 visitors experienced what Esther McCoy has described as “mirrors of an age in which emerging pragmatism veiled Rooseveltian idealism.”¹⁰⁶ Encouraged by this positive reaction and convinced that America was ready to embrace a more modern, mass-produced version of the suburban tract house, Entenza expanded the program.

Venturing outside the single-family market into the more complicated arena of development, he initiated the Triad project by Killingsworth, Brady, and Smith in 1960 in La Jolla. The positive public response that it received encouraged him to invite Jones and his partner, Frederick E. Emmons, to adapt one of the 260 homes they were then designing for Joseph Eichler on a 148-acre site near Chatsworth in the San Fernando Valley as Case Study House No. 24. The scheme that Entenza received differed radically from earlier entries because it was mostly underground, with only an extended *porte cochere* projecting out to announce its existence. It was intended as a model home that would be repeated throughout the development. It was T-shaped, with the cross bar ending in open pergolas on each side that rested on retaining walls that made the subterranean scheme possible, and included a symmetrical pair of perimeter courtyards that let light inside.¹⁰⁷

Case Study House No. 24 is arguably the most extreme example of Jones’s commitment to the integration of nature and architecture; the unusual design received Planning Commission approval but was rejected by the City Council Committee on Zoning on the basis that the communal green space it made possible could not be properly maintained.

There are many other instances of his commitment to the synthesis of building site, however, at a variety of scales, beginning with Palm Springs Tennis Club and Town and Country Restaurant designed in 1947–1948 in collaboration with Paul Williams, the Griffith Park Girls Camp of 1949 with Whitney R. Smith, Warner Brothers Records in Burbank in 1975, and the Annenberg School for Communications at the University of Southern California in 1976.

Frank Gehry: The Schnabel Residence

Frank Gehry is perhaps best known today for his pyrotechnical design approach in public institutions such as the Guggenheim Museum in Bilbao, Spain, or the Disney Concert Hall in Los Angeles. But he started his career with a series of private houses in which he experimented with and developed his unique architectural language. These private houses are primarily located in and around Los Angeles, beginning with his own house, which he designed in Santa Monica in the early 1970s. In that first instance, he added to an existing bungalow using a series of disjunctive forms, which are attached to it as a way of exploring the potentials of commonplace materials not normally used in house design at that time. Gehry is a graduate of the University of Southern California School of Architecture, but he associated in the early part of his career just as easily with artists as architects. He identified with the fledgling art movement in Los Angeles in the early 1950s but also had a special affinity for the work of the Russian Constructivists. The Constructivists were a politically based art movement that arose in the Soviet Union soon after the Revolution that only lasted until the rise of the Soviet Realism at



The Schnabel Residence, which is on the west side of Los Angeles, is one of the last in a series of private houses designed by Frank Gehry, who soon afterward started to focus on larger public projects. *Source:* James Steele

the beginning of the reign of Joseph Stalin. Constructivism was based on the idea of finding a new means of artistic expression to adequately conform to the political shift from Capitalism to Socialism, combined with the rise of industrialization that Russia then needed in order to progress. The dilemma that Constructivism faced was how to express the technological ethic of industrialization without mimicking the images that had been produced by Capitalist countries that had done so previously. To do this, the Constructivists questioned every precept and principle that existed at the time, in an attempt to find new ways of creating form. One of its most extreme positions, it included a proposal by artist and architect Kasimir Malevich, who believed that in order to create a new Socialist architecture, it was necessary to first imagine the absence of gravity to arrive at conceptual purity. He then believed that gravity could be factored back in the engineering equation as judiciously as possible to arrive at a different constructed solution that would differentiate this new architecture from its Capitalist predecessor. This direction is called Suprematism. Theoretically, it shares a great deal with Rationalism in that each position is based on the possibility of perfection and the necessity to avoid the compromises that are imposed by real world conditions. Constructivism differs from Rationalism, however, in its political basis for a utopian solution. Many Constructivist artists preferred to use commonplace materials and found objects in their art as a symbol of their allegiance to an egalitarian society or, alternatively, as a commentary on the wastefulness of consumerism.

The Schnabel House After designing his own house, which caused a great deal of controversy and even violent reaction when it was completed, Gehry went on to design other residences that were equally unorthodox. One of these, for the Norton family, is located on the boardwalk in Venice, California. It remains a prominent part of the scene in that eccentric neighborhood even though it now has been surrounded by other houses that are equally unorthodox. The Norton House is divided into two parts, separated by a central courtyard. It has an entrance directly from the boardwalk, or more accurately, asphalt track, which runs parallel to the beach. Mr. Norton was once a lifeguard, and to recall his youth Frank Gehry designed an office for him at the front of the property that looks like a large lifeguard stand. From this high perch, Mr. Norton can look out over the beach and reminisce about days gone by. Below the assimilated lifeguard stand, which is supported by a huge square steel column, there is a one-story apartment clad in blue tiles that are intended to mirror the color that people wish the Pacific Ocean would be. This apartment has an off-the-shelf pair of patio doors that lead out to a small patio between it and the front wall. It has a shade structure running horizontally above the door, which is modeled after a Japanese temple gate, in recognition of the fact that Japan is directly across the Pacific Ocean from the house, about 5,000 miles away. A cactus is located on the opposite side of the front elevation from the lifeguard stand to counterbalance it and add yet another exotic image to this cluster of symbols. The main house is placed at the back of the rectangular site and is hardly visible from the boardwalk in the front to give it more privacy. This assemblage is typical of Gehry's early habit, prior to the latest stage of his career, of creating what may be described as small villages composed of separate elements. In the Norton House, those elements are visually distinct and symbolically divided

as well. The Norton House is in the middle of a series of houses in which the architect explored this idea of clustering various elements around a site. This exploration culminated in his design of the Schnabel House in 1987.

The Schnabel House is located in Brentwood on the west side of Los Angeles, north of Sunset Boulevard near the Pacific Ocean. The houses in this wealthy neighborhood run the gamut from Italianate palazzos to Tudor mansions. Gehry's response to this eclectic context was to pull the house back from the front of the 100-foot by 250-foot lot and to create a world of his own. The Schnabels bought the lot in 1986, just before Rockwell Schnabel left to become the U.S. ambassador to Finland. Even though the family knew that the posting would last for three years, they decided to have their first meeting with Frank Gehry to discuss the preliminary design of the house. Marna Schnabel is also trained as an architect, and, like Gehry, graduated from the University of Southern California School of Architecture. They all agreed on a design that would allow as much open space on the site as possible, and Gehry once again began imagining the house as being a series of small pavilions located around a village green.

Memories of Finland While the Schnabels were in Finland, Gehry was asked to give a lecture in Helsinki and decided to visit the family while he was there. During that time, they were invited to dinner at the home of a famous publisher on Lake Hvittrask. While they were there, they walked around the lake at sunset; the wind was rustling through the birch trees on the shore and creating small waves on the water. They all decided at that time that this would be something that they would like to recreate in Los Angeles, and so the basic ingredients of the house were set by the time the Schnabels returned to America. These components were the idea of separate pavilions dispersed on the long and narrow sloping site with the most public of these being at the main street called Carmelina Avenue. The most private of these, such as the master bedroom, were envisioned as being at the far end on the site. The second of these was the desire to recreate in some small way the romantic image of the lake that they all visited in Finland. Gehry managed all of this with his usual deceptive ease in a composition that, in less talented hands, would be extremely difficult to achieve.

There are basically five parts to the Schnabel house, beginning with the garage with the maid's quarters above, which is the first of these located nearest to the street. This is connected to an L-shaped kitchen and living room wing by a narrow, covered arcade. This arcade ends at one leg of the "L," which runs parallel to the property line on the northern edge of the site, and contains the kitchen, family room, and a small study as well as a stairway leading up to the bedrooms of the two Schnabel daughters. The second leg of this "L," which projects perpendicular to the first, crosses the site at approximately its midpoint, dividing it into two separate courtyards. The first of these courtyards is more public since it is between this wing and the street. The second courtyard is more private because it is protected by the angle of this wing and the kitchen wing from which it projects and faces the downhill side of the site, which is in the back. The second wing is roughly cruciform and focuses on a living and dining area in the middle with a library at its far end. It has a pair of doors leading out to the private courtyard. This entire L-shaped complex makes up the second main body of the house.

The third piece, located to the side of the front public courtyard, is almost a perfect square in shape and is intended to be a private office for both Rockwell and Marna Schnabel. It has a fireplace in one corner and its roof is inspired by the dome of the Griffith Observatory, which is a major landmark in Los Angeles. Marna Schnabel suggested that Gehry consider interpreting the Griffith Observatory dome here, and the clients tell an amusing story about its construction. The interior of the dome is faced with drywall, and the contractors who built it had to use long ladders to reach the top and inner sides of the dome. Making drywall conform to a smooth curve is a real art, involving a complicated process of wetting the thin drywall panels and then spackling them before painting them. Such a curved space, however, induces what is known as a Ganz effect, in which someone in the middle of a domed space like this loses his sense of orientation, so the contractors were constantly falling off the ladders. This office is the third element of the house.

The fourth main part is another nearly square piece perched precariously on top of an intentionally created cliff-like edge. This is actually a concrete retaining wall that demarcates the upper part of the site from its downhill end. This fourth component is the bedroom of the Schnabel's son, Evan, and has a serrated roof made up of monitor-like skylights. This bedroom, which terminates the private courtyard, is visually connected to the domed office in the more public courtyard in the front of the site by a long, narrow lap pool, which mitigates between them. The change in level made possible by the retaining wall that crosses the entire width of the site on its lower end was utilized by Gehry as an opportunity to place a home gymnasium under the private courtyard part of the house at that edge. This gymnasium has a corridor running along its entire outer edge, which provides access to a series of workout rooms and a sauna, which is another reminder of the Schnabel's trip to Finland.

The architect made ingenious use of the downhill back end of the site by designing a reflecting pool that occupies most of it. This reflecting pool is polygonal and is only 9 inches deep because of local codes that would have required a protective fence around it if it had been deeper. To avoid this restriction, Gehry made it shallow, but used a blue surface at the bottom to make it appear to be deeper than it is. There is a stairway leading down from the kitchen wing to this level, which is approximately 10 feet lower than the main courtyard levels above. The Schnabel's master bedroom is located above this reflecting pool at the lower level. It is placed at an angle from the house above and clad in metal panels, with windows facing out in each direction for light. It has a metal parasol roof of the same material suspended above it, supported by a series of diagonal braces and a pair of intersecting beams in a cruciform shape that hold up the roof. This shades the skylight on the roof below. The windows are shielded from public view by a series of freestanding vertical shafts that are clad in a darker brown metal. These are strategically placed around the perimeter of the master bedroom block to prevent any possibility of the neighbors seeing into the space. These vertical elements are of various heights and profiles, appearing like silent sentinels positioned around this romantic bower. The reflecting pool and the master bedroom, which seems to float upon it, are most obviously inspired by the evening walk around Lake Hvittrask in Finland that the architect and the Schnabels shared. The boat-like appearance of the master

bedroom suite in which the parasol roof may be read as a sail of a ship and the angular form of the base can also be imagined as a prow offer a clue that the reflecting pool may have been imagined as a harbor by the architect as well.

The serrated roof of Evan's bedroom resembles many of the factories in postindustrial cities throughout America. The cruciform shape of the living room and library wing that projects out from the kitchen to divide the property into two separate courtyard-like squares has obvious religious references, which might allow it to be construed as a church-like form. These three images taken together suggest a New England village, with the church taking pride of place on the village square and an industrial building overlooking a harbor where fishing boats are moored. This image is consistent with Frank Gehry's pattern, which is most evident at the time this house was built, of creating small cities within a city. The reason for this miniaturization may have come from the fact that Los Angeles really has no city center, and so to make up for that, Gehry feels he has to create his own context.

Los Angeles, like every other city in the United States, started around the kernel of a civic center where the pueblo was once located. It grew from that beginning in the way that other cities have grown and seemed poised to become a metropolis on the West Coast that was the equivalent of its urban alter egos to the East Coast. But, with the advent of the automobile, a critical juncture was taken in an administrative decision to give priority to highways and freeways and to neglect a fledgling railway system, which at that point in the city's history was one of the best mass transit systems in the nation. With the abandonment of the railway system and the priority given to the automobile, the center of Los Angeles was atomized, as freeways spread outwards from the center like the tentacles of an octopus. In the post-World War II era, these were extended even farther to the north and south, creating suburban sprawl that continues to expand today. This has led to Los Angeles being described as many cities in search of a center and, depending on the source, these many cities number from seven to nine. Prior to his alienation from the Los Angeles scene, due to circumstances surrounding delays in the construction of the Walt Disney Concert Hall that were not his fault, Frank Gehry was considered an oracle who had his finger in the heart of the city. No wonder, then, that Gehry's reading of how to respond to the rootless condition of Los Angeles would result in his creation of contexts that are self-sufficient in their own right. The Schnabel house is the most evocative of all of these villages in miniature.

Not as Random as It First Appears In order to convey the impression that the house gives to a guest who visits it for the first time, it is necessary to begin at the front gate, which opens in from Carmelina Avenue at the southwestern end of the site. The Schnabel family park in a garage located farther to the west of this gate and have secure entry along an arcade leading to the kitchen wing, but the gateway is the customary way for guests to enter. After coming inside, the house appears to be almost random, a habitable sculpture garden with no obvious reason for the positioning for each of its parts on the long narrow site. That first reaction is soon replaced, however, by the awareness of the delicate balance between each of the pieces of the composition that are judiciously placed so that each is neither too close nor too far away from the others. The straight pathway provided for visitors is paved in a cream-colored California sandstone. This leads past the domed office

element described earlier toward the cruciform church-like element, which divides the site in two. The living room, dining room, and library are located here. The path leads past an olive grove and a lawn of uncut Bermuda grass on the right-hand side. This lawn also has several small palms and succulents on the left-hand side of the pathway.

Olive trees were once unusual in Los Angeles until they were introduced in Barnsdall Park in the early 1900s. In their native habitat, olive trees grow randomly. But on Olive Hill in Barnsdall Park, they were planted in rows. By emulating that here in a much smaller scale installation, Frank Gehry is also showing his awareness of the role that Frank Lloyd Wright played in the history of Los Angeles architecture. In his early work, Gehry revealed an obvious debt to Wright's contribution to the city, and this small olive grove is a more subtle testimony to it. The copper panels that clad the living and dining area, which is the central part of the house, match the grey-green color of the olive trees.

The living wing is a complex building—while the idea of attaching several box-like forms at angles to the central hall may seem simple, the spatial experience that this arrangement creates is far more intricate. Gehry skillfully uses level changes and compartmentalization to essentially create five rooms inside of one. The living area, which is in the center of the cruciform building, is the primary spatial experience. The interior of this entire wing is finished in gypsum board, which is painted white to reflect the brilliant light that is typical of this neighborhood only 7 miles away from the Pacific Ocean. There are exposed pine beams and a plywood roof, which are a reminder of Gehry's habit of using commonplace materials in an uncommon way. Gehry uses glass doors opposite the front door into the living room, to give a sense of transparency to the space and to direct the view of a person entering into the room through it and onward to the end of the site. He also uses windows high up in the space that let natural light flood into it during the day. The contrast of white walls and natural wood in the ceilings adds to the richness and texture of the shadows. The living room wing, which has an access that is oriented roughly east and west, is a prism that refracts the light in unexpected and beautiful ways. This symmetrical nave-like access sets up a certain formal arrangement in the space reflected by the arrangement of the furniture in it. Marna Schnabel personally designed an ensemble of leather club chairs for this area, which underscore its formality. There is a square tower with a window on each side, with another cube positioned askew above it to mark the importance of this central space. By sheer coincidence, or carefully calculated planning, there is a palm tree on the southern end of the axis through the living room that can be seen by the high skylight window on that side, providing a memorable reminder of Southern California. This tower has an even more pragmatic purpose as well, since warmer air rises up through it by convection and can escape at the top, reducing the need for air conditioning.

Environmentally Challenged In the 20 years since the Schnabel house was built, however, the sustainable movement has taken center stage as an architectural direction. Gehry's work as a whole raises important issues about the need to balance aesthetic issues with environmental concerns. Arranging each part of the Schnabel house in a separate pavilion has made it necessary to increase the mechanical services to reach each one of them, raising the amount of energy required to do so.

Separate pavilions also heat up and cool down faster than one single house would. So environmental advantages such as the stack effect, created by the tall tower above the living room, are offset by the fragmentation of the house into six different parts, and the individual systems that this then has required to heat and cool them.

Gehry's skill, however, in providing a sense of continuity within this fragmented plan is paramount. In the cruciform living block, for example, the dining room is adjacent to the kitchen in the service wing that connects to it and is raised several steps above the living room in the middle. This small gesture of a level change makes all the difference in giving this space a quality of its own. On the other side of the living room there is a fireplace nook that makes up the southern arm of the cross; it has a group of banquettes next to and across from the fireplace that make it a very intimate and comfortable place to sit. This room is several steps below the living room, which also make it seem quite separate from it. This sequential progression from the kitchen into the dining room, then down several steps into the living room, and then down several more steps to the fireplace area provides continuity and also a sense of separation, which is very difficult to achieve. The kitchen, family room, and study wing, which are perpendicular to this cruciform living portion of the house, extends along the northern edge of the property. It is a continuation of the more private circulation spine that begins at the garage near the street, and has a maid's quarters above it. This wing is the more private equivalent of the entertaining center of the house that is focused around the living room. The kitchen in this linear portion of the house has a U-shaped counter component, which is positioned in such a way to facilitate service into the dining room while not presenting an obstacle to the family room located next to it. This family room is designed to encourage a more casual relaxing atmosphere, which becomes the heart of the private portion of the house. It is the epicenter of activity for this busy family of five. Marna Schnabel's office and studio, which is a counterpoint to her husband's office of roughly equal size that is covered with a dome and located near the front of the site, is located directly next to the family room. It can be shut off with pocket doors when seclusion is necessary to separate it from activity in the family room. It has a built-in desk to increase the amount of open space and this faces the reflecting pool and master bedroom with its elegant canopy roof, to the east. The office is also located near a straight run stair, which leads up to the bedrooms of Mary Darrin and Christy Schnabel, and another stair that leads down to the master bedroom below. The family room in the center of this long rectangular hall-like wing has three pairs of doors that open up to the second, more secluded open courtyard on the site and is also multistory, giving it a sense of spaciousness and connection to nature. A bridge-like corridor that appears like a balcony above it connects the bedrooms of each of the daughters located at either end of this long rectangular wing.

SOUTH AMERICA: BRAZIL

Oscar Niemeyer: The Canoas and Strick Houses

Oscar Niemeyer, who celebrated his centenary on December 15, 2007, and won the Pritzker Prize in Architecture in 1988, is the leading proponent of the Modern

Movement in South America, and specifically in Brazil where a majority of his work is located. He still practices, working out of his studio in Rio de Janeiro. The Canoas House that he designed there in 1953 has been referred to as the Brazilian equivalent of Fallingwater by Frank Lloyd Wright or the Villa Savoye by Le Corbusier, as a masterpiece that captures the essence of its time as well as the spirit of the nation in which it was built.

Throughout his long career, Niemeyer has consistently adhered to the Modernist ideal of the architect as protean form-giver, as well as the belief that architecture should express the highest technological achievements of its time. He differs, however, in his poetic and naturalistic use of those forms, which reflect the rich context in which he works. This sets him apart from purely pragmatic Modernists, such as Walter Gropius, who viewed architecture as a means to an end, of bringing about social equality through minimal, rational, replicable, and typically rectilinear strategies. This does not mean that Niemeyer's politics do not include the desire for social reform, but rather that the sensual forms he prefers are not universally applicable.

The Canoas House The Canoas House, which Niemeyer designed for himself in 1953, with the assistance of landscape architect Roberto Burle Marx, is named for the street on which it is located in the Sao Conrado district of Rio de Janeiro. At first glance, the house seems to be simplicity itself, as a wing-shaped roof made of a flat slab of concrete that hovers over the glass-enclosed living area beneath it as if by magic, seeming to protect it without any visible means of support. The approaches to each of the other Modern masterpieces to which it is frequently compared, such as Fallingwater in Pennsylvania and the Villa Savoye outside of Paris, are each predicated on the automobile. But, one first sees the Canoas House on foot, after leaving the car at a gated fence along the street at the top of a hill far above it and walking down a winding pathway through the jungle toward it. Fallingwater is at the end of a narrow road that winds down the slope of the valley in which it is located, crossing a bridge over Bear Run, before ending under a concrete pergola that connects the house to another hill, rising on the opposite side of the gulch created by the rushing stream. The Villa Savoye, in Poissy-sur-Seine near Paris, was also intended by its architect to be fully accessible by car and to be appreciated in a 360 degree spiraling approach around it, before the automobile pulled under the house and parked near the front door. By stopping cars at the gate and forcing people to walk down a ramp from there to the house, Niemeyer has added another layer of sensory discovery to what Le Corbusier termed the "*promenade architecturale*."¹⁰⁸ The Canoas House is surrounded by tropical jungle, and so the simple act of clearing a space in the dense foliage, placing a huge boulder and free-form shallow pool there, and integrating a pavilion-like single-story house with a flat sculptural concrete roof with them, is much more profound than a more complex architectural strategy would have been. The three elements symbolize their elemental equivalents: the granite boulder represents the Serrado Mar Mountains that loom above the house nearby, the pool is the sea, and the roof is a canopy of trees, hinting at the shelter that they provide.¹⁰⁹

But the house is not as simple as it first appears, since it also has a lower cut into the side of the cliff, which is oriented toward a view of the sea. A stair running



The Canoas House. © Arcaid / Alamy

alongside the boulder leads down to this level, adding the symbolic natural element of a cave to those of the mountain, forest pond, and tree-like canopy mentioned above when seen from the clearing; the concrete roof only appears to be a single curving horizontal white line. Since the cylindrical black steel columns that support it are inset and dispersed around its perimeter as randomly as the trees in the jungle-like surrounding, they seem to visually disappear. The roof overhangs the line of the glass enclosure, shading it and further blurring the line of demarcation between nature and human-made space.

The Strick House Nearly ten years after Niemeyer completed his own house in the mountains above Rio, he was commissioned to design another for Joseph and Anne Strick in Santa Monica, California. Strick was a film director who had visited Brasilia and wanted the architect to solve the problem of a difficult site next to a steep bluff overlooking the Santa Monica Mountains in the distance.¹¹⁰ The Stricks' wish was complicated by the fact that they had never met the architect and that Niemeyer was not allowed into the United States at that time because of his political affiliation. Niemeyer, however, was fascinated by the prospect of having his first project built in North America and was undaunted by the inconvenience of being unable to visit the site. The first conceptual proposal he presented to the Stricks was remarkably like his own house on Canoas road, with a slightly

more angular flat concrete roof replacing the curving one he had built for himself in Rio. In that first proposal, he pulled the house, which curls in a fetal-like “U” around a pool and open courtyard in its midst, away from a main road toward the edge of the steep bluff at the far end of the site. He then carved a second lower level, reminiscent of the subterranean floor of his own house, into the face of the bluff, facing stunning views of the mountain. This lower level eliminated the need for a second story, which would have destroyed the purity of the flat concrete roof.

Red Tape Unfortunately, local building codes prohibited the lower story, and so Niemeyer graciously provided an alternative scheme, with a far more rectilinear form than he is usually associated with, to satisfy legal requirements. The new design is T-shaped, with the crossbar of the “T” spanning the entire length of the site along its right-hand property line when facing the house from the street. The stem on the “T” crosses it at midsite, dividing the rectilinear plot into a somewhat public forecourt near the street and a private backyard facing the Santa Monica Mountains and Canyon below. With his typical restraint, Niemeyer kept the palette of materials simple, restricting it to a brick wall running along the entire forecourt side of the crossbar of the “T” on the sideline of the site, and laminated wooden beams spaced on a short module supporting the roof of the stem of the “T” running across the middle of the lot, at a higher level. This diagram made the allocation of functions inside the house equally simple, since private areas like the bedrooms, bathrooms, and study fit naturally into the wing running parallel to the side of the site, with a solid brick wall protecting them from the large and more public living space placed perpendicular to them. The kitchen, which is located at the intersection between the two, reflects the more public role that this space was beginning to assume in the postwar period in America, as does the open dining room beside it. A walkway, leading directly from the street, follows the brick wall to the front door, which is placed slightly off-axis to the right of the centerline of the pavement, as if to deflect the imaginary line of force that it transmits. It opens directly into the living room at the center of the transecting part of the house in the stem of the “T,” perpendicular to the private part, which is separated from it by the brick wall. This is logistically the focal point of the house, and this entire wing, which has a 14-foot high ceiling, is also the dominant spatial zone of the entire dwelling. The wall facing east, toward the forecourt and then the street is only partially glazed, but its linear west-facing complement is entirely composed of floor-to-ceiling glass panels that provide a completely unhindered view of the pool deck and the mountains beyond. Both the lower private wing and this higher living, dining, and study wing, along with the large area of glass on the walls and the hardwood floors give this space a fragile, brittle, and almost inhospitable feeling that is at odds with the protective, humanely scaled nurturing and elemental aspects of the Canoas house that preceded it. This may be due to the difficulty that Niemeyer had in communicating with the Stricks, combined with his inability to visit the site, as well as being forced to change his scheme from an initial concept that conformed almost exactly to the Canoas model to a more rectilinear direction. What the Strick House does demonstrate, however, is Niemeyer’s exceptional ability to work within the more minimal linear language of the Modern Movement when circumstances dictated that he do so, when he was prevented from following the more organic direction he preferred.



Hassan Fathy House Hassan Fathy was an Egyptian architect who sought to discover a truly authentic architectural identity for his country. To do so, he researched historical typologies, focusing on the Medieval core of Cairo to do so. He also investigated preexisting sources of information, such as the surveys carried out by French archaeologists during the Napoleonic expedition that resulted in the book series called *The Description of Egypt*. To the typologies he discovered in this way, he added Nubian techniques of building in mud brick. Source: James Steele



The Airport House The Airport House is one of more than a dozen residences that have been custom designed for a development called the Great Wall Commune located near the Badaling section of the wall. Architects were commissioned to showcase the rising talent of Asian design, and each took a different approach to his or her own project. The idea behind the Airport House is one of “terminals” attached to a circulation spine, with each “terminal” being allocated to a different living space. *Source:* James Steele



Cheong Fatt Tze Mansion In the mid-1800s a wealthy Chinese merchant named Cheong Fatt Tze built a mansion in the Georgetown section of Penang Island, which is now one of the 13 states of Malaysia. He had worked his way up from being a day laborer and coulee on the docks there when he came from Fukian province in China, as a young boy. His house, known locally as the “Blue Mansion” because of its distinctive hue, is eclectic, combining traditional techniques such as a central courtyard with the latest and best construction materials available in Europe at the time it was built. *Source:* James Steele



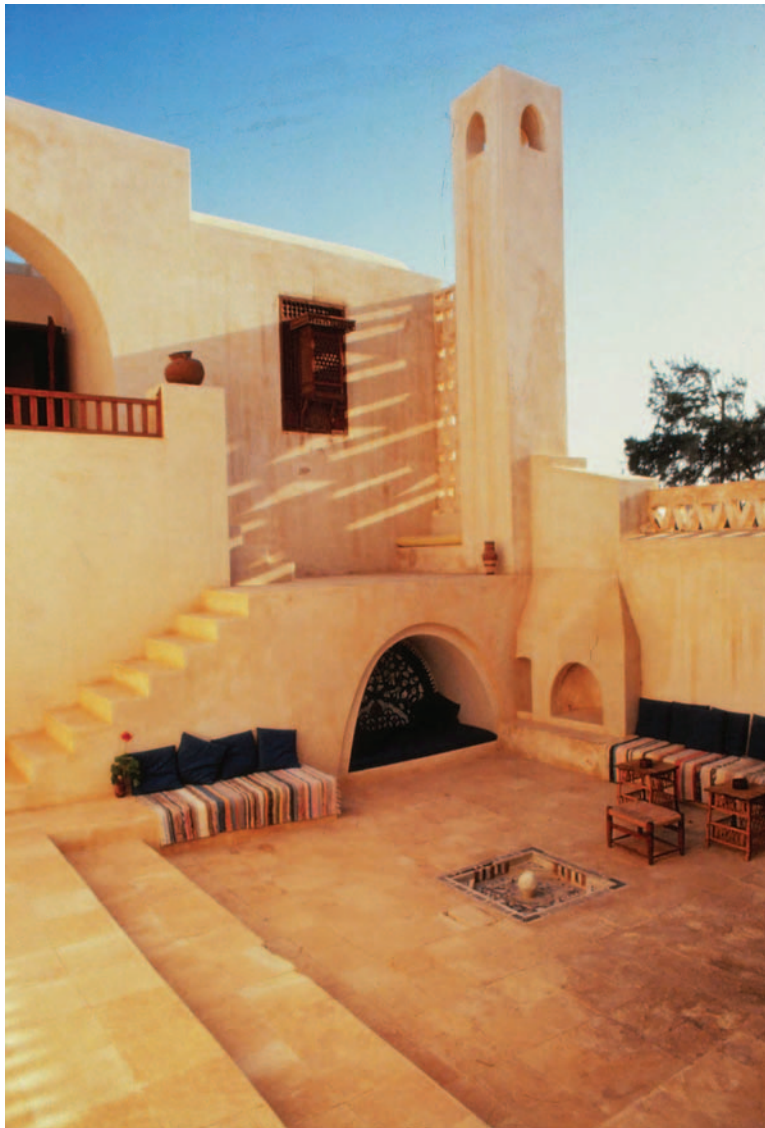
The Salinger House Kuala Lumpur-based architect Jimmy C.S. Lim has created a contemporary translation of the traditional Malaysian house, for Rudin Salinger and his wife, on a site that was once part of a rubber plantation, south of the old capital city. He had introduced exciting new elements into the historical model, making it fresh and yet still comfortably familiar. *Source:* James Steele



Hvittrask While they were still students, Armas Lindgren, Herman Gesellius, and Eliel Saarinen formed a successful partnership that led to their commission to design Finland's pavilion at the 1900 World Exposition held in Paris. They jointly bought a large property on a hillside overlooking Lake Hvittrask, about an hour's drive from Helsinki; with the idea of building a living and working compound for themselves and their families there. This compound was inspired by a wave of nationalism sweeping through the country at the time, mixed with other influences, such as the work of the American architect H. H. Richardson, as well as the British Arts and Crafts Movement. *Source: James Steele*



Chiswick The Arts and Crafts Movement favored the Gothic Revival style because of its allusions to a more egalitarian and less secular time. The “battle of the styles” between advocates of Gothicism and their Classical counterparts was loaded with moralistic overtones. Norman Shaw, who designed the houses in Turnham Green Terrace, chose to stay above the fray by introducing the Queen Anne Style, rendered in red brick, which provides a sense of uniformity. *Source:* James Steele



Suliaman House Abdel Wahed El-Wakil, who is one of the foremost disciples of the late Egyptian architect Hassan Fathy, has translated the traditional vertical Jeddah tower house into a horizontal equivalent on an open site. This house, which is really a palace, is one block from the Red Sea and includes many of the same typological elements that Fathy introduced as historical ties to his culture. © Christopher Little/AGA Khan Trust for Culture



Villa Hvittrask Villa Hvittrask, 1903, by Armas Lindgren, Herman Gesellius, and Eliel Saarinen. It served as a communal house and studio for these three architects until a personal issue broke the team up. It is located on a hillside overlooking the White Lake several hours from Helsinki Finland and is a good example of the Finnish Arts and Crafts style. © Rolf Richardson/Alamy

Joseph Strick never lived in this house, since he and his wife separated before construction was complete. Anne lived there and raised the children in it, putting it up for sale in 2003. A local developer tried to tear it down, but Michael and Gabrielle Boyd bought it in 2004, and have restored it as closely as possible to Niemeyer's original intention.

COLOMBIA

A Contemporary Hacienda in Colombia, Casa Puente Rogelio Salmons

The colonial tradition is as well established in Colombia as it is elsewhere in Central and South America. That period, which was called the *Nuevo Reino de Granada*, or the New Kingdom of Granada, ended in 1830, with a hiatus until the Republic of Colombia was founded in 1886.¹¹¹ As in other Latin America countries, such as Mexico and Brazil, which share in that tradition, there were large *haciendas* and land holdings or *latifundio* throughout the land, where geography permitted, before huge coffee plantations came to dominate the economy. That shared heritage includes a similar layering of the social class structure, beginning with the Spanish colonial overload at the top, followed by the landlord, then the sharecropper and/or peasant farmer.¹¹²

A Simple Life The *haciendas* of the colonial period reflected the infrastructural economic and production systems themselves, which were rudimentary in the extreme. The *hacienda*, which centered around farming and the raising of cattle, were self-sufficient bastions in the jungle that relied upon agents at a point of sale to move their products. Farming techniques were crude and yields were relatively low. The *haciendas* here, as in other colonized parts of Central and South America, were made up of a *casa grande*, or main house, a bunkhouse or living quarters for the farm or ranch hands, barns for the horses, equipment sheds, and pens for the cattle when needed, as well as a small chapel, all arranged within a walled compound. Walls of the houses, service buildings, and enclosures were typically adobe, and the grounds were usually shaded by nature trees and interspersed with open courtyards of various sizes at strategic points to effectively separate public and private areas, ensure the integrity of the landlord and his family, and promote cross ventilation throughout the entire *hacienda* complex.

A civil war, followed by rapid industrialization, slowly destroyed that way of life, as laborers who went into the army never returned and train tracks, built to serve special interests, carved the various *latifundio* up into smaller pieces.¹¹³ The *haciendas* had tended to be clustered on the Cundinamarca and Boyacá Plains, as well as in the Cauca Valley, because those were the areas where it was easiest to farm and raise and herd cattle. There were other zones, to be sure, such as the Magdalena, Casanare, Huila, and Tolima Prairies, but the first group had more impressive *haciendas*.

These farms did differ somewhat from those in other Latin American regions in that the landlord often did not live in the *casa grande*, but in the nearest urban area, only visiting the *hacienda* occasionally to make sure that the foreman had everything under control and that production was going smoothly.

This pattern is reminiscent of that followed in colonial Egypt, where landlords in the Delta region would often build “resthouses” on their huge estates, but these would remain empty until they visited. Transport there was easier than in Colombia, however, where landlords remained in the cities such as Rio Negro or Santa Fe and went to their *haciendas* rather infrequently, due to the difficulty involved in reaching them.¹¹⁴

King Coffee Coffee, for which Colombia is perhaps best known to the rest of the world today, only started to gain a substantial place in the national economy in the mid-1800s, and only in the higher and cooler regions of Caldas and Antioquia. Coffee had come to Colombia from Africa, through Brazil, where it had an equally profound impact on what had previously been an agrarian and cattle-based economy. The outside demand that Brazil created for the product paved the way for Colombia.

The coffee estates, however, are quite different in form and design from the agrarian *hacienda*. They are more formal and are built of more industrialized imported materials, due to the easier access to markets in the United States and Europe during this later period.

The Power of Memory In spite of the fact that many of the old colonial *haciendas* have been destroyed, and the political and social system they represent has a bitter taste for many, there is still a great deal of nostalgia for these houses in Colombia. Rogelio Salmona, who died at age 78 on October 4, 2007, designed several houses in his long career that are reminiscent of the intention of the *hacienda*, without copying its style literally. Salmona, who was born in Paris in 1929, came with his parents to Colombia when he was 2 years old. He apprenticed with Le Corbusier in Paris for many years as a young man, before coming back to set up his own practice in Bogotá. The majority of his work, which ranges in scope from small single-family homes to large institutional projects, is located near that city.

Bogotá is located at the southernmost end of the same high plateau of Cundinamarca and Boyacá, in central Colombia, where the majority of the old *haciendas* were built, because it has a temperate climate. Salmona was inspired not only by their rich legacy but also by the North African, Islamic, and Iberian sources behind it, mixed with the Pre-Colombian heritage of the area before the Spanish arrived. The informal organizational planning principles on which the *hacienda* is based, as well as its plain exterior appearance in stark contrast to ornately decorated interiors, strategic use of courtyards, gardens, and water, come straight from Islamic precedents, which were brought into Spain from North Africa and transplanted there over several centuries of occupation, prior to the *Reconquista*.

Salmona adopted all of these techniques, translating adobe into brick, which is also telluric, but more durable and acceptable to a contemporary client base. Of the many houses he completed in the Sabana during his career, the *Casa Puente*, which is in Suba and was realized in 1975, is one of the most typical. It also demonstrates the strong influence that Le Corbusier had on his Colombian apprentice, since it has a strong processional line of entry. It is also made entirely of brick, with several courtyards reflecting a quote from a Mayan Codex that Salmona kept on the wall of his office. It reads: “When I enter my home, I enter the earth and when I leave my house I ascend to heaven.”¹¹⁵

Africa

EGYPT

Abdel Wahed El-Wakil: The Halawa, Chourbaggy, and Hydra Houses

Abdel Wahed El-Wakil's Halawa House in Agamy, Egypt, was completed in 1975. While a trained eye can determine several basic relationships from the plan, which divides public and private spaces with a square central courtyard, the play of forms that results from the massing of these spaces does not become evident without deeper study. In acknowledgment of this richness, this house was awarded an Aga Khan Award for Architecture in 1980, because, in the words of the jury,

it represents a dedicated search for identity with traditional forms. The courtyard plan, the use of domes, vaults, and arches, the articulation of space, and the sensitive use of light, combine to produce a house that fully satisfies contemporary needs. This imaginative handling of a traditional vocabulary is also enhanced by the consistent use of traditional methods of construction and the careful attention to details and craftsmanship.¹

This award marked the beginning of worldwide recognition for the architect, as well as the end of his training with his mentor Hassan Fathy, and so can be identified as the first of several landmark commissions in the first major cycle of his career.

The house is not only a final homage to El-Wakil's teacher, Hassan Fathy, but also to Fathy's master mason, Aladdin Moustafa, whom El-Wakil had helped and insisted should receive a portion of the award. This was a sign of his key role in making Fathy's architecture possible, and the lack of official recognition of that partnership in the past. In describing his determination to include Moustafa, the architect is fond of telling a story about a major university in the United States that had once contacted Fathy about the possibility of organizing an exhibition of his work, which at the time would have been one of the first of its kind. Fathy was, as

always, extremely hesitant to part with his drawings, but was persuaded to do so by El-Wakil, who saw the potential for international appreciation that this exhibit held. When Fathy insisted that travel arrangements also be extended to include Aladdin Moustafa, the university was hesitant and then offered a token allowance that was so ridiculously meager as to be insulting. While Fathy eventually consented to send some material, he refused to attend the exhibition because of his vivid memories of this incident as well as his own debt to the teachings of this mason. El-Wakil persisted in recognizing him in an article for *Domus Magazine*, in which Moustafa made the cover. In that issue his true contribution was put into perspective because it emphasized El-Wakil's focus on traditional wisdom and officially considered for the first time the possibility of an autonomous Muslim architecture without the associated issues of separation. The notion put forward in that issue, of a contemporary version of Islamic architecture that might arise out of Fathy's and El-Wakil's example has now come true. While there has been a sense of continuity in both materiality and in traditional methods of construction, the Halawa House demonstrated how these consistent elements can be adapted to a contemporary way of life. The lesson of the Halawa House is the timelessness of vernacular architecture, in spite of the changes that take place in social values over time.

In the traditional life view, time is seen as a cyclical continuum, naturally marked by night and day, birth and death, and the changing of the seasons. This is central to an appreciation of the difference between El-Wakil's architecture and the latest fashion of the moment. Fathy himself constantly reminded his followers that a true, socially related architecture such as the Sultan Hassan Mosque takes more than one generation to develop. He saw himself as only a single link in a long chain, stretching backward to the beginning of his own culture. In the majority of cases, the most characteristic constructs of that culture have emerged as an expression of the people themselves, without any architect taking the credit for them. They are also part of nature rather than alien to it. As El-Wakil has described the appeal of traditional architecture as being versatile and durable, as well as humane, it also has a spirit of place and has been adapted over time to comply with specific human needs. It was built by the community and has always incorporated existential needs, including heritage and mythology as well as comfort. "In addition to seeing architecture as a functional art," he has said, "the traditional builders also treated it as a significant art reflecting human faith and a concrete image of our metaphysical aspirations."²

In such architecture ego has no place, and in recognizing Aladdin Moustafa's part in the Halawa House, which exhibits all of these attributes at their best, El-Wakil has acknowledged the importance of transferring knowledge. This transcends the mason himself, regardless of his contribution, which was considerable in many ways.

The Chourbagy House In another project, for his uncle, Abdel Wahed El-Wakil accepted a self-imposed challenge to apply the social and environmental lessons that were used by Hassan Fathy. He converted them into a prototype for an urban setting in order to silence those who have criticized his mentors' principle as never having been applied in this way. The idea for such a prototype came about

as a result of the client's purchase of a row of long, narrow plots of land that had been in an agricultural zone near Cairo. These were quickly being converted to housing because of pressure of a rapidly growing population. Rather than combining all of these thin, rectilinear plots into one, and building a large villa on a single piece of land, both client and architect agreed that it would serve a greater social purpose and make better economic sense to build a prototype terrace house, to be followed by others of similar design in the future. The architect set out to prove, as one observer has noted, "that a modern Egyptian house traditionally inspired could be built economically, comfortably using conventional reinforced concrete under urban conditions."³

Because of these parameters, the Chourbaggy residence now looks rather strange, like a townhouse without a town, but will change as the inexorable growth of Cairo continues. The fate of Fathy's clients who have ignored this possibility, such as Hamid Said in Marg, who had the opportunity to put acreage around his small mud brick studio when it was first built in 1943 and refused to do so, is proof enough of the wisdom of El-Wakil's tactic here. In the best Cairene tradition, which can be clearly seen in the medieval part of the city in examples such as the *Beit Soubeimi*, *Beit Gamal-adin Dababi*, and *Beit Sennari*, this house presents a plain face to the street with *mushrabiyya* screens that are smaller on the lower story for privacy and wider at the top for view, being the most prominent feature. As is also the case in those older examples there is a "magaz," or indirect entry from the front door, which leads onto a set of stairs and into an open courtyard before coming to the offset door to the interior of the house itself. True to past examples, this courtyard also has a "mastaba" or bench along the wall, which has historically been used by the doorman or "hawab" to rest on while he guarded the inner sanctum, but is here conceived of as a place to sit and talk to those not known to the family. The *mastaba* also provides a convenient way of squaring off the court in order to more easily design a paved tile floor for it, which is hexagonal and surrounds a small fountain. Two doors lead out of this court, with the least obvious one giving convenient access to the kitchen, and the more prominent of the two leading into a reception room. This is organized as a *Qa'a* in which to greet and entertain guests, with one *iwān* provided with built-in seating, and the other used as the stairway to the upper floors of the house. Contrary to the traditional arrangement, there is also another grouping of built-in seating in the *Qa'a*, which is placed between the central *Dorga'a*, and the court from which it is divided by an open *mushrabiyya* screen. A *shuksbeikha* of sorts also covers the *Dorga'a*, which is a double-high space, but it is a false cupola, built beneath the thick concrete roof slab, and not open to the sky to allow heated air to escape by convection, as *shuksbeikha* were in the past. This *Qa'a* also opens onto an additional sitting area and then finally onto a garden. The view of the fields beyond this view, in fact, is the primary force behind the form of these two sitting rooms, as well as the U-shaped built-in seating in front of the courtyard itself, with a continuous shaft of space being seen to connect inside and outside in the ground floor plan. Two groupings of "Sabra" doors, which when open leave no obstacle between the reception areas and the exterior make this connection possible. The stair in the second *Qa'a iwān* leads to the first floor, which has three bedrooms and each has an en suite bath for added privacy. A hallway, which runs the width of the house and connects each of the bedrooms with the stair, passes

between the *Qa'a* and the court with *mushrabiyya* screens provided for a secluded view into each space below. This device was also commonly used in the past as can be seen in the *Beit Kriteyya* where the women of the house habitually sat in window seats above the *Qa'a* to secretly watch the men discussing business and drinking tea. A light well, which is used to pull the windows of the two largest bedrooms away from the exterior wall, adds additional insulation from the rising noise level in Cairo, and anticipates the future role that this house will play as a model urban residence. Regardless of several compromises, the architect obviously met his own challenge, and the result is a contemporary expression of traditional residential typologies.

House in Hydra, Greece It is ironic that one of Hassan Fathy's most talented disciples should be given a commission to design a house in Greece, which had such a profound effect upon the master himself. While Fathy is not known to have built anything on any of the Greek Islands, his travels there while a member of the Doxiadis organization between 1957 and 1962 had a visible impact on his later work. Fathy did design a house for Marion Carr in Liopepsi near Athens, which was never built. In it he shows a facility equal to that of El-Wakil for the assimilation of a local vernacular style, as well as a different way of life. Hydra, like most Greek fishing villages, totally revolves around the life of its port, and yet its topography, which tightly juxtaposes mountains to close, curved proximity with the shoreline, gives this house a special clustered character, similar to the village, which has a visual unity and identity that is even greater than other Greek islands. The bowl-shaped form of the town, as it rises up from the water on both sides of the mountains, puts almost every house in it on view when it is seen from the water. This unity is even evident while walking along the quay, where most of the social life in Hydra takes place. Steep stairways lead up the mountainside to small plazas that then feed into the narrow pedestrian streets that serve the houses. The plot allocated for the El-Wakil design, which is about halfway up the mountainside, is approximately 13 meters wide and 25 meters long with a 7 meter drop across its width. The foundations and the primitive means of transport, which is still limited mainly to mules, discouraged costly excavations and any thought of leveling the site to make design easier.

In Tune with Its Site As a consequence, the design conforms to existing contours, and this makes optimum use of the land available by making the house plan conform to the irregularities of the site. With typical thoroughness the architect spent a great deal of time researching the traditional architecture of the island, in order to make this house blend in with those around it. His concern was to retain the unity of the architectural panorama seen from the quay. The main gate to the house, which was commissioned by Julius Nezer in 1978, was placed on the lowest corner of the steeply sloping lot and was, as the architect has described it, "intended to be seen as a welcoming hand reaching out to newcomers arriving after an exhausting climb from the harbor below."⁴

After this restful welcome, the ascent continues through a stepped passageway, which leads up to a terrace that also includes a swimming pool. While this may seem a bit redundant on a Greek island, the beaches on Hydra are especially rocky with difficult access to the water, making a pool of this sort desirable for comfort as

well as privacy. There are two bedrooms at this terrace level, as well as a small living room and porch that have all been provided for guests in order to ensure the necessary degree of seclusion. From this terrace another flight of stone steps, which are carved into the landscaped slope of the hill, lead up to the upper terrace of the main floor above.

The main living room is based on the form of the traditional fisherman's houses on the island and opens directly onto the surrounding terrace in a way that is typical of the Mediterranean preference for an indoor-outdoor continuity of space. The master bedroom, along with the children's bedroom makes up a house within a house, and while this wing is connected by a passageway it is totally self-contained around its own courtyard, which overlooks the Bay of Hydra. The living room has been positioned in such a way that visitors can be kept to a terrace of their own without disturbing the privacy of others when large groups are being entertained. A kitchen, which is adjacent to the living room, also opens onto the terrace, as well as an outdoor barbeque that can be used in conjunction with the ovens inside, making entertainment here a joy rather than a drudge. An *au pair* suite with its own entrance from the uphill side of the house completes this upper level, utilizing the elongated character of the site to its fullest.

The result of all these considerations is a scheme that capitalizes on difficult site conditions rather than being defeated by them, in the creation of a series of stepped terraces that provide openness and privacy where each is required. This has been achieved by working with rather than against the natural and the man-made environment of Hydra, and by accepting the particular lifestyle that exists there. In the process, the architect has produced what he feels is a microcosmic image of Hydra with water terraces and stepped gardens representing the bay, dockside, and mountains that are the essence of the island.

The Suliaman Palace, Jeddah, K.S.A. In his design for the Suliaman Palace, El-Wakil has not only overcome the twin challenges of a large and relatively flat site, but has also successfully turned them to his advantage. To fully understand how this has been done and the subsequent importance of these residences as a prototype for others in this region, it is first necessary to recall that until relatively recently Jeddah where the palace is located was a walled city confined to a few square miles of area along the coast of the Red Sea. For reasons of efficiency, as well as privacy, the houses within this walled area were organized within a vertical tower, typically using three main divisions of space. Ground level, which was much more accessible to the public, was usually reserved for rooms associated with service and storage, as well as an official reception room for guests. The second and third floors of these tower houses were set aside for the family, with the topmost floor being the most private of all. Because of the compact nature of these residential quarters and the proximity of the houses inside them, *musbrabiyya* screens or *rosban*, as they are called in Jeddah, were an essential addition to the windows of each house as was a central courtyard that also provided privacy.

After the city wall was demolished and Jeddah began to expand after World War II, the restraints that had faced house builders in the past became redundant. Detached villas sprung up on individual lots as quickly as civic services could be extended to them. El-Wakil's concept for this particular residence was to make a contemporary version of the traditional Arab house in Jeddah. He believes

tradition is dynamic and is open to change, and that the architect must maintain continuity within change by being aware of constants and reinterpreting them in a new context. As he says, "This interaction between what is constant and what is change brought on by newly arising situations results in new formal entities."⁵

The Suliaman Palace is located in new Jeddah, which is reclaimed desert area to the north of the older city and is mainly used for housing. There are no narrow streets as there are in the old city, and building sites are isolated by wide avenues to allow for cars. The Palace is different from older houses in being on an individual site. As a visible symbol of these new conditions, the Suliaman Palace extends horizontally from the middle of its triangular site, with long elevations toward the north and south to take maximum advantage of the best light and views toward the Red Sea. It is formally defined by the different functions in it. These include the public area, the semipublic and totally private sleeping quarters, and service wing. The house has a southern elevation that is over 70 meters in length. This profile was imposed by the site, which is an extended triangle. El-Wakil also wanted to provide maximum views of the Red Sea. He used a standard square module of 6 feet, or 180 centimeters, throughout the design as an ordering device. This module helped to bring order to what would otherwise be a confusing array of forms and a variety of dimensions. This would have been difficult to build, due to its size. He also used a dominant axis to give order to the plan.

As originally conceived, the sequence of spaces along this axis begins with a small courtyard that acts as one part of a *magaz* leading to the main entrance of the house itself. A large *majlis*, or *salamlik*, which is located on one side of this court upon entrance, is organized in the shape of a "U" with its open end facing the court, and it has a continuous banquette running along three walls in the fashion of a traditional male reception room. Of these three walls, the one to the south facing the door is dominant. It has a large ornately carved wooden panel running from the back of the banquette to the ceiling to designate it as a place of honor for the sheikh himself, with windows looking out to the gardens and the sea beyond flanking it on both sides. The walls of the two sides of the "U" also have smaller carved wooden panels, which alternate with solid vertical bands of brick and plaster wall. Antique *Bedu* rifles from the sheikh's extensive collections of weapons, hanging muzzle down in these white bonds, are a vivid reminder of the bands of tribal fealty that he still commands.

Sometime after the construction of the house had already begun, the client decided that there was a need for several guest rooms, and, in spite of the generous size of the site, the placement of the foundations and linear increasingly private character of the concept dictated that these be located near the entrance courtyard as well. Because of municipal setback requirements, the proximity of the site line to the guest wing dictated that it be deflected from the main axis. With characteristic optimism, the architect also looked upon this unexpected turn of events as an opportunity rather than a difficulty. He used the apparent conflict between the space required and the area remaining to the advantage of the design. To some the result may be reminiscent of the kind of juxtaposition and transformation that takes place in the Fatimid and Mamluk complexes in medieval Cairo. Three examples are the *madrasa* of Al Salih Najm al Din Ayyub, the *madrasa* and mausoleum of

Amir Sanjar al Jawli, and the *khangab* and mosque of Amir Shaykhu. Such examples were definitely in the architect's mind as he went about solving this problem. As he says:

As the space for this added wing was confined within the existing internal vehicle drive-ways use was made of an old design technique; aligning the elevation walls with the streets and disposing of the rooms inside accordingly filling in spaces where necessary. This solution was often used in the old irregular street patterns and especially in Mosques where the buildings were aligned with the street whilst prayer space was directed toward *Makkah*.⁶

The resulting addition, which represents one of the few examples of such complexity in El-Wakil's residential work, serves to augment the entry court and *sama-lik* across the drive and to act as a visual hinge generating the extended fugal of movement of spaces that extend horizontally from it. As such, it both begins and ends the linear form of the house, paradoxically giving it more animation than it could otherwise have had.

The towering *Qa'a*, which is the highest volume in this extended elevation, is reached through a long, exquisitely tiled hallway that joins the public zones of the Palace. A subtle shift in zoning, from the grouping of the *majlis*, to an inner sanctum reserved for close friends, is marked by level as well as scale with three semicircular steps leading up into the high, square space. This change of level, which is repeated in an even more exaggerated way between the semiprivate and private zones is far from accidental, as can be seen in an early rendering, in which a tripartite garden, rendered in the fashion of Hassan Fathy's pharaonically inspired gouaches, clearly indicates these horizontal break points and an increasing sense of closure where they occur. The dining room, the kitchen, and the party wing that is perpendicular to it further confirms the purpose of this zone, meant for entertaining important guests, relatives, and close friends. The family quarters located across an open courtyard from this middle zone terminates the line and is really a self-contained atrium house in its own right. A wooden cupola, inspired by one of similar formed design for the Monesterli residence in Cairo by Hassan Fathy signifies the fragile character of this grouping as compared to the *Qa'a* across the court casting delicate shadows on the white walls of the bedroom arcades below. This sense of playfulness continues in the central fountain of the atrium itself, which is updated here into a plunge connected by a covered passageway to the swimming pool beyond.

Through such innovation, El-Wakil has shown the possibility inherent in the traditional typologies of the past, and these four houses each represent a different contemporary condition in which they have been implemented.

Hassan Fathy

Hassan Fathy was born in the Delta region of Egypt, far from the bustle of Cairo and Alexandria. His family owned an agricultural estate, and he recalled that some of his earliest and fondest memories were those of his interaction with the laborers on the farm with whom he seemed to have an affinity. When the time came to go to university, he naturally chose agriculture as a major, and both he and his family



Dar al Islam, Abiquiu, New Mexico, Hassan Fathy. Source: Laura McAlpine; Flickr

were disappointed to find that he had no aptitude for it. He also liked music, knew how to play the piano and the violin, and drew well. Because of his artistic sensibilities, he decided to enroll in architectural school; the prospects for financial survival seemed better in that area than they would be as a musician or an artist.

A Classic Beaux Arts Education He attended Cairo University; since Egypt at that time was under colonial rule, his instructors were British. The curriculum followed the *Beaux Arts* conventions, and so was based on Classical Greek and Roman precedents. This meant that Modernism, which had just begun to emerge when he was a student in the early 1920s, was officially excluded from his educational experience. But, he was aware of it nonetheless, and as soon as he graduated, in the early 1920s, he started to explore the same formal language then being promoted by Modernist leaders such as Walter Gropius, Ludwig Mies Van der Rohe, and Le Corbusier. This early phase of his career included a project that was never built for a villa for Hosni Omar, intended for a site in Giza on the outskirts of Cairo near the pyramids. It is starkly modern in style, with flat roofs, white stucco walls, and severe steel industrial windows. It was designed in 1930 in collaboration with Ahmed Omar, who was related to the client. The Villa Hosni Omar was the first of several Modernist designs that Fathy completed at this time. Another of these was the Sada Al-Barreya Villa, designed for a site in Fomm Al-Khalig. This villa design pragmatically linked a living area for the owner with two additional rental units. Each of these, while joined, are perfectly self-contained with separate internal stairs that make the two-story plan feasible. While this is again a Modernist plan, there is a vestigial central court in it that is used to provide privacy for the owner, giving evidence of the kind of spatial organization that proved to be so characteristic of the work that Fathy was to do in the future.

Several other Modernist exercises followed, such as the Azmi Bey Adel Malek and El Beyli Villas, designed in 1934. But soon afterward, in 1937, Fathy made a distinct change of direction in a house he did for Mrs. Isabel Garvice. It has several traditional elements that were new to his work, which in addition to a more clearly defined and intentionally placed central courtyard and separation of public and private spaces, included a *máqaad*, which is a covered second story balcony open to the courtyard where the family would gather for an evening meal, and *mushrabiyya* screens, used to protect the privacy of the female occupants of a house in the past, on an otherwise blank exterior wall. This house, revealingly named “Dar al Islam,” or the “world of Islam” on the architect’s drawings, is a benchmark in Fathy’s development, but is still tentative and uninformed in its execution.

Part of a Nationalist Movement About this same time, in the period just before the Second World War, Fathy became a member of a group of artists, writers, musicians, and architects who were using their individual talents and media to express their dissatisfaction with colonial occupation and the government that enabled it. Naguib Mahfouz, for example, who won a Nobel Peace Prize for literature for his stories of a typical neighborhood in Cairo, was writing thinly veiled allegories about times during the Pharaonic period when Egyptians had overthrown and expelled foreign invaders. Others, such as the artist and poet Hamid Said, who became Fathy’s close friend and an important client, were really expressing their belief in Egyptian traditional values.

For Fathy, an intention to find a true indigenous architecture language that could replace one that imposed Western values on his country was his way of responding to colonial rule and contributing to this effort. He worked on a series of projects using this new language, which he was starting to learn by studying documents such as *The Description of Egypt*, in the Institute Francaise Archaeologique Oriental (IFAO) in Cairo, and by surveying old homes in the medieval quarter such as the Beit Gamal-adin Dahabi and the Beit Souheimi. When he had completed several of them at a conceptual stage, he held an exhibition that showcased his new style in Mansouria, on the outskirts of Cairo, in 1938.

Some of the projects included a villa for Taher al-Omari Bey, which was intended for a site in the Fayum at Sedmant al Gabal, which has a long linear plan, centered around a *qa’a*, or reception room of the kind found in the houses built in the twelfth, thirteenth, and fourteenth centuries in the medieval quarter of Cairo.

In 1941, Fathy was commissioned to design a farm for the Royal Society of Agriculture, and this project was critical as a beginning point in his search for an inexpensive alternative to more expensive ways of construction involving imported steel and cement. These materials were in short supply at any rate, due to the war. He made several attempts to build domes and vaults in this project, following the formal language that he had unveiled at Mansouria, but they all collapsed.

His brother, Aly, who lived in Luxor, suggested that Fathy visit the Nubian villages near Aswan, since the masons that built them used an ancient method of construction that eliminated the need for centering or internal supports of any kind, and just required the use of mud brick.

Traditional Nubian Wisdom Fathy went to several Nubian villages and studied the traditional method that they used. It started with a standard wall, made of mud brick. A mason then inscribed a parabolic arch on that wall in mud mortar and laid

up a first course of brick on it, with the bricks near the ground being wider than those near the crown, so that a compressive thrust was set up into the wall and down to the ground. Each subsequent course of bricks on the vault was scored by the mason's fingers before the brick dried to create grooves that would allow that course to adhere to the next. The vault was built, constantly moving the base out, slightly further than the crown, until the entire space was covered. A dome could be built in the same way by using this same process in a 360 degree turn.

Ezbet Al-Bazry In 1942, Hassan Fathy tested this system of Nubian mud brick vault and dome construction, using the spatial typologies such as the central courtyard, *qa'a*, and *maqaad* that he had discovered in his research at the IFAO and the medieval quarter of Cairo, by constructing a small house at Ezbet Al-Bazry. It was built beside a canal running between Cairo and Maadi, and was intended to prove to the Red Crescent Society that was sponsoring the experiment that this kind of construction could be used to replace 25 houses that had been destroyed by a flood shortly beforehand. The prototype had a *qa'a*, or reception room for guests, as well as a dining room, kitchen, large sleeping area, and bathroom. Each of these spaces was covered with a dome and was grouped around a central court. Fathy was convinced that the Red Crescent Society would choose to replace the ruined houses with his prototype when they saw how comfortable it was and how inexpensive it was to build, and he was disappointed when they chose a more expensive concrete design proposed by a local builder. This was his first encounter with what he would later describe as the "contractor establishment" in Egypt, which was later to intentionally undermine his theories because they saw his work as a low-cost threat to their business. He was later to describe this experience in detail in a book he wrote in the 1960s called *Architecture for the People*, which was later published in 1973 as *Architecture for the Poor*, in a chapter entitled "Iblis in Ambush," referring to *Iblis*, the name given to the devil in the Quran.

Undeterred, Fathy then went on to build a series of houses in his new style. This was for the El-Razek family, and it was built in 1941. In it, Fathy established a sequence of formal reception spaces, related to the clients' need to entertain guests quite frequently, and this is set up along a north-south axis. In contrast to this line, he also established a counteraxis for all of the private family spaces, and at that intersection of these two axis, he placed a series of courtyards that relate directly to each grouping.

Hamid Said His friend Hamid Said, who was also part of the group of young artists, musicians, writers, and architects that Fathy had joined because they shared his belief in the need to establish an indigenous Egyptians means of expression in the arts, asked Fathy to design and build a house for him using the new elements the architect had developed.

The Hamid Said House, which is in Marg, was begun in 1942, and was built in two phases. The first began with a large vaulted loggia, or *iwan*, which was intended as the main entrance as well as a sitting area from which Said could look out on the lush green countryside, since this area was once an oasis. It also included a domed studio space with another attached *iwan* for sleeping. The second phase, built three years later, provided Said with a dining room, kitchen, and larger bathroom wing, and is linked to the first phase by an articulated gallery leading to a

larger studio that was built across the central court. This courtyard later became the meeting place for the Society of Art and Life, which was founded by Hamid Said to promote indigenous Egyptian art.

MOROCCO

Charles Boccara: The Abtan House, Marrakesh

Charles Boccara was born in Tunisia in 1940 and was raised in Morocco. He was trained as an architect at the *Ecole des Beaux Arts* in Paris, just before that legendary program was discontinued in the late 1960s. His thesis project was located in Fez, and after graduation he returned to Morocco in 1970. He apprenticed with E. Azagury in Casablanca before establishing his own office in Marrakesh. Soon afterward in December 1979, King Hassan II expressed his support of the preservation of the traditional architecture of Morocco, and of the perpetuation of its values in its contemporary as a way of protecting family values as well. This led to royal sponsorship of an extremely important publication of an enormous two-volume set of books entitled *Le Maroc et l'Artisanat*, by Andre Paccard in 1980. This anthology of the Moroccan building craft consolidated and reiterated the unique position of this nation as a valuable repository of traditional construction skills at all levels, throughout the Islamic world. As one example of this, Moroccan craftsmen were brought in to do the final detailing, including the exquisitely ornate plaster work that only they know how to do, throughout the interior of the Ministry of Foreign Affairs in Riyadh when it was completed in 1987.

Charles Boccara, then had access to a remarkably well established and protected heritage of traditional craftwork extending back for hundreds of years to draw from in his own work, as well as the official mandate of the Moroccan government to follow well-established historical prototypes in doing so. One example of his skill and sensitivity in doing so is the Abtan House.⁷

The Abtan house, which was completed in 1984, is located on the outskirts of Marrakesh. It continues the grand tradition of the garden in Islamic architecture, and updates it by adding other components to it. The site is an irregularly shaped extended polygon that pushed out into a triangle on the east. Boccara has used this irregularity to its best advantage by creating a main axis along the elongated north-south line, placing the main residence at the far end of the entry on the north, and a cross-axis from east to west with a guesthouse occupying the triangular piece on the east. The design challenge then was to tie these two disparate parts together, which Boccara does by establishing two allies that radiate outward from the guesthouse toward the main axis, each being at an angle that is parallel to the legs of the triangular site lines at that part of the relatively small property.

The Islamic Garden The landscaped garden is a well-established tradition throughout the Islamic world. This partly derives from the idea of paradise, or *al-firdous*, mentioned in the Quran, where a judgment day will take place in the presence of “a crowd of those of yore, and a few of the latter day,” who will be served by “eternal youths and large eyed maidens.”⁸ The Garden of Paradise described in the Quran was also divided in two, with each one being shaded by trees and irrigated by fountains. One was for dates and the other was for pomegranates. This

encouraged a landscaping tradition based on three key ingredients of shade trees, which could be of various kinds, water, and flowers. One of the earliest expressions of the Islamic garden occurred in Persia, in the tenth century, as well as during the Mughal Dynasty in India. Each of these was carefully detailed in miniature paintings which were popular at the time. These typically show gardens that were divided into sections by water channels, or lines with fountains located at their intersections, or a pavilion. Four channels were commonly used in Persian gardens, perhaps because, as one historian has explained, “of the cosmological idea that the universe was divided into quarters by four great rivers, an ancient belief suggested also by the Old Testament description of Eden.”⁹

As the Islamic garden developed, these three essential elements were refined to also include more ornate pavilions, such as the *chabutra*, which was raised and open, with a railing around it, or a *baldaquin*, which was a tent-like canopy. These pavilions also became more elaborate extending up to more than one story. The water lines also changed, becoming wider or larger pools. But in recognition of the source of Islam, in the desert of Arabia, and the predominance of a hot arid climate where most of the gardens were located, the preference was for fountains that sprayed rather than gushed, like a waterfall, reflecting both the preciousness of water in the desert and the physical phenomenon that a mist of water can actually perfume the air in an arid climate, as well as cool it more effectively.

Symbolism Was Important The kinds of trees used in the Islamic garden also began to proliferate, as depicted in Persian miniatures based on certain symbolic associations. Cypress symbolized death, while plum and almond trees represented life. In Pharaonic Egypt, the Sycamore tree was associated with Osiris and rebirth since, according to the myth, his wife, Isis, finally found the coffin in which he was entombed and set afloat down the Nile, held aloft in the branches of the quick-growing sycamore tree, which had grown up around it when it ran aground. Palm trees were introduced from Arabia, fulfilling part of the bisected image of *al-firdous* provided in the Quran, and were the source for dates. Shade trees that were indigenous to the region where the garden evolved were added, such as poplars and sweet myrtle. Fruit trees, such as pomegranates, fulfilled the second half of the Quranic image of paradise.¹⁰

The evaluation of this early phase culminated in the Menghal Garden of Shalimar in Kashmir perfected by the Emperor Jahangir, who also built the Taj Mahal in memory of his wife, Mamtaz. Shalimar was built on four levels, with each terrace dedicated to different kinds of trees and flowers and having its own pavilion. A waterfall runs through the four terraces connecting them.

This garden tradition then spreads across North Africa to Morocco, and then into Spain, producing examples such as the Alcazar in Seville and those within the Alhambra in Granada. The two most famous of these gardens are the Court of the Myrtles and the Courtyard of the Lions, which each have arcades that feature the high Moorish arches that curve like a horseshoe and have become closely associated with this region, as well as the fairly flat, tile-covered pitched roof of the symmetrically placed pavilions into which the waterlines of the Courtyard of the Lions terminate.

Continuing a Proud Heritage Charles Boccara continues this proud garden tradition in the Abtan House, which is as much an extended pavilion as a residence. The long, narrow house, which runs across the bottom of its site along an east-west axis is symmetrically divided into three sections, the first of these is aligned with the front entrance, is linked to it by a waterline that stops short of the main entrance, and is separated from it by a one-story vestibule with rectangular pools of water flanking the entry corridor inside. This is a traditional local typology, called a *riad*, or enclosed garden. This leads to the double-height reception hall with the focal point of the residence, which is square in plan, and twice as high as it is wide. Its roof is the same form as those of the pavilions of the Courtyard of the Lions at the Alhambra, a triangular tile-covered hip roof that evokes the Moorish tradition that moved from this part of North Africa into Spain and was firmly established there over many centuries. The arches in the colonnades around the reception hall are also reminiscent of the horseshoe-shaped *vouissions* found in the arcades of the Alhambra.

There is a garden behind the main reception hall that is the classic model of the paradise gardens of early Islam since it is divided into four quadrants by waterlines on each axis, with a fountain in the middle. The central reception pavilion of the house is symmetrically flanked on each side by equally sized living pavilions. These also have a two-story space as their focal point, but in this case the floor of each is given over to a pool, setting up a studied solid and void counterpoint across the entire front elevation of the house. Water penetrates it on the first axis of the three parallel lines used in front of the house, then is stopped short of the main entrance in the second, and then penetrates it again in the third.

The guesthouse is presented in the site plan in much the same way that a pavilion would have been located in one of the classic pleasure gardens of the past, keeping intact the illusion of timelessness that Boccara creates.

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Asia and Australia

AUSTRALIA

Glenn Murcutt: The Magney House

In the 1970s, historian Kenneth Frampton helped to popularize the term “Critical Regionalism,” to draw attention to a variant of Modernism that took context, environment, and local heritage into consideration. In retrospect, this seems a bit inconsequential and even unnecessary, but it does give some indication of the hold that this movement had over the architectural profession at an international scale. The list of practitioners, both alive and dead, that may be grouped under the title of “Critical Regionalist,” however, is still surprisingly short. Hassan Fathy comes to mind, as do Geoffrey Bawa, Balkrishna Doshi, Sedad Hakki Eldern, Abdel Wahed El-Wakil, Rasem Badran, Sam Mockbee, Kengo Kuma, Jimmy Lim, and Glenn Murcutt. What each of these architects share is an intense interest in their own national culture and identity, as well as its vernacular tradition. They have respect and admiration for the social and environmental efficacy of that heritage, and seek to perpetuate, but not literally copy it. They believe it has lessons to teach us about how to survive, and coexist, in various natural settings of a range of extremities, and have collectively attempted to learn from the past, rather than dismissing it as redundant and irrelevant.

In some cases, such as that of Glenn Murcutt, the link to Modernism has been retained, making him one of the best examples of what Kenneth Frampton meant when he spoke of a Critical Regionalist. The term is meant to convey an abiding belief in the benefits of science when applied to architecture, overlaid with the equally determined intention that technology should be used in ways that make it adapt to vernacular, collective wisdom.

The Magney House The Magney House, in New South Wales, is one of the clearest examples of Murcutt’s belief in such adaptation. It is on the South Coast, at Bingie Point, near Moruya, which is more than 250 kilometers from Sydney. The clients had been drawn over the years to the site, which is near the ocean, as a place to camp, eventually buying a 33-hectare property on a slope overlooking

the water, which circles around the point in front of it. The family wanted the house to replicate the tent that they used to camp in, rather than being a heavy structure, since it was intended as a vacation home and not a permanent residence. There have been several other notable examples of campsites that have become houses, with varying degrees of permanency as a result. Fallingwater, at Bear Run, Pennsylvania, by Frank Lloyd Wright, was built on a property where the Kaufman family used to camp. They would drive down from Pittsburgh for the weekend to stay in a cabin at the top of a hill overlooking the valley and mountain stream where the famous house now stands.

In that case, Wright gave them much more house than they had expected, but once they saw his concept they changed their mind, spending more time there after it was finished. The house is made of stone and reinforced concrete, inextricably connected to its hillside site. Another memorable example of a campsite that has been converted into a residence is the Kings Road House of Rudolph and Pauline Schindler, built in Los Angeles in 1922. This is a less literal case, since the young couple wanted to replicate an experience they had in Yellowstone while camping there earlier. The house that Schindler designed, of light wood frame, sliding canvas screens, and glass, with concrete used only for interior and exterior fireplaces and kitchen counter tops, feels impermanent, but has been preserved because of its landmark status as a model for the California courtyard house that followed. Schindler combined a series of L-shaped wings that are used to protect individual courtyards related to each of the living spaces, and the couple originally slept in a canvas-covered loft on the roof to replicate the feeling that they had of sleeping under the stars at Yosemite.

Glenn Murcutt has taken an approach very different from either of these, since his long linear scheme is neither permanent, like Fallingwater, nor protective, like Schindler's residence on Kings Road. The clients expressed the wish to connect with the elements, and this house certainly fulfills that request, seeming to be nothing more than a covered platform from which to watch the sea and the sky and the changing of the weather. Murcutt backed the house into the slope and opened it up toward the north and the view. This is a necessary reversal of the ideal *feng-shui* position of having a mountain or a slope behind the house to deflect the north wind and having water to the south.

The *parti* of the house is very simply a dotted line connected by a continuous, gently curving roof that opens up toward the front, and slopes toward the back, with a gutter in the middle to deal with the rain. One part of the line is for the adults, the second part is for the children, and a break in between is used as communal space and an entrance. The line is also zoned, with a long, thin service bar running the length of the house at the back, separated by a corridor that is parallel to it from the "served" rooms in the front.

Murcutt has used a 5.6-meter bay as an organizing device for the one-story high building. The corrugated metal roof, which recalls the use of this material on barns and sheds throughout the Australian outback, is kept thin and braced by struts against updraft. The gently curved roof appears to have been spontaneously designed, but it was not since it is curved to relate to the angle of the sun in the summer and the winter. The goal was to use it to block the heat of the high

summer sun while allowing the warming rays of the lower winter sun to come in. The curve on the south side, over the service zone in the back, was also configured to protect against the high winds coming off the top of the hill. Louvered blinds behind glass walls can be adjusted to protect from the sun when necessary, or to be opened for a view to the Pacific whenever possible. Fixed glass on the upper range, just below the roof, is louver-free, because it is shaded by the roof overhang.

Le Corbusier once described a house as “a machine for living,” and the Magney House has a machine-like quality to it. This comes from its logical modular construction, highly crafted materials, precision engineering, and minimalism. Yet the difference here, relative to the earlier discussion about Critical Regionalism, is that it is integral to its time and place, with a clearly defined connection to its vernacular legacy.

CHINA

The Great Wall Commune

The Great Wall Commune is a group of 11 houses and a clubhouse, commissioned by Zhang Xin, each designed by a different Asian architect. The project was conceived by SOHO China Ltd., a development company run by husband and wife team Zhang Xin and Pan Shiyi, and represents a \$24 million investment. The site is located near the Badaling section of the wall, which attracts many tourists because it is one of the best preserved and most well-restored parts of this phenomenal movement. Each of the architects for the Commune were especially selected by Zhang Xin and Yung-Ho Chang, who is a professor at Beijing University, from Asian countries including China, Japan, Singapore, and Taiwan in order to help generate an Asian identity in the next generation of emerging designers. The architects were asked to experiment. The intention in organizing the residential equivalent of an art collection in an open museum beside the Great Wall is to inspire young Asian architects and artists to develop their talent. It was inaugurated in 2002, only 24 years after Chinese leader Deng Xio Peng opened that country up to capitalism. Prior to 1978, Chinese architects typically worked in government offices or bureaus in collective organizations that discouraged individual initiative or identification with the design of a specific building. The houses are placed throughout the 8 square kilometer site and are connected by a winding access road that snakes up into the mountain pass on which they are located. The barren hills in which they are placed create a dramatic backdrop for the houses, which have each been designed with a different theme in mind, as follows.

The Suitcase House Architect Gary Chang from Hong Kong proposed a solution to the perennial problems of storage and clutter in a house by designing one that acts like a suitcase. Compartments, organized in what the architect has called “stacking strata,” allow everything in the house to be kept out of sight when not in use.¹ The bottom “strata” contains all domestic equipment and is also the level where the household help live. The top strata contains a series of partitions that collapse into the floor and can be raised to subdivide the long, narrow rectangular house into different sections as desired. The skin of the house is also stratified into layers, made of folding panels that cover the entire side, which can be moved to



The Airport House is one of a group of contemporary homes that comprise the Great Wall Commune, near the phenomenal structure in China from which they take their name. *Source:* James Steele

create various patterns of openings. A middle stratum has been conceived as a *piano nobile* for living.

The structure of the house is essentially a steel box beam that cantilevers out over a concrete base on all four sides. This base houses the mechanical equipment. This long, narrow box beam allows the house to project out over the Nangou Valley wall on which the house is sited on one end, to take advantage of the view toward the Great Wall, and to use a north-south orientation to reduce solar exposure. The architect has named the 374 square meters residence the House of Wood; the middle, the House of Wind; and the bottom, the House of Stone.

The Furniture House The second house, by Japanese architect Shigeru Ban, is a contemporary translation of the traditional Chinese *hutong*, based around a courtyard in a square compound. Ban was also inspired by the rebirth of the furniture industry in China, and this, in addition to a furniture system he has been working on for several years, was behind his selection of the theme: He based the construction module on the standard sizes used in the contemporary Chinese furniture industry, and during his research found that bamboo plywood was used for concrete formwork and that it is stronger than veneer plywood used in Japan. He laminated bamboo strips onto plywood to create laminated veneer lumber that became the construction system of the 333 square meters house. Each of the rooms around the central courtyard are different inside, but share a floor designed like the deck of a yacht to convey a sense of luxury.

The See and Seen House The third entry was the See and Seen House by architect Cui Kai from China. This designer addressed the issue of how to interact with

projects around him to retain a sense of privacy while still being a good neighbor. The name he chose also reflects the need to preserve a sense of identity, while still being one part of what is essentially a series.

The Distorted Courtyard House Rocco Yim, who is based in Hong Kong, also chose the theme of the traditional courtyard, as Shigeru Ban did, and at 481 square meters it is substantially larger than that of his Japanese counterpart. Yim has introduced an interesting twist, however, in deciding to “distort” the vernacular prototype both to provide good views of the wall and to fit the house to the hilly terrain of the Shuiguan Mountains foothills. Yim was also interested in the effect that contemporary life has had on past ideas about privacy, making the idea of distortion symbolically as well as physically relevant. This house, like the others in the collection, is intended for rental by guests on holiday so that the way it will be used is far different from the way a family occupied a courtyard dwelling in the past.

The Split House Chinese architect Yung Ho Chang responded to the poetic notion of *Shan*, or mountain, and *Shui*, or water, as the beginning idea for his design. To accommodate both, he split this house into two parts so a stream running down the side of the mountain and through the site could pass through the middle, under an entrance with a glass floor, so the water can remain visible. By introducing a natural element into the center of the house, he intended to blur conventional distinctions between exterior and interior and the natural and human-made environment. He also approached it as a prototype that could be joined together on another site, if conditions permitted. He took a rather unconventional approach to materials, as well as using rammed earth combined with a wooden frame. Rammed earth or *terre pisè* has been used in China since the Prehistoric Period, and has been found in archaeological digs dating from the Shang Dynasty. Earth has the environmental advantage of leveling out temperature swings during the diurnal cycle, which can be extreme in this region.

The Twins Kay Ngee Tan, from Singapore, was also inspired by a poetic image from China’s past, but in his case, it was the landscape-painting tradition, which focused on the improbably vertical limestone karsts found in Guilin. He saw a parallel between the Shuiguan Mountains and these paintings, and intended for his design to blend into its surroundings. To do this, he chose local stone as the predominant material, and then decided to break down the scale of his residence by dividing it into two L-shaped parts. One contains the main living areas, and the other is positioned next to a steep cliff in this part of the valley, is placed at a 45 degree angle to the first, and holds the dining room, kitchen, bedrooms, and baths. There is a secluded courtyard between them, with a series of stepped wooden decks that connect the main living levels with the landscape. A stone pathway leads to the main entrance, located between the “twins.”

The Shared House Kanika R’kul, from Thailand, decided to concentrate on expressing the difference between the rugged character of the site and the lack of exposure to nature that is typical in the city, where a majority of the guests would be coming from. Rather than being inward and protective as urban houses are, he wanted this experience to be different, so that those in this rural equivalent could share the open surroundings, breathe clean air, see “a clear sky full of stars,” and participate in other things that are now rare in all urban areas in China.

The Cantilever House The Suitcase House, described earlier, has a cantilevered structure, but it is secondary to its basic concept of putting the detritus of daily life in storage, out of view. This Cantilever House, by Chinese architect Antonio Ochoa, however, uses the structural device as its main idea, to create a platform from which to look out and down to the Great Wall, the mountains, and the valley floor. It has a commanding location, nearly halfway up the steeply banked road that links all the projects together. Ochoa, following Le Corbusier in all but his rejection of the grid and its subsequent “freedoms” of plan, elevation, and strip window, does appropriate the idea of a *promenade architectural* from the Modernist master and the roof garden as its termination point. This *promenade* leads up naturally from the sloping path that approaches the flat-roofed, orthogonal, box-like building jutting out above it, into a telescoping monumental stair beneath it that leads up to a hidden entrance. The roof garden is treated, in the architect’s words, as a “*belvedere*.”

The Bamboo Wall Rather than concentrating entirely on the character of the site, as the majority of the other designers who were selected to contribute projects to the Great Wall Commune decided to do, Japanese architect Kengo Kuma chose to make a commentary on the historical relationship between his nation and that of his client. This is a fundamental, symbolic decision that strikes at the heart of the choice by Zhang Xin and Pan Shiyi to promote Asian identity in their selection process on two levels. The first is the issue of the reality of Asia itself, which is really a western construct, implying a unity when no such conformity exists. The second issue is the relationship between China and Japan, which has not always been smooth, especially during the period just before World War II. As Thai architect Sumet Jumsai once said, “The only thing that Asian nations have in common is the monsoon, bamboo and rice.” Rather than being uniform, however, bamboo comes in many shapes and sizes. While both China and Japan have bamboo, there has been an active trade in it between the two nations because of this difference. Kuma chose to use it in his house design as a gesture of sharing. His idea of also using the metaphor of the wall has the same intent, echoing the Great Wall nearby. In his original concept sketch, Kuma reveals it very clearly, because it shows a wavy base line, representing the undulating terrain throughout the project site with a series of straight vertical lines running across it. These are longer or shorter on the bottom as necessary to deal with differences in topography, but are all of the same height, implying the seemingly endless continuity of the Great Wall itself.

Kengo Kuma stands alone, among the top international group that he belongs to, in his expressed wish to create architecture that is transparent to the point of immateriality and has a light footprint and impact on the earth. He favored the concept of a form that implies continuity such as a wall made of light bamboo rather than a single object building for the same reason. At 716 square meters in area, this house is one of the largest in the entire series, but because of this lightness, it does not seem to be.

The Forest Home Kuma’s fellow countryman Nobuaki Furuya selected an equally evocative but less potentially polemical metaphor in his design. He was inspired by a dream that Italian sculptor Alberto Giacometti had described, of seeing a ball of light shining in a dark forest, and thought of people coming to the wild

Great Wall Commune site from all over the world in this way as a communion of spirits.

The Airport House Chinese architect Chien Hsueh-Yi approached the design of the last of these 11 guest residences as a series of pavilions that are each designated to serve a different function, attached to a common service spine, like terminals at an airport. This led him to use the linear service zone as a retaining wall, backing it against a slope at the back of the site, and to connect the house to the main road with a curving driveway, across the gently rolling site. There are, finally, three “terminals” on living spaces that project out at different angles from the spine, relegated to living room, kitchen, and dining room functions, while the stone service bar behind them also acts as an internal “street,” or concourse-like circulation pathway, that joins them all together.

The Commune Club The clients also commissioned Seung H-Sang, from South Korea, to design a “Commune Club,” to provide shared facilities for the guests renting these 11 houses, as well as management offices and a reception area. The facilities include two different restaurants, a swimming pool, and several shops. The main material used for the Club is Corten steel, which provided maximum contrast with the trees and rocky terrain around it. As the steel rusts, however, it will increasingly blend in with its rugged setting.

JAPAN

Tadao Ando: The Koshino, Nakayama, and 4 X 4 Houses

Tadao Ando is a self-taught Japanese architect who has been inspired by proto-Modernists such as Le Corbusier and Louis Kahn. He served as an apprentice in a traditional carpenter shop near Osaka and was a professional boxer for a short time before setting out on a journey of self-discovery that led him to be an architect. His time as a boxer left him with the belief that life involves struggle and that to survive and succeed, one must be physically and mentally tough.² This philosophy has served him well in his chosen profession, in which these two attributes are certainly important. Ando shares with Le Corbusier and Louis Kahn what historian Kenneth Frampton has described as a “virtually religious conviction about the spiritual calling and capacity of architecture and its critical potential for the revitalization of society and life.”³

This belief in the regenerative power of his art is especially poignant in Japan, where a majority of Ando’s buildings are located, because of the chaotic soullessness that has characterized Japanese urbanism since the end of the American occupation in the mid-1950s. That lack of order is even more surprising in a nation that prides itself on its affinity with nature and the beauty of its traditional architecture and especially its houses. Whether they are rural *minka* farms or more formal *shoin*, these vernacular residences are invariably in complete harmony with their natural settings. This is also because they are built of local material, such as wood and stone, which accentuate their close relationship with their context.

Tadao Ando continually strives to recapture the sense of place that traditional dwellings in Japan consistently convey. But, paradoxically, he does so with untraditional materials, such as concrete. This may seem strange, but after understanding

his motives more completely, it becomes clear that his work exemplifies the essential attributes of *Shinto*. This is an animistic religion, unique to Japan, which is based on the idea of a sacred life force, or *kami*, that exists in both the animate and inanimate elements of nature. Ando has managed to combine the quest for spatial spirituality, typical of the early Modernists, with the idea of a life embodied in all materials that comes from his own ancient heritage.

Concrete Comes Alive In Ando's hands, concrete is transformed from an inert, industrial material, into beautiful walls with silken surfaces that provide the perfect foil for sunlight, shadow, and the sky. He uses it in minimal geometric configurations that emphasize the contrast between its nontelluric essence and the natural context around it. The order that he imposes on nature with these Cartesian systems heightens our awareness and appreciation of each. To achieve this, Ando has investigated concrete construction, in his goal to make the material seem to come alive. He has done this by interrogating and altering each of the steps involved in building a concrete wall. First of all, he uses a stiffer mix to give it a denser consistency. Second, he carefully controls the spacing of the steel reinforcing bars inside it. Third, he specifies a more thorough vibration of the mix, once it is placed inside the forms, which also makes the surface of the wall smoother. Fourth, he has carpenters handcraft these forms, and uses tightly grained wood for the face boards, instead of a generic brand of plywood. He even assigns two separate teams of carpenters to build the forms at this stage so that there is a sense of competition, and at least one of them will approximate perfection.⁴

Ando has described his intention as an attempt to create "architecture which brings new energy and life through constant dialogue with and the collision of contextual elements." He says he seeks to compose "purified spaces defined by light."⁵

The Koshino, Nakayama, and 4 X 4 Houses Three examples of Ando's approach that span the range of his career, in the chronological order of their completion, are the Koshino, Nakayama, and 4 X 4 Houses.

The Koshino House, which he completed from 1979 to 1981, is located in the foothills of Mount Rokko, in Kobe, at the edge of a national park. It was designed for fashion designer Hiroko Koshino, for the upscale neighborhood of Ashiya, located there. The original house was based on the concept of two parallel bars, and a semicircular addition was placed next to them in 1984. The house illustrates Ando's idea of contrasting concrete against a natural background because of the lush, forested landscape beside the house. One of the bars is private, with bedroom and bathroom functions located there, while the second is more public, with living, dining, and kitchen inside. In the public part, Ando has held the flat roof slightly away from the concrete wall, which lets the sunlight cascade down its side. The roof is supported by two thick crossbeams, which divide the rectilinear roof into three equal square bays. The light coming through the rift between the roof and the wall also casts deep, diagonal shadows from these beams, which open from wall to wall, and this angle constantly changes as the sun moves, marking the passage of time as they do so.

There is a courtyard between the parallel, bar-like wings, with steps that allow it to conform to the sloping site. Ando designed this as an outdoor living room, to

be used when weather permits, and this reinforces the idea of connecting to nature, which is so important in his work.

The Nakayama House The Nakayama House, which is located in Suzaku on the border between the Prefectures of Kyoto and Nara, was completed between 1983 and 1985, at the same time as the Koshino House addition. The *parti* is similar to that of the Kobe house in that it is also based on the idea of two parallel, rectangular forms, but rather than being separated by a courtyard as they are in the Koshino House, they are divided by a wall. This is due to the restrictions caused by a long, narrow, urban site, which Ando accepted as a challenge. The house is two stories high, divided into a built bar and a second, unbuilt volume of equal width and length that is its walled, open courtyard. This division between living spaces in one volume, separated by a wall along their longitudinal east-west axis from an open courtyard, sets up a tense spatial dialectic, and Ando says that “this relationship, of the house to the courtyard is central to the entire composition.”⁶ A second wall, running along the site line on the east, acts as a guide to the entrance, located on the side of the house, in a gap between the two. This gap is 20 percent as wide as the combined house and courtyard, based on the module that Ando has used to divide the site along its north-south axis. All that is visible, on approaching the house across an empty open court in front of it, is the blank two-story concrete wall joining the living bar and its twin courtyard. The finish of this wall is typical of the level of excellence that Ando has consistently achieved in the use of this material. It serves as a dramatic screen or background for the shadows that are cast on it by several tall trees placed at the edge of the small, open, entry courtyard. There are only three long, narrow, vertical slots, which are cut into this two-story high wall, along its eastern edge on the right-hand side of the entry court as one approaches, which are placed there to offer a hint of the long-walled inner courtyard beyond.

The entrance leads into a short L-shaped hallway, past a kitchen and dining space, into the living room at the end of the long rectangular volume. Sliding glass doors along its entire length can be opened to allow it to be joined to the courtyard beside it, essentially doubling its size. The parallel courtyard, which is like an open-air alter ego of the house beside it, has no plants or trees or water in it, just a flat concrete floor, and stark enveloping walls that are as high as the living component of the house itself. This starkly minimal, almost monastic, Zen-like space is a microcosm of Ando’s aesthetic, intended to heighten one’s awareness of nature, rather than destroy it. All that is visible from inside the house is the concrete wall surrounding the open courtyard, the trees above the wall, and the sky above them. He has said,

the problem I set for myself in the design was to see how rich an imagery could be created by means of natural elements such as sunlight and wind operating on these spaces. I wondered if it would not be possible to create sublime architectural spaces, paradoxically through an exhaustive concern for the conditions of materials, and to transform hard materials in something that appeared soft.⁷

The 4 X 4 House The 4 X 4 House was built soon after the Kobe earthquake in 1995, near the Akashi Kaikyo Bridge connecting Kobe with Awaji Island. Ando had access to the extremely small 65 square meters site, with an allowable building



External view of 4 X 4 House. Courtesy of Leo DiLeo, France; Flickr

footprint of only 23 square meters, and thought of an unorthodox way of finding a client for a house there. He advertised in a popular periodical that he would design one for whoever provided the most interesting response to his question of why they would want to live in such a restricted space. The answer he chose came from a young bachelor with architectural training who simply drew a cartoon of himself sliding down a board from the top of a tower into the bay below.

Ando's design is characteristically deceptively simple. It is a four-story high square plan tower with a scissor stair taking up one-third of its volume, divided into an entry and bathroom on the first floor, a bedroom on the second, a study on the third, and a living room, dining room, and kitchen on the fourth at the top. To accommodate the additional area needed to accommodate these extra functions and to maximize the potential of a view, the volume at the top shifts one meter south and east, toward the water, adding an L-shaped piece of space, and more square footage as it does so. The visual effect of this offset is that the top floor is presented as a cube, with one whole side of glass equally divided into four square panes, facing the water, displaced from the centerline of the tower that supports it. This glass wall ensures that the living and dining areas are constantly full of light, and at night the light inside this cube makes the tower look like a lighthouse from the bridge and the water.

The Ushida Findlay Partnership: Soft and Hairy House

Ushida Findlay is an architectural firm that is based in Tokyo, made up of husband and wife team Kathryn Findlay and Eisaku Ushida. Findlay, who attended

the Architectural Association in London, was greatly influenced by Peter Cook, of Archigram and Plug-in City fame. In his own work and in his teaching, Cook has always tried to challenge established conventions and has drawn inspiration from popular culture in making iconoclastic attacks on the status quo. The Archigram group, of which he was a part, for example, focused on the city rather than individual buildings and proposed solutions to urban overcrowding and Wright that seemed outrageous when they were put forward in the 1960s, but are gradually appearing to be extremely visionary now. In spite of the fact that their proposals were entirely graphic, they were delivered in a Pop Art style, and they never actually had anything built, they had an enormous impact on several generations of young, mostly British architects.

Findlay went to Japan after leaving the AA to do postgraduate research at the University of Tokyo, while also working in the office of Arata Isozaki. She met Eisaku Ushida there, who had also worked in Britain previously. They are now married and have a family. Findlay claims that the partnership has resulted in a “duality that gives us perspective through distance, which is quadrupled with familiarity. Knowledge from one culture provides a fresh approach to the designs we execute in the other country.”⁸

The Soft and Hairy House After testing the objectivity that this duality provided them in several unorthodox projects such as the Truss Wall House, which explores the structure potential of replicating an exoskeleton, they were contacted by a young Japanese couple who wanted to build a house near Tsukuba, in Ibaraki Prefecture. Because of overcrowding in Tokyo, the Japanese government has adopted a satellite city policy in an attempt to decentralize the services provided by the capital and distribute the population more evenly throughout the country. Tsukuba is one of these new centers, and it received attention in architectural terms with the new Civic Center that was built there in 1988 to announce its higher status, designed by Arata Isozaki. Isozaki used that opportunity to make a commentary on the social and urban conditions that this disbursement policy is causing by clustering the various buildings of the Center, such as the offices, shops, and a hotel that are usually associated with complexes of this sort, around a sunken, elliptical plaza. In addition, he deliberately used historical references, such as Michelangelo's plaza at the Campidoglio in Rome and Charles Moore's Piazza d'Italia in New Orleans, and eroded the edges of them to convey the sense of an empty, decaying middle. By replicating and then erasing recognizable precedents of an urban public realm, and then sinking it below ground level, Isozaki tried to symbolize the plight of such instant cities as Tsukuba, which have not had the benefit of a long period of evolution, which others, like Kyoto, have had. This has left them with a soulless, empty feeling, as contemporary versions of an urban wasteland.

As development of quickly constructed, contractor designed and built structures continues to cover the flat *ibaragi*, or flat rice fields, of the Prefecture that takes their name, this chaotic human-made landscape continues to metastasize. This, along with the brief given to the architects by their young clients, was the point of departure that Ushida Findlay used in designing this house. The clients, who are architectural journalists, were fascinated by a prophecy that the Spanish artist Salvador Dali made about the architecture of the future, saying it could be “soft

and hairy.”⁹ They wanted to explore the possibility of creating such a house for themselves and felt that Ushida and Findlay were the architects who could best help them realize their fantasy. They wanted to use surreal devices to free themselves from the predictable banality being propagated around them. This desire dovetailed nicely with the architect’s wish to make a commentary on the state of urban development in Japan, similar to that made by Isozaki in Tsukuba, but at the microscale of the house.

Social Order, Urban Disorder Kathryn Findlay has verbalized that intention quite eloquently when she said,

In Japan, the promise of the future obliterates any meaningful ties with its rich cultural history. In the West, society is unruly, but its cities are ordered, while in Japan, it is the reverse. Chaotic cities, free from aesthetic planning control, are inhabited by a population controlled by a rigid social order.¹⁰

Ushida and Findlay started with the idea of reproduction, inspired by a photograph that their clients had given them of the young husband and wife lying on the floor of their previous house, curled toward their baby, who was placed between them. They translated this photograph quite literally into a plan in which two opposing walls, which form the external perimeter of the residence, meet on its northern edge, and each curls inward to form a spiral that represents the heads of the mother and father. The front door is located in the gap between these circular, stylized heads, which each contain a “den.” An egg-shaped form, presumably coming out of the part symbolizing the mother, projects into an open central courtyard and contains the bathroom. This egg is distinctly different in appearance from the rest of the one-story reinforced concrete and granite/Gunite house in that it is intensely dark blue in color, nubby in texture, and covered with small portholes that let in light. One larger porthole at the tip of the egg allows a direct view out from and into the Jacuzzi-style bathtub to and from the central courtyard. There is a uniformly wide cornice, starting at the continual 8 feet height used for the doors, surrounding the open courtyard, which is more than a meter deep, creating a parapet for a garden that covers the entire, flat roof of the house. A stairway, running along the southwest edge of the court, opposite the front door, provides access up to this planted surface, which represents the “hairy” part of the house. The egg is tucked underneath the soffit of the continuous cornice, with its wider arching bottom effectively providing a separation between an anteroom located just beyond the front door to its left and the master bedroom. The other spaces that are distributed in continuing series around the court are a living room in the northwest, which has a built-in, inflatable, amphitheater-like sofa in that corner as seating, a gallery-style kitchen, and a large playroom. There is a back entrance directly next to an uncovered, two-car off-street parking area, with several steps leading up from that concrete apron onto a long, narrow walkway that leads past the playroom. This is the less formal entrance that the couple uses everyday, with access to and from it through the kitchen.

An Edible Roof Because of its verdant covering, the Soft and Hairy House has been cited as a model of sustainability and ecological sensitivity. It is true that the green roof cuts down on energy use, and it does include herbs and edible greens

in addition to the local grasses and larger bushes and trees that grow there, making the owners partially self-sufficient, since they save a few trips to the grocery store. The use of a courtyard typology may also be said to contribute to this claim of environmental credibility, but that argument really misses one of the main points behind the design. The house is intended as a reflection upon the character of the built and unbuilt landscape around it, in addition to its role as a three-dimensional representation of a Surrealist painting. The predominant impression that the greenery on the roof gives is one of continuity with the underdeveloped plots around the house. After some time living in it, the young owners have also told the architects that entering the house is like experiencing a utopian version of the constructed monotony outside. In a sense, inside and outside are reversed, which is suitably surreal. But, the claim of sustainability is also questionable because this is a single-family house, mostly made of reinforced concrete.

Life Imitates Art Imitates Life The planting on top may be the hairy part of the house, but where is its soft equivalent? This virtually unseen component, which is integral to the experiential impression of each of the spaces, is a pleated, tent-like, canvas ceiling that runs around the entire tube-like interior, with the exception of the kitchen. In the corner, above the inflatable mini-amphitheater of the living room and above each of the cranial dens, the pleating turns into a complete circle, creating the impression of a sultan's palindrome of the type that would be used as the ceiling of a battle tent. In their search, carried out prior to design, the architects encountered the writings of Bachelard, who discusses the symbolic, and "psycho-geographical" aspects of space and has attempted to empirically measure human reaction to different kinds of interior, three-dimensional experiences. There were also many other precedents, such as *Association Sens Espace* established in Paris by Hervé Baley in 1969, to explore the connection between environmental deprivation and psychological disorders, in an effort to reverse that dehumanizing process.¹¹ *Sens Espace* also advocates "soft, flexible, morphogenic" architecture to facilitate the reintroduction of biomorphic unity.¹² Other, previous attempts to achieve this same goal include the "Endless House" by Frederick Kiesler, in the 1960s, and the Casa Mila and Casa Batlló by Antonio Gaudi, described elsewhere here.

Neither the Kiesler nor Gaudi examples, however, are soft and hairy; they are just organic, rather than being based on orthogonal spaces. As such, the Ushida-Findlay house is part of the Expressionistic tradition in contemporary architecture, based solidly in the desire to allow subjective feelings to predominate over a rational, objective approach in an effort to establish continuity between the human body and the built spaces around it. The fluidity of those spaces not only recalls the biological form and functions of the human body, but also reproduces the psychosensorial landscape of the subconscious.

Shigeru Ban: The Picture Window House

The Picture Window House is located in Shizwoka, Japan, near Tokyo. It was completed in 2002 and is one of a series of houses by Shigeru Ban in which the well-known Japanese architect has explored the ways in which the envelope or skin of a building can be manipulated to create a better relationship to the natural environment. This idea was the driving force behind the Picture Window House. It is

located on a gently sloping site that overlooks the Pacific Ocean, making the need for an external connection to maximize the view one of the most important considerations. Ban decided to use the side of the house facing the ocean as an unobstructed frame for this view, requiring a creative structural solution to do so. The house is two stories high, with a long and narrow rectilinear configuration. Ban has supported the second floor by using two 60-foot long trusses, creating a columnless 8 feet high by 65 feet long opening facing the ocean.

The concept is essentially based on the use of two parallel 10 feet deep trusses, supported at each end by equally wide, cross-braced, truss-like legs, to create a completely column-free middle, open in both the front and the back. One potential problem with this very straightforward Craig Elwood-like box beam solution is that the long parallel walls of the second floor have the diagonal cross braces of the trusses running along the entire length, blocking the view. Ban has solved this potential conflict by conceptualizing the second floor as a private zone where the bedrooms are located, with their privacy protected by a floor-to-ceiling louvered screen that runs along the entire oceanside elevation, which also blurs the issue of obstruction of the view by the cross bracing. The wide legs at each end of the pair of trusses also provide areas for subsidiary uses, the category that Louis Kahn referred to as “servant spaces” in his own work. The first floor of the house has been kept as open as possible and is treated as one large space divided by a free-standing kitchen counter and a stairway to the second floor. This minimal approach to the interior accentuates the direct reference to the ocean and the horizon in the distance. The second floor has four bedrooms, which are each also oriented to the view. Subsidiary spaces, such as an entrance vestibule, study storage rooms, and bathrooms, have been treated like saddlebags attached to each end of the rectilinear plan on each level to keep the center of the house as open as possible. The stairway is made of thin metal treads and rails, using as little material as possible, and no risers, to make it seem to float in the central space. The wide legs at each end of the two trusses make this possible.

The minimal approach and singular vision of the architect of the Picture Window House, related to a confrontation with nature, make it tempting to compare it to several of the houses designed by Ban’s fellow countryman, Tadao Ando. There are obvious similarities in these areas, but the one major difference, of course, is the palette of materials that each architect uses and the reasons behind their use. Ando prefers concrete, because it is essentially antithetical to nature and he finds beauty in this paradox. By contrasting the delicate, living ecological context in which he places his houses with the harsh unnatural material he uses to make them, Ando heightens the experience of appreciation. His minimal interiors and judicious use of natural light do the same. Shigeru Ban, on the other hand, characterizes himself as an architect who is at the forefront of the battle for sustainability, using environmentally friendly materials whenever possible. He first gained international recognition through his creative use of paper tubes as structural components in projects of various types and sizes. He was inspired by the stability of a commercially available product called a Sonotube, which is a pressed paper cylinder that comes in an incremental series of diameters that is used as a form for a round concrete column. A circular cage of reinforcing bars is slipped into the tube,

which is braced to stand vertically, and after the concrete is placed in it and has been allowed to cure for the required time, the paper Sonotube is stripped off by cutting and uncoiling it. Ban has used the tubes on their own, without the concrete inside, by connecting them with metal wires or fasteners. One of his most memorable projects is a “paper” church, built entirely of these tubes.

The deep steel trusses that were a necessity to support the goal of an unobstructed view in the Picture Window house are obviously not as sustainable as the use of paper tubes, but the environmental impact of the use of steel here is somewhat mitigated by the reduced amount of material that the clean span makes possible, as well as the natural ventilation that it provides, since both the front and back of the house is entirely open on the ground floor. This clear span also reduces the amount of energy needed to heat and cool it during the year, in a region in which summers are hot and humid and winters can be bone-chillingly cold.

Ando and Ban also share an interest in updating the traditional elements of Japanese houses, such as the *engawa*. This has historically been used as a narrow porch beyond the demising line that separates the interior from the interior in which people can sit and enjoy a garden view, or see beyond the confines of that landscaped enclosure to the forests or mountains beyond. The *engawa* is usually a few steps lower than the interior, but not yet at the level of the garden, and so it is truly an intermediate space that mitigates between the human-made and the natural world. There are many contemporary equivalents of such a space in Ando’s houses and Ban’s Picture Window House has one as well. This runs the entire length of the oceanfront side of the house and is roughly as wide as its traditional counterpart.

MALAYSIA

The Cheong Fatt Tze Mansion

Cheong Fatt Tze came from Fukian, China, to Penang as a young man and labored as a coulee on the docks at the main port of the island at Georgetown.¹³ He rose up through the ranks of the stevedores, and after saving his wages for some years became a merchant. He grew wealthier and in the late 1880s built a house on Leith Street that is one of the finest examples of a Chinese Courtyard style house outside that country. It took him over 20 years, until 1904, to complete it because he insisted on using only the best craftspeople and materials available for its construction. He brought masters of various crafts techniques to Penang from China, such as experts in the art of using pieces of varicolored broken glazed pottery for the decoration of the gable ends of the roof. He also imported Art Nouveau-inspired stained glass windows from Europe, geometric floor tiles, which were then in vogue in the most stylish Victorian homes in England, from the principle tile works in Stoke-on-Trent, and cast iron railings from Glasgow, Scotland.¹⁴

A House with Many Rooms and Wives The house, which has a large-scale rectangular section aligned with, but set back from, Leith Street, also has several wings, containing 38 rooms in all, five courtyards covered with massive granite pavers, seven staircases, including several elegant spiral examples, and 220 windows. The eclectic character of the house, which is a result of the mixture of Asian and

European styles, building techniques, and materials, is also the main reason for its charm. Dependencies, including the houses for the staff, were built in the same style in a row house configuration on the other side of Leith Street.¹⁵

One of the most beautiful artifacts in the house is a gold-leafed wooden screen that separates the front reception hall from the first major central courtyard in the midst of the family section beyond. Cast iron columns support an upper level balcony that surrounds this courtyard, and several of the spiral stairs also have composite risers and treads that were cast in one piece, with cast iron railings.

This central courtyard serves an important environmental function in helping to keep the house cool by promoting natural ventilation. Cooler outside air, provided by the prevailing breeze from the water, little more than two blocks away, is drawn in across the front lawn and in through the windows and front doors, which are left open during the hottest time of the daily convection. As the air heats up in the wide expanse of the square, open courtyard, it rises, keeping the cycle going. The courtyard is also several feet below the level of the ground floor, so that drains, or sluices, cut into the middle of each of its four sides, direct rainwater, which is considerable in this tropical region, into channels and pipes placed below the floor. These run in a complex network beneath each of the rooms on the ground floor of the house to cool them off during the humid aftermath of each storm.

Cooler temperatures were certainly important in a household in which there were a number of women competing for the position of lady of the house, since Cheong Fatt Tze had several wives as well as a number of concubines that were constantly vying for attention.

Feng Shui *Feng shui*, which translates roughly as “wind and water” in Chinese and amounts to a form of geomancy, was a major determinant in all of the choices made in the design of this mansion. These relate to the relationship between the primary and secondary courtyards, in order to amplify the benefits of cross ventilation to the entire house. But *feng shui* relates to more than just physiological phenomenon, involving beliefs that border on superstition as well. This may be based in the origins of the practice, which were solidly based on common sense decisions about beneficial orientation, which then shifted to the desire to use it to increase the good fortune of the family living in a particular house. It has now evolved into a mixture of sound environmental strategies and siting decisions based on beliefs about the best direction to face to receive wealth, or at least not to lose it.¹⁶

The Blue Mansion The Cheong Fatt Tze house is known locally as “the blue mansion” because of the vivid hue of its exterior walls. This color is so powerful that it hardly seems possible that it is original, and yet the present owners, who have extensively restored the house over the past several decades, found it as the final color under many other different ones that were layered over it in the past. Architects Laurence and Lillian Lo, who bought the house in the late 1980s, found it in a dilapidated state, with many different people occupying every room, including the central hall. The wooden screen had been removed and sold, and there were motorcycles parked in the courtyard as well. The couple has done a remarkable job in bringing the house back to its original state, in what has clearly been a labor of love.¹⁷

One apocryphal story that deserves retelling, among many others about the eccentric millionaire businessman who lived a quiet adventurous life, is an incident related to his lifelong dream to sail on a cruise liner to America. When he was wealthy enough to be able to afford the price of a round trip ticket for himself and his entourage, he was refused passage because he was Chinese.¹⁸ He then bought the cruise line and fired those responsible for the prejudicial decision before setting sail for New York. Among the many photographs of Cheong Fatt Tze and his family that now hang in a room used as a library in the mansion, there are two that are especially memorable. One of those is of the tycoon dressed in top hat and tails, with his many wives and concubines around him, ready to leave for his transatlantic voyage. The second is of his seventh wife, who apparently ruled the household with an iron hand. Her piercing eyes seem to follow you, no matter where you move in the room.¹⁹

Ken Yeang: Roof Roof House

Ken Yeang was born in Penang, on the west coast of Malaysia, in 1948. He attended both the Architectural Association in London and Cambridge University in that city in Britain before studying for his doctorate at the University of Pennsylvania. His area of emphasis, not surprisingly, is ecological design, because each of these institutions, especially at the time he attended them, had particularly strong areas of emphasis on the subject. While he was at the Architectural Association, Maxwell Fry and Jane Drew were working on their landmark book on tropical architecture, which remains the standard text in the field. The reputation of the Environmental Division of Cambridge University continues to build from strength to strength, and while Yeang was at the University of Pennsylvania, Ian McHarg was also just completing *Design with Nature*, which revolutionized the way that architects and landscape architects viewed their interventions into the environment. The publication of McHarg's book coincided with the first Earth Day in June 1970, becoming a handbook for all those who were actively involved in the ecological awakening that took place at that time.

The Advent of Sustainability Ken Yeang, then, had the best training in ecological design that was available to him at the time of his professional education, just prior to the rising interest in sustainability, which is so prevalent in all the design disciplines.

Yeang returned to Malaysia after leaving Philadelphia to open his own firm in partnership with T. R. Hamzah, in Kuala Lumpur. Soon afterward he designed and built a house near his office for his growing family that bears testimony to his personal design principles. It was completed in 1984 when Yeang was 36 years old.

The Roof Roof House The Yeang house is commonly referred to as the Roof Roof House because of a distinctive curving canopy that stretches across a second, enclosing roof below it. This name is a double *entendre* of sorts as well because in Bahasa, which is the local language of the Malays, plurality is expressed by repeating a word rather than ending it with "s," so that books, for example, are *buku-buku*.

Yeang uses three passive strategies to ameliorate the hot, humid microclimate in which the house is situated, in addition to the canopy roof, which provides shade

for the second enclosure, and so reduces heat again through the surface that gets the majority of the solar exposure during the day, including a veranda, a wind tower, and a fountain.²⁰

The Black and White Bungalows of Singapore as a part of the bungalow typology, described elsewhere here, are equally effective in dealing with an even hotter and more humid equatorial climate of that city-state to the south of Kuala Lumpur. The second louvered canopy of the Roof Roof House, as well as numerous open air decks and balconies on both the lower roof and first floor below it, serves a similar purpose to that of the verandah of the colonial bungalow, of providing a shade structure that induces air movement across the decks and up through the openings in them, through a chimney effect that begins at the core of the house on the ground floor. This effect overlaps the second concept of the wind tower, which is associated more with the Gulf States, such as Bahrain, than it is with Malaysia. The principle of the wind tower, described elsewhere here, is to capture the high laminar flow of the prevailing breeze and to direct it into the main living space. People in the hot, humid regions of the world in the past planned their houses according to diurnal zoning, in which they occupied the most climactically suitable area of the residence at the time of the day that it was at peak performance, with functions of the various rooms following suit, rather than remaining in one space during the diurnal cycle. A more succinct way of describing the difference between the living patterns of people in the past and those today is that in traditional societies people moved from room to room as the day progressed. Today people remain stationary in the living room, family room, or whatever the main space of the house is, while the mechanical equipment that keeps the house warm or cool is the only thing that moves.

In the case of the wind tower, the air that it brings into the house begins to rise by convection as it heats up, moving up through the openings in the decks mentioned earlier, and this is how the overlay with the verandah effect takes place. Wind towers in the Gulf States, as well as Saudi Arabia and Egypt, were typically also paired up with a water source, called a *salsabil*, placed at the base of the tower, to cool the breeze as it entered the room. Environmental testing laboratories, such as those at Cambridge University, are now experimenting with misting devices to produce a contemporary version of this interaction between air and water, but Ken Yeang has used a swimming pool to replicate the process in a way that is appropriate to his fun-loving nature.

The house is divided into living, dining, and kitchen functions on the first floor, along with large and small bedrooms that each have an en suite bathroom connected by a spiral stair to a second level above. This upper floor, which is organized around a small open, central atrium, has an additional three bedrooms and two baths, including a south-facing master bedroom suite presumably positioned to take maximum advantage of good *feng shui* and *chi*.

The house is modest in size, with each room being of minimal scale. Outdoor decks, however, nearly double the livable square footage of the residence, concurrent with Yeang's general belief that the relatively benign climate of Malaysia can support an indoor-outdoor lifestyle at all but the hottest times of the day.

Jimmy C. S. Lim: The Salinger House

The Salinger House, by Jimmy Lim, is located on the fringe of what used to be a rubber plantation about one hour south by car from Kuala Lumpur, Malaysia, and was built in 1992. It was commissioned by Rudin Salinger, the brother of Pierre Salinger who was well-known as the press secretary during the Kennedy administration, and his wife, Monica. Rudin Salinger, who converted to Islam, and his wife wanted a traditional Malay house, and Lim decided to translate that venerable vernacular standard into a contemporary equivalent. He wanted to provide the clients with all of the environmental advantages of the traditional Malay house, but to add necessary modern convenience as well.

To achieve this double objective, Lim enlisted the help of a master carpenter from the area named Ibrahim bin Adam to help him. Adam was one of the last remaining craftsmen in the area who knew how to build a Malay house in the traditional way, with no metal connectors, such as nails or screws, of any kind. The process of design and construction took more than six years, mostly because of the difficulty that both the architect and the builder had in obtaining the wood they wanted and in precutting the wood into the components they wanted, to be assembled on the site. In the past the material most commonly used to build a house of this kind was either ironwood or chengal because of their resistance to rot and infestation by termites, but due to increasingly stringent regulations that safeguard rain forest hardwoods in Malaysia, these species have become very scarce and expensive. Lim was able to find three chengal trees that were available from the state park service, and Adam assured the architect that they were big enough to provide all of the timber necessary to build the house. This gives some idea of both the size of these trees and the efficiency of the builder in cutting the pieces he needs from them. Ironwood and chengal are each so dense that they sink when put in water. They also grow very slowly and are very heavy, and one 25-foot column in the Salinger house weighs one ton.

When the time came to buy the trees, the architect, along with Ibrahim bin Adam and several members of his crew, went to the state forest and selected them personally. They were delivered to the bottom of the site, which is located on a slight rise, and the builders worked with them there since they were too heavy to move. Adam was constrained by several disabilities, since he is blind in one eye and lost his right hand in a fishing accident, yet was still able to precisely measure each piece of wood and to make the intricate cuts required to join them without metal fasteners. These joints are similar to those used in the construction of the traditional Japanese house. One of them, called a *tebuk pasak*, is a mortise and tenon joint, involving the making of a slot through one piece of wood and a shaped projection that extends beyond this slot, with a hole in the end of it, on another, so that the two pieces can be joined by a peg.

Two Adjoining Triangles Jimmy Lim changed the conventional, linear, and inherently additive organization of the traditional Malay house in this instance, using a plan form that resembles two conjoined triangles. The larger of these, which is enclosed by timber walls for privacy, has the living area on the first level and a kitchen raised by columns above the ground, joined by a stairway to the bedroom and bathroom above. Strip windows have been placed in the wood slotted

walls where necessary to provide light and air, and these are shaded by wide roof overhangs. The smaller triangle contains the dining area, on a veranda or deck adjoining the kitchen, which is partially shaded by its sown angular pitched roof. These roofs are covered in handmade tiles, produced by packing clay from the site into a frame-like open mold and then putting the wet tiles out in the sun to dry. The tiles, which are straight on three sides and pointed on the fourth downslope edge, have one curled edge opposite the pointed end that wraps around a horizontal roof purloin below it. This eliminates the need to nail the tiles down, since they overlap like the feathers on a bird, and their weight holds each successive layer down. This vernacular system is impressive, considering the fact that Malaysia is subject to monsoon strength rains and wind. The clay also allows the roof and the spaces it covers to breathe, ventilating the house vertically as it does so. The house has a hexagonal masonry core, unlike its traditional counterpart, which contains the entrance, a small foyer, a toilet, and the main stairway. This stair links the living room, inside dining area, kitchen, and guest bedrooms on the raised first floor with the master bedroom, dressing room, and study on the second, and also provides an air shaft for an additional source of vertical ventilation in the process. The house has a contemporary equivalent of the *anjung*, which plays such an important part in the social life of its traditional Malay equivalent. This room, which straddles the public/private division that is critical in this society, is partially inside and partially out; it is meant for receiving visitors and guests as well as serving as a social space for the family. In the informal postoccupancy evaluation made by the architect, he found that the house performs very well environmentally, with the stairwell having the most stable temperature readings and being the coolest area over a 24-hour period, and the *anjung* having the most pronounced temperature swings, being slightly cooler than the outside temperature during the day and cool at night.

Similarities and Differences The key similarities between the Salinger House and its traditional Malaysian predecessor then are that each was made by hand, with no machinery or machine-made parts being used. They are each made of tropical hardwood to resist rot and termites. They are raised on stilts to allow for natural ventilation and to prevent rats and reptiles from getting in. There is a similar use of precut, standardized timbers put together with intricate joinery, carving, and symbolic forms. The Salinger House, like the Malay house, is also oriented toward Makkah.

The differences between the traditional house and this contemporary translation are formal. The Salinger House is triangular, while the traditional Malay house is always rectilinear. Lim also incorporated electricity, running water, masonry, and a second story. He did not follow the vernacular pattern of emphasizing the importance of different parts of the house by raising or lowering adjacent sections. He also did not use premade, carved, wooden wall panels that are typically inserted between vertical columns.

A Difficult Task It is very challenging for an architect to attempt to translate traditional residential conventions into a relevant and meaningful contemporary equivalent. It takes sensitivity, extensive knowledge of the precedent involved, and a willingness to both follow and confront conventions. In his design of the

Salinger House, Lim has provided a model for others to follow. He has been inspired by the book *Tropical Architecture*, by Jane Drew and Maxwell Fry, which begs to be updated and yet provides the most comprehensive attempt yet published at defining what it means to build in these environmentally extreme parts of the world. Jimmy Cheok Siang Lim is one of the few architects in that region to convincingly demonstrate that he understands the difficult climactic parameters he is faced with, and he has poetically referred to them as “the rites of the tropics.” The rites of the tropics, in his view, are the recognition of the colors of nature, the play of light and darkness that one experiences in the rain forest, the feel and sound of rain, rivers, and streams, the feel of intense heat and the way it radiates from the ground, especially after a storm, and the mystery of things that cannot be seen but only felt. In his travels throughout Southeast Asia, he was particularly impressed by the way the Balinese view nature. They see it as being sacred, to be revered and not treated with disrespect. He observed that water is given special status in Bali, as a source of life. He describes the destruction of the rain forest throughout his region as being criminal, drawing parallels between chain saws that can cut down a tree that is several hundred years old in a few minutes and a lethal weapon, like a gun. This profound respect for the natural environment lies behind his approach to the design of the Salinger House and his decision to use chengal in its construction. Before he did so, he made sure the trees were replaceable.

Abdul Harris Othman: Serendah House

Almost every child wants to build a tree house, although very few have the opportunity to do so. There is an almost primeval appeal in being high above the ground, in the middle of a natural canopy of leaves, in a somewhat secret place away from the prying eyes of parents. That desire, of course, passes as we get older and social conventions increase their inexorable hold on us, but two architects in Malaysia, Abdul Harris Othman and his wife, Liza, have managed to renew this childhood dream and realize it in mid-career. Their adult version of this fantasy is located in Ipoh, which is several hours drive away from Kuala Lumpur, to the north. It is located at the crest of a steep slope, which allowed them to locate a more conventional part of the house, made of concrete, block, and stucco coating, on the flat part of the site at the top. The solid part, facing the driveway, takes the form of a tower, which is thick and wide at the base and tapers up gradually to an open lookout covered by a pent roof at the top. This tower seems to stand like a sentinel, guarding the far more fragile wooden component of the residence that hovers above the heavily forested slope below it. It serves the double purpose of entrance and mechanical and stair tower.

A Deliberate Departure Abdul Harris and his partner made a deliberate decision to create a new prototype for tropical residential architecture here that differed markedly from a current trend toward Balinese or Thai inspired typologies, or other regional directions initiated by designers such as Ken Yeang or Jimmy Lim, each described elsewhere here. The Othmans sought to discover, or rediscover, a truly Malaysian expression, rather than an imported one, no matter how seductive the lure of traditional Balinese or Thai houses might be. Contemporary interpretations of historical artifacts from these countries, as well as other crafts, are flooding

the market in Malaysia, and while they are primarily intended for tourists, they are difficult for Malaysians to ignore since they seem to be everywhere.

The Bidayuh Tribal House The Othmans turned to the Bidayuh house, built by a tribe in the state of Sarawak, for inspiration, avoiding the other stereotype of the traditional Malay house in the process. The reason for this may be the similarity of this type to Balinese and Thai houses, which all fall into the Australasian category of residence that is typified by being raised above the ground on columns to avoid flooding, reptiles, rats, and insects, a flexible floor plan that is multifunctional rather than space specific, and an all-encompassing nipped or gambrel roof. The Malay house, like its Balinese and Thai counterparts, is based on modular measurements derived from the anthropomorphic equivalents, and built of precut hardwood members that make its construction fast.

The Bidayuh house, on the other hand, is very similar to the Japanese Jomon dwelling; its foundation is a round pit, about 4 to 6 feet deep, covered by a thatched roof supported by angled rafters that meet at a peak, giving it a conical appearance. Unlike the Jomon house, however, the Bidayuh cone has flaps along its lower edge, near ground level, that can be opened to allow for cross ventilation during the hottest time of the day and closed during the torrential rainstorms that are typical in this region.

The architects felt that a complete conical roof would not allow them the sense of freedom that they wanted, and so have used only a segment of it, which relies upon the concrete and masonry tower for support at the ridge point. They have not eliminated traditional Malay influence entirely, however, using it to provide a sense of openness and lightness in the way that the various platforms that act as floor levels are framed underneath the segmented Bidayuh-style covering above. The main roof girders radiate from the tower and angle down and over these open platforms, which are supported by wooden columns anchored to small concrete foundations dug into the steep slope below.

This provides both a structural and a visual duality in the house, created by the solid vertical tower and sloping, light framed floors attached to it, intentionally expressing a delicate balance between opposing forces to achieve harmony. In less skillful hands this architectural equivalent of Yin and Yang may not have been as successful, but it certainly is in this case.

There are other parts of the traditional Malay house that have also been assimilated in this design, such as the *para* or kitchen, which *is* completely open, and aligned with the dining area located next to the edge of the middle platform and its railing. Abdul Harris describes the feeling of living here as like being in a tree house, because “you can feel the breeze, hear the leaves rustling, birds chirping and animals moving along the ground at night.”²¹

SCDA: Heeren Street House, Malaka

Soo K. Chan was born in Penang, Malaysia. He received a bachelor's degree from Washington University, followed by a master's degree in architecture from Yale in 1987. He founded Soo Chan Design Associates (SCDA) in Singapore in 1995, and since that time he and his firm have been at the forefront of a quiet revolution that is transforming the architecture of Southeast Asia. Since achieving

independence, Singapore has been a remarkable success story in its region, but its stability and progress has left a legacy of conformity. With a new administration, however, the prosperous city-state began to open up and be more receptive to different stylistic directions in residential design, as it became more confident of its image. In the category of the single-family house, which is a bit of a luxury on a tiny island nation on which land is at a premium and tower blocks are the norm, this revolution is most visible in a shift from the predictable and somewhat conventional language of thick bearing walls, defended on the basis of the social tradition of privacy, covered by steeply pitched clay tile roofs, deemed necessary because of the heavy rains that are typical in this region.

A New Architectural Language Soo K. Chan and his firm have been among a small group of architects who have been challenging that stereotype. SCDA is modest in size, but has an impressive list of projects in many other countries besides Singapore to its credit. In each of these, the signature of the firm has been a sensitive response to the particular constraints of each unique context and an unexpected way of solving design problems, with innovative approaches for each one. Their work is characterized by transparency, rather than the mute solidity that has been typical of residential architecture in the past. They also prefer flat, rather than pitched, roofs; expressive structure; a judicious mix of materials, textures, and colors; and a preference for natural light. Sunlight has understandably been viewed with suspicion in the climactic zone on the equator, where Singapore is located. But SCDA has shown an acute awareness that a little bit of it goes a long way in this region, so that a sliver of glass at the top of a wall, which washes it with light during the day without appreciably raising the heat level in the house, or deep overhangs used to shade glass window walls are among their strategies for providing natural light to the interior. They also pay attention to landscaping, including the use of water, in their residential work. This area of design has been sorely neglected in contemporary residential design in general, but this has been especially true in Asia, which is sad in a region with such a variety of proud landscaping traditions. While the Japanese strand of that complex history does not pertain to Singapore, it does have Chinese and Indian presentation in a diverse population that also includes many Malays. Water has played a key role in both the Chinese and Indian gardens in the past, and SCDA has typically used it as a line of demarcation between the public realm and the privacy beyond the entrance to each house.

The Heeren Street Shophouse The unique approach to each project that typifies SCDA's style is clearly evident in a house they have designed in Malacca, which is located halfway up the Straits of the same name, on the west coast of Malaysia. Malacca was the first major settlement in Malaysia, and it was founded by Javanese Prince Parameswara to take advantage of its strategic location at the narrowest point along the only shipping route from Japan, China, and Southeast Asia to India and the West. This Malay city was subsequently conquered and occupied by the Portuguese, who were then replaced by the Dutch and then the British, before being returned to Malaysia after independence in 1957. There is still vigorous debate about whether or not the British actually colonized Malaysia, with the consensus being that it was *de facto*, if not *de jure*. The main mechanism of what was effectively their colonial enterprise was the establishment of three Straits Settlements along the west coast of Malaysia, which were Penang, Malacca, and

Singapore. Penang, which is the northernmost of these, was established after Malacca, followed by Singapore. Partially because of an assessment of the harbor capacity and potential for future growth by Sir Stanford Raffles, British attention slowly shifted toward Singapore, which remains one of the largest ports in Southeast Asia today. Although they retained Straits Settlement status until independence was declared, which included the granting of British passports to those who were born there, Penang and Malacca faded in importance over time. This demolition accelerated in Malacca as its river began to silt up and landfill continued to move its coastline seaward.

All of the Straits Settlements share a traditional residential typology, called a shophouse, discussed in detail elsewhere in this series. This type of house is found throughout Asia and Southeast Asia, in the cities and villages that served the aquatic version of the Silk Route that started in Japan, Beijing, and Shanghai and extended south along the coast of China to Taiwan, then down to Hoi An, in Vietnam, followed by Penang, Malacca, and Singapore. The route then turned northwest, toward India and Arabia, where European merchants traded for the goods on these ships.

The Shophouse Although the basic unit changes slightly in each place, according to local conditions, the shophouse typology consistently demonstrates a live-work environment in which trading takes place on the ground floor, with delivery of goods from either the main street in the front or a back alley, storage of goods is allocated to a mezzanine and attic, and living space is confined to the second floor. These houses are typically long and narrow, and are lined up along the street, with thick masonry party walls separating them from each other. In some cases they have a central open courtyard that helps to regulate internal temperatures by inducing cross ventilation, since air that enters through the street side, which is open during the day for over-the-counter sales, is then drawn into the courtyard and moves upward due to convection. Sir Stanford Raffles added a refinement called the 5-foot way, or *Kakilima* in Bahasa, which is a 5-foot wide covered arcade that joins the houses together and is raised about 8 inches above the level of the street. This provides shade and also protects pedestrians from the torrential rains that are typical throughout this region. It also accelerates the flow of cooler air from the street through the front of the house to the courtyard and the living area above.

The Heeren Street Shophouse The shophouses in Malacca are concentrated in the center of the old city. They are primarily owned by Malaysians of Chinese descent, or mixed Chinese and Malay background, which is called *Peranakan* in the local dialect. This is because the British administration encouraged this ethnic group to be merchants during the Colonial Period and displaced earlier occupants of Portuguese descent from this district to the outer ring of the city to facilitate trade in the central zone. Heeren Street, which is named after the Dutch associations of the street that preceded British rule, was once one of the most prestigious thoroughfares in the old city, but as Malacca fortunes declined its elegant shophouses also started to deteriorate. This process has been hastened by a practice of boarding up vacant or abandoned shophouses and using them as meeting places for swallows, who fly in and out through several openings cut into the roof. The

swallows' nests, used for birds' nest soup, bring high prices on the market, but to make the houses more appealing to the swallows, rain gutters are redirected into the interior to make it damp. This destroys the structural timbers and erodes the mortar that holds the side walls together, making it nearly impossible to restore such a house, even if someone wanted to.

A client from Singapore who wanted a second weekend home in Malacca bought a shophouse on Heeren Street and asked Soo K. Chan to convert it. He and his firm adopted a typically novel approach to the problem by gutting the existing roof and floors, leaving only the 5-foot way, front, back, and side walls intact. They have then built a second, smaller house inside the ruin of the old house, using its walls to screen the new house from view from the street. This creates an unexpected surprise for those who visit the house for the first time, because it completely reverses conventional expectations of exterior and interior, solid and void. In this instance, the inner wall of the preexisting house becomes the compound boundary of the new one. Chan has left the inner face of the old shophouse unfurnished, to further sharpen the contrast between it and the sleek, new modern residence inside it. This house has four rooms reduced down to the essentials of kitchen, dining room, office space, sleeping area, and bathrooms. It also has a long narrow pool that runs from the front of the old house, under the raised floor of the new one. This symbolically and physically joins the two, visually easing the historical transition between them.

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Europe and the Western Mediterranean

AUSTRIA

Adolf Loos: The Villa Scheu, Vienna

Adolf Loos remains a shadowy figure in the recent history of architecture in spite of the profound influence he has had upon it. A steadily increasing amount of research on his life and work has begun to redress this imbalance, but he remains something of an enigma to many. He concentrated mainly on residential design, in which he had a particular interest. The topic of the house played both an empirical and a symbolic role in the development of his highly individualized theory of the contemporary condition and the way that people should cope with it. The general lack of appreciation for his contribution derives, in large part, from the dichotomies that he intentionally embraced, related to the ambivalence of the period and city he inhabited.

Adolf Loos was born in Brno, Czechoslovakia, in 1870, in the midst of what was then the Austro-Hungarian Empire. After enrolling and withdrawing from a succession of educational programs that were related to architecture or engineering in one way or another that eventually gave him sufficient credentials to practice, Loos decided to take some time out to travel. Instead of making the conventional Grand Tour that was typical among young artists and architects of his generation, he decided to travel throughout the United States instead, supporting himself by working a variety of odd jobs in several large cities as he did so.¹

Like Frank Lloyd Wright, Loos also visited the World's Columbia Exposition that was held in Chicago in 1896, before an extensive tour of New York City on his way back to Vienna that same year. The time that Loos spent in America changed him, making him believe that he lived in a closed, intolerant, and highly stratified society. He started to write critical articles about it in newspapers and journals, contrasting what he characterized as a Viennese tendency for pessimism, negativity, and small-mindedness with the progressive, positive can-do spirit he



Tristan Tzara House. © Wayne Andrews / Estol

had encountered in America. He quickly gained a reputation as a contrarian and a dissident, which he seemed to both relish and encourage.

Fin de Siecle Vienna At the time of his return to Austria, Vienna was in the midst of a whirlwind of creativity in all of the arts and sciences, including architecture. Otto Wagner and disciples, such as Josef Hoffmann and Josef Maria Olbrich, were each searching for new ways in which they could resolve perceived dichotomies between tradition and modernity, attempting to retain several meaningful aspects of historicism and to strengthen cultural continuity, while embracing new materials and technologies. Wagner's design of the Viennese Central Post Office, the *Postparkasse*, is a clear example of this since it combines Classical motifs and strategies with engineering advances that are avant-garde even by today's standards. These include freestanding aluminum stanchions that are strategically placed around the main hall to deliver hot air during the winter and air conditioning during the summer. These are placed slightly above head height, to deliver the air in the most energy-efficient way possible, so that additional power would not be needed to move it down from the ceiling, where it is usually delivered, resulting in a temperature rise or drop in the process, depending on the season. This concept of task delivery has also been used more recently, in large projects such as the King Khaled International Airport in Riyadh, designed by Hellmuth Obata

and Kassabaum, in 1988, and was advertised as an engineering breakthrough at that time. The *Postparkasse*, however, was built in 1901. The use of aluminum, as well as air conditioning, was also very advanced for its time.

In addition to such bold strides in architecture, there were equally audacious advances in art, music, theatre, and psychology, making the critiques that Loos was launching at the time seem all the more outrageous and unfounded.

Das Andere, or The Other While he may have been on somewhat shaky ground in castigating such a progressive milieu for being backward, his most profound contribution, which still seems staggeringly insightful in retrospect, is his theory of external anonymity and internal luxury in a house in the face of a hostile urban condition. In the wake of the first Industrial Revolution as in the second taking place in the developing world at the moment, there was an unprecedented migration from rural areas to the cities to find work, and Loos himself is an example of that trend. The painting called *The Scream* by Edvard Munch captures the *angst* that this painful expulsion from a rural Eden caused, showing a monad, representing everyone, seeming to be alone on a bridge, even though surrounded by other people. Loos fastened on this phenomenon of being thrust from a rural community in which everyone knew each other and helped or hindered each other for good or ill, into the enforced anonymity of urban life as a member of the “lonely crowd.” As an architectural response to it, he put forward the idea that stylistic responses on the outside of a house made no sense, since the communal recognition of the status that such gestures supported no longer made any sense. Classical, Tudor, or other external styles, then could and should be replaced, in Loos’s view, with a black façade, free of decoration or historical associations, which might convey ancestral lineage or economic status rendered irrelevant by relocation.

On the other hand, by way of compensation, he also proposed that the interior of the house for the new urban nomad be as luxurious, comforting, and personalized as possible, as the ultimate retreat from the dehumanizing indignities suffered outside its protective walls. Rather than agreeing with the Arts and Crafts notion, popularized by William Morris, that the interior of a house should contain “nothing you do not think to be beautiful or know to be useful” as a gesture of solidarity with the working class, Loos lined it with unctuous layers of leather, rare hardwoods, fine woolens, rare marble, silver, chrome, and glass, to make it a protective haven of precious identity.

The Raumplan Loos also introduced into this bifurcated equation the idea of the *Raumplan*, which translates roughly as “the spatial implications of a plan.”² In his design methodology, he carefully considered the volumetric impression made by a sequence of spaces, as well as the size of their perimeter; as a consequence of the ability of new materials and technological advances to provide longer spans and more wide open spaces in the house, he approached each design problem as a three-dimensional challenge involving interlocking voids joined by staircases, and he often used mezzanines or half-levels in his sections: He typically placed the more pragmatic spaces, at a time when families still hired live-in household help, at the lowest level, in the typical “upstairs-downstairs” division that was commonly found in middle, upper-middle, and upper class houses of the time, on the ground

floor, or in a basement. He then subdivided the remaining household functions into day and night or public and private spaces and combined each on its own separate floor accordingly. There is usually also provision for the living quarters of the servants on the top floor.

Consistent with his idea of everyone having a social persona as well as a private domestic one, he approached the design of the entrance as a transitional zone between the two. It typically has a washroom or bathroom in it to cleanse away the cares and dirt brought in from the outside.

The Villa Scheu Of all of Loos's house designs, the Villa Scheu, which was completed just before the war in 1913 that would bring his world crashing down, is the most prophetic of the external severity that would soon become the norm in Modern architecture. It is sited parallel to a main street, rather than perpendicular to it, like a row house, organized in a series of three distinct volumes that step upward in regular progression from the entrance, which is raised up one level above the street. When looking at the house from the front, these levels march upward from left to right, and there is a stairway leading up from a gated entrance along the street to a small entrance hall with an adjoining bathroom. An outdoor terrace opens out from this hall toward a garden in the back, reiterating Loos's consistent distinction between the public and private worlds experienced by each person, between civilization and nature, which the garden represents in this case. This outdoor, covered terrace is one of the largest spaces on the ground floor, and it has its own stairway, leading back down to ground level.

After this ritualistic gesture of purification, by both washing and viewing the natural world in miniature, there is a second, more compressed passage with three doors offering entrance into a sitting room to the left on the garden side, a dining room straight ahead, and a kitchen to the right. A music room and a library, as well as the main stair leading up from the sitting room complete the ground floor plan. This spatial arrangement perfectly describes the social conventions of a family at this economic level in pre-World War I Vienna, with a series of rooms organized primarily for socializing and entertaining, greatly assisted by the availability of household help. After being met in the foyer, guests would be led into the sitting room while a meal was being prepared in the kitchen, on the other side of the house. They and their hosts would then move to the dining room, in the middle, and after dinner they would all retire to the music room for entertainment, passing beneath the highest run of the central stair in the process.

The stair leads up to the second floor, where the children's bedrooms and bathroom are located as well as the maids' quarters, to be close to them. The first step back of the volume of the house designates this level and serves as a terrace for it as well. The master bedroom and bath area is located at the topmost, third level, with its own equally spacious setback terrace. This is adjacent to an interior counterpart, designated as a "winter garden," which is full of light and would have been a welcome retreat during the cold Viennese winters. Loos was way ahead of his time in his minimalistic architectural language, which would not surface again until Le Corbusier's work in the 1920s.

BELGIUM

Josef Hoffmann: The Palais Stoclet, Brussels

The Palais Stoclet, by Josef Hoffmann, has only recently been analyzed in any detail by historian Eduard F. Sekler, in 1985.³ Yet, even now, it remains something of a mystery because of both its scope and the timing of its construction, as well as the architect's allegiances outside of his own contemporary circle. Any attempt to shed some light on the significance of this extraordinary house might best start with a brief discussion of those allegiances, since they are central to both its final form and content; and help them place it in context.

Fierce Competition In the decades just before the end of the nineteenth century there was intense competition for market share taking place between the rapidly industrializing nations of the world, involving Britain and Germany in particular. Some historians believe that this was one of the most important factors behind the First World War as a testing ground of technology, but what is uncontested is that a struggle for national industrial dominance characterized the end of this era. The Great Exhibition, held in London in 1851, may reliably be used as the beginning of this rush, since it marks the point at which the British government felt confident enough in its own manufacturing superiority to invite other nations to display their wares in the Crystal Palace in Hyde Park. In this instance, and in several that followed, such as in Paris and Philadelphia, German goods suffered by comparison, consistently getting low marks from the judges and bad reviews in the press. To correct this disparity, which had enormous economic implications for the country, Germany made a concerted effort to catch up with and surpass the British. This included a sophisticated attempt at industrial espionage under the guise of diplomatic and artistic exchange. In one instance, Hermann Muthesius and his wife, Anna, were sent to London as cultural attachés, with the real intention of discovering the secrets behind British manufacturing skill. During this period, Muthesius wrote *Das Englische Haus (The English House)*, which is based on the premise that one major goal of British industrial production is to make things for domestic consumption, and that if Germany could comprehend inventory and duplicate each of the manufactured items in the



External view of the Palais Stoclet. Courtesy of Amy Hood; Flickr

technology, but what is uncontested is that a struggle for national industrial dominance characterized the end of this era. The Great Exhibition, held in London in 1851, may reliably be used as the beginning of this rush, since it marks the point at which the British government felt confident enough in its own manufacturing superiority to invite other nations to display their wares in the Crystal Palace in Hyde Park. In this instance, and in several that followed, such as in Paris and Philadelphia, German goods suffered by comparison, consistently getting low marks from the judges and bad reviews in the press. To correct this disparity, which had enormous economic implications for the country, Germany made a concerted effort to catch up with and surpass the British. This included a sophisticated attempt at industrial espionage under the guise of diplomatic and artistic exchange. In one instance, Hermann Muthesius and his wife, Anna, were sent to London as cultural attachés, with the real intention of discovering the secrets behind British manufacturing skill. During this period, Muthesius wrote *Das Englische Haus (The English House)*, which is based on the premise that one major goal of British industrial production is to make things for domestic consumption, and that if Germany could comprehend inventory and duplicate each of the manufactured items in the

typical English house, it could surpass its rival. But Muthesius went further than that in his book by identifying the Arts and Crafts Movement and Charles Rennie Mackintosh, in particular, as stylistic exemplars to be followed. He personally sought out Mackintosh and befriended him. As a result of his research, Josef Hoffmann followed Muthesius, and also made the same pilgrimage to Glasgow to meet the Scottish icon of English-Free Architecture, as the British themselves were then referring to the legacy of A. W. N. Pugin, John Ruskin, and William Morris.

A Tragic Figure There are several conflicting opinions about why Mackintosh did not receive the recognition at home that many of those from abroad, like Muthesius and Hoffmann so openly offered him. Some attribute it to the fact that Mackintosh came from a working class background rather than the upper-middle class, as Ruskin, Morris, and a majority of other Arts and Crafts architects did. Others believe it was because of his Scottish background, since Glasgow was considered to be provincial by those in London. Still others feel that Mackintosh was his own worst enemy, habitually engaging in behavior that alienated him from the clients that others won away from him. Wherever the truth lies, Mackintosh certainly was the prophet without honor in his own land. One particularly tragic circumstance of this neglect, with direct relevance to the Palais Stoclet, was a competition that Mackintosh and his wife, Margaret Macdonald, entered for a House for an Art Lover in 1901. Their submission, which was disqualified because one of the required drawings was missing, depicted a long, linear building running parallel to a main street next to it from which it is separated by a high fence. The competition program described what was essentially a residential gallery, or museum, syncopated by social spaces such as a main entry and reception hall, a music room, and a dining room, which were all predicated upon the main purpose of the exhibition of art. A wealthy entrepreneur in Glasgow named Graham Roxborough has subsequently built the Art Lovers House in Bellahouston Park in the center of that city, based on the plans that Mackintosh and Macdonald did complete.

There can never be any doubt that the Mackintosh and Macdonald scheme for the *Haus für Ein Kunstfreundes* influenced what is widely considered to be Josef Hoffmann's most important work: the Palais Stoclet in Brussels, of 1905.

On one of his many trips to visit Mackintosh in Glasgow, reciprocated when the Scottish architect and his wife came to Vienna on several occasions to exhibit their work there, Hoffmann recalled that Mackintosh advised him to found a workshop that would finally fulfill William Morris's dream of producing beautiful hand-crafted goods for the home at an affordable price. This ideal was rooted in the Arts and Crafts aspiration of alleviating the burden of the working class by making finely crafted objects available to them that would be aesthetically uplifting. Hoffmann responded by founding the *Weiner Werkstätte*, which translates roughly into the "Vienna Working Cooperative," or "Workshop," based on the same idea. The problem that he faced, just as William Morris did before him, was that he could not keep his production costs low enough to justify sales below the upper-middle range of the market, putting these products out of the reach of the people they were intended for.

Good Architecture Requires a Good Client The clients for Hoffmann's masterwork were Adolphe and Suzanne Stoclet. The Stoclet family had made their

fortune in banking, in operations related to trade with the Congo in Africa, which was under Belgian colonial control at that time. Mrs. Stoclet was the daughter of a French art dealer named Arthur Stevens, and her uncle, Alfred, was a well-known painter. Adolphe Stoclet had been based in Vienna for some time before coming to Brussels, and so had become familiar with the work of the *Weiner Werkstätte* while he was there.⁴ They officially met Hoffmann while on a stroll through the wealthy district of Brussels called the *Hobe Warte*. They saw a new house under construction and came into the garden to have a look at it. It belonged to Carl Moll, who invited them to meet the designer, Josef Hoffmann, later that afternoon.

As in the House for an Art Lover that inspired it, the house that Hoffmann designed for Adolphe and Suzanne Stoclet was primarily intended to be a gallery or museum in which to display the vast collection of art and sculpture that they had amassed. More than that, however, it was also conceived as a *salon*, in which new talent in each of the arts could have an outlet for discovery, as well as a creative laboratory in which the architect could test out new ideas and collaborate with artists in fulfilling them.

Hoffmann was a student of the influential Viennese architect Otto Wagner who, because of his social and academic connections, played an important role in formulating the aesthetic direction of that time. In his book *Modern Architecture*, Wagner argues that only the latest materials, technologies, and construction methods should be used in contemporary construction to set it apart from the past. Yet, he still attempted to accommodate historical precedents in his work, especially from the Classical past that the Viennese associated so closely with. In projects such as the Church of Steinhof and the *Postsparkasse* in Vienna, Wagner attempted to bridge this apparent dichotomy by making sure to mix traditional materials, such as marble, with new ones, such as aluminum, and to clearly show the difference. In the *Postsparkasse* building or Vienna Postal Savings Bank of 1904, for example, this resulted in marble slabs used as veneer on a concrete substructure, and connected to it with intentionally visible aluminum bolts.

The Palais Stoclet In the Stoclet house, Hoffmann transformed this declaration of honesty in the use of materials into a flat, two-dimensional image, in which the marble slabs used as a surface are joined by half round metal strips. The windows on both the elongated elevation along the Avenue de Tervueren, in front, and the garden façade facing the garden in the back are designed to be flush with the marble surface, and this, along with the decision to have them protrude through the cornice line of the slightly gabled metal roof, as dormers at the top, gives the house the overall appearance of unmitigated flatness.

Also in keeping with the spirit of the Art Lovers House, the ground floor rooms of the Palais Stoclet are given over to public, ceremonial functions. The conceptual device that Hoffmann uses to do this, is counterpoint, juxtaposing the large spaces that are allocated to each of the functions located there, such as the main reception hall and gallery, as well as the dining room and the music room and theater at a cross axis to the main one running parallel to the Avenue de Tervueren. A long, thin pergola extends from the fenced wall along the sidewalk to the front door, which once acted as an exact symmetrical cross axis to the long street-front elevation of the house, but was moved to the right in the last permutation of the plan to make way for an apse at the end of the great hall in the middle. The result is

an indirect, bent entrance, reminiscent of those used in medieval Islamic houses in Cairo or Spain and the shift from a compartmentalized sequence of increasingly large, nearly square entry spaces into the vast expanse of the two-story-high great hall, is elegantly done. The attention to detail and sensory overload caused by a surfeit of materials, patterns, colors, surfaces, and spatial experiences that characterize the interior of this house begin here. The walls of the entrance vestibule are faced in green marble and have niches filled with vases that hold golden branches. The entry floor has alternating white and black stone pavers. There is a mosaic by Leopold Forstner inset into a stucco ceiling. Turning left from the entrance vestibule and then right, one comes into the two-story-high great hall, which is the main space of the house. Its walls are clad in yellowish Paonazzo marble, with gold flecks and veins, contrasting with the light grey Belgian marble that wraps the thin, square, seven-meters-high forest of columns that fill the space. The railing of the mezzanine that wraps around and overlooks the hall is made of solid white panels. Dark marble pedestals placed through the hall showcase the Stoclets' collection of Classical, Greek, and Roman as well as Byzantine sculpture. Josef Hoffmann designed a carpet for the floor of the hall as well as the Macassar wood and suede sofa and chairs, and all the lighting fixtures, among everything else.⁵

A Musical Plan The contrapunctual flipping of the main space along the elongated axis from the music room, which projects into the garden at the back on the far left of the entry, to the great hall, with its fountain-filled apse pointing to the street in the front, in the middle, to the dining room, behind the entrance vestibule, which again projects toward the rear, sets up a musical rhythm that is very appropriate to the artistic purpose to which the house was dedicated. After the great hall, the dining room is the second most important room in this carefully choreographed sequence, most fully representing the spirit of artistic collaboration that both the clients and the architect wanted to achieve. The walls of the long, narrow room step back in three stages from the floor to ceiling, with base cabinets running along the entire length of the wall at the bottom. There is a space between the top of these cabinets and the bottom of a mosaic frieze by Gustav Klimt set into walls of Paonazzo marble that clad the entire room. Seklar has interpreted the mosaic as being composed so that “the two figural elements occur in proximity to the window,” so that one sees them last after entering the room at the other end. This, he believes, is intended to hold the friezes together as a “total composition” as one enters the room from the great hall, so that one “sees first the Dancer (Expectation) and then the Pair of Lovers (Fulfillment)” displayed in “a garden of art and love, a garden that, unlike the real garden in front of the windows, would never wither.”⁶ Klimt was only one of a series of artists who contributed their skills to the house, including Moser, Czeschka, Metzner, Minne, Khnopff, and Forstner, as previously mentioned.⁷

FINLAND

Hvittrask, Lindgren, Gesellius, and Saarinen

Finland has been in the orbit of its two most powerful neighbors, Sweden and Russia, for most of its history, and has only recently achieved independence from

foreign rule. It became a Grand Duchy of the Russian Empire in 1809 and at first had relative autonomy in that relationship, before Tsar Nicholas II started to take measures to restrict Finnish freedom that became more aggressive as the century progressed.⁸ These actions prompted a patriotic response from all those in the arts, including architects in a movement that is now referred to as Finnish National Romanticism. Artists, such as Axel Gallen, writers, poets, and musicians, such as Jean Sibelius, tried to solidify Finnish identity in the face of autocratic rule, and focused on the idea of a homeland as a way of projecting a collective spirit and independent tradition. In 1835 an amateur historian named Elias Lönnrot, who was actually a physician, compiled all of the written and oral evidence of possible origins into the *Kalevala*, which served the same purpose of unification that other, similar documents have for various cultures in the past. Lönnrot directed attention to an area on the border between Finland and Russia, called Karelia, which stretched from the White Sea to the Gulf of Finland, as the national homeland, and the historical birthplace of the Finnish people.

The Log Cabin as a Patriotic Symbol Architect Lars Sonck built a log cabin in the Karelian style, on one of the Aland Islands between Finland and Sweden. It had ornate detailing on the exterior molding around the windows and the door, as well as an ornamented ridge beam, and drew the attention of three young students of the Polytechnic Institute of Helsinki, which he had also attended several years before they did. Herman Gesellius, Armas Lindgren, and Eliel Saarinen, whom Sonck had impressed, decided to start their own firm before they had even graduated, and in 1898 they completed a house project called Villa Wuorio, similar to that of their mentor.⁹

As some indication of the status in Finland and of the talent that this young trio of prodigies had at that time, they were selected to design the national pavilion that would represent their country in the Paris Exposition of 1900, just as Edwin Lutyens had done for Britain. By the time of Lutyens's selection, he was already in mid-career and well established as an architect, doing country houses for the British upper-middle class and aristocracy with his partner Gertrude Jekyll. The opportunity to participate in the Paris Exposition, which happened only after a strategic public relations campaign on his part, launched his career into orbit.

A Magical Hillside One year after the Exhibition, Gesellius, Lindgren, and Saarinen found a property on a hillside overlooking Lake Vitträsk, near the town of Kirkkonummi, south of Helsinki.¹⁰ They decided to build a shared housing and studio complex there because of the isolation of the site, the beauty of the surrounding forest, and the view out over the lake.

Among the three, Saarinen was especially knowledgeable about international trends in architecture, judging from the diversity of topics found in his library at Hvittrask.¹¹ Among these were books on the Arts and Crafts Movement in Britain and the work of Henry Hobson Richardson in the United States, which was just gaining popularity as the trio started to design their creative retreat. In spite of an attempt to arrive at a culturally pure style, there are strains of each of these influences in the final scheme that these architects produced.¹² These emerge in various ways, primarily related to the massiveness of the scale used in the complex, the use of rough, local materials, and the detailing uniformly employed throughout.

Each of the three architects had originally intended to have a residence within the walled compound as well as to share a common studio space. After entering the compound through a gated wall, from a road that winds its way through the dense woods, each of these distinct units becomes distinct, one each side of a central courtyard. The house of Herman Gesellius, who was a bachelor at the time that construction started at Hvittrask, is located on the left side of the court, when looking into it from the entrance gate. It was the first building built and is more primitive in appearance than the rest. It was completed in the late summer of 1902, and Saarinen and his family lived on the top floor while their own house and that of the Lindgren family, as well as the joint studio, were being built on the other side of the courtyard at the edge of the hillside facing the lake. This part of the compound extends from the gate wall on the north in a line toward the two-story Saarinen house at the southern end of the cliff. The studio portion, which originally had a tower, was in the center, dividing the Lindgren residence from that of the Saariens. A stone stairway leads down the hillside to the lake, far below, and it is easy to imagine the three partners and their entourage spending long, languorous summer afternoons and evenings by the water's edge.

When seen from this hillside stair, the combination Lindgren-Saarinen houses and the joint studio of the three partners seem to fuse seamlessly with its cliff-like site. This is because the architects have used local granite for the basement and foundation of this part of the complex, which changes to wood frame covered with shingles above that level. This tendency to use local materials in their rough state recalls the same strategy used by British Arts and Crafts architects such as C. A. Voysey and Edwin Lutyens, as well as H. H. Richardson, in America. The Arts and Crafts references continue throughout the interior of the larger residential and studio wing, in areas such as the Saarinen master bedroom, which has white furniture in the best Mackintosh and McDonald manner.¹³ The difference lies in the delicacy and consistency of the detailing, which is not as skillful and self-assured in this room, or throughout the rest of the complex.

The common thread between Hvittrask and the Arts and Crafts aesthetic, in spite of this difference of execution and consistency of vision, is the idea of the total work of art, in which the house and everything in it is designed by one hand. The Saarinen house has a great deal of built-in furniture, the most memorable of which is a series of green leather couches, which establish a feeling of domesticity in the living room, and the freestanding tile stoves, which augment the fireplaces in many of the rooms, becoming sculptural objects in their own right. Dark wood floors and heavy timbered exposed beam ceilings in addition to the built-in cabinets and couches make the social areas of this house seem heavy and stolid, but a line of windows in the living room, with a uniform sill height that aligns with the top of the leather settees, lightens the mood during the day.

Brief Occupancy In retrospect, it should have been obvious that regardless of how close their friendship was, it would be difficult for three architects with such strong egos to remain together in such isolated surroundings for very long. This is especially true, considering that two of the partners were married and one of them was single, setting up the same uncomfortable dynamic as a young male coming of age in a pride of lions. The first obvious signs of divisiveness occurred

in 1904, only two years after the partners and their families occupied Hvittrask, when Eliel Saarinen entered and won a competition to design the Helsinki Railway Station on his own. While the reasons for his decision to exclude his partners is not known, subsequent events suggest that it may have been done out of spite.

Trouble in Paradise In the same year that he won this prestigious competition, for what remains one of the largest and most visible public buildings in Helsinki, Saarinen divorced his wife, Mathilda Gylden, who then married Herman Gesellius. Saarinen then married Gesellius's sister Louise, who was known as Loja.¹⁴ Armas Lindgren left Hvittrask at about the same time, selling his share to the other two partners and moving back to Helsinki. In spite of the obvious tension that then existed between the two couples that remained, Gesellius left his log cabin across the courtyard, and he and his new wife moved into the house that Lindgren had vacated, next to Eliel Saarinen and Loja. They built a wall between them to make their separation easier, which later, in 1922, kept a fire from spreading to the Saari- nen's house, and saved it. Saarinen and Gesellius dissolved their professional partnership in 1907, but Gesellius and Mathilda continued to live in their section of the Hvittrask complex until Gesellius's death in 1916. Ownership of the entire estate then passed to the Saarinen family and remained with them until they sold it in 1949. The government of Finland acquired it in 1981 and has restored it, with the exception of much of the furniture, which was auctioned in 1968. It is now run as a museum.

Alvar Aalto: Villa Mairea

By the time that Alvar Aalto was commissioned to design a house for Maire and Harry Gullichsen, in Noormarkku, Finland, in 1938, he was already a well-established architect with a growing international reputation as a leading Modernist. The most prestigious design he completed prior to the Villa Mairea was a Tuberculosis Sanatorium in Pairnis, Finland, which he finalized in 1933. Aalto had won a competition to design this hospital in 1928 because of his revolutionary holistic approach to the connection between architecture and health, by giving patients as much exposure as possible to light and sun, to help cure them. To do so, his plan is broken into clearly defined fragments to provide maximum external exposure. The seven-story patients' wing is a long narrow linear building, with rooms and an adjacent open porch on each floor on one side and the corridor on the other, to allow as much time outside as possible when weather permitted.

Aalto's approach to the design of the Pairnio Sanatorium is indicative of the humanistic values that set him apart from a majority of other Modernists at the time. He was cognizant of the necessity of connecting people to the natural environment, and of bringing context into his architecture as much as possible.

The Villa Mairea Maire and Harry Gullichsen were close friends of Alvar and Aino Aalto, and shared a love of art and good design.¹⁵ Harry Gullichsen was the general director of the Ahlstrom Company, and Maire was a wealthy heiress of the family that had founded the firm. They gave the architect a free hand in the design, which they hoped would be unconventional, and they certainly got their wish.

Aalto and his wife had built a home for themselves near Helsinki two years before receiving the commission for the Villa Mairea, and in spite of the difference



External view of Villa Mairea. *Source:* Rafael Rybczynski; Flickr

in scale and scope between the two houses, there are some obvious similarities. These lend weight to the conclusion that Aalto was working out several ideas that remained constant in his work. In his own house, as in the Villa Mairea, these are the necessity of having continuity between interior and exterior space, typically through the use of a courtyard, the primacy of natural rather than industrial materials, the combination of a living and working environment, but the separation of those functions into public and private zones, and the judicious use of light, air, and scale.

The L-shaped plan of the house he built for himself and his wife Aino, which lends itself well to these principles because the inner angle of the “L” creates a natural inner courtyard and outside living space, as well as being an obvious diagram for the separation of working and relaxing, or private and public space within the home. In the Gullichsen house in Noormarkku, this nascent “L” actually transforms into a “U” wrapped around the north side of a courtyard to protect it from the cold winds coming from that direction. The house has been placed in a clearing in the middle of a forest, and Aalto underscores this wooded context by using clusters of thin round columns, wrapped together with rope in some cases, throughout the interior to recall the trees outside. The main stairway, which leads from an expansive, open living room to Maire’s studio and the master bed and bathroom wing above, has a screen of these randomly clustered tree-like poles on either side of it, making it seem like the entrance to a magical kingdom hidden behind a forest glade. The “U” of this plan is really an “L” with a turf-covered sauna at the end of

one leg that turns inward. It is next to a free-form plunge pool, making it possible to follow the Finnish tradition of moving back and forth from the hot sauna to the cold water in the pool as part of the sauna ritual.

Aalto never visited Japan, but was influenced by the traditional architecture of that country. There are echoes of the Katsura Palace throughout the Villa Mairea, even though climactic extremes did not allow Aalto to use the *engawas* or the long, narrow viewing porches that are used throughout the *shoin* of the Emperor's rest house in Kyoto. These come from the horizontality of the Gullichsen house and its sensitive interaction with its site. From some angles, when seen from the outside, the Villa Mairea has an almost identical relationship to its adjacent body of water as well, in spite of the fact that its pool is much smaller than the artificial lake in front of the Japanese equivalent.

Japanese *shoin* architecture was based on the concept of *MA*, which came from the tea house tradition established by Sen-no-Rikyu for the Shogun Hideyoshi Toyotomi. While the character for the word "*MA*" translates literally as "space," it has other, more complex, esoteric connotations. The most essential of all of these is a space-time relationship related to perfection symbolized in the tea house as a rudimentary structure made from materials found close by to shelter friends meeting to celebrate a peaceful moment in time together. The durability of this shelter was not as important as its ability to contribute to a feeling of togetherness. In fact, the aspect of impermanence was as important as its intimacy and naturalistic source. As the *shoin* typology developed, however, a certain amount of formality was also layered over what became known as the *sukiya* style of casual dwellings, which seem to have been randomly built of the natural materials that were readily at hand, such as wood, rice straw, and clay, even though this apparent randomness was carefully considered.

The Villa Mairea also has this feeling of having been built of found materials, but this is skillfully layered beneath a formal exterior in many places. The two conditions of formality and studied randomness coexist in delicate balance, with the long, narrow white band of the second floor elevation, which acts as a visual datum above and behind the partially enclosed, partially open courtyard at the front of the house, serving as a compositional foil for the free-form elements faced in vertical wooden strips that project out from it.

This is a *shoin*-like house for Finnish aristocracy, with just enough *sukiya* to remind everyone of their solidarity with the common people. Its college-like appearance is no accident, since Aalto tried diligently to have the house convey a sense of immediacy, mixed with permanence that matches its inner mixture of spaces intended for both work and play, business and relaxation, public and private use. He actually stopped the construction of the first iteration of his design soon after it started because he was not happy with this balance, and he redesigned part of the house at that point.

Maire Gullichsen's Studio The most obvious manifestation of this interplay between formal and casual, or rational and spontaneous, or industrial and natural, is the studio that Aalto designed especially for Maire Gullichsen on the second floor, at the far end of the southern leg of the "L." It is curved, and overhangs the living room on the ground floor below. It is also faced in vertical wooden strips

that contrast sharply with the stark, white flat surface of the upstairs hallway leading to it.

Aalto's allegiance to the Modern Movement, in this early stage of its evolution, is clear in his expressed wish that the Villa Mairea serve as a prototype for others in the new egalitarian society that he and his clients hoped it would inspire in the future.¹⁶ But it is more difficult to imagine how this custom-designed mansion in the forest could be converted to public use than the Villa Savoye could be, for example. While he did use concrete, steel, and glass in its construction, there is an equal amount of dark timber, brick, tile, wooden ceilings and screens, and hemp used as a counterpoint, and this transforms it into a highly individualized masterwork.

Details This individuality is evident in the spatial experience that Aalto has carefully orchestrated in his plan beginning at the front entrance on the outer, northeastern side of the "L." It leads directly into a spacious living and dining area that is reminiscent of a Wrightian interior, completely devoid of walls or partitions, so that the space seems at one with the exterior courtyard in the angle of the "L" beyond. This openness is countered by a service wing, containing the kitchen, as well as an office and service functions, that is in the other leg of the "L" on the ground floor, offering functional support to the first.

There are few structural supports in this wide open area, but those that Aalto had used are each treated individually as metaphorical representations of trees. One is finished in black lacquer. Others are wrapped with thin, vertical wooden slats. These and the thin wooden slats used on the ceiling made this seem to be a finely crafted symbolic landscape, which is the architectonic equivalent of the forest and carefully protected field on the other side of the glass walls and doors that enclose it.

FRANCE

Pierre Chareau: *Maison de Verre*

The *Maison de Verre*, or Glass House, was designed by Pierre Chareau in 1931. It is located on the Left Bank of the Seine in Paris, behind a traditional eighteenth-century townhouse that faces onto the Rue Saint-Guillaume, and is separated from it by a nearly square cobblestone courtyard. Every house has a history, but that of the Glass House almost defies description. The architect, for example, only had this house and another small artist's studio completed before dying, largely forgotten and unknown in New York almost 20 years after the Glass House was finished. His clients for the Glass House in Paris, Dr. Jean Dalsace and his wife, Anna, were prominent members of the Jewish community there when the Second World War started, as were Pierre Chareau and his wife, Dottie, so they were equally threatened when the Germans occupied France. The Dalsace family joined the Resistance and were forced to constantly keep on the move throughout the country. Pierre Chareau and his wife left for America before the Germans arrived, by way of Marseilles and then Morocco.¹⁷ The Dalsace's were no strangers to German persecution since Anna's family, the Bernheims, had been displaced from Alsace Lorraine in 1871 at the end of the Franco-Prussian War. After they settled in Paris,

Pierre Chareau's wife, Dottie, who was British, was hired by the Bernheims to teach Anna English, which eventually led to a friendship being established between the two couples and the commissioning of the house on Rue Saint-Guillaume.¹⁸

Pierre Chareau was born in Paris in 1883 and was educated at the *Ecole des Beaux Arts*. He started his career with an apprenticeship at British furniture maker Waring and Gillow in 1918. They had a Paris office and also branched out into theatre design, being responsible for several small theatres throughout the city, such as the Gaité, the Vaudeville, the *Ambigu*, and the Renaissance.¹⁹ Chareau was one of the founding members of the *Union des Artistes Moderne* in 1929 and, in spite of his Classical *Ecole des Beaux Arts* training, was interested more in industrial design than space planning. He shared the Gallic tradition of *ingenier* with other notable French architects such as Auguste Perret and Jean Prouvé. While the Crystal Palace Exhibition Hall by Joseph Paxton, which was built in Hyde Park in 1851, is generally remembered as the building that inaugurated the Industrial Age, the *Gallerie des Machines* by engineers Dutert and Contamin, which followed it soon afterward in Paris, was actually more technologically innovative, with a mezzanine viewing platform that moved on rails above the vast hall. This allowed observers an unobstructed view of the mechanical marvels on display on the exhibition floor below.

Like Prouvé, Chareau was as much an inventor as an architect. His Glass House is like a technological jewel box, filled with the latest innovations of the time, such as a new type of glass block that had just come on the market several months before he received the commission to design the house. He was also one of the first to use a recently invented type of rubber floor matting, with a raised circular pattern that increased traction that is now widely found in industrial interiors. It was then unknown, and his use of duraluminum in the bathrooms was also among many other novel and unusual applications. As if to underscore Chareau's egalitarianism and love of invention, a bronze plaque on the side of the house reads, "Pierre Chareau 1931; Coll-Bijvoet; Fers-Dalbert." Chareau had been assisted by Bernard Bijvoet, and the metal work throughout the majority of the house was done by a blacksmith named Bernard Dalbert. Bijvoet had just completed another collaboration with Dutch architect Johannes Duiker on the Zonnestraal Sanatorium in Hilversum, which was completed in 1928. It clearly reflects Duiker's affiliation with Constructivist principles that were then being formulated in Russia at the same time, related to the clear formal description of the way a building functioned. Constructivism, which was a state-sanctioned movement that had a short but incandescent life span in post-Revolutionary Russia before being replaced by Stalinism Realism, was based on the premise that the Communist ethic required a different noncapitalistic architecture, made in a new way. Ironically, however, the mechanistic image that the Constructivists proposed as an alternative was also inspired by the industrial-capitalistic model.

Forced to accommodate a neighbor who would not sell to the Dalsace family, Chareau fit the Glass House into a narrow site and under an existing house and yet managed to retain a traditional Parisian *Hotel Particular* typology of a central courtyard. This courtyard, which is slightly skewed by the adjacent properties, is part of a sequence that Chareau carefully orchestrated, beginning at a pair of gates leading into a long, narrow walkway from the Rue Saint-Guillaume and ending in

the *pièce de résistance* of the house, which is a soaring grand salon on the second floor overhanging the main entrance from the courtyard below.

A Processional DNA Jean Dalsace was a gynecologist, and Chareau reserved the ground floor for his professional office. So a second challenge, after that of how to deal with the constricted site, was the problem of how to deal with the separation between the public and private zones of the house. Chareau managed this by setting up a clear circulation path that guides patients into the office suite on the one hand and family, friends, visitors, and guests up to the main living space on the first floor on the other. A patient, entering through the double doors at the end of the courtyard, would go straight ahead along a short corridor to the office at the back of the ground floor, facing onto a garden at the rear. Dr. Dalsace used a stair in that area as a shortcut to his living quarters upstairs. The examination area is in an open space, made flexible by a field of steel I-beam columns in the best Corbusien grid and free-plan tradition, divided by curving, straight, and angled partition walls into examination rooms, as well as a surgery near the center. What makes the plan of this ground floor so exceptional, in addition to its main characteristic of being able to effortlessly separate public and private circulation through the strategic interlocking arrangement of divergent corridors and sliding doors, is the extent to which Chareau utilizes the free-plan ideal. Enclosure is difficult to distinguish from circulation space, open from closed, and hall from room in what amounts to an opus to the non-load-bearing wall.

For this reason and a multitude of others, the Glass House is unique, unlike any other house before or since. Every inch of it was custom designed by Chareau, Bijovet, and Dalbert, on the spot, as construction progressed. This aspect of particularity begins to become clear when one approaches the house from across the small courtyard in front of it. There are two permanent metal ladders placed wide apart at some distance away from the front wall to serve as masts for movable light fixtures that can be moved up or down at will to create different angles or intensities of illumination in the main salon on the first floor at night. These klieg lights reinforced Chareau's main intention of encouraging visitors and guests to move through the ground floor when the pocket door was opened. This allowed them access into the inner sanctum, and they then had to turn back through a curved glass door that would have been left open to invite them upstairs. The lights, shining through the glass wall of the front façade, would have provided an additional, unmistakable clue that they should come upstairs, as would the music from the piano in the upstairs *salon*. It was just as much an architectural fixture as the steel columns that soar up like industrial imitations of trees at various places in this elegant, soaring two-story space. Guests to the house at the height of its social activity, prior to the German invasion of France, recall the host and hostess standing at the top of the stairs, with the golden glow of the light coming through the glass lens of the front wall behind them and piano music in the background as being a magical image. The upper *salon* was intended to live up to its name as a place to entertain, to have *soirees* that would include the intellectual elite of Paris. The furniture looks out of place because it came from the Bernheim family, as a gift for Anna.²⁰ In addition to the piano, these pieces, which are each masterpieces of Art Deco design, include divans of various sizes and side chairs, with small tables

for putting down glasses. These are located strategically between them and were clustered to allow for different conversation groups to form or for the entire group to talk to each other.

The stair leading up to the first floor contributes to the sense of floating in air that guests must have felt as they moved effortlessly upward toward the light above. It has steel treads coated in the same rubber matting used on a majority of the floors throughout the house, but no risers, so that the steps, which are supported by two substantial steel girders that run diagonally from the ground to the first floor, seem to hover, without being subjected to the rules of gravity. The handrailing is also unusual, since it is much lower than most and splays slightly outward, as if to say that it is there to catch someone if he or she falls, but it really is not necessary to use it, since that would be *déclassé*.

The movable klieg lights on their twin steel ladders serve a second purpose, beyond the purely functional one of turning night into day, or at least a modulated version of it, in that they literally convert the *salon* into a stage on which the *glitterati* of the time could perform. The *salon* has a mezzanine running across part of the back wall that serves as a balcony for the sleeping level, with private bedrooms and bathrooms behind it. It also has a floor-to-ceiling bookcase covering the third inner wall on the opposite side of the glass façade. The books, which are accessible by yet another handcrafted metal object unlike most ladders, create a pattern of their own on that two-story high wall, with their varicolored spines angled this way and that. Their titles reveal the full intellectual breadth of the owners, far afield of the medical topics that one would expect to find there.

This wall of books, along with an easel, a piano, the random pieces of Art Deco furniture, the macassar wood inserts on the balcony railing, and various potted plants placed here and there seem incongruous at first, but eventually become an indelible part of the quasi-futuristic, quasi-retrograde image that makes the *Maison de Verre* so unforgettable. The spatial concept of the house, then, is one of a contemporary version of an eighteenth-century Parisian *hotel particulier*, with work and storage space on the ground floor, the *piano nobile* for receiving visitors and guests on the first, and the private quarters for the family on the second.²¹ One can only imagine what an evening spent in the *salon* there must have been like, with soft, filtered light shining in through the glass lens of the front façade, someone playing the piano, clusters of sitting and standing people having animated conversations about politics, art, architecture, the theatre, and recent books. The Surrealist painters were particularly favored guests, including Miró, Tanguy, Cocteau, Paul Eluard, Aragon and Max Jacob.²² The house itself has often been compared to a three-dimensional, habitable piece of Surrealistic art, as a collage of the kinds of found objects that Marcel Duchamp would use in his mechanistic constructions. This was the thesis of one of the first, and certainly the most insightful, articles written about the *Maison de Verre* by Kenneth Frampton. He has compared it to Duchamp's 1923 piece *Large Glass; The Bride Laid Bare by Her Bachelors, Even*.²³

The Congress Internationale d'Architecture Moderne The first meeting of the *Congress Internationale d'Architecture Moderne* (CIAM) was convened in Saaritz, Switzerland, in the mid-1920s. The formulation of this powerful organization and its ultimate impact on Modern architecture was profoundly important because it established the principles of the movement for the next three decades. Its

authority remained unchallenged until the Team Ten Group, which included Aldo Van Eyck and Alison and Peter Smithson, humanized its basic tenets in the late 1950s. The dominant figure in the CIAM was the Swiss-French architect Le Corbusier, who directed it toward an *über*-rational path, devoid of the possibility of subjectivity and spontaneity. He specifically targeted a position labeled Expressionism. By emphasizing a scientific approach to architecture and urban planning that he and C.I.A.M members believed to be most consistent with the spirit of the industrial age, and the objective, empirical, analytical, and typological methodology that accompanies it, this group marginalized those who believed in a subjective alternative, or at least a more balanced, left and right brain approach to design.

In a historic photograph taken of the architects, urban planners, and theoreticians that attended the first C.I.A.M Conference, Le Corbusier is in the center of the group, but is almost enveloped in the shadow of a deep stone doorway. He is unmistakable nonetheless, his striking features and signature round glasses, which he had custom-made for himself, making him stand out. He is an almost sinister, partially hidden presence amidst a number of people whose names are now synonymous with the early, heroic phase of Modernism. Pierre Chareau is clearly visible at the periphery of the group, which is appropriate given the fact that he is known to have been something of a solitary genius, as well as a loner. His inclusion in this photograph is significant because it indicates where his sympathies remained. This is in spite of the fact that his name was virtually excluded from all of the mainstream histories of the Modern Movement written after the dust from the revolutionary moves that it made in its first and most radical phase had settled.

His tendency to remain aloof from the fray continued after he and his wife emigrated to the United States, at a time when other famous Modernists, such as Walter Gropius, Ludwig Mies Van der Rohe, and Marcel Breuer, had also relocated there. Unlike each of them, he did not open an office in America, avoided academia and politics, and except for several close friends, such as Leo Castelli and Ileana Sonnabend, he and his wife kept to themselves. In an interview about the architectural opportunity that was lost by not having Chareau involved in design projects in the later part of his career, Philip Johnson, who was the *doyenne* of Modernists in post-World War II America simply stated, "He was never really *around*."²⁴ Through the few friends that the couple did permit themselves, they started to socialize with people who had summer houses in the Hamptons, on Long Island, including art patron Jane Bowles. Through Bowles, Chareau met American abstract expressionist Robert Motherwell. He agreed to allow the French architect to design a house for him in exchange for letting Chareau build a modest residence for himself on the four-acre property Motherwell had bought in East Hampton in 1945. Motherwell had a limited budget and Chareau suggested that they look into the possibility of using a Quonset hut to stay within it.²⁵ Quonset huts are semicircular prefabricated corrugated metal units developed by the CB's during WWII that would be airlifted and dropped in any location as an emergency shelter. Motherwell and Chareau bought two of them, for a grand total of \$3,000, which Chareau combined into one long house. He added a partial upper level for a sleeping loft accessible by a steep stair at one end supported by a series of off-the-shelf round steel lally columns. Chareau cut long slits into the sides of the hut to insert

a 36-foot long strip of casement windows that Chareau retrieved from a dismantled greenhouse he had found to provide light and ventilation and designed an integral system of cloth blinds that could be rolled up or down to control light and heat.

To counter the sense of a thin metal wall, Chareau also added a three-foot deep cabinet below the sill of the windows where they occurred and up to the bottom of the mezzanine level where they did not appear, facing them with louvered metal panels that give the interior an aesthetic that was reminiscent of the *Maison de Verre*.

To gain the interior height necessary for the loft space, which was not envisioned by the Navy engineers who designed the Quonset hut, Chareau excavated the site to create a floor level that was several feet below grade, and then contained the wall that was built to retain the earth on each long side up several more feet to act as the foundation for the bottom edge of the arch. The arched ends of the Quonset hut had custom-made fixed windows divided by steel mullions and a glass door that Motherwell replaced with a wooden one. The few walls that he used to divide spaces inside the house were made out of smooth plywood. There was also a fireplace. The ground floor was paved in brick, and, to save money, the upper, mezzanine level was covered with sections of oak trees pressed into concrete because Motherwell could not afford tile. The house has subsequently been torn down, which is a loss for American architectural heritage.

The Legacy of the Glass House The Villa Savoye, which is generally considered to be one of the most significant buildings of the Modern Movement in the twentieth century, was designed and built after the Glass House, and Chareau and his clients liked to speculate that they had an impact on Le Corbusier's groundbreaking design. But, the two houses are quite different in several essential ways. While Le Corbusier envisioned the Villa Savoye as a replicable prototype, the *Maison de Verre* is the paradigmatic *gesamtkunstwerk*, or total work of art, a custom-made celebration of mechanization and the new materials made possible by the Industrial Revolution. It is unique to its context and also replicates a traditional Parisian housing typology, being a contemporary translation of the *hotel particulier* that evolved in that city in response to the residential requirements of the nobility during the *ancien régime*. It also has political overtones, in its references to Russian Constructivism and all that is implied.

The *Maison de Verre* had had a quiet, but profound, influence on several important architects, such as Richard Rogers, whose own work reflects the impact that this house had upon him.

Le Corbusier: The Villa Savoye

Though Le Corbusier is remembered as a protean modernist, his architecture also shows great sensitivity to context and an interest in more earthy forms of building. He was born in 1887 to a French-speaking Swiss family, Le Corbusier (originally Charles Edouard Jeanneret-Gris) and is the most influential architect of the Modern Movement. He trained as a watch engraver, but he decided to study architecture when he was 19, and almost immediately began to work on local commissions. These show a strong Arts and Crafts influence. He then moved to Paris, where he served his apprenticeship with Auguste Perret. His mentor pioneered the use of *beton armé*, or concrete reinforced with steel, and this was to remain

Le Corbusier's preference for the rest of his life. In 1910 he studied trends in German architecture, and around the time of his *Voyage d'Orient*, a tour of the French colonial holdings at that time, was deeply impressed by Ruskin's *Seven Lamps of Architecture*. He died in 1965.

The Villa Savoye Le Corbusier is generally associated in the public consciousness with the machine aesthetic of Purism that he introduced soon after the First World War. The Villa Savoye in Poissy, near Paris, completed in 1929, is the apotheosis of that philosophy, a constructed demonstration of the "Five Points" that he used as a shorthand list to describe the opportunities made available to architects by the Industrial Revolution. High-strength steel, he argued, dictated a switch from the masonry bearing wall to the columnar frame, predicting the first and most important of his points—the grid—from which all others follow. The grid made it possible to have a free plan (the second point), since structural loads are no longer carried by partitioning walls. The third and fourth points: a free elevation, or external skin, and long horizontal strip windows (rather than small rectangular openings punched out a bearing wall) logically follow since internal columns (rather than continuous masonry exterior bearing walls) carry the load of the roof. And this roof, which is the fifth point, can become a garden to replace the land on which this new, lightweight trabeated structure is raised. From this he developed his own reinforced concrete post-and-slab system, which he named *Dom-i-no* because of the resemblance of the pattern of the columns on plan to the numerical designations on the game pieces of that name.

Two Opposing Views of the World, Expressed in Architecture In spite of Le Corbusier's determined advocacy of the *Dom-i-no* idea, perfected through many built examples prior to final fruition in the Villa Savoye, it is, initially, difficult to reconcile his development of an alternative bearing wall system called the *Monol*: he was, after all, possessed of an exceptional, visionary grasp of the potential of the new materials made available at the end of the nineteenth century, making him the leader of the Modern Movement. When viewed against the political and intellectual climate of post-First World War France, however, this second system begins to make sense as a complement to rather than a contradiction of his trabeated theory. This less abstract, more humane and environmentally sensitive, direction adds richness and depth to the enormous contribution of this singular figure, revealing him to be even more complicated than commonly believed.

Le Corbusier proposed a variant of the *Dom-i-no*, or "Citrohan," system to the French government as a solution to the housing crisis following the 1914–1918 war. It was initially conceived as a panel system connected by metal channels that could easily be transported and erected as framework to be filled with concrete made with crushed stone aggregate from the area in which the houses were built. The roof was a slightly curved or vaulted corrugated steel sheet, also covered with a thin layer of concrete; the long, narrow houses were intended to be parallel and to share walls for additional support. The *Dom-i-no* and *Monol* systems of 1919 then were structurally antithetical, but each was the result of a search for an easily replicable standard. Each alternative was subsequently explored, the *Dom-i-no* approach most notably in the early to mid-1920s, in the Esprit Nouveau Pavilion at the "Arts Decoratifs" Exposition in Paris (1925), the Ozenfant House in Paris (1922), the

Fruges garden city in Pessac, near Bordeaux (1925), two houses in the Weissenhofseidlung in Stuttgart (1927), the La Roche/Jeanneret house in Paris (1923), and the Villa Stein in Garches (1927), prior to its culminating statement in the Villa Savoye in Poissy (1929).²⁶

The radical futuristic images of the projects of Le Corbusier's "White Period" epitomized by the Villa Savoye have fixated public perception to the point that the *Monol* has not been given the consideration as the counterpoint it was intended to be. He described the *Dom-i-no* approach as "a strong objectivity of forms, under the intense light of a Mediterranean sun: male architecture," and the *Monol* as "limitless subjectivity rising against a clouded sky, a female architecture." Following its appearance in 1919, the *Monol* system did not surface again in a significant way until it was used in a small, stone, sod-covered "Maison de weekend" in Saint-Cloud (a suburb of Paris) in 1933—it appeared in a village cooperative five years later, then in a residential complex in Cherchell, North Africa (1942), a house in Sainte-Baume, La Tourade (1945), the Roq and Rob Housing Project in Cap Martin (1949), the Fueter House in Constance, Switzerland (1950), and the Maisons Jaoul in 1952, before its *denouement* in the Sarabhai house in Ahmedabad, India, in 1955. The Sarabhai house may be considered to be the equivalent of the Villa Savoye, the final evolution of an idea—in this case, the *Monol* concept.

Rational and Irrational Alternatives These two alternatives—the light, frame, modular system of reinforced columns and beams that culminated in the Villa Savoye and its massive, vaulted bearing wall alter ego, finally realized in Ahmedabad—represent more than the tectonic equivalent of a balance of x and y chromosomes, however, being instead a consistent search for elemental types by a committed rationalist. Over and above the political and social motivation of finding a practical and inexpensive solution to the postwar housing shortage, Le Corbusier was also motivated by the intellectual debate taking place in the early part of the twentieth century, centered in the art world, being carried out in the café society of Paris. He explored his formal and spatial innovations in a variety of media, in addition to conventional architectural means, much as his groundbreaking contemporary Pablo Picasso did in his art.

Back to Basics In a broader sense, the typological experimentation represented by Le Corbusier's frame and bearing wall antipodes is best understood against the background of the aesthetic revolution initiated by Cézanne and then expanded by Picasso, culminating in the *Demoiselles d'Avignon* in 1907. The advent of Cubism that had a relatively short life span, ending with the First World War, was symptomatic of the disaffection that Picasso, following Cézanne, and a small group of *avant-garde* artists felt with conventional, perspectival methods of describing reality, as well as with the social system that such a singular view of the world represented. At the time of this breakthrough the Marxist critiques of capitalism, as well as its Arts and Crafts equivalent as a riposte to industrialization, were still fresh issues. The appeal of a simpler pre-Industrial world had been eloquently evoked by William Morris and John Ruskin as well as by Dante Gabriel Rossetti, the leader of the Pre-Raphaelite movement, but Cézanne, Gauguin, and Picasso wanted to go back further, in search of the "noble savage" described by Rousseau, and found inspiration in tribal art such as that exhibited in the Musée d'Ethnographie du Trocadéro, which opened in 1882. Rousseau also provides the link with the rationalist

traditions of which Le Corbusier is a part, since his writing distills the dissatisfaction of Enlightenment *philosophes* with the excesses of the *ancien régime*, much as Abbé Laugier did in his *Essai sur l'architecture*, in which the concept of the “Primitive Hut” is introduced.

The paradigm shift prompted by tribal or primitive art has been described as being from the perceptual to the conceptual: of using simple forms and symbolism as a critical “instrument,” a lens through which to examine a preconceived worldview. Primitivism is defined as “deriving its energies from differences and their cancellation, creating a charged division by recognizing the significance of that which is distinctly *other*. It does not view this *other* as inferior, only different seeing purity and virtue in simplicity, in contrast to the perceived artifice and superficiality of civilized society.”²⁷ Primitivism is also based on the idea “of a beginning or original condition, and the irreducible foundation of a thing or experience, referring to that which is most deeply innate within oneself.”

As one of a handful of buildings that are considered to be the most important structures of the twentieth century, the Villa Savoye has had its share of analysis, but it somehow seems to resist explanation, literally and figuratively rising above all attempts to ground it in reality. Why is it so important, and why is it also so elusive?

“*Les Heures Claire*” The Villa Savoye, or *Les Heures Claire* as it was named by its owners, is important because it represents the synthesis of the initial stage of development of a designer who is inarguably the most important architect of his



Villa Savoye exterior. Courtesy of Sandra Draskovic; Flickr

time, against whom all other Modernists are now measured. The Villa Savoye is located in Poissy, in the Yvelines region of France, about 30 kilometers west of Paris. It is situated at the top of a slightly rounded hill, with a view of the river Seine in the distance. This hill, which is like an inverted bowl surrounded by trees, gives the house an added sense of presence, making it appear to be like a temple in its own sacred enclosure with a vast convex lawn stretching out in all directions to the tree line around the site. This location in the center of the site also objectifies the house, making it seem to be placed on a pedestal. It also encourages a sense of progression, and actually initiates it, beginning at the entrance through the tree line. Le Corbusier visualized the approach to the house as being made by automobile as shown by the intentional lifting of it on columns, or *piloti*, to allow the car to drive underneath it, up to the front door. In this sense, the house is raised up to become a large *porte cochere* and the car was intended to spiral around the house in a constantly narrowing arc before arrival.

The columns make the house seem to float, which, along with its siting at the crown of the hill, contributes to its sense of detachment from nature, which was certainly intentional. It seems ethereal, rather than real, but the aura of perfection is also deliberately compromised by a series of discrepancies.

Deliberate Ambiguities The first of these is the geometry of the house. It looks square, when seen from a distance, but is actually rectangular. The perfection of the square is also compromised on the inside by a long ramp that is placed off-axis, bisecting the plan into two unequal parts. The ramp is also a key element in the theme of procession, which in turn is a key ingredient in Le Corbusier's intention of revealing the spaces within the house slowly, and of having the roof garden, which is the fifth of his five points, and the breathtaking view that it provides out to the 360 degree circle of trees in the distance be the last impression.

This optical illusion of what is apparently a perfect square, being revealed as a compromise, leads to the second ambiguity, which is symmetry. The appearance of the house as a contemporary version of a classical Greek temple implies the same symmetry that is associated with that historical image, but the dark enclosed area of the ground floor, below what appears to be the square volume above it, is pulled toward the back or underside of the house, setting up an asymmetrical dynamic that continues with the displacement of the ramp inside. This symmetrical/asymmetrical dichotomy is also played out in the four elevations, since the front is symmetrical and each of the sides are not.

The elevations then are the third ambiguity, since each one of the four is different from the rest. This also stems from the expectation that the approach to the house by automobile would involve a spiral path around it, in which each elevation would be revealed in turn, before entering under the house and moving to the front door. The elevations also hint at tropism toward both the sun path, at a diagonal from the lower right to the upper left-hand corner of the almost square enclosure, as well as the view to the Seine, toward the upper left, or northwest corner.

The fourth ambiguity is the use of mass and space. The long horizontal voids, corresponding to the strip window as another one of Le Corbusier's five points, are glazed on the front elevation and open on the others, making the enclosing wall of the upper *piano nobile* seem like a screen in some places and a more conventional, and formal, window wall on approach. This selection degree of enclosure also

helped the architect control the amount of sunlight that he allowed into the interior. This leads to the play of light and shadow in the house that is the last dichotomy and that led the owners to name it “Les Heures Claires,” which refers to the long shadows that are typical just before sunset.

Interacting with Nature Roq and Rob, an apartment-hotel project intended for a steeply sloping site on the Côte d’Azur but never realized, is a good example of Le Corbusier’s intention to use the *Monol* model as a synthesis of vernacular forms and the latest construction technology. The units, which stretch out in horizontal ranks along the hillside, on either side of a central, open access stair, are based on a pre-fabricated modular 89 inch (226 centimeter) cube that the architect called *le brevet*. Each unit is composed of three cubes in a row, perpendicular to the hillside. The vaulted roofs, which are reminiscent of sketches Le Corbusier had made of houses he had seen in desert villages in North Africa, were intended to be curved corrugated aluminum sheeting supporting a thin concrete layer covered with earth sown with grass. Portions of the modular grid would have been left open to create an irregular checkerboard pattern of courtyards stepping up the hill. Hellenistic Priene is an obvious historical precedent and the organizational principles are very similar in each case. Horizontal terracing is used in both to adapt to the sheer, cliff-side site as is a central stepping spine, and public plazas carved out of a dense, honeycomb pattern of houses, allowing light and air to penetrate into the midst of the lightly structured, cellular structure of the community.²⁸

The defining feature of the Roq and Rob project is structural thinness to the point of frailty and a relentless modular regularity, compared to the relative weight of the earth on the roof. The challenge that this dichotomy presents to previously held images of barrel-vaulted, bearing-wall buildings, is deliberate. The long, narrow interior of the units, with interlocking upper level balconies, recall those of the *Unité d’habitation* in Marseilles, also proposed as a mass-produced solution to postwar housing shortages, but the most obvious difference between the Cap Martin and Marseilles proposals is lightness, airiness and a much more humane relationship to, and connectedness with, the environment in the Roq and Rob project. The *Unité d’habitation* almost single-handedly launched the New Brutalist movement and the tower blocks that are arguably its grim inheritance. It is particularly regrettable that Roq and Rob was never realized to provide a more human alternative.

Maisons Jaoul In 1952, Le Corbusier did build a weightier version of the Cap d’Antibes community at Neuilly-sur-Seine using a different modular interval. The Jaoul houses on the rue de Longchamp lack the wire-frame thinness of the Roq and Rob structures, having rough concrete piers, beams, and vaults, with brick infill and colored glazed tiles pressed into the underside of the vaults, which are exposed as the ceiling of the interior spaces. The beams, which are the end of an enormous vaulted concrete roof, are scaled to support the exposed brick walls on top of them, and so are lateral members taking the thrust of the tiled arches and longitudinal bond beams at the same time. An interwoven arrangement of formwork on the exposed outer edge of these beams creates a basket weave pattern that intentionally offsets their massiveness and visually defrays their critical structure role as the containing frame that holds everything up. This is one of many small



Maisons Jaoul exterior view. Courtesy of Philippe de Chabot; Flickr

but revealing details that show Le Corbusier's innate understanding of structural forces. Like the Roq and Rob experiment, the Jaoul houses also have sod and grass roofs, but in this instance concrete seems more suitable for the heavy loads that the earth transmits.

The Sarabhai House in Ahmedabad Le Corbusier's intellectual search for a historical, environmental, and technological synthesis as well as a balancing of the polarities in his own personality as revealed in his paintings, sketchbooks, and diaries came to fruition in Ahmedabad, India, in a house designed for Mrs. Manorama Sarabhai, in 1952. Having been commissioned by Nehru to design the capital city of Chandigarh in East Punjab soon after independence in 1947, Le Corbusier began a series of biannual trips to India, which he was contractually obliged to make. Sketchbooks from these trips, like those he religiously kept from all his travels, reveal a number of important impressions of sites he visited, beginning with the capital complex in New Delhi by Sir Edwin Lutyens and the Jantar Mantar astronomical observatory built by Maharajah Jai Singh in the older section of that city. These initial images were followed in quick succession by those of the *Diwan-i-Am* inside the Red Fort in Delhi, the Mughal city of Fathipur Sikri, the Palace at Sarkej, near Ahmedabad, and especially the pillared pavilion near the palace mosque, and the step well in that city, among other sites.

Balkrishna Doshi, who worked in Le Corbusier's Paris office for five years in the early 1950s, was heavily involved in both the planning and construction of the capital city of Chandigarh. Born in Gujarat and based in Ahmedabad, he was a natural guide to these critical historical monuments and a source of information about them. Ahmedabad was destined to play an important role as a manufacturing

center in newly independent India, because of its well-established textile industry, and was a fertile source of commissions for Le Corbusier because of the wealthy Jain families—the owners of the textile mills—who lived there. Through Doshi, he soon met members of the four leading mill-owning families, Kasturbhai Lalbhai, Chinubhai Chimanbhai, Surottam Hutheesing, and Gautam Sarabhai, all of whom supported the growth of cultural and educational institutions in Ahmedabad. They saw the opportunity of having buildings designed by this world famous architect as a rare chance to enhance their city, and acted decisively to engage him. The optimism and syncretism of Le Corbusier and his prospective clients overlapped to a remarkable degree, both he and they wanted to preserve the rich traditions of the region and advance them with the most up-to-date technology.

The Millowner's House During Le Corbusier's first visit to Ahmedabad in March 1951, Chinubhai Chimanbhai commissioned him to design both a cultural center, which included a museum, and a house, while Surottam Hutheesing, the president of the Millowners' Association, asked for a new headquarters overlooking the Sabarmati River, as well as a house for himself. The Chimanbhai house was never realized, and only the museum portion of the cultural center was built, though in greatly altered form. The Millowners' Association was built as designed, but the Hutheesing house was abandoned by its intended owner. The plans were acquired by fellow millowner Shyamubhai Shodan and built exactly as originally designed for another site. Both the Millowners' Association Building and the Shodan House fall into the category of the Maison Citrohan model: frame and flat-plate structures fitted with either a deep egg crate or *brise-soleil* façade and a separate, elevated, "parasol" roof to adapt them to the extreme climate of India. As innovative as these adaptations are, the basic type remains substantially unchanged in them, but his approach to the Sarabhai House advances the diametrical, *Monol*-type considerably. Where the Roq and Rob project had been an attempt to render indigenous pattern in a light, modular frame, and the Maisons Jaoul use a much more muscular concrete frame and brick infill rendition of the Cap Martin idea, the Sarabhai House is organized within a series of parallel bearing walls (with pieces left out to allow cross ventilation), with the vaults in line with the front and back of the house, implying circulation patterns between public and private areas.

Far from being constant, the climate in Ahmedabad has drastic swings from a monsoon season from June to August, when rainfall averages 50 inches (125 centimeters), temperatures vary between 90 and 120 degrees Fahrenheit (32 and 49 degrees Celsius), and the prevailing wind is from the southwest, to a winter season that is dry and cool with temperatures as low as 70 degrees Fahrenheit (21 degrees Celsius), and prevailing winds are from the northeast. The gaps in the parallel bearing walls allowed Le Corbusier to accommodate these extreme shifts, but also provide diagonal views, recalling the Cubist viewpoint, which Le Corbusier began to explore 30 years earlier. In Primitivism, as discussed earlier, reality is perceived as cyclical and episodic rather than teleological and predictable, just as time is understood in traditional societies, and these diagonal views encourage a similar reading of diurnal cycles. Rather than framing linear views, the staccato walls layer them, as well as create shifting patterns of light and shadow, depending on the time of day and season. In stark contrast to many of Le Corbusier's object buildings,

which stand in isolated grandeur apart from or above their natural surroundings, as indeed do the Shodan house and the Millowners' Building, the Sarabhai residence is so seamlessly integrated into its lush tropical setting that it seems to be part of it, an impression strengthened by a planted sod roof and a green courtyard in the midst of the house. The earthen roof is refined as an insulative cooling device here with the addition of water channels that traverse it, perhaps inspired by the Mughal gardens that Le Corbusier had seen nearby.

Both this and the parasol introduced at the Villa Shodan (and later made the key design concept of the High Court at Chandigarh) show a concerted effort to come to terms with the lethal power of the sun in India, which is directly overhead well before midday, making the roof the main built surface most susceptible to heat again. Water troughs running across a planted vaulted roof were later the basis for the Sangath studio of Balkrishna Doshi, also in Ahmedabad, a long work in progress finally finished in 1981. Although air conditioning is used in part of the Sarabhai House, installed long before it was generally commercially available in recognition of the client's wish to be comfortable at the hottest time of the year, the house is oriented to maximize natural ventilation and wide wooden doors that pivot 180 degrees are used to present as little of an obstacle as possible to air moving through the house. Cross ventilation then, as well as the prevalence of concrete, masonry, and stone to increase thermal mass, and the water-cooled earthen roof, are the key environmental strategies used here.

Chandigarh Named after Chandi, the Hindu goddess of power, the new capital city of the Indian side of recently partitioned Punjab region was intended by India's first Prime Minister to announce separation from the past and symbolize hope for the future. Based on his earlier position on urbanism, made manifest in his Plan Voisin for Paris (1925), Plan Obus for Algiers (1932), and a plan for war-ravaged Saint Die (1945–1946), Le Corbusier seemed to be the perfect choice as a *tabula rasa* city planner who would completely ignore history, culture, and context. With his Plan Voisin, he had almost single-handedly launched the modernist myth that by concentrating activities in tall towers, the land below could be returned to nature or parks and gardens for the people (resulting in less-enlightened hands in the desolate, wind-swept plazas in central business districts today). The “brave new world” he envisioned with his Plan Voisin towers flanking multilaned expressways has become a reality, a familiar sterile concrete landscape that is remarkably the same, whether it is encountered in Bulgaria, Buenos Aires, or Riyadh. In his previous plans, Le Corbusier had also demonstrated his eagerness to break with the past: his political views aligned with those who considered historical structures to be nothing more than a regrettable, tangible record of social divisions and class struggle. The Plan Voisin occupied and required the destruction of the entire medieval center of Paris and his plan for Saint-Die ensured the demolition of everything not leveled by Axis bombing, rather than the restoration of an ancient core that had been thoroughly documented and could have been at least partially rebuilt. But Chandigarh would be different, because it was a *tabula rasa*, in which the architect had to find parameters to anchor it to its vast, open plain. The axiom that restrictions are a blessing in design is proven by exception here: Le Corbusier chose to rely upon themes prevalent in “A Poem to the Right Angle” that he wrote at the time of this commission. In it, he describes the place of the human being in

nature and the cosmos, in an attempt to make sense of the boundless parameters presented to him in the Punjab. At Chandigarh, he relied first on immutable, seasonal patterns and the sun as the most predictable of these, to establish boundaries: a “tower of shadows” remains as a shrine dedicated solely to his study of solar patterns. His opening moves in designing this city reveal an elemental strategy traceable to Stonehenge as a means of establishing a place in a trackless universe and inform his first steps in conjuring a specific vocabulary of architecture for Chandigarh. The Sarabhai House shows that he came to realize that the sun is not always an enemy in India, that it is welcome for four months during the winter, and that the sunshades that he was adapting as a critical part of his urban vocabulary, based on regional precedents, could accommodate that need. As Le Corbusier later wrote of this realization:

besides the administrative and financial regulations there was the Law of the Sun in India: a calendar of sensational temperature, extraordinary heat, dry or humid according to the season or the location. The architectural problem consists: first of all to make shade, second to make a current of air (to ventilate), third to control hydraulics (to evacuate rain water). This necessitated a real apprenticeship and an unprecedented adaptation of modern methods.

This “law” dictated every move he made, from the choice of material with sufficient thermal mass to withstand the withering heat, to the orientation of streets in what was then still a relatively automobile-free country to avoid having to drive into the sun in the future, and burrowing into the ground for protection from it. His response to this “law” in his design for the High Court of Justice was particularly inspired, an institutional application of the parasol roof that he had introduced in the Villa Shoden on a monumental scale. At the High Court, it is supported on arches shaped to generate and accelerate the flow of air through it, so it both shades the second, closing roof below it and washes it with a steady laminar flow of air. The main entrance is also sized and oriented to catch and direct as much breeze as possible, the remainder of the interior converted into a soaring cool, dark, cave-like space in which ramps are used to reduce the amount of heat-generating, calorie-burning effort needed to reach the upper levels. Relegating the majority of the interior of the High Court of the portion not allocated as office or courtroom space, to darkness, reflects Le Corbusier’s realization that cross ventilation is useless as a cooling strategy during the hottest time of the year, and that the only effective tactic was the “creation of cool interiors, as large as possible, and as amply protected from the southwest sun as ingenuity and funds permit.” During this critical superheated period, he found, “the only defense is to retreat behind massive walls or their equivalent, with every aperture closed, and if possible sealed.”

Le Corbusier chose concrete to provide the thermal mass necessary to create these massive walls and cool interiors, but this technological part of his tradition through science equations resulted in a high investment of human capital. A reporter observing construction described how more than 30,000 men and women, working seven days a week, poured concrete from buckets carried on their heads, climbed up bamboo scaffolding, and mixed mortar with their feet. Aggregate was

made from boulders that were broken with hammers, and asphalt was poured and spread on roads individually by workers who wrapped their hands in burlap sacks to keep them from being burned.

A New Tradition The financial restrictions that made this hand labor necessary became Le Corbusier's second parameter, after "the Law of the sun" and climate. The third parameter he chose, to bracket the infinity of choices made possible by an open-ended site and ambitious nationalistic brief, was symbolism, referring back once again to his earlier, Cubist roots. At Chandigarh, Le Corbusier relied heavily on universal, primitive phenomenology, cosmological themes and iconographic references specifically drawn from regional sources, to an extent not seen in his earlier architecture or planning projects. The governmental center contains especially overt anthropological analogies, but more than being a straightforward gesture of respect to Indian heritage, they have been identified as "being in accord with Le Corbusier's definitions of 'types' that is, forms that have been refined over a long period of everyday use resulting in a careful selection based on utility, function and aesthetics."

The City as a House, the House as a City As a true rationalist Le Corbusier saw the historical city as not just a random assemblage of buildings, but rather a laboratory full of specimens waiting to be classified, with the most successful of these, as proven through evolution, fit to be selected and refined for future repetition. In his final city, he determined that traditional responses to physical as well as psychic well-being were far more effective than forms alone and that technology should be assigned a supporting rather than a leading role in providing those benefits.

As Chandigarh has matured, Le Corbusier's intentions have become clearer, as residents' satisfaction with their city continues to grow. Focus on the center in the media during and just after construction, for many of the same reasons that have already been discussed here, tended to obscure the fact that most of the master plan is given over to housing, organized along green fingers that extend out from the more megalithic and photogenic palm. These wide pathways are now filled with trees and are much appreciated by those who live and work along the shaded streets that connect the public residential parts of the capital. In a sense, Chandigarh is the urbanistic realization of the *Monol* experiment, finally proven in the Sarabhai residence in Ahmedabad, with its residential part being a model for the green city of the future.

Auguste Perret: Apartment House on Rue Franklin, Paris

Auguste Perret was born in Ixelles, Belgium, in 1874. His family, which was French, had taken refuge there as a result of the Communard Insurrection of 1871, and they returned to Paris in 1881 when the political climate was more favorable. Auguste entered the *Ecole des Beaux Arts*, but did not graduate because he, like his brother Gustave who entered with him, had always intended to join their father's construction company instead.²⁹ At the time he attended the *Ecole*, its curriculum was extensively based on Classical principles. The school had began before the French Revolution as a training ground for a select group of young architects who were primarily intended to serve the monarchy, which patronized their education. Several embarrassing structural failures led to the parallel establishment of an engineering branch, the *Ecole Polytechnique*, starting the schism that defines the two

fields today. After the revolution, Napoleon Bonaparte was under a great deal of pressure to disband the schools because of their royalist associations, but decided instead to make the entry requirements less stringent and not based on connections to the aristocracy. While admission was easier, the requirements necessary to remain in the school were made more difficult, so attrition was high and the number of students who finally matriculated approximated the size of the earlier classes. To deliberately choose to withdraw from such a competitive and prestigious program in 1895 was courageous and demonstrates a highly focused sense of purpose.

The Rational Tradition Although his exposure to *Ecole des Beaux Arts* theory was abbreviated, Perret still managed to assimilate a great deal of the Rationalist tradition of the school, which dovetailed nicely with its emphasis on Classicism. The architecture of Classical Greece and Rome, after all, is based on harmony and proportion and the logical structural relationship of parts to the whole. Perret adopted the ideas of Abbé Laugier, who, in his *Essai sur l'Architecture*, proposed a return to basic typological elements as an antidote to the excesses of the *ancien régime*. Laugier offered a more simplified approach as an alternative to the overdecorated Baroque and Rococo styles that were favored by the court, suggesting a simple column and beam system based on natural forms. The frontpiece of his book has an engraving of a rough, wooden structure made entirely of pieces of tree trunk, cut into columns and lintels and beams that support a pitched roof, which Laugier calls "the primitive hut." The influence, of course, was that architects should return to essentials.

Perret did that by helping to arrange for his family firm, then known as Perret Frères, to be one of the few in Paris to be licensed to use a reinforced concrete system devised and patented by Françoise Hennebique.³⁰ Hennebique was one of the first engineers to realize that by embedding steel bars, which were deformed to allow them to adhere, into concrete, it was possible to take advantage of both the strength of masonry in compression and the tensile strength of the steel, which make an almost perfect material when combined. The advantage of this unity is augmented by the fact that the modulus of elasticity, or expansion in hot weather and retraction in cold, is very similar in both the concrete and the steel, increasing their compatibility.

Limestone Is Prevalent Because limestone is so prevalent in the area around Paris, it has commonly been used in the past for building. But it is not strong enough for large, straight spans, and so has typically been used in either solid walls or arched arcades. As has been discussed earlier in this service, in an analysis of the evolution of the Place Royale in Paris into the Place Vosges, wood has also been popular as a construction material, and in that instance as elsewhere was often replaced by stone at a later date. Wood requires the use of a frame system, however, rather than the monolithic bearing wall system required by masonry. Reinforced concrete, however, finally allowed masonry to be used like wood, in a lightweight frame system that was much stronger and capable of much longer spans than its timber counterpart. Auguste Perret's interest then was to use reinforced concrete in a trabeated, post and lintel frame system that was much lighter and more flexible than masonry buildings in Paris had been in the past.³¹ He was inspired by two books in this quest, which allowed him to join together Classical

trabeation with reinforced concrete construction: the first study of Classical precedents and *Le Béton Armé*, by Paul Christophe, released three years later, which details reinforced concrete construction and the advantages of the Hennebique system.

The House on Rue Franklin In 1903 Auguste Perret, along with his brother Gustave, designed and built an apartment house on the Rue Franklin in Paris that marks an important transition point from the limestone bearing wall masonry tradition that had been used in Paris since the Middle Ages to the modern townhouse typology found there today. It is very modest in scale and is essentially six single family units, which each occupies a single floor, stacked on top of a reception and service lobby that also contains the elevator and stairs that lead up to them, with two additional units of a different configuration on top of them, making eight units in all in an equal number of floors. Each of the lower six are efficiently organized in a “U” toward the stair, elevator, and service bathroom core at the back. A bar, running parallel to one of the legs of the “U,” contains a galley kitchen, which has direct access to the service core and stair to facilitate direct deliveries. The rooms in the interior of the single level flat consist of a dining area adjacent to this kitchen bar, which also has a separate entrance at street level to avoid having deliveries going through the lobby, a “drawing” or living room in the middle, and a bedroom on the other side, adjacent to the bathroom component of the service core in the rear. The lip of the kitchen/dining leg of the “U” extends out to become a “smoking room” on one side and a “boudoir” on the bedroom leg of the other, using nomenclature that is indicative of the social mores of a middle class family that would have occupied one of these flats at the turn of the twentieth century in pre-World War I Paris. In spite of their modest means, and the relatively small size of their apartments, the occupants of these units would have had domestic help and would probably have entertained frequently. Guests would first have been received in the drawing room, and then have moved into the dining room, after which men would have retreated to the smoking room for brandy and cigars, while women would have returned to the drawing room for conversation there. Sliding doors would have closed off the bedroom from view, as well as its attached boudoir, which was a dressing room for women. Each of the rooms on the sides of the “U,” that is, the dining room and its adjacent smoking room, as well as the bedroom and its symmetrically projecting boudoir, has a fireplace, so that two chimneys that project up through the deck of the two idiosyncratic units at the top of the apartment tower and past them, to expel smoke at a safe distance above the roof of the penthouse flat at the top, bracket the units below. Windows at the top of each end of the “U,” as well as at the end of the galley facing the street, ensure that the kitchen, smoking room, and boudoir are flooded with natural light. Angled windows next to these introduced light into the dining room and bedroom, and an Oriole window in the center lets light into the drawing room at the heart of each house. French doors, which make up the angled windows, provide access out to a reasonably large balcony, attached to both the dining room and bedroom, completing the thoughtful provision of humane amenities through these extremely well-planned flats. No room, except the hallway that joins the service core to each flat, is without light and natural ventilation. Service, and access to it, is well provided for. The public areas of each flat work as an entity, without compromising

the integrity of the private zone. Access to each zone is well worked out so that entering and leaving each flat as the building itself is compartmentalized and can be managed in a way that is considerate of the privacy of others. The plan of the unit is brilliant and deceptively simple.

Style as a Function of Technology Auguste Perret, who was a professor at the *Ecole des Pans et Chaussées* in Paris, keeping with his proficiency in engineering, taught his students that style in architecture is technically determined, that is, that it is the result of the materials used and the construction method required to build with them.³² This theory, which was also popularized by Viollet-le-Duc at the time the apartment house on Rue Franklin was built, sought to explain Classical Greek or Gothic Architecture, for example, as products of the building technology available at the time, but did so at the expense of social habits and conventions and other cultural dictates of form. The theory does not account for the Greeks' desire to transform a vernacular timber system into marble as the temple evolved, due to symbolic associations, or the commitment of the builders of the Gothic Cathedral to striking a balance between mysticism and subjectivity on the one hand, and empiricism and scholastic rationalism on the other.³³ Each style is indeed a product of the highest level of building skill possible at the time, but also of the social norms that prevailed as well, as is the apartment house on Rue Franklin.

Jean Prouvé: *Maison Tropicale*

Jean Prouvé was born in Nancy, France, in 1901. His father had helped to form an art collective there, which is now known as the School of Nancy, based on the idea of strengthening the connection between art, social awareness, and industrial production, in order to make it more accessible to everyone. This had a formative effect on his ideas about the role of design. He apprenticed with a well-known metal worker and blacksmith in Paris, and worked with many well-known architects and furniture designers throughout France at that time. His career trajectory is similar to that of Pierre Chareau, the architect of the *Maison de Verre*, discussed elsewhere here, with whom Prouvé shares the French tradition of being an engineer-architect, who got extensively involved in the design of each element of the buildings he was involved in. Following World War II, Prouvé was commissioned by the Ministry of Reconstruction to design houses for the homeless, and he built a factory in Maxeuille to mass-produce prefabricated components for this purpose in 1947.

His lack of conventional training, which is a characteristic that he shared with a surprising number of other modern architects, was, perhaps, one of the main reasons for his objectivity, and his talent in being able to point out the failure of contemporary architects to fully utilize the potential of industrialization. Ludwig Mies van der Rohe, who, like Prouvé, also came to architecture through a building trade, repeatedly said that the art of building only really existed when technology had reached complete fulfillment, and that the goal of Modernism should be to encourage building and industrialization to grow together. Prouvé sought to reach that fulfillment in metal, which was the medium that he knew best, and his unquestionable success in achieving it has been an inspiration to many others who have attempted to explore the architectural potential of technology ever since.

An Engineer-Architect Serving mostly in the capacity of engineering consultant to other architects throughout his career, Prouvé constantly looked for ways to introduce the techniques of industrial production into the profession, and to also have the building trades benefit from the efficiencies that have been realized there. He frequently noted that the construction process today has really changed little since the Middle Ages. It still depends primarily on separate trades working sequentially rather than in unison toward what should be a common goal. In that process, however, he realized that the architect no longer fulfilled the key role of the master builder of the past, being largely separated from the construction sequence once the working drawing stage had been completed. This division from the actual building phase, in his view, had also been aggravated by the cult of individuality that had been introduced as early as the Renaissance, but accelerated by the Modern Movement, which tacitly encouraged the development of distinct stylistic personalities that looked upon standardization as being anathema to individuality. As an alternative, Prouvé recommended that architects seek reunion with the building process. As a first step in that reunion, he advocated that they come to have a far better understanding of the materials that they specify, including the way in which these materials are made, in order to more fully appreciate their characteristics. By also becoming familiar with the way the machines that produce those materials operate, Prouvé also felt that architects could utilize them better. He differed from a majority of his contemporaries in his respect, rather than disdain, for the lessons of the past, and rather than considering historical monuments to be technologically primitive, as might be expected, he saw that each of the best of them was a complete expression of the most advanced physical knowledge and tectonic skill available at the time of their construction.

Techné When considered in this way, a megaron, pyramid, or Gothic cathedral begin to take on a completely new dimension, reminding us that *techné*, which is the Greek root word in “technology,” represents craftsmanship and no electronic wizardry. When carried out as the combined effort of an entire culture, rather than a single individual, this craftsmanship carries a special kind of inspiration in it that Prouvé perceptively identified as being absent in the majority of the architecture built today, making it dead in a sociological sense. While similar feelings have been expressed by a few enlightened and more traditionally minded architects from the developing world in the past, Prouvé parts company with them in his belief that this lost inspiration will return only when the full potential of industry is realized in architecture. To do this, he also proposes that in addition to involving architects in the manufacturing process, they must also be educated differently. In the system he proposes, the conventional pedantic emphasis on methods of construction should be replaced with a stress upon the idea of a building as being composed of elements that each have infinite variations much like the parts of the automobile or the notes of a musical scale. While the numbers of notes on the scale are fixed, the possibilities within that system have been used to create seemingly endless combinations.

Of all his projects, his *Maison du Peuple*, designed in conjunction with Bodansky, Beaudouin, and Lods in Clichy, near Paris, is possibly the best example of his philosophy that architecture must totally harmonize with the methods of its production. Made up of entirely movable walls, floors, and ceiling panels, wrapped in

stressed, spring-loaded metal panels, the building clearly defines what Prouvé meant when he spoke of the need to produce “conditioned” buildings descendant of this philosophy; its architect Norman Foster, perhaps more than any other designer today, seems to personify the new attitude toward technology that Prouvé had in mind.

In the many exhibitions of his work that he organized, Prouvé used the word “*Constructeur*” as a title rather than architect or engineer. The word is difficult to translate into English, having mixed connotations of contractor, master builder, and even mechanic in it. The title is very appropriate for him, as he was all of these, serving as an example of the multidisciplinary talents necessary to cope with today’s highly complex construction industry.

The Maison Tropicale While the *Maison du Peuple* is widely regarded as Prouvé’s greatest large-scale commission, his prototypical *Maison Tropicale* is generally thought to be one of his most visionary residential projects. He designed this house as a prototype to be used in the French colonial enterprise in North Africa soon after World War II, and three of them were actually produced between 1949 and 1951 and built in Brazzaville. They follow his basic principles of designing buildings and furniture that were efficiently conceived and could be logically and inexpensively fabricated for general use. He was primarily involved in developing prefabrication techniques that would make this goal possible, focusing on ease of production and assembly, primarily in aluminum.

The *Maison Tropicale* prototype was mostly built of prefabricated aluminum parts. It was raised off the ground and had a wide, covered verandah running around the entire perimeter. The cover of this verandah was part of an all-encompassing gable roof, which extended out over the enclosure surrounding the main living area, with a set of three operable louvers forming a deep cornice for the roof on all four sides of the house. This louvered cornice allowed the occupants to control the amount of sun and air coming into the house at all times of the day. A ventilator, similar to those used on barns to prevent the interior from overheating, ran the entire length of the gable ridge. Slender pipe columns spaced at regular intervals around the perimeter of the house supported the gable overhang, making it possible to break the louver assemblage in the deep cornice into shorter bays. This gave it more strength and less chance of deflection. The *Maison Tropicale*, which was a rectilinear I plan, was five modules wide and seven modules long with a wooden deck inset into a deep metal foundation frame on the verandah position of the house. The demountable floor to ceiling enclosure walls, which are also made of aluminum, were perforated with large circular holes to allow cross circulation. Some of these panels were fixed and others were intended to slide.

GERMANY

Ludwig Mies van der Rohe: Weissenhofsiedlung

Ludwig Mies van der Rohe was born in Aachen, Germany, in 1886 and apprenticed with his father as a stonemason. Aachen is particularly rich in the number of historical artifacts and meaningful associations that it has, in a nation with no shortage of them. The most important of these is the Palatine Chapel of the

Emperor Charlemagne, which was built soon after the beginning of the first millennium and marked the end of the Dark Ages in Europe. Mies van der Rohe was surrounded by masterpieces of stone construction as he grew up and as a young apprentice had many important monuments to inspire him. At the age of 19, he went to Berlin to work with architect Bruno Paul, and three years later joined the office of Peter Behrens. Behrens was one of the most influential architects in Europe at that time, having managed to divert attention away from the Arts and Crafts Movement in England by securing the commission to design a country home for the Bassett-Loewke family called “New Ways.” Although this is a relatively small project, it had enormous significance because the choice of Behrens to design it pre-empted the influence of Charles Rennie Mackintosh, who had renovated a small townhouse at Derngate for the same family and had expected to be given the chance to work on this larger house himself. It was a personal blow to Mackintosh, but in a larger sense was also a repudiation by a member of the British upper-middle class of what was then called “English-Free Architecture,” or the more traditionally based version of Modernism that Mackintosh represented.

Passing the Torch The commissioning of Peter Behrens to design New Ways then marks the symbolic passing of the torch of the impetus behind Modernist architecture from Britain to Germany, and Ludwig Mies van der Rohe was perfectly positioned to become one of the leaders of the next generation to carry that torch forward. Behrens eventually became the corporate architect for the *Alle-magne Electricish Gesellschaft* or AEG, the national supplier of electricity, with the responsibility of designing everything related to the public image of the company, in addition to its factories and office buildings. His Turbine Works for AEG, built in Berlin just after World War I, is a masterful example of his attempt to balance historical and modern elements by using the latest industrial materials available to him, while also employing metaphysical references to both institutional and rural precedents that would both enable the workers in the factory and make them feel more at home.

Disparate Influences While he was working for Peter Behrens, Ludwig Mies van der Rohe interacted with just about everyone who was of any importance in the Modern Movement in both Germany and Europe as a whole, and yet he claimed as major influences the work of two people who were not part of that elite group. Karl Friedrich Schinkel, who was the first of these, was a Prussian architect, who practiced during the later half of the nineteenth century and whose Altes Gallery in Berlin is generally considered to be one of his best projects as well as the most important early museum after the Louvre in Paris. Mies van der Rohe was drawn to the Classical strain in Schinkel’s rational language, and this would surface again and again in all of his later projects, in a wide variety of scales and contextual relationships.

The second rather surprising influence on Mies van der Rohe’s architecture was Frank Lloyd Wright, who became well-known in Germany right after World War I because of the publication of a monograph on his work by the Berlin-based firm of Wasmuth. This so-called “Wasmuth Portfolio” made its way through the ateliers of Germany to Holland, France, and England as well, and had a profound impact in each country that surfaced in various ways. In the Netherlands Robert van’t Hoff popularized Wright’s more open approach to space planning in ways

that arguably culminated in the De Stijl movement in that country later on. In Germany, however, the effect that the Portfolio had is more difficult to trace, but can be found primarily in the tendency of Ludwig Mies van der Rohe to “break the box,” just as Wright prescribed. This term, which Wright used frequently, referred to his belief that conventional room divisions, separated by walls, should be eliminated in residential design and should be replaced by a free flow of space from zone to zone, in what is now more commonly referred to as an open plan.

In a house he designed early in his career, Mies van der Rohe famously expanded Wright’s open plan idea by extending the peripheral walls of the residence far beyond the edge of the enclosure, like tentacles stretching out to hold onto the adjacent land. This exaggerated extension of the walls, as well as the opening up of the interior, the use of brick throughout, the flat roof and extensive use of glass, helped update the rather historicist image of Wright’s Prairie School typology for a new generation of Modernists.

A Humiliating Defeat Ludwig Mies van der Rohe opened his own office in 1912, at age 26, just two years before the military conflagration that was to have such tragic social and economic consequences for his country. He, like many other Modernist architects of his generation, such as Walter Gropius, fought in that war, and the humiliation of defeat as well as the crippling reparations that followed left an indelible imprint on their collective psyches. They seemed to emerge from the experience with a fierce determination to raise their nation up again through design excellence, which they saw as the only avenue open to them. It is instructive that the German entry in the International Exhibition, held in Barcelona, Spain, in 1929, and designed by Mies van der Rohe, was a small pavilion that replicated the open plan and extended walls of his earlier brick house, but had a skeleton of chrome-wrapped steel columns, with marble space dividers instead. This “Barcelona Pavilion” is now regarded as an icon of early Modernist principles, which, along with its minimal spatial message, established a new standard for furniture design as well. Mies van der Rohe had absorbed the essential lesson preached by Adolf Loos, of the need to use the most luxurious materials possible in the interior of a house, to adequately reflect its role as a refuge from the rigors of daily life in the public realm, and proclaimed it to the world as part of a more ambitious mission in this pavilion. That mission was nothing less than the reconstruction of the international reputation of his country through the mechanism of renewed industrial production and a culture of design excellence, which would raise the gross national product and expedite economic recovery. There were no kitschy stalls with *leiderhosen* clad bartenders selling steins of German beer or any of the other more commonplace examples of national self-promotion here, just a stunningly beautiful and blissfully minimal pavilion, which was empty except for several exquisite chairs, tables, and benches that Mies van der Rohe also designed for his setting to represent his country and its present and future intentions.

The Villa Tugendhat in Brno, Czechoslovakia Shortly afterward, in 1928, Mies van der Rohe produced his first conceptual sketches for a house for Grete Weiss Low-Beer and Fritz Tugendhat, located on Cernopolni Street in Brno. The site slopes away from the street quite dramatically toward the southwest, which is also the direction of the center of Brno and Spilberk castle, which is the most visible

monument there.³⁴ The clients accepted his idea, which was radically new at the time, of using a steel frame system similar to the one he had introduced at the Barcelona Pavilion the year before, and then dividing spaces with the freestanding screens. They asked that several of these columns, which are cruciform in shape and also wrapped in chrome, be recessed into the wall, so that movement between spaces would be easier. They also asked the architect to shade the large areas of glass. But otherwise, they entirely approved his approach.³⁵

Using the Slope to Best Advantage Mies van der Rohe took advantage of the steeply sloping site by locating an entrance and a garage on street level at the top of the hill. The roadside elevation is modestly long and low, with the house separated from the sidewalk and the street by a custom-designed steel mesh fence, which runs the entire length of the site except in front of the garage. The roof of the house is flat and the roof and the roofline are continuous, broken only by the vertical shaft of a chimney.

The front door at this level led into the top floor where the bedrooms and bath areas were located. Two bedrooms, for the couple's children and their nanny, as well as a shared bathroom were located on the street side, while the master bedroom and bath, as well as a dressing room, were located across from them, on the side overlooking the garden, the hill, and the grand distant view of the city beyond. From this upper level, where all the bedrooms and bathrooms are also located, a glass-enclosed spiral stair leads down to the living area, which has a dramatic view of the center of the city of Brno in the distance through floor-to-ceiling glass windows, as well as a landscaped garden in the foreground. The concept behind the use of a steel frame system was to have this level be as open as possible, with only one semicircular divider made of ebony wood, demarcating the dining area, and another short straight screen, made of onyx, used to separate the living room from a more private sitting area. The floor-to-ceiling glass used along the exterior wall facing the downhill side of the house makes the interior space seem much larger than it actually is and allows light to flood the space. Mies van der Rohe positioned the onyx wall so that it would seem to glow at sunset, making it translucent at that hour of the day. This level of attention to detail is typical of this architect's work, and he custom designed every part of the house, including furniture, door handles and hinges, heating and air conditioning ducts and pipes, carpets, and curtains. To satisfy his client's request that the amount of glare inside the living area be reduced, he used a black, beige, and white silk velvet material for the curtains along the floor-to-ceiling glass walls in certain areas to separate certain zones and make the space seem smaller, if need be.

The Essence of Opulence The floor was covered with white linoleum, and this, in combination with the chrome-covered columns and curtain rails, semicircular ebony wood dining enclosure, onyx wall and bluish white velvet silk curtains, as well as the white leather and chrome furniture that Mies van der Rohe had made for the house, must have conveyed an overwhelming impression of opulence. In critiques that appeared at the time, the house and its architect were judged to be an example of conspicuous consumption, built at the expense of the economically disadvantaged, such as the workers.

The Weissenhof Estate in Stuttgart Ludwig Mies van der Rohe was perfectly capable of designing minimalist workers' housing, however, which was an essential

part of his Modernist credential. He was selected as the master planner of such a complex, or *siedlung*, by the membership of the Deutsche Werkbund at their meeting in Bremen in 1925, which was intended to provide prototypes of the kinds of houses that could be built for working class families with limited financial resources. It has 60 house units of different kinds, built of the latest materials available at the time. The housing complex was part of an exhibition called “The Dwelling” (*Die Wohnung*) that was held in Stuttgart from September 6 until October 31, 1927.³⁶ Mies van der Rohe himself designed the central housing block of the complex, and also commissioned 17 other prominent European Modernists to contribute to the *siedlung*. These included Walter Gropius, Le Corbusier, and J. J. P. Oud, who provided schemes for single family and multifamily units as well as terrace houses and apartment blocks. Mies van der Rohe started out with the intention of providing a proper setting for what he termed “New Living” that would transcend purely rational and functional requirements, and he began to explore the spatial possibilities that new materials and structural innovations offered.

HOLLAND

Gerrit Rietveld and Theo van Doesburg: The Schroeder House

It occasionally happens in the history of contemporary architecture that a building will emerge that perfectly reflects a new theory or, even more fortunately, a key aspect of the spirit of its time. The Schroeder house, in Utrecht, Holland, designed by Gerrit Rietveld is one such building. It is something of a miracle that it was realized at all, given its location at the end of a row of conventional brick apartment houses on Prins Henriklaan, at the edge of a middle class suburb in the southeastern part of the city. It is next to a large park and was originally conceived so that openings in the wall on that side were wider to take maximum advantage of the view. In a majority of the photographs that have appeared of the house over the years, it looks rather large in scale, because the row houses that it is connected to have been skillfully eliminated. But, it is actually diminutive when seen in its true context, since it is about half as high as they are, although equally as long. It is 9.6 meters wide and 12.5 meters long, but has 3.7 meter ceiling heights throughout, which is much higher than a conventional house. This proportion gives the interior of the house an air of spaciousness that defies its small perimeter.

The client was a single parent with three children. She had a restricted budget, but wanted the house to be as open and as free of furniture as possible to accommodate her family. She was also a painter and wanted an artist’s studio with north light and a good view. This direction encouraged her architect, Gerrit Rietveld, to open the house as much as possible and to design built-in furniture to save space.

De Stijl This commission, however modest, allowed Rietveld and his partner Theo van Doesburg to test several new ideas that they had been exploring, related to what American architect Frank Lloyd Wright had described as “breaking the box.” Wright’s work had become well-known in Europe as a result of a monograph on him that had been published by the German firm Wasmuth just before World

War I. He had managed to open up the traditional pattern of enclosed residential spatial arrangements in which individual rooms were set aside for a living room, a dining room, and a kitchen, for example, replacing this series of contained volumes with a free flow of space in which functions were defined by custom-designed, built-in furniture arrangements.

This new approach was best expressed in Wright's Robie House, in Oak Park, near Chicago, in 1910, in which permanent wood screens help to define space and provide privacy wherever necessary, but still allow a feeling of openness throughout the lower two levels of the house. Wright's experimentation with the idea of the free flow of space stopped short of bedrooms and bathrooms.

Wright's work and ideas were promoted in Holland by such influential figures as Henrik Berlage, J. J. P. Oud, and Robert van't Hoff. Berlage, who designed the *Beurs*, in the middle of Amsterdam, as well as being the impetus behind a new master plan for that city, was the leader of a movement related to a rediscovery of traditional values in the Netherlands, and so his endorsement of Wright had considerable weight.

Other developments were then taking place throughout Europe, which, when layered over Wright's revolutionary insight, created the intellectual climate necessary to take his ideas further into an even more abstract realm. One of these local breakthroughs was Cubism, which was being advanced by French artists such as Braque, Picasso, and Duchamp, even Cézanne, starting in 1907.³⁷ The goal of this movement was to challenge the conventions of visualization that had been in place since the Renaissance, based on the idea of perspective, and to replace them with what these artists maintained was a more accurate rendition of the way people perceive the world. They argued that, rather than experiencing space from a fixed point, looking out to the horizon, as Renaissance masters such as Leonardo da Vinci, Brunelleschi, Michelangelo, and Raphael had proposed, people really absorb their surroundings in fragments as they move their head and eyes. This is especially true when they are seen at speed, from a train or a streetcar, which was the new factor that made the Renaissance theory redundant. These artists experimented with new ways of describing reality, involving time as well as space, as shown in the painting *Nude Descending Staircase* by Marcel Duchamp. In that instance, the artist attempts to show the entire event, depicting movement in sequence from the top of the stair to the bottom, as a series of overlapping broken images that convey the actual experience of watching the action rather than a perfect, realistic rendering of one point in time while it was taking place.

In Holland, artist Piet Mondrian began to experiment with these ideas in his paintings of landscapes, and of trees in particular. Between 1907 and 1914 his method of expression evolved in a more minimal, abstract direction until, by the end of that period, his trees were nothing more than pure linear forms, rhythmically organized on the canvas with the landscape around them shown as planes of pure color. Mondrian was also influenced by the theosophical philosophy that was then also popular with several influential architects, which promoted the idea of a higher spiritual order, based on mathematical laws that transcended reality.³⁸

Elsewhere in Europe at that time, between 1912 and 1920, other architects like Le Corbusier were attempting to translate Cubist experimentation into built form, by combining its principles with the mechanistic images of industrialization and

production. This attempt, which became known as Purism because of the intention to simplify the means of expression that was being used and make it more abstract, in the same way that Modernism was refining his landscapes, emerged as Constructivism in Russia, soon after the Revolution.

All of these revelations, taken together, inspired Gerrit Rietveld and Theo van Doesburg to put forward a Dutch variant, which they called simply *De Stijl* or “the Style.” They, like the Purists, saw the legacy of the Arts and Crafts Movement, which had been reborn in Germany in the Deutsche Werkbund and first and second Bauhaus, as being tainted by the desire for materialism and tied too closely to the cycle of commodification. They wanted to elevate their new language to the level of antimateriality, as a spatial expression that was free of conventional restrictions, layered over with the aura of divine inevitability that had previously been adopted by the Theosophists. Their movement included artists, sculptors, and craftspeople as well as architects, and the house for Madame Schroeder was to be the first, three-dimensional evidence of their claims.

This debate, between those who favored the Arts and Crafts approach, perfected by the Scottish architect Charles Rennie Mackintosh, of marrying handicraft and assembly line production and those who wanted mechanization to reign supreme, unhindered by human intervention had been going on since the latter half of the nineteenth century. The leaders of the *De Stijl* movement wanted to resolve the issue once and for all, in favor of what historian William Curtis has described as “spiritualized, mechanized abstraction.”³⁹

In the Schroeder house, that translates into asymmetrical three-dimensional composition made up of a series of horizontal and vertical lines and planes, rendered in a series of primary colors, in addition to black, white, and grey.

Rietveld aimed to make these planes appear to float in space, concurrent with the *De Stijl* intention of contravening materiality. This was similar to a theme in the work of Supremacist Kasimir Malevich who advocated the ideal of weightlessness as a beginning point in the design process, with gravity factored back into it incrementally, and only in the minimal amounts necessary for structural stability. His idea was to replicate the perfect condition of the spiritual realm he aspired to. The *De Stijl* architects were equally utopian in their approach and seemed to be even more intent on conveying the impression of weightlessness than their Russian counterparts.

Changing Fields of Vision Rietveld and van Doesburg conceived of the house as a three-dimensional, habitable sculpture, to the extent of organizing the composition in such a way as to take advantage of the changing fields of vision that a viewer would experience in approaching it. They planned the intersection of horizontal and vertical lines and planes to be appreciated from three sequential zones.⁴⁰ The first of this is defined by a gate that closes off the street, Prins Hendriklaan, on which the house is located, so that a corner window, on both the ground and first floors, is detailed to look continuous and to wrap around the 90 degree angle of the edge, rather than just being purchased through each wall surface at that point. This is consistent with the approach of using solid planes and voids to imply space, rather than delimit it that is used throughout the project. A balcony covered by a deep, flat horizontal plane that acts as an eave and that is partially supported by a

thin vertical member contributes to the assembly at that edge, as does a wide vertical band that designates the circulation “core” or stair. The second rapidly diminishing field of vision is defined by a gate in a fence around the property and a garden path leading to a patio in front of a study on the ground floor. The glass door, used as an entrance here is framed with glass shelves, and the study is shaded by the projecting balcony above. The third field of vision in this progressive sequence, which is now internal, is toward the southeastern corner of the house, toward a living area and a kitchen that is partially shielded from view by a high counter. Rietveld tried to use a balcony to extend the view from the interior of the house toward the park.

The first floor of the house was designed as a studio for Madame Schroeder, to give her the best light and view possible, and the bedrooms and bathrooms are also located on that level for privacy. Throughout the house there is no consistent, axial approach to space, and elements such as window frames, door frames, columns, balconies, and railings, all painted in a variety of primary colors, serve instead to make points of transition. The approach to structure is equally unconventional, since the construction system is a mixture of steel, concrete, and wood frame. Steel was necessary to provide the stiffness that was lost in places where corners have been opened up to convey the visual sense of openness and spatial freedom that Rietveld wanted. He pushed the limits of structural integrity here to do so, and the progression shown in the numerous study models he produced is toward more and more openness as time went on.

John Hejduk: The Wall House

John Hejduk was as much a philosopher as an architect, in the same way that Louis Kahn was. Each of them was concerned with the abstract meaning of elements and their relationship in architecture as well as their interaction with the people that inhabit a building. The design of the spaces was the end result of their search for this meaning, rather than being an end in itself. Hejduk, whose background was Dutch, started to explore these interests in depth in a series of houses he called “Nine Square Texas” between 1868 and 1974, and his own description of these tells the whole story:

The problems of point-line-plane-volume, the facts of square-circle-triangle, the mysteries of central-peripheral-frontal-oblique-concavity-convexity, of right angle of perpendicular, of perspective, the comprehension of sphere-cylinder-pyramid, the questions of structure-construction-organization, the question of scale, of position, the interest in post-lintel, wall-slab, the extent of a limited field, of an unlimited field, the meaning of plan, of section, the meaning of spatial expansion-spatial compression-spatial tension, the direction of regulating lines, of grids, the forces of implied extension, the relationships of figure to ground, of number to proportion, of measurement to scale, of symmetry to asymmetry, of diamond to diagonal, the hidden forces, the ideas of configuration, the static with the dynamic, all begin to take on the form of a vocabulary.⁴¹

In the early 1960s a book entitled *Five Architects* appeared that featured the work of Peter Eisenman, Michael Graves, Charles Gwathmey, John Hejduk, and



The Wall House. Courtesy of Robert Plaskota; Flickr

Richard Meier. Their joint allegiance to the five points of Le Corbusier at that time was the reason behind the joint publication. These points, as described in detail elsewhere here, were intended as a kind of shorthand, to describe the advantages provided by the use of a steel or reinforced concrete frame system, and the formal implications of its use. For Le Corbusier and these five disciples, among many others, the use of the frame, or “grid” in lieu of bearing walls allowed architects much more latitude and freedom in the design process. It meant that rather than being dependant for support on the location of bearing walls, which then determined the size and location of specific rooms, a column-supported slab allowed room dividers to be relieved of structural responsibility so that they could be placed anywhere. A point loaded rather than a bearing wall structure also allows external walls to be more free-form, since they only carry their own weight, rather than that of the floor slabs roof. It also allows windows to span across the entire elevation if need be, rather than being small, because of the uniformly distributed loads that typify a bearing wall system. Other than these three “points,” of a free plan, free elevation, and the strip, or continuous, horizontal window, made possible by the first, generating one, which is the grid, Le Corbusier added the possibility of lifting a house up above the ground on the frame, and providing a garden on the roof as well, as the fifth and final advantage.

Each of the five participants in the *Five Architects* publication project, who utilized these ideas in one way or another, subsequently went on in either new or

nuanced directions, becoming leaders of different styles of architecture that continue to prevail today. While John Hedjuk was involved in his Nine Square Texas series, Peter Eisenman was working through his own set of issues in a similar progression of houses that he simply referred to as a roman numeral that designated its place in the evolution of his exploration of what he termed “deep structure.” He took the grid requirement of Le Corbusier into a more complex philosophical realm by trying to make it legible in three dimensions spatially, rather than as a rank of horizontal columns alone. After exhausting the possibilities of this line of investigation, Eisenman changed direction by aligning himself with the French philosopher Jacques Derrida in the early 1980s and trying to translate Derrida’s theory of deconstruction into architecture at the Wexner Center in Ohio. Several other architects, such as Zaha Hadid, Bernard Tschumi, and the Austrian firm Coop Himmel, initiated parallel lines of inquiry at that time, but Eisenman was arguably the most literal interpreter of Derridian intentions, as a founder of this movement.

Michael Graves, on the other hand, went in an entirely opposite and equally radical direction. After feeling that he had reached the end of the possibilities inherent in the five points method in a series of houses that included the Benecerref addition in Princeton and the Hanselmann and Synderman houses after that, Graves started to examine more historically based precedents for inspiration. He determined that anthropomorphism, manifested in Classical architecture as a base, middle, and top that parallel the foot, body, and head of the human body, would provide a more promising basis for his future creative development, and he arrived at this decision soon after Robert Venturi and Denise Scott Brown had launched what is now referred to as postmodernism. As was the case with Peter Eisenman’s formative role in Deconstructivism, Michael Graves’s shift of direction was part of a more general trend toward a rejection of Modernist dogma. But, the remaining members of the New York Five, including John Hejduk, continued on in much the same way, simply expanding their aesthetic and creative repertoire, rather than changing it entirely. As a result, Richard Meier and Charles Gwathmey, now in the partnership Gwathmey and Siegel, are each leaders of the resurgence of interest in what is often referred to as New Modernism.

The Column as Part of the Wall As the previous list of Hedjuk’s design interests indicates, he had an all-encompassing, highly complex, inquiring mind, which in addition to all of the interrelationships that he mentions in it, also included the planar source of the column, as the main component of the grid. Leon Alberti who was an architect in Late Renaissance Italy, was one of the first to make an analogy between the wall and the column, which has obvious relevance for Le Corbusier’s five point system. Alberti speculated that his column could be considered a strip of a wall, or that a wall was simply a long series of columns joined together, and this is essentially the point of departure that John Hedjuk used in his Wall Houses I and II. As a result of his Nine Square series of houses in Texas, he became particularly fascinated by the relationship between a column and the planar surface of a wall, or the “phantom volume” of the column buried in the wall.⁴² Unlike the other members of the Five, who focused primarily on the implications of using the grid, as a deep structure as Eisenman had employed it, or as a syntactical element as in Graves’s last three Corbusian models, or as tartan arrangements in Meier’s elegant

houses of the late 1970s and early 1980s, or as an icon by Charles Gwathmey in the de Menil house, John Hedjuk decided to examine its origins as part of a wall.

Hedjuk started this search with the idea of a series, as he had done so successfully in Texas, in the late 1960s and 1970s. His first attempt was what he called the “Grandfather” wall house, which was only one story high, but contained the embryonic elements of the final design. These were the idea that the wall could also symbolize the present, with one side representing that past and the other the future. Once this became clear, geometric or organic forms could also be used in symbolic ways, and it seemed to him that rectilinear shapes and service functions were more appropriate to the past, since they are fixed, rigid, and relatively difficult to change, just as our part is. Organic, or what he called “biomorphic,” forms, on the other hand, imply freedom of expression, unpredictability, and joy. This division between the past, on one side of a wall, and the future on the other also implied an equal division between private and public spaces and between the human made and the natural, as well as dark (memory) and light (dreams). Hedjuk intended that these multiple meanings coexist in a way that replicates the intricate layering of our consciousness, as well as the reality of our constant mental cycling between past and present, which is also possible in the Wall House.

The Wall House II The evolution of Hedjuk’s idea for the Wall House culminated in a residence for landscape architect A. E. Bye, which he called Wall House II. It was finally realized in 2001, in Groningen, the Netherlands. It consists of a 14 meter high wall, and a steel framework. This grillage is filled in with a timber frame and coated with stucco, which was especially difficult to do on the curved surfaces on the “future” side of the massive line of demarcation.

ITALY

Casa Malaparte

Solid and void overlap in the most lyrical of Adalberto Libera’s works, a villa realized in close collaboration with his client, Curzio Malaparte.

Sections reveal the extent of its solidity: the building is literally carved into the rock promontory on which it sits, the foundation progressively stepping upward toward the edge of its rocky site as if in an attempt to spring away. The void, which this tenacity makes possible, and the flat rectangular plane that is simultaneously a roof and viewing plane transcend the frequent associations of “terrace” to become a symbol with various levels of meaning. Following the Mediterranean tradition, in a way that is reminiscent of such buildings as the Temple of Sounion, there is no mimesis here, but a high contrast with nature, a heightening of perspective in relationship to the horizon that was transformed by the Rationalists into an emphasis on the roof terrace. This expression of endless space in the distance raises the house to a metaphysical level. The first of these, international or not, relates to Malaparte, who preferred to style himself as a champion of the poor and the oppressed; the obvious parallel of such a precarious *parti* is inevitably a metaphor of endurance and aspiration.

At another level, the increasingly wider steps up to the platform recall the seats of ancient theatres ubiquitous in the region. Capri was a focal point of official



Casa Malaparte. © Roberto Schezen / Esto

interest in archaeological studies of Imperial Rome that intensified while the house was under construction in light of the fact that Roman emperor Tiberius had chosen the island for his villa.

More contemporary cross-references to vernacular forms—from the generic flat roofs of houses on the island that serve as outdoor rooms to a more specific connection with the pinched, triangular steps of the Annunziata Church on the island of Lipari, where Malaparte was once imprisoned—bring the associations around full circle, to the client's contemporary experience. Malaparte once characterized Italian civilization as surrealist, ironic, fantastical, and unreal.

Adoption of such a position obviously put Malaparte at odds with his architect, who was one of the most doctrinaire members of the Gruppo 7, and dismissed him as a romantic. Libera's early schemes show a simple rectangular villa without a monumental staircase to the roof, and according to the client, the builder, a contractor named Amitrano, played a more critical role than the architect in the realization of the house, by working out ways to weld it to the rock.

Such claims are part of the mythology of many great works of architecture and, as is usually the case, the truth lies somewhere in between. What remains, on a promontory on Capri, is a poetic statement about the place of the built object in nature, a worthy entrant into a timeless debate. Malaparte's view of nature as deficient fantasy indicates it is a highly subjective statement in parts, with some windows placed like frames (sill heights almost touching the floor) to appreciate selected views that evoke Chinese painting.

The interior is a highly personalized environment; the private counterpart of the public persona is expressed outside. The detailing provides an interesting dichotomy that emerges in this public/private split. Beyond the formal aspect of the external polemic, the details are rough, almost casual in presentation; the stairs are uneven flagstones and the color of the walls a deep Pompeian red. The interior, by contrast, is minimal in the extreme. Giorgio Ciucci has explained this by saying, "the controlling idea was one of a unity that embraced contradictions" and in coherence, "a house like me," as Malaparte called it. Such contradictions evidently embraced a rational aesthetic, yet could not be entirely contained by it.

Mario Botta: Riva San Vitale

Mario Botta is an architect based in the Canton of Ticino in Switzerland. That district is unique in that it is equally influenced by its proximity to both Germany and Italy, which each have a strong rationalist tradition. It also has beautiful scenery with steep foothills cascading down to pristine Alpine lakes. Lake Lugano and Lake Como are two of the most famous of these, and each has small eponymous cities connected to them that each date back to before the Roman Empire.

Botta has been clearly influenced by several prominent architects in the past. One of these is Louis Kahn, who shared Botta's Rationalistic principles. Both visited Kahn's office in Philadelphia when the Swiss architect was just starting his career. Botta took away several key ideas from that experience that still remain constant in his work today. The most essential of these is Kahn's preference for Platonic forms, such as circles, squares, and equilateral triangles, because they are the purest and are easily proven by geometrical theorem. In a fable called the *Phaedo*, Plato compared the human condition to the existence of a person in a cave, whose entire understanding of the outside world is conditioned by the limited view from a narrow opening. He uses this as an analogy for the imperfection of our collective existence compared to the perfection that he believes must exist in a parallel universe. He says pure forms are also found there, which is why his name is used to refer to them. The second obvious influence that Kahn had on Botta was his promotion of common materials, such as concrete block, which was shunned by other Modernists, because they believed it was too utilitarian. For Kahn, it symbolized his allegiance to the common people as well as his Humanistic, populist stance, in addition to the obvious financial advantage that the choice of a less expensive material offered to his clients.

The Italian architect Carlo Scarpa also had a profound impact on Mario Botta, which is evident in the Swiss designer's love of history and tradition as well as his attention to detail and support for good craftsmanship.

Botta has developed a successful international practice of his own over his long career and, in the course of it, has decisively added his own personal interpretation to the Rationalist canon. He has tended to soften its stringent emphasis on empiricism, typological purity, and objective reasoning, layering over those commonalities an awareness of what he refers to as territory. This concept is related to his idea that the psychological, social, and visual repercussions of any work of architecture extend far beyond the legal boundaries or site lines it is confined to, and that a perceptive designer must take this phenomenon into account. While this may not seem to initially be connected to Rationalist idealism, it does conform to it, in a larger sense, because the corollary to the idea of territoriality is the ability to control future growth around a building by using it to establish a new order around it.

The House in Riva San Vitale Botta has been evolving this idea since the beginning of his career, to great effect. One of the best examples is also one of his earliest projects, which is a small house built for Carlo and Leontina Bianchi, which was completed in 1973. It is located at midslope of the San Giorgio mountain range facing Lake Lugano, standing gloriously alone like a sentinel on its steep, heavily forested mountainside. Botta has disturbed the site as little as possible, simply creating three subsequent levels in the slope that relate to each of the floors in the tower house he has designed. The first of these levels, at the top of the tower, has been used to anchor a bridge that leads to the top, entrance floor of the tower. The bridge is actually a trussed box beam, made of steel chords that have been painted bright red. The truss chords eliminate the need for a railing, since they enclose the entire bridge, and create a feeling of security, since the chasm the bridge spans is relatively deep. The top of the concrete block tower has been treated as a landing point, or platform with a roof above it, and openings on three sides. The entrance to the house itself is on the left-hand side of the tower, and the bridge end is attached to it. The opening facing the downhill side of the slope provides a stunning view of Lake Lugano far below and the mountains on its far shore.

The idea of entering at the top of a house and then moving down into it has been used to great effect by several other famous architects beside Mario Botta, such as Frank Lloyd Wright and Richard Meier. In the Douglas House by Meier, for example, which is discussed elsewhere in this volume, there is an equally precipitous slope in the design equation, as well as a lake below it, and the architect has also used a bridge in that case, to heighten a sense of anticipation, surprise, and delight, after arriving at the end of the bridge and seeing the view beyond. Entering at the top of the house, and arranging the floors below the entry in such a way as to allow an unobstructed view from top to bottom, is also an effective way of providing a sense of orientation for guests and visitors.

In the case of the Riva San Vitale house, Botta has made the entry space two stories high, and has located the bedrooms at the top level as well, to take advantage of the view from that floor. From that point on, a stairway in the middle of the square perimeter of the tower, which has also been placed in a square enclosure, leads down to each of the floors below to the living, dining, and kitchen spaces at the bottom of the tower.

The square footprint of the house and its cubic volumes belie its Rationalist roots, as does its assertive presence, in spite of its relatively small square footage.

It is unlikely that the land around it will ever become a residential enclave, but if it does, it will be difficult to ignore its stately presence and the order that it implies and establishes.

SPAIN

Antoni Gaudi: The Casa Batlló, Barcelona

In the middle of the nineteenth century, there was a resurgence of Catalan identity in Spain, which centered around Barcelona, in spite of attempts by the central government to eradicate it. This eventually led to calls for the secession of Catalonia, which grew stronger up through the Spanish Civil War.⁴³

The architect Antoni Gaudi was a fervent advocate of Catalan individuality, and he was also a devout Catholic. He is perhaps best remembered today for his design of the as-yet unfinished Sagrada Familia Church in Barcelona, begun in 1898, which is also indicative of his stylistic principles. Gaudi sought to revitalize Gothic architecture by infusing it with a Mediterranean character overlaid with Islamic overtones, since Spain was exposed to Muslim culture for hundreds of years before the *Reconquista* or Reconquest, when many mosques were converted to churches and Christianity reestablished its preeminence. Gaudi wanted to transform Gothic architecture through the application of even more associations, including the use of color, to replicate the processes and elements of nature. The structure of the Sagrada family is almost skeletal in appearance. Antoni Gaudi was fortunate in having a patron, and this wealthy textile manufacturer, Eusebio Guell Bacigalupi, not only offered him key commissions of his own but also provided Gaudi with an introduction to other clients in the same socioeconomic class.

Of the many projects that Gaudi designed for his patron, two of the most well-known are the Park Guell and the Palau Guell, also in Barcelona, built in 1888. The Park was only one part of a much larger project for an entire community to be built for those who worked in the Guell Textile Mills, and so was based on the principle of social improvement that was consistent with the politics of both the architect and his client.

Gaudi was inspired by the legend of the Holy Grail, which, according to local tradition, was kept in Montsalvat Castle on a mountain near Barcelona called Montserrat.⁴⁴

Like Paul Cézanne, who was nearly obsessed with images of Mont Sainte-Victoire, Gaudi replicated the jagged profile of Montserrat in many of his buildings, especially in the outline of the Park Guell as well as in an apartment house in Barcelona called the Casa Mila, built between 1906 and 1910. Also known as the *Pedrera*, this apartment block is located on a corner site in the middle of the city, with an undulating, organically geological façade that masks units organized around open central courtyards behind it. In addition to Montserrat, the Casa Mila was also intended by Gaudi as an homage to the Virgin Mary, with the undulations of the façade also replicating the waves of the Mediterranean nearby, lapping at the feet of Mary. Gaudi originally intended to create a sculpture of the Virgin holding the infant Jesus, surrounded by angels, to be inset into the front elevation of the *Pedrera*, but an antireligious riot that broke out soon after the building was

completed led the client to abandon the idea. The intention to do so, however, gives a good indication of Gaudi's devotion.

In addition, to its wave-like façade, the Casa Mila also has something of a cult following because of its phantasmagorical chimney blues, which far exceed the menace of the gargoyles on French Gothic cathedrals, such as Notre Dame in Paris. These chimneys, which appear like an army of demons released from the underworld, are surmounted by cruciform spires, as if to imply that they have been vanquished or are at least under control. The exterior façade also has highly ornate metal balconies, decorated with large leaf-like railings of the same level of quality as the ironwork found in the houses he designed elsewhere.

The Palau Guell After his design of the Colonia and Park Guell on Montana Pelada with collaborators Berenquer and Jupol, and the completion of a Palau for the same client, in 1904 Gaudi started a redesign of a house for the Batlló family, who were also involved in textile manufacturing. It is similar to the Palau Guell in that it also has an elaborately eclectic façade, as well as hints of Islamic influence. These references in the Guell house are primarily related to a cleverly devised atrium covered by an intricately carved, elongated dome, which lets light and air penetrate deep into the interior of the house around and below it. A grand stairway, leading up from entry level at grade leads up around this court to what amounts to a *piano nobile* on the first floor above. The elongated dome is covered by a steeple-like spire and the chimney towers, which are miniature versions of those that populate the roof of the Casa Mila surround it. Projecting window boxes, which are reminiscent of Islamic *musbrabiyya* screens found in the medieval quarters of Muslim cities throughout the Middle East, complete the obvious reference to pre-*Reconquista* Catalonia, which is a constant theme in Gaudi's work.

The Batlló family wanted Gaudi to completely change the style of their existing house primarily as a way of keeping up appearances amidst other prominent houses on the same street in the wealthy area of Barcelona at that time. When his reconstruction was complete, the house could most certainly not be called boring, and quickly got the nickname locally of "The House of Bones."⁴⁵ The exterior columns look like *tibia*, and the balcony railings are skull-like in profile. The tiles that cover the house, which are iridescent green and beige in color, have also been compared to lizard skin. The reptilian metaphor here was as intentional as the religious reference used in the Casa Mila, for somewhat the same reason, since Gaudi intended to invoke the story of St. George and the slaying of a dragon.⁴⁶ Gaudi followed the model of early Gothic cathedrals, in which biblical stories were recounted in sculptural relief on the sides of churches and in their stained glass windows at a time when the majority of the churchgoing public was illiterate and the Bible had yet to be widely translated from Latin. But his allegories and metaphors were far less literal or obvious, while being equally powerful and meaningful to him.

Through the fusion of Spanish Gothic elements and motifs and tile and mosaic work that is reminiscent of Islamic influence, Gaudi tries to proclaim the unique identity of Catalonia in this house. The interior spaces are just as organically conceived as the exterior, full of swirling curves. Even the doorways and doors are irregular. There are no orthogonal reference points, giving the impression that the spaces are constantly moving. This feeling is augmented by the tile work of

Jujol who was without parallel in his skill and craftsmanship at the time the house was built.

Gaudi also designed a majority of the furniture in each of the interior rooms, even though the family retained some of the pieces they had used previously. The cabinets, tables, beds, and chests that the architect produced for these spaces are as fluid and organic as the house itself, as well as equally original.

THE UNITED KINGDOM

Hampstead Garden Suburb

Like Bedford Park, which is an earlier Garden City project conceived by Norman Shaw, Letchworth was speculative and self-contained, designed to project an image of exclusivity and individuality. It is larger in scale than anything Ebenezer Howard had attempted before. A competition for the new town was announced by Howard in 1900; and a plan by Barry Parker and Raymond Unwin was selected in 1904. In addition to Parker and Unwin, the competition included Richard Norman Shaw of Bedford Park fame, as well as W. R. Lethaby, Halsey Ricardo, Geoffrey Lucas, and Sidney Cranfield, who were all asked to prepare plans by the directors. The Parker and Unwin plan was selected because it most specifically conformed to the unusual topography, which is 3,800 acres of uneven land located near the Cambridge Branch of the Great Northern Railway, which bisects the site. Other existing features that greatly influenced the planning were the Hitchin and Baldock Road, the Norton and Wilbury Road, and the Icknield Way between them, running approximately parallel to the railway.

Parker and Unwin proposed individually designed houses in a “cottage” style, based on the preexisting estate village of Old Letchworth. The village, along with Letchworth Hall and St. Mary’s Church, still had several blocks of seventeenth-century cottages, a town center, and a main north-south axis through the center. Parker and Unwin used this axis to full advantage, having residential areas of detached and semidetached houses fanning out from it. They had intended to use a uniform palette of materials throughout their new village, but the onset of war and the pressure for housing afterward introduced unintended features into the planned community. The planners did manage to save almost all existing trees, boasting in promotional brochures that only one was cut down during construction. They also identified a level plateau at the highest part of the site near the town center as the ideal location of the Common, with roads spreading out from the circular strand around it offering impressive vistas into the surrounding countryside as they slope down in all directions.

The Search for Paradise Letchworth was the first of what Ebenezer Howard envisioned as a series of Garden Cities, each with a population limit of 32,000, which would surround industrial cities throughout Britain. To ensure the success of his enterprise, Howard determined that Letchworth should be incorporated and that any increase in property value should be shared by the entire community. He formed a Garden Cities Association in 1899 to implement his plan. The association purchased the Letchworth estate in April 1903 from 15 different owners totaling 3,818 acres, for £155,587. The Association bought the parcels in ways that

would prevent the individual owners from realizing they were contributing to a unified development so they would not raise their selling prices. On September 1, 1908, First Garden City Ltd. was registered and Howard's idea of public participation in a company in which the owners and tenants held shares and received dividends on their property was finally realized.

A Cheap Cottage in the Country Since Howard, Unwin, and Parker were among those owners with shares in Letchworth, their vision was not completely altruistic, even though Raymond Unwin was a fervent supporter of the Socialist League and a vocal advocate of affordable, working-class housing. Both Parker and Unwin built houses for themselves on Letchworth Lane in 1904 in a "Yeoman" Tudor style, and in 1907 Parker designed a thatched studio on Norton Way South in East Anglia vernacular, which now houses the First Garden City Heritage Museum. The unlikely pairing of egalitarian ideals and speculative motives is further personified by Howard's efforts to have Edward Cadbury, planner of Bournville, and W. H. Lever, who built Port Sunlight for company employees, on the Board of Directors of a public company from which he hoped to profit. It is also epitomized by the Cheap Cottage Exhibition, which was ostensibly intended to demonstrate that affordable workers' housing was a key component of the Letchworth community. The insistence on including these houses also demonstrates Howard's realization that, in spite of his dream of a return to a preindustrial paradise, manufacturing was necessary for financial success. It was vital to his goal of self-sufficiency, since employment in the community would be needed to sustain it.

A sales brochure for Garden City included a circular diagram entitled "The Three Magnets" separated into pie-shaped divisions labeled "Town," "Country," and "Town-Country." Garden Cities represent the final combination, having all of the advantages and none of the disadvantages of the first. Unlike the "Town," Garden Cities would have "Low Rents" and "High Wages," "A Field for Enterprise," and "Flow of Capital." Unlike the "Country," they would also have social and cultural activities as an attraction for prospective residents.

The press was invited to the unveiling of 114 houses built especially for the exhibition, advertised at £150, using every new construction method possible to lower costs without compromising the standards of quality or style originally established by Parker and Unwin for the rest of Letchworth. The exhibition attracted nearly 60,000 visitors, but it is unlikely that many of these had agrarian aspirations, given the location of the houses. The contrived attempt to make the cottages seem bucolic was a strategy intended to make them appeal to middle-class urbanites looking for an inexpensive retreat in the countryside.

Letchworth was administered by the Hitchin Council as a rural district until after the 1914–1918 war, when it was elevated to urban status, due to rapid growth. After the Second World War, development pressures drove property values up even higher. To protect this first example of Howard's Garden City concept from takeover, the Letchworth Urban District Council backed a private bill enacted into law in 1962, which established the Letchworth Garden City Corporation. It continued to administer profits for community benefit as before, but enforced stricter controls on development. Administration transferred to the Letchworth Garden City Heritage Foundation in 1992, again through a Private Bill in Parliament, creating an Industrial and Provident Society with charitable status.

Setting an Example The missionary zeal of Ebenezer Howard's "back to the countryside" movement was diverted into nationalistic fervor prior to the First World War and lost its impetus because of the profound social and economic consequences of that conflict. Its importance as a precedent for various aspects of the environmental sensibility that has begun to become so pervasive, however, cannot be overemphasized. This is primarily due to the emphasis placed on living and working in the same community that is now also a central tenet of New Urbanism. The reasons for the importance of the Garden City movement as a precedent may be outlined as follows.

First of all, it was unarguably the prototype for suburban growth, and the urban flight that went with it, beginning in the late 1940s and early 1950s, but it differs from those developments in having a more traditional approach to nature. Rather than the ubiquitous, finely manicured, and watered lawns with which suburb developments have now become synonymous and which, along with the sidewalks, separate each detached house from its neighbors, the Garden Cities that Howard completed were designed to fit into their environment and were respectful of existing contours, trees, and vegetation. They were compactly organized, with semidetached as well as detached houses provided.

The construction of the Garden Cities movement in America, led by Clarence Stein and Henry Wright, perpetuated Howard's ideals and planning tactics, but they could not withstand the economic forces unleashed by the baby boom that followed the Second World War and the speculative opportunists that took advantage of them. Howard's dream, carried forward by Stein and Wright, of profits from property serving the common good and providing affordable housing for all, fell victim to market forces, and architects who held to Howard's ideals withdrew from popular housing completely.

There was a short-lived rebellion in Southern California, just after the Second World War, referred to by Reyner Banham in his classic *Four Ecologies* about Los Angeles as "the Style that Nearly," because it almost prevented the defection of architects from the mass-housing market. Concentrated in an effort called the Case Study House Program, organized by John Entenza, this campaign was intended to convert people to modernism by using prefabrication to lower costs and make houses available to all. What Entenza and his chosen Case Study architects failed to appreciate, which Ebenezer Howard and Jonathan Carr before him did, was the power of image on the public consciousness: the need for people to feel that they were escaping the city to a bucolic cottage in the countryside, rather than a machine in a well-mowed garden.

The second reason why the Garden City movement is an important precedent is that while it ostensibly appears to be antiurban, many of its principles have now been adopted by the New Urbanists as part of their strategy to repopulate inner cities in a more humanistic way. Howard did not visualize his communities as refuges from the city but as alternatives to the urban conditions of the times, which is why he planned to have an outer belt of light industry surrounding each one. Mixed use, which is now one of the New Urbanists' most frequently repeated mantras, was a central idea of Garden City planning to reduce traffic and promote a closer sense of community.

The third reason why the Garden City movement is an important precedent is the idealistic legacy it has left. Howard's dream of having an egalitarian framework that would allow everyone to return to the land has endured in spite of the suburbs and the sprawl that are its more prevalent common denominators. That dream is evident in the early modernist emphasis on workers' housing and the numerous *Siedlungen* that resulted from it. It was also the basis for Frank Lloyd Wright's ambitious Broadacre City plan, which he envisioned as a prototype for American cities of the future, as well as for the groundbreaking plan for the Valleys, put forward by McHarg, Wallace, and Todd in 1962.

In spite of several impressively effective local ordinances in the United States, such as those enacted in parts of Oregon, to contain sprawl, the general tendency, abetted by population rise and economic opportunism, is toward exurban growth as well as movement back into the cities. Howard's model is relevant to each of these trends and offers valuable lessons on how to accommodate all of them.

Charles Rennie Mackintosh: Hill House

Charles Rennie Mackintosh was an extremely talented and highly influential advocate of Arts and Crafts principles, and is widely considered to be an important link between that tradition and Modernism. He sought to continue to honor the past, while utilizing all of the technological advances that the Industrial Revolution had made available to him by combining the two. He studied vernacular Scottish architecture thoroughly, as is obvious in the eclectic stylistic language in his houses. He was a pragmatist, as well as a romantic.

Windyhill Begun in 1899 and completed in 1902, Windyhill postdates a house of similar appearance by C. F. A. Voysey in South Parade, Bedford Park, London, and Perrycroft, Colwall, outside Malvern. The white stucco rendering of the former, intended to make it unmistakably different from its neighbors, and a central splay-chimneyed composition are of particular relevance to Windyhill in Kilma-corm. More particular still is the similarity between the plans of Windyhill and Blackwell, Windermere, Cumbria, by M. H. Baillie Scott built in 1898. There is an obvious concordance of enclosed entry from the court created by the L-shaped plan, and the bay window asymmetrically placed opposite a fireplace is especially noteworthy.

In direct contrast to the sophistication of the Hill House hall, which is entered on axis, rather than at a right angle, the central circulation spine of Windyhill is all on one level and narrower, which makes it seem more severe. As in the Hill House, this hall is also intended as a room in its own right. It was pressed into service as an extension of the main dining room during large family gatherings. A prominent historian relates that Davidson had known Mackintosh for about five years prior to this commission and had asked him to design several pieces of furniture for the Davidson family home at Gladsmuir. These pieces were augmented by his new design for Windyhill, and in an attempt to save money, as for Walter Blackie at the Hill House, the architect was instructed to focus his attention on the hall and drawing room. This was because they were most visible to visitors and guests and should convey a formal, unified impression as the owners' retreat.⁴⁷ The division between the use of oak in the public spaces, as an expression of durability and utility, and white enamel in the bedroom, to lift it above such

associations, is also similar in each house. The rectangular dining table used in the hall, and its square extension, as well as two tapering high-backed chairs, which are Jacobean in profile and feeling, reiterate this study manorial approach, mitigated at the Hill House by the perpendicular, rather than axial, orientation of the stair and raised central portion of the hall, which lift and turn the space, making it lighter. These pieces were subsequently donated to the Glasgow School of Art, so the feeling of the hall has now completely changed.

Contrary to persistent criticism, Windyhill in Mackintosh's final expression is compelling simply because it lacks the balance and finish of the Hill House, for which it, through the Blackwell *parti* of Baillie Scott, was obviously a precedent. Its elevations are less assured, and, in the case of the projecting, axial stairway, deliberately disproportional. This does not diminish their significance as the first, independent declaration of a clean break with historical eclecticism as well as the

Scottish Baronial impetus that was then so fashionable.

Hill House The Hill House in Helensburgh is the best known of Mackintosh's domestic buildings and is also considered his best. It is here that the insights seen in Windyhill emerge full-blown. In the early 1890s, the Glasgow publisher Walter Blackie, who specialized in popular titles for all ages, took the daring step of hiring Talwin Morris, who had established a reputation for *avant-garde* designs while with the *Black and White Journal* in London, as art director in 1893. The Glasgow School of artists and designers was tightly knit and Morris, by necessity, established strong connections within it. Five years later, Blackie established Gresham Publishing Company as an independent subsidiary to produce academic reference books to be sold by subscription, all of which were intended to have covers worthy of a classic collection. In its second year, the Gresham Library of Standard Fiction produced 18 titles, including *Jane Eyre*. Talwin Morris was recognized, in an article in *The Studio*, as a leader in promoting design motifs related to the Celtic Revival. Morris's arrival in Glasgow coincided exactly with publication in *The Studio* of illustrations such as the *Three Brides*



Hill House. Courtesy of Shutterstock

by Jan Toorop and those by Aubrey Beardsley for *Le Morte d'Arthur* by Sir Thomas Malory. These issues have been identified by historian Andrew MacLaren Young as marking the birth of a direction later to be labeled "The Glasgow Style."⁴⁸ Because of his profile, Talwin Morris, who may be considered a leading practitioner of this movement, was able to broadcast it most effectively. It becomes increasingly difficult, after 1897, to separate his work from that of others like Mackintosh and his wife, Margaret Macdonald, who were also a part of it. An article published in *The Studio* in that year by Gleeson White, entitled "Some Glasgow Designers and Their Work," linked them together.

Despite the extent of this symbiotic influence, Mackintosh was introduced to Walter Blackie by Talwin Morris. As Blackie had decided to move from Dunblane in Stirlingshire to be closer to his business interests in Glasgow, in 1907 he purchased a spectacular site to the north of Helensburgh with distant views of the Firth of Clyde and needed an architect to design a house there. Windyhill is not far away, in Kilmacalm, and Mackintosh took the publisher to see it, since it had roughly the same orientation and situation. Mackintosh found Blackie to be a very receptive client, as averse to noncontextual historicism or eclecticism for its own sake as he was. Blackie was just as concerned that external appearance did not supersede function. Apocrypha about the design process includes a story, contested by Walter Blackie's daughter, that Mackintosh lived with the family in Dunblane for several weeks to determine their daily routines and patterns. But another account from Blackie's memory, written 36 years after the house was completed, relates that no elevations were presented until the plans were finalized, and that Mackintosh's preference was for simple massing, as opposed to ostentatious detailing. Blackie's recollections give the impression that there were no preconceived notions involved in the development of the plan, which evolved entirely from family requirements, but further inquiry indicates otherwise.

In an incisive analysis of the Hill House, which focuses primarily on sources and the exterior of the building, James Macaulay has examined the relevance of the *Haus Eines Kunstfreundes* Competition that Mackintosh had entered with Margaret Macdonald in 1900. They produced a scheme that was disqualified on technical grounds because of a lack of the required number of interior perspectives. Yet, it was the only entry that met the judges' expectations of an architecture that decisively broke with existing conventions. While the *parti* is different from that of the L-shaped plan of the Hill House in that it is completely linear, the Art Lovers House remained in Mackintosh's mind as he designed the Blackie residence. Hermann Muthesius could just as easily have been talking of the Hill House when he wrote in the Introduction to *Meister der Innen Kunst* of the Mackintosh's Art Lovers scheme:

The exterior architecture of the building . . . exhibits an absolutely original character unlike anything else known. In it we shall not find trace of the conventional forms of architecture to which the artist, so far as present intentions were concerned, was quite indifferent. The mass of the building consists of a large plain block, without any breaking up of the walls, the effect being sought for in unbroken uniform surfaces. This produces a curious, yet distinctly ingenious impression. The windows have the appearance of accidental openings, deeply recessed in the walls . . . Ornament save in the two or

three places, is conspicuously absent, all allurements being sternly, repressed in order that the desired effect of plainness, reticence, and therewithal of mystery and height, might be revealed as strongly as possible.⁴⁹

What obviously also remained in Mackintosh's mind was that M. H. Baillie Scott won the *Haus Eines Kunstfreundes* Competition, based on his skill in interior design, and had conquered the intricacies of the L-shaped plan in classic country houses such as Blackwell, in Windermere, Cumbria, completed in 1898. This was Baillie Scott's first major commission after his return from Darmstadt, where he had been involved in the renovation of the Palace of the Grand Duke of Hesse, and his work, particularly his furniture designs, were frequently published in *The Studio*. The similarities between the plan of Blackwell and those of the Hill House, not to mention the layout of Windyhill in 1900, are remarkable beyond coincidence. In Blackwell, as at the Hill House, formal functions are distributed along a central hall-corridor in the elongated leg of the L, where services are compartmentalized into the shorter half. The sequence and relative size of the spaces in the formal segment begin with a dining room near the service wing, placed there to be close to the pantry and kitchen. It continues with a central sitting-living room with projecting bay window and fireplace and concludes with a drawing room-library at the opposite end of the central hall. Rather than placing a main entrance in the middle of the elongated leg, however, as Baillie Scott did at Blackwell, and as he had done at Windyhill, Mackintosh decided that a less grandiose solution would be in order. In keeping with Blackie's wishes, he put the entry at the western end of the central hall. The retention of the semicircular Art Lovers House stair, also turned at right angles to the major circulation axis as in that plan, is also notable, since a similar form in a different orientation was also used at Windyhill and was later to be adopted by Gropius, Le Corbusier, and others as one symbol of progressive Modernism. Howarth has commented on the fact that the circular tower or turret, which was a familiar component of Scottish domestic architecture from the sixteenth century onward, may be the antecedent of this form, and Frank Walker has gone further, identifying it as part of

plans developed first from generally quadrilateral or sometimes circular enclosures reinforced by square or round towers, regressed to simpler tower-house model during the war-torn 14th century, developed next to "L"-plan variant of the latter, the staircase tower tucked in the angle. . . .⁵⁰

Its appearance here as a sculptural component of the north elevation is more dramatic than at Windyhill, where it was buried into an end wall and was far less legible. It seems, like the industrial windows of the Glasgow School of Art, to be the harbinger of a coming age, at once part of the architect's highly advanced reading of a distinct traditional language and yet somehow beyond it.

This modernized turret is clearly visible from the entry gates at the western end of the house, but it is the architect's signature asymmetrical massing of windows of various sizes, door, and angled chimney reminiscent of Lamb's House, Leith, that are most memorable. The most obvious similarity is the bay window of the first floor dressing room projecting out over the deep stone lintel and jambs of the door,

in contrast to the long and slender fenestration of the flanking library and cloak-room below. Achieving the same feeling of additive randomness found in vernacular buildings in new construction, without making the combinations seem forced or chaotic, was a skill in which Mackintosh excelled. The plain, uniform harling cementations pebble dash frequently used in Scottish farm buildings to weather-proof them is rarely alleviated with other materials as an external skin, and this makes the skill of the architects elevations even more evident. Mackintosh's choice of harling, a cement slurry mixed with crushed pebbles and traditionally used as added protection against infiltration by wind-driven rain, is important, considering that his client could conceivably have afforded other materials on the exterior. It is applied here over stone, since local codes discouraged the use of brick, which would have lowered the standard of construction in this wealthy community. It creates an impression of uniformity, joining the diverse sculptural elements of angled chimneys, towers, gables, and projecting bays together into one homogeneous composition, contrasted against the consistent datum of extended, sheltering slate roofs. When viewed from the descending terraces that cascade down to the south, the house seems to increase in scale and magnificence, largely due to the same uniformity of surface ostensibly employed to avoid ostentation. The harled white skin of the house, which takes on a bluish coat on the rare occasions that the sun shines and a grey sheen when it does not, effectively separates the house from the verdant landscaped *parterres*, also laid out by the architect, below it.

In startling contrast to the rough weatherproof exterior, the interior of the house, which first becomes visible from the expanding central hall that telescopes from the black wooden door in the western gable end, is all wood and warmth, with judiciously placed openings providing filtered light to enhance the glow of fine materials. Frank Lloyd Wright, with whom Mackintosh is frequently compared, also understood the effectiveness of an entrance placed on axis with, rather than perpendicular to, the main line of circulation. Here it allows immediate orientation, as well as a comprehensive spatial impression of the house, with an inviting built-in window seat beyond, giving the feeling or image of comfortable, secure domesticity. A library immediately to the right of the entrance was intended to serve as an office in which Mr. Blackie could meet visitors to discuss business without disrupting the privacy of the family who might be in the living room beyond, as well as to provide a quiet place to work. The library is paneled in dark wood which, when combined with the leather-bound gold-lettered spines of the books for which Blackie and Son were famous and the glow of the fireplace that generates the angled chimney on the western wall, must have produced a contemplative ambience. In keeping with the paneling, a tree motif has been introduced here, with pieces of colored glass insets in blue, white, and red, a counterpoint to the darkness of the wood.

The hall that follows the library and the delightful interlude of the fireplace, which, in spite of its utilitarian purpose and position in a space too narrow for any use except circulation, is carefully designed as an integral element.

This hall is of another level entirely above what one normally envisions such a relatively utilitarian space to be. Windows along the stair allow clear north light to flood into the space. As they typically have in all of their designs, Mackintosh and Macdonald took responsibility for everything in the space, including the

furniture, which is all made of oak and has obvious Jacobean lineage. The walls are paneled with vertical strips of pine, which have been stained to match the darker finish of the furniture. These alternate with equally wide strips of exposed white plaster wall behind them. Macdonald prepared a free-form stencil that serves as a frieze around the entire room, with a range of purple, blue, and pink tones that were continued in the carpet that the couple also had custom-made for the hall.

This underscores the extent of Mackintosh's commitment to the total work of art, in which furnishings, textiles, carpeting, and silverware all combine with architecture, as part of the Arts and Crafts thesis of a unified built environment. At the Hill House, Blackie's finances and use of his own favorite pieces of furniture prevented complete integration, forcing the architect to select such spaces as the hall, drawing room, and master bedroom in which to focus on total design.

The drawing room in the middle of the house is accessible from the hall. It is raised up by four steps, and is divided into three identifiable zones, for listening to music at one end, conversation around a fire that backs onto and uses the same chimney as that in the hall on the other, and an extended bay window for reading and enjoying the view of the Gare Loch in the distance. The aspects of integration in this space, which serve to link the three parts together, generally begin with the significant elaboration of an idea that may be traced back through the Art Lovers House scheme and the drawing room of the Mackintoshes' flat at 120 Main Street, to a similar space in Dunglass Castle in Bowling, Dunbartonshire. It continues in the interior prepared for the Eighth Vienna Secession Exhibition in 1900 related to a tripartite division of sectional height. This division stems from one that is typically seen in Victorian drawing rooms, created by a picture rail near the ceiling and a dado about three feet above the floor, which each ran horizontally around the entire room. The picture rail at the top provided the structural strength needed to hang the heavy family portraits that were popular at the time. The dado, on the other hand, protected plaster walls from being damaged by the backs of chairs being pushed into them. Mackintosh simplified these two distinct and equally pragmatic lines that divided the drawing or living room laterally into thirds by using them as a way of integrating it vertically. They did this by having ceiling lights come down to picture rail height, and chair tops and fireplace mantels stop at dado height.

In the Hill House drawing room this device tends to visually expand vertical comprehension of the space, making it seem to open upwards and be loftier. It is also exaggerated. The effect is startling and fresh, as each alcove retains its own integrity, and yet contributes to a sense of a complex periphery, binding the space together. A built-in seat, filling the entire bay window, incorporates the architect's thoughtful touches, such as heating beneath to ensure comfort in winter, since this is the most open and extensively glazed expanse on the southern elevation. It also has book and magazine racks, providing easy access for a client whose business and pleasure involved a great deal of reading. A box chair, originally designed for the third conversation space by the fire, continued the theme of enclosure.

This device, of punching spaces into the bottom two-thirds of tripartite zoning and designing furniture to match, is extended further in the master bedroom, which also functioned as an extra morning room for Mrs. Blackie. Two large white

wardrobes at the opposite end of the room from the arched alcove allocated for the fitted double beds continue at the same head height of an adjacent window. These take on an architectural capacity in the space. The lights here, like those originally designed for the drawing room, are equally sculptural, projecting down to the proscribed datum of the picture rail to retain it as an unbroken line around the room. The lights originally designed for the drawing room, which were substantial in size and suspended in each corner, were removed shortly after completion for unknown reasons, but photographs taken in 1904 show that they served as visual anchors, unifying even further the diverse parts of the drawing room. It may be argued, however, that this intentional tripartite division, which Mackintosh utilized so effectively in the hall, drawing room, and master bedroom of the Hill House, originated as an expedient in his flat at 120 Main Street to lower the high ceiling to a more human scale. This was in the tradition of many contemporary Arts and Crafts houses, such as those by Philip Webb, which reinterpreted and gave spatial purpose to the Victorian device of the picture rail. Mackintosh, however, immediately transformed it into a more authoritative line of demarcation, and this module takes on a higher level of meaning in his hands.

Edwin L. Lutyens: Deanery Gardens, Sonning, Heathcote

Edwin Lutyens is primarily regarded as an Arts and Crafts architect, in spite of the fact that he practiced a bit later than a majority of those who are generally associated with that Movement, as well as because of his love of Classical rather than Gothic stylistic sources. He is also perhaps best known for the larger public projects, completed later in his life, than for his country houses, which sustained him throughout a long career. These large projects include his plan for the British colonial section of Delhi, India, including the residence of the Viceroy, who was the representative of British authority during the Imperial Period. He became a member of the Delhi Planning Commission in 1912 and immediately set himself the task of redefining what had been, up until that time, a rather patronizing official approach to the style to be used in such projects. The raj style was an eclectic amalgamation of inappropriate elements that had little to do with the climate, history, or culture of a particular place in the far-flung reaches of the British Empire. Lutyens replaced that approach with a more sensitively rendered version that effectively blended western elements, based on his extensive knowledge of Classicism, with well-established Indian precedents, taken from its Buddhist, Hindu, and Islamic traditions, especially the Mughal examples. The majority of his design for New Delhi was completed and implemented between 1911 and 1920, and so was finished within only a few decades of independence. Once that occurred, his capital complex became a bitter reminder of British authority, in spite of the obvious cultural awareness that it demonstrates. After exploring several alternatives, the new government of India commissioned the internationally renowned Modernist architect Le Corbusier to design a new capitol at Chandigarh, which was completed in the early 1960s.

Among many other public buildings and monuments, Lutyens also designed a memorial to the British soldiers killed in World War I, which he called the Cenotaph, in White Hall, London, and is now the focal point of an annual day of remembrance that is held there.

The Country Estates Edwin Lutyens was of Dutch heritage but came to represent the perfect Victorian gentleman architect. Much less is known about the more than 30 large country estates he designed during his long career, as well as his remodeling of Lindisfarne Castle. He worked closely on many of these with the notable landscape architect Gertrude Jekyll, to an extent rarely seen in residential design, so that house and garden in each case are carefully integrated into one complete vision.

Lutyens initially worked with Sir Ernest George after graduating from what is now the Royal College of Art in 1885, and remained there until 1889, when he established his own practice. He met Gertrude Jekyll in the spring of that year and designed her house at Munstead Wood, which was completed in 1896. He married Lady Emily Lytton the following year and became heavily involved in the design of many country houses, such as Fulbrook.⁵¹

In 1898, Gertrude Jekyll's brother, Sir Herbert, was influential in having Lutyens chosen as the architect for the British Pavilion of the Paris Exhibition of 1900, which gave him international recognition.⁵² Between 1899 and 1908, he produced Deanery Garden in Sonning and Heathcote among many other houses.

Deanery Garden in Sonning and Heathcote Sonning is an idyllic village near the River Thames, in Berkshire, with a complex layering of vernacular houses, including several that have been either designed or restored by the noted Victorian architect Henry Woodyer.

Many of these are built in a local rose-colored brick, which has an identifiably soft red tone, rather than the harsher hue found elsewhere in London. Edwin Lutyens and Gertrude Jekyll designed a house and garden for Edward Hudson near this village, which is generally considered to be one of their best collaborations. They took advantage of the fact that the property was surrounded by an old wall made of the same red brick as the majority of the houses in the village, as well as having an orchard on it. The house takes its name from a local tradition related to an ecclesiastical function for the property in the past, but no remnant of a monastic use remained when Lutyens and Jekyll began their design. They used the same rose red brick for the house as found elsewhere in the circuit wall and the village. Lutyens pulled the roof eave down over the front entrance to provide a feeling of protection and privacy. This heightens the surprise of seeing a framed view of the elegant garden, designed by Gertrude Jekyll, on the other, southwest side of the house. A two-story bay window divided into small sections, with 48 medieval scaled panes in all, is the dominant feature of this garden side elevation, which floods the great hall, sitting room, and dining room with light, and provides that view. An arched doorway leads out from these rooms onto a raised terrace, and a curved stairway in the midst of it, which echoes the arch of the door, leads down to the garden that is perpendicular to the house.

Heathcote Heathcote, on the other hand, which is in Ilkley, Yorkshire, is much more formal, demonstrating Lutyens's virtuosity with the Classical and, especially, English Renaissance languages. This elegant country house, which was completed in 1906, is sited on a four-acre property outside the village, but the estate seems much larger because of the skill that Lutyens and Jekyll have shown in its planning.

It is built of local yellow Guiseley stone, trimmed with grey stone from Morley, with a red tile roof.⁵³

The two main elements that Lutyens uses in this Italianate house as a recurring structural language are the pilaster and rustication to tie it together. Lutyens and Jekyll continue the geometrical modules used by the architect out into the garden, further unifying the scheme.⁵⁴ This project demonstrates that, regardless of his proficiency in creating an Arts and Crafts, quasi-medieval gem in Sonning, Lutyens was at heart a Palladian devotee, and mastered that language better than any of his British predecessors. He admired Inigo Jones, Sir Christopher Wren, and Norman Shaw more than the Gothicists of the Arts and Crafts Movement. Unlike Deanery Gardens, the massing of Heathcote is compressed and powerful, reminiscent of Syon House, near Chiswick, but in a much more cosmopolitan and accomplished way.

A. W. N. Pugin: Ramsgate

Augustus Welby Northmore Pugin was the son of a French antiquarian. The family fled to England to escape the Revolution and subsequent terror. Father and son shared a passion for French cathedrals, and together they published *Specimens of Gothic Architecture* and *Examples of Gothic Architecture*. The younger Pugin enrolled in the Christ's Hospital School in London, but did not go on to university, collaborating instead with his father on projects of mutual interest such as the books just mentioned. After the revolution, as soon as the danger to those with royalist leanings such as himself had passed, A. W. N. Pugin started to make trips across the Channel to measure, survey, and draw Gothic cathedrals, and he was one of the first to record them in this way, serving a purpose similar to that of Brunelleschi in Renaissance Florence, who rediscovered Classical Roman ruins in the same way. By his early teens, Pugin was already recognized as an authority on Gothic architecture. At that time there was a surge of interest in it during the Gothic Revival, and many bad renditions of the tradition that were being made. Strawberry Hill in Twickenham, by Horace Walpole, which is thoroughly described in Volume 2 of this series, was one of the best of these because Walpole diligently collected every book he could find on the style. But many other less skillful attempts were also being put forward as authentic, when they were far from it.

With his unique background and interest, Pugin shone out amidst a great deal of mediocrity, and when he was only 19 years old, he was commissioned to design furniture for the Royal family.

The Victorian Age Queen Victoria ascended to the throne in 1837, to become one of the longest reigning monarchs in British history. Her tenure also coincided with the cataclysmic growth of the Industrial Revolution, the rise of an Empire that both sustained it and was spread by it, rural-urban migration on an unprecedented scale, and a host of social ills that resulted from it. Because of the concentration of labor in factories in urban centers such as London, Manchester, Birmingham, and Glasgow as a consequence of the wider utilization of steam power, cottage industries could not compete, and entire families left the countryside for the city. Following what is now seen to be a predictable pattern that is occurring again in

developing nations around the world, many of those who relocated did so without any assurance of a job or a place to live once they had arrived in the city. This resulted in widespread homelessness, poverty, crime, disease, and death. Social reform to address these issues, and the growing economic rift between the rich and the poor that only served to further calcify a well-entrenched class system, was slow in coming, but it did come. It was led by intellectuals such as John Ruskin, William Carlyle, and William Morris, who adopted the idea of the regeneration of Gothic architecture as part of their campaign. The logic behind this was that Gothic architecture represented a collaborative communal effort in the past, and as such was symbolic of a time in which social classes were less stratified. There was also a spiritual agenda in promoting it, since Gothicism was seen to be part of a less secular and less materialistic age and so was a perfect antidote to the consumer mentality promoted by the industrial age.

Pugin Was Their Guide A. W. N. Pugin in both his writings and his architecture was the guide for this group of reformers. After the initial publications that he produced with his father, Pugin went on to write *The True Principles of a Pointed or Christian Architecture* in 1841, in which he praised the Gothic style for its honest use of materials and formal expression and promoted it as the one true national architecture as a palliative to social problems. This book followed close on the heels of a previous tract with the long title of *Contrasts, A Parallel Between the Nobile Edifices of the 14th and 15th Centuries and Similar Buildings of the Present Day Showing a Decay of Taste*, which appeared in 1836. A derisory poem that appeared soon afterward said, in part:

“Oh have you seen the work just out,
By Pugin, the great builder?
‘Architectural Contrasts’ he’s made out
Poor Protestants to bewilder
The Catholic Church, she never knew
Till Mr. Pugin taught her
That orthodoxy had to do
At all with bricks and mortar.”⁵⁵

In both his *Contrasts* and *True Principles* books, Pugin equated Gothic architecture with moral purity, and this belief carried through into his design work as well.

Pugin predated this group, but was still alive when they came to the forefront. In 1851 he was given the opportunity by the organizers of the Crystal Palace Exhibition in London to contribute a design for a “Medieval Court” pavilion in one of its bays, which probably seemed like an anachronism but was well received by the public nonetheless. At that time, William Morris, who had been a divinity student at Oxford University, had just decided to change his career course to architecture after hearing John Ruskin deliver the Slade lecture about the social ills caused by industrialization. After graduation he joined the architectural office of G. E. Street, where his friend Philip Webb was working, and Morris and Webb set up their own firm in 1857. Webb designed Red House for William Morris in Bexleyheath, Kent, in 1859, following the direction that Pugin had already established in his own house, called the Grange, in Ramsgate nearby in 1843.

The Grange, Ramsgate The 1830s were a chaotic, as well as highly productive, time for Pugin. Because of his Gothic expertise, he was approached by Charles Barry and asked to assist in the rebuilding of the Houses of Parliament in 1834 that had been damaged by fire. His contribution to the partnership was extensive, so that Parliament, as it appears today, owes much to Pugin's skill. He married in 1831 and his wife died in childbirth the following year. His father also died in 1832, and his mother followed a year later. He converted to Catholicism in 1834 and settled in Salisbury to be near the great Gothic cathedral there.⁵⁶

He built a house in Salisbury, based on Gothic principles, with arched windows and steeply gabled roofs, as well as a bell tower. But, he had remarried, and because of his growing family and his desire to be closer to the Channel so that he could visit France more easily, he decided to move to Ramsgate, in Kent, in 1841 and build a larger version of his Salisbury house there.

Rather than using brick, as he had previously, however, he chose to use a flinty local stone instead, which gives the house a less delicate, more substantial feel. The house is located near a monastery called St. Augustine's Priory, and Pugin sited his house to take advantage of it to create a sense of enclosure.

The plan of the house literally duplicates the L-shaped configuration that would later become so popular among Arts and Crafts devotees in the decades that followed; in that it is a pair of "L"s placed back-to-back separated by a square entrance hall with a grand stairway leading up to the second floor. The first of these L-shaped portions, on the north, contains a chapel and a kitchen. The second,



The Grange, Ramsgate. Courtesy of Kelvin Barber; Flickr

which is joined to the first by a connecting hallway, has a dining room, sitting room, and library, which are each well proportioned, and each has a fireplace. The bedrooms and bathrooms are on the second floor. Pugin had a daughter from his first marriage, and he had five additional children with his second wife, Louisa Burton, so the additional space that this house provided must have been most welcome. A second, service stair served the kitchen and chapel wing.

A Master Builder In realizing the design of the house, Pugin followed the Gothic tradition of architect as master builder, becoming involved in all aspects of its construction. It was a repository of his detailing skill in all media and an example of what would become the Arts and Crafts precept of the total work of art. Masons, carpenters, blacksmiths, and artisans were all under his supervision, and he was known to be an energetic and exacting supervisor. As opposed to other, less informed and correct attempts at Gothic Revival at this time, the Grange represents an accurate rendition of the design and detailing of a private home of the eleventh and twelfth centuries, due to Pugin's scrupulous surveys of original examples.

In a rare exhibition of his sketchbooks, held at the Victoria and Albert Museum in the early 1990s, page after page of minute, carefully drawn details of Gothic houses and cathedrals that Pugin did throughout France and England provided ample testimony of his dedication and skill. That was translated into the third



Red House. © Wayne Andrews / Esto

dimension in the few architectural commissions that he was able to carry out during his relatively short lifetime, and the Grange at Ramsgate is among the best of these.

William Morris and Philip Webb: Red House

William Morris is one of the towering intellectual figures of the Victorian Age and is closely associated with the attempts at social reform that started to coalesce in England in the middle of the nineteenth century. These eventually resulted in the formulation of the Arts and Crafts Movement there. Morris was born in 1834 in Walthamstow, of Welsh heritage on both his mother's and father's sides. After attending private school near his home, he went to Marlborough College when he was 14, and then to Exeter in Oxford five years later in 1853. His father, William Sr., died in 1847 at age 50, leaving behind a large estate accumulated through investment in the Devonshire Great Consolidated Copper Mining Company. His inheritance provided William Jr. with a monthly allowance that would be considered substantial even by today's standards.⁵⁷

William Morris as King Arthur Morris studied history at Exeter with an emphasis on religion. He was particularly taken with *Le Mort d'Arthur* by Sir Thomas Malory, which had been popularized by Sir Walter Scott at that time. Morris seemed to internalize the chivalric code that is one of the main themes of that tragic story, and to some extent his personal life may also be seen as a reenactment of the Arthurian legend of Camelot. The ideological position that Morris started to formulate while he was at Oxford has been compared by his biographer, Fiona MacCarthy, to that of the Young England Movement started by several influential Conservative politicians in the 1840s. MacCarthy describes the goals of this group as the emulation of the "ideals of medieval England, not in a regressive way but in a creative one. They wanted to extract from medieval England those elements from which the Victorian age could learn." These lessons included equality and the elimination of a class-based society, the return to small communities and rural values, and "architecture as the measure of civilization and the means by which the people reconnected themselves with the past."⁵⁸ The monastery and the convent, which emerged as indispensable social institutions during the Middle Ages because of the uncertainty, random violence, and destitution of that historical period, are also the paradigmatic egalitarian community and appealed as a symbol to Morris because of the sense of camaraderie and self-denial that they represented.

While he was at Oxford, he married Jane Burden, who came from a far less prosperous family than his own. Her appeal to him, beside the difference in their social position, was her exotic appearance, and while she came to respect him, she later claimed never to have loved him. She said she was primarily attracted by the financial security that marriage to him offered. He painted her as Guinevere at one point early in their relationship, and then only lacked a Lancelot to make his Arthurian fantasy complete. Dante Gabriel Rossetti, who was the founder of the Pre-Raphaelite Movement and shared many of Morris's beliefs, filled that role. Rossetti's attentions quickly shifted from his own partner, Elizabeth Siddal, to Jane Burden soon after she married.

The Red House Bexleyheath, in Upton, which is close to London, was selected in 1859 as the location of Morris's new Camelot. It appealed to him because it was

near Watling Street, which pilgrims used to get to Canterbury, as well as the ruins of Abbey Farm, which was once a monastery. By this time his business venture, which would finally be formalized as Morris, Marshall, Faulkner and Co. in 1861, was beginning to demand more of his time and prodigious energy. William Morris had a lasting effect on the future direction of architecture, since it can be argued, as Peter Davey has, that Arts and Crafts principles morphed almost completely into those of the Modern Movement.⁵⁹ But, Morris realized early in his postacademic career that he did not want to actually practice architecture, or painting either, given the awkwardness of his portrait of Jane Burden as Guinevere. His talent was in what is now generally called interior design, but the term does not come close to describing his explorations and contribution. Interior design today rarely runs parallel to its architectural equivalent, and the two professions are now typically viewed as being separate and distinct disciplines. Arts and Crafts advocates, however, viewed a dwelling as an entity, in which the spaces and interiors, including all of the furniture, floor coverings, fabrics, and other accoutrements were all part of a total work of art. The ideological basis of this approach was social improvement, beginning with the family, or group of people living in the house as the catalyst of change. Beauty was considered to be transformative and could be effective only if it was integral to the entire living experience. Architecture and interior design, completed at different stages by different contributors, present ideas that would have been anathema to an Arts and Crafts believer, such as Morris. This principle is one of the most essential similarities between the Arts and Crafts and Modern Movements, which is why the Red House is often mentioned as being one of the first modern houses, in spite of its medieval cast. Another reason for the designation of Red House as a modern design is its minimalism and practicality, which is also central to Morris's ideological intention. In an article entitled "Art and the Beauty of Life," he famously said, "Have nothing in your houses that you do not know to be useful or believe to be beautiful."⁶⁰ This contradicted the Victorian tendency of filling the house with furniture, portraits, decorations, potted plants, heavy drapes, carpets, and bric-a-brac. It was also a mantra intended to be an antidote to the meaningless production of things for their own sake, at the expense of the time and effort of a laborer to do so. By calling for the judicious selection of items to be placed in each house, Morris was trying to sensitize people to the human price, rather than the financial cost of each piece that was chosen, asking them to consider if it was really worth the soul-destroying, repetitive effort that the assembly line demanded. This minimalistic approach was also intended as a critique of industrial production for profit by a budding iconoclast, who was instrumental in composing the Manifesto of the Socialist League, which he also signed in 1885.⁶¹

Red House is close to Abbey Wood railroad station, which allowed Morris to go down to London easily when business interests required him to. The site he and his architect friend Philip Webb chose also had an apple orchard on it, which heightened the rural romance of the place for him.⁶² Morris and Webb envisioned Red House, which is named after the color of the brick used to build it, as a monastery, and these typically had orchards that sustained the monks who lived in them. It was inspired by the bricks used in Tattershall Castle in Lincolnshire, built for the Lord

Treasurer of England, Ralph Cromwell, in 1440.⁶³ The plan of the Red House is L-shaped, but was positioned to be easily extended into a quadrangle with an open central courtyard. The allocation of spaces in the house was also unconventional, conforming to Morris's communal, utopian ideal of friends and family sharing life together. Accordingly, the zone that is usually associated with receiving guests during the Victorian age, such as the drawing room and living room, are located on the second floor of the two-story house, near the bedrooms and bathrooms. The ground floor is dominated by a large Gothic-style oak staircase at the end of a large entrance hall. It has a sharply pointed ball-capped newel post and solid rails pierced with circular cutouts that contribute to the medieval aura of the residence.

The furniture, designed primarily by Morris and Webb, was also inspired by Gothic and Medieval motifs, layered with a tendency for the romantic, such as a dresser lacquered in a color they called "Dragon's Blood Red." One of the most imposing pieces is a settle at the end of the drawing room, which is architectural in scale. It has a ladder on the side so that musicians can climb up to a "minstrels' gallery" on top, which was used on holidays, such as Christmas. The walls are filled with murals intended to relate to Morris and his wife, Jane. One of the most revealing of these, painted by family friend Edward Burne Jones, is based on a fifteenth-century romance of Sir Degrevault, and shows Morris as a king and Jane Burden as queen attending a wedding banquet.⁶⁴ Morris and his wife, as well as his close circle of friends, were also involved in the preservation and renewal of crafts of all kinds, such as embroidery, which was also displayed on the walls. Morris was obsessed with recreating medieval techniques with absolute accuracy down to the last detail, in his production of furniture, carpets, silverware, and embroidery. He researched the kinds of plants that would have been used to create the dyes and grew them in the garden of Red House. He went to Aubusson, France, which was a thriving tapestry center during the Middle Ages, to research the technique and materials used in making these wall hangings.

Kelmscott On the outside, Red House looks like an apparition, or a re-creation of a setting in a fairy tale by the brothers Grimm, complete with a circular turreted wishing well. As Morris's business expanded, he, his wife, and their close friends, including Dante Gabriel Rossetti, required a more spacious stage set in which to act out their medieval fantasy. And so Red House was sold and Morris bought a sixteenth-century house, which he renamed Kelmscott, near Oxford in 1871, when he was 37 years old.⁶⁵

The Richard Rogers House, London

Richard Rogers is widely regarded as the archetypal Modernist and one of the chief international proponents for that aesthetic. Best known for the Pompidou Center in Paris and the Lloyd's building in London, he has been given the title Lord Rogers and has been credited with changing the direction of contemporary architecture. As part of his Modernist heritage, Rogers believes in the primacy of technology and the need to express the way that it is used to make each of the buildings he has designed in a very clear way. This has led to his having been classified as being part of the high-tech school of British Modernism, but he rejects that label. He simply agrees to relying upon the empirical tradition, which has been such a powerful force in contemporary architecture. His belief in that direction

began with Team 4, a mid-1960s partnership that included fellow English architect Sir Norman Foster, whom Rogers had met while on a Fulbright scholarship at Yale. The firm produced the Reliance Controls Factory in Swindon, which would effectively redefine the Modernist approach to industrial and commercial architecture. After Team 4 broke up and a brief time collaborating with Su Rogers, he worked for several years with Italian architect Renzo Piano with whom he designed the Pompidou Center. He then formed his own practice in 1977.

The process of ongoing reinterpretation, which Rogers sees as the central issue of Modernism, is clear in his newly remodeled residence in London. It is located near Kings Road and the Thames, and overlooks the Royal Hospital gardens in Chelsea. Rogers and his wife, Ruthie, bought the house in 1983 after an extensive search for property on which to build was unsuccessful. They were seduced by the central location of this house and the orientation. They feel that the best thing about the house is the view and the fact that it faces south. This provides it with light from three sides and a cool breeze coming from the garden across the way.

The building was originally a pair of 1840s houses, each 15 feet wide, located on the corner of a small square. They were once divided by a party wall, and the interiors, including elements such as the staircase, fireplaces, and moldings, had been lost in earlier renovations. The first of Rogers's periodic efforts toward rehabilitating the structure was to seal off the entrance to one house and make the doorway to the other into a private entry to his mother-in-law's flat. He converted the old tradesman's entrance to the second house into a new front door. This involved taking out a small badly lit garden and inserting a stair. He opened up a huge living area and kitchen on the first floor by removing the common wall and part of the upper floor. He then installed a staircase to a second-floor gallery that served as the couple's bedroom. Separate spiral stairs to the third floor also lead to a library, a children's bedroom, and a playroom.

The Rogerses have two sons, Bo and Roo, and their house is also a London base for Rogers's three sons from a previous marriage: Ben, Zad, and Ab. They stay in a basement apartment when they visit.

The need for more space and for light prompted Rogers to undertake the current renovation. This resulted in having only a small study upstairs, but Rogers actually prefers reading in bed, especially in the early morning before the demands of the day start to intrude on his time.

In its latest remodeling the Rogerses extended the staircase from the gallery to the third floor, changing the mezzanine bedroom into a library and study, and made the third floor into a bedroom and bathroom zone. Rogers has also expanded a rooftop garden, which previously covered only one house, onto the roof of the second. This has created a private, quiet sanctuary for him and his wife.

Rogers's essential design idea for his residence, which is a functional mezzanine overlooking a soaring central living space, stems from the lasting impact that seeing several classic Modernist California houses had on him. While working for Skidmore, Owings and Merrill in San Francisco in 1961, Rogers became familiar with the work of Rudolph Schindler, Raphael Soriano, and Charles and Ray Eames. The Eames House had an especially strong effect, especially in the way that

the mezzanine is used there to overlook the two-story-high living room below. Rogers shares the Eameses' process of design as well as his habit of beginning with the detail and then working up from there. He was also influenced by the Eameses' use of primary colors, which has its roots in the De Stijl movement, Constructivism, and Purism.

Like the Eameses, Rogers is fascinated by artifacts from the past and the sense of continuity that historical elements bring with them. In spite of the fact that Modernism is often regarded as involving the rejection of history, Rogers sees unison between the two, such as in the art of Japan where objects are old but look modern. Rogers believes that he can be a Modernist and still appreciate the past.

Rogers and his wife furnished the house with pieces they like, such as Jacobsen stacking chairs in different colors. These provide a counterpoint to the more classical modern pieces, such as a Norman Foster glass table and a Le Corbusier leather sofa and chairs, and this brings the interior alive. The bed in the master bedroom was designed by Ab Rogers, and it can also be used for storage. It is painted yellow to add to the brightness of the room.

Rogers's preference for large sealed space is evident from the size of the first floor main living area, which visually extends up the stairway from the kitchen, dining and sitting areas to the mezzanine. Rogers and his wife refer to this living area as "the piazza" because everyone gathers there. The original full-length windows are now hinged and open inward.

Good food is an important part of the Rogerses' lifestyle since they are also involved in the River Café restaurant. Despite its cleanly refined, metallic efficiency, the kitchen in the piazza is transformed when in use into a compact, ergonomically tested model of professional, foldout efficiency. Ruthie Rogers is also one of the chefs of the River Café.

Rogers, who was born in Italy and spent his childhood in Florence, has been raised on great Italian food. He designed this house so that he and his wife can socialize with their guests, rather than disappearing while cooking goes on. A counter-height island of stainless steel is all that separates the cooking and sitting areas, so that people can talk easily and everyone can enjoy the cooking experience.

A solitary totemic plated steel I beam, used vertically as a column in the kitchen, is a hint that the *Maison de Verre*, which is described elsewhere in this volume, was another important design resource for Rogers, in addition to the Eames House in Los Angeles. His quoting it here reinforces his view that Modernism need not be antiseptic and sterile but should include relevant references to time, place, and people. The Glass House, like the Rogers House, was an experiment that involved the latest innovations that industry could then produce. But this empirical approach on the part of the architect, Pierre Chareau, was tempered by his awareness of the needs of his clients to personalize their house, most specifically with a collection of Art Deco furniture that the couple had inherited from Dr. Dalsace's wife's parents. The *Maison de Verre* is perhaps a more aggressively Modern context than the Eames House because of its scale and the degree to which its architect interjected himself into the design process. But both Pierre Chareau and Charles and Ray Eames now represent a concerted effort to personalize technology and make it user friendly.

Rogers believes that his early years, including his family's move to England in the late 1930s, played an important role in the development of his deeply held architectural ideals and preferences. He had an Italian background and his mother was a potter. He recalls having Bauhaus furniture in the house and always being surrounded by good design when he was young.

The Richard Rogers house is a good example of the balance between permanence and change that he constantly looks for in his work. He has attempted to popularize modern architecture and, in contrast to the prevailing view that Modernists dislike history, has also tried to reconfigure the past. More people see the Pompidou Center every year than the total number of visitors to the Eiffel Tower and the Louvre combined. He wants to use architecture as a vehicle with which to make London a model for other cities. He has done so in his renovation of Billingsgate Market; his scheme to turn Trafalgar Square from a traffic roundabout to a pedestrian piazza; and his visionary, long-range plans to convert the Thames, which is the biggest open space in London, into a vibrant civic meeting place. It was once this way. Viewed in this context, Rogers's house is only a small part of his vision, but it reveals the consistency of his principles and their allegiance with the Humanistic tradition.

Charles F. Annesley Voysey: The Orchard at Charleywood, Hertfordshire

Charles F. Annesley Voysey was the quintessential English Arts and Crafts architect, practicing in and around London at the end of the nineteenth century. Charles Rennie Mackintosh seems to have received a majority of attention as a leader of the Movement in the recent past, perhaps due to the recognition he received from an appreciative audience on the Continent in the late 1800s, and that support, outside of Britain, eventually led to his playing a formative influence at the beginning of the Modern Movement in Germany and then throughout Europe in general. But as a Scotsman, from a financially restricted background, who was raised in a tenement in Glasgow, Mackintosh was never fully accepted into the closed society of the British Arts and Crafts branch. He was considered to be far too plebian and provincial. William Morris and John Ruskin, who provided the theoretical underpinnings of the Arts and Crafts Movement, were each independently wealthy members of the British upper-middle class, as were Webb, Ashbee, Baillie Scott, Shaw, and many of the other talented members of this elite group. While Morris, as someone of Welsh heritage, shared the passion for a Celtic Revival personified by Mackintosh and his mentor, Patrick Geddes, the clientele for his extremely lucrative practice were primarily members of the English aristocracy. This and the obvious dilemma of a confirmed Socialist being extremely wealthy were the two seemingly irreconcilable conflicts of Morris's life.

A Paragon of Arts and Crafts Principles While Charles F. Annesley Voysey was not wealthy, he arguably represents the English branch of the Arts and Crafts Movement best because of the clarity of his design principles, made legible in his work. These are most especially visible in a house he designed for himself and his family near the Charleywood station of the Metropolitan Line of the London

Underground, which he called the Orchard because of a stand of old apple trees on the site. His budget was limited to between £1,000 and £1,500, which was not much even in 1899, when the plans were drawn up.⁶⁶

Voysey had always wanted to design a home for himself, but the demands of a successful growing practice had not allowed him the luxury of having the time to do so. His marriage to Mary Evans in 1897, however, seemed to finally offer him the perfect opportunity to realize his dream. The newlyweds first looked at land in Colwall, near Perrycraft, but were eventually unable to obtain it. They found another property near Charleywood, which is a station on the Metropolitan Line of the London Underground. This decision to build near a commuter stop is reminiscent of a similar choice by William Morris when he chose a site for Red House for himself and his wife, Jane Burden, at Baxley Heath, and it once again underscores the obvious paradox involved in wanting to live in a house that approximates a country cottage as closely as possible, while still being able to commute to an office in the city. This preference did not begin with Morris, since developers such as Jonathan Carr had gotten wealthy on the trend as early as 1875, when he bought a 45-acre parcel at Turnham Green, which is a station for both the Central and Piccadilly Lines, and commissioned architect Richard Norman Shaw to design homes on it for families with annual incomes in the £300 to £1,500 range per year. The new community was treated as a self-contained village, with its own church and inn, as well as a sports club with tennis courts and an art school. This community, named Bedford Park, started with nearly 900 houses, which was eventually expanded to 113 acres because of its popularity. Shaw chose to design in the Queen Anne style, which this project also served to popularize, in order to avoid the aesthetic war then taking place between the Gothic Revivalists, on the one hand, and the Classicists, on the other.

Although they were inaugurated much later, the Garden Cities promoted by Ebenezer Howard, such as Letchworth in 1903, Hampstead Garden Suburb in 1907, and Welwyn Garden City in 1919, and produced in partnership with Barry Parker and Raymond Unwin, were also aimed at the same audience to “return people to their last paradise.”⁶⁷

Once the rural-urban migration into London, which had started at the beginning of the Industrial Revolution in the mid-eighteenth century, started to slow down, there was a reverse migration of sorts as the workers who led the rush to the city began to prosper. They wanted to move to the suburbs once the railroad allowed them easy access to their jobs to escape the pollution, congestion, clamor, and worse that were the legacy of industrialization.

The Orchard The house that Voysey designed for himself, his wife, and their three children conforms to the ideal middle and upper-middle class image of a country cottage, even though it would be difficult to find a home of similar style in any rural district in Britain. That is the essential importance of the Orchard, in that Voysey created it to embody all of the subconscious clues of bucolic living, without literally collaging them together in one house. Construction of the house started in 1899 and the final cost was about £1,500.00.⁶⁸

The elements that Voysey chose to include in this highly edited and carefully thought-out paragon are as telling as those he also decided to exclude. The first is

the roof, which is the most elemental of all, since it has primeval connotations of shelter and security. The roof here, as elsewhere in Voysey's residential *oeuvre* is gracefully steep, with slightly curved, deeply overhanging eaves and a very thin barge board, or edge, which makes it look thin and light, like a hat. He chose slate for the Charleywood house, because he liked its gray simplicity and the slightly iridescent quality it has when it gets wet, which is quite often in London. This notion, of the potential of unexpected, hidden beauty in the most commonplace things, extends to every other aspect of the house, as well. Voysey wanted to allow as much light into the interior as possible, and so he used dormers on the roof here as elsewhere. These tended to break down the scale and potential monotone of a long horizontal slate surface but did not allow them to cut through the surface in a major way. The surface of the house is called roughcast, similar to the harling or pebbledash favored by Mackintosh for the exterior walls of Hill House and Windyhill in Helensburgh, near Glasgow. As the name implies, it consists of small pebbles that act as an aggregate in a cementations wash, which seals the structure against the worst weather. It was a favorite solution to the nearly horizontal rains in the Highlands by farmers and crafters, because it is relatively inexpensive and as easy to apply as whitewash.

In addition to a simple, long, and broad slate roof that seems to sit almost weightlessly on these roughcast walls, and the tall, slender dormers that rise up like vigilant sentinels along its perimeter, Voysey used a line of red tile that extends out slightly from the exterior wall and runs above the top of the ground floor windows around the entire perimeter of the house to serve as a horizontal datum that ties the entire elevation together. He also uses a porch here, as he frequently did elsewhere, to protect people using the front door from the weather. In other houses he has designed, such as Broadlegs, near Lake Windermere in Cumbria, a similar thoughtful gesture, around and above the entrance into the house from the service yard, is a substantial building in its own right and indicates the architect's sensitivity to detail.

Living at the Orchard This sensitivity extends to every part of the interior of the house, which is rectangular in shape. Voysey has located the main social, or public, spaces, which include the entrance hall and foyer, the study, and dining room, along its western edge to make the most of the late afternoon sun, while the service spaces, such as the kitchen and an extended pantry, are on the northern side. The study also has a view out toward a small wooded area to the north so that it takes advantage of the light from that direction as well. Voysey's attention to the prevailing direction of sunlight at certain times of the day and the need to locate the rooms that would be used at those times to take advantage of it may seem elementary, but it is remarkable how few architects are aware of this technique, which is also called diurnal zoning, let alone are able to use it skillfully. The result at the Orchard, as well as in other Voysey houses, is a warm glow in the major rooms during the early morning and at the end of the day. Voysey balanced his love of light, with a keen understanding of thermal heat loss through large expanses of glass, carefully sizing windows to the minimum necessary to satisfy both requirements. He also changed sill heights for the same reason, to frame views yet also cut down on drafts and heat loss. The warmth of natural light in his own house was matched

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by the color of the materials, fabrics, and paint colors that he chose for each space. The ceilings above the picture rail were white to better reflect the light, but below it were covered with richly hued wallpapers. Each room has a fireplace, each of which is a work of art with small openings for coal and peat, and a broad surface clad in thin long vivid tiles.

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West and Southwest Asia

SAUDI ARABIA

Abdel Wahed El-Wakil: Suliaman Palace, Jeddah, K.S.A.

In his design for the Suliaman Palace, Abdel Wahed El-Wakil has not only overcome the twin challenges of a large and relatively flat site, but has also successfully turned them to his advantage. To fully understand how this has been done and the subsequent importance of these residences as a prototype for others in this region, it is first necessary to recall that until relatively recently Jeddah where the palace is located was a walled city confined to a few square miles of area along the coast of the Red Sea. For reasons of efficiency, as well as privacy, the house within this walled area was organized within a vertical tower, typically using three main divisions of space. Ground level, which was much more accessible to the public, was usually reserved for rooms associated with service and storage, as well as an official reception room for guests. The second and third floors of these tower houses were set aside for the family with the topmost floor being the most private of all. Because of the compact nature of these residential quarters and the proximity of the houses inside them, *mushrabiyya* screens or *rosban*, as they are called in Jeddah, were an essential addition to the windows of each house as was a central courtyard that also provided privacy.

After the city wall was demolished and Jeddah began to expand after World War II, the restraints that had faced house builders in the past became redundant as detached villas sprung up on individual lots as quickly as civic services could be extended to them. As the architect himself explained his concept for this particular residence then:

In the Suliaman Palace I wished to make explicit a philosophy of design for the traditional Arab house. An architecture that serves society is dynamic and is proof to change. The challenge of architecture is to maintain continuity within the change that occurs by referring to the constants and reinterpreting them within the new context. This interaction between what is constant and what is change brought on by newly arising situations results in new formal entities . . . The Suliaman Palace is located in new

Jeddah, which is reclaimed desert area to the north of the older city and is mainly for housing. There are no narrow streets and plots are isolated by wide avenues to provide for modern traffic. The Palace differs therefore from older houses in that it is on an individual isolated plot.

As a visible symbol of these new conditions, the Suliaman Palace extends horizontally from the middle of its triangular site with long elevations toward the north and south to take maximum advantage of the best light and views toward the Red Sea. As the architect once again explains:

The Palace is clearly and visually defined by the different functions: the public area, the semi-public and totally private sleeping quarters and service wing. The building extends on the southern elevation to over 70 meters in length. This elongation was imposed by the site an extended triangular shape and the desire to obtain a maximum view of the Red Sea. A standard square module of 6 feet, or 180 centimeters, was used throughout the design for dimensioning purposes. Planning on a module helped to bring order in what would be a confusing disposition of walls and a variety of dimensions that would be burdensome in executing an edifice as large as this one. Also, the use of a dominant axis was adopted to give order to the massing of the plan.

As originally conceived, the sequence of spaces along this axis begins with a small courtyard that acts as one part of a *magaz*, leading to the main entrance of the house itself. A large *majlis*, or *salamlik*, which is located on one side of this court upon entrance, is organized in the shape of a “U” with its open end facing the court; it has a continuous banquette running along three walls in the fashion of a traditional male reception room. Of these three walls, the one to the south facing the door is dominant and has a large ornately carved wooden panel running from the back of the banquette to the ceiling to designate a place of honor for the sheikh himself; with windows looking out to the gardens and the sea beyond flanking it on both sides. The walls of the two sides of the “U” also have smaller carved wooden panels, which alternate with solid vertical bands of brick and plaster wall. Antique Bedu rifles from the sheikh’s extensive collections of weapons, hanging muzzle down in these white bands, are a vivid reminder of the bands of tribal fealty that he still commands.

Sometime after the construction of the house had already begun, the client decided that there was a need for several guest rooms and, in spite of the generous size of the site, the placement of the foundations and linear increasingly private character of the concept dictated that these be located near the entrance courtyard as well. Because of municipal setback the proximity of the site line to the guest wing dictated that it be deflected from the main axis. With characteristic optimism, the architect also looked upon this unexpected turn of events as an opportunity rather than a difficulty, using the apparent conflict between the space required and the area remaining to the advantage of the design. To some the result may be reminiscent of the kind of juxtaposition intentionally created by Robert Venturi to exaggerate the contemporary drift away from the functionalist aesthetic of the modernists in projects such as the Vanna Venturi house in Chestnut Hill or the Brant House in Bermuda; another level is also evocative of the kind of

transformation that takes place in the Fatamid and Mamluk complex in Medieval Cairo, as an example in the madrasa of Al Salih Najm al Din Ayyub, the madrasa and mausoleum of Amir Sanjar al Jawli, and the khangah and mosque of Amir Shaykhu, and such examples were definitely in the architect's mind as he went about solving this problem. As he says:

As the space for this added wing was confined within the existing internal vehicle drive-ways use was made of an old design technique; aligning the elevation walls with the streets and disposing of the rooms inside accordingly filling in spaces where necessary. This solution was often used in the old irregular street patterns and especially in Mosques where the buildings were aligned with the street whilst prayer space was directed toward Makkah.

The resulting addition, which represents one of the few such examples of complexity and contradiction in El-Wakil's residential work, serves to augment the entry court and *samalik* across the drive and to act as a visual hinge generating the extended fugal of movement of spaces that extend horizontally from it. As such, it both begins and ends the linear form of the house, paradoxically giving it more animation than it could otherwise have had.

The towering *Qa'a*, which is the highest volume in this extended elevation, is reached through a long, exquisitely tiled hallway that joins the public zones of the palace. A subtle shift in zoning, from the grouping of the *majlis* to an inner sanctum reserved for close friends, is marked by level as well as scale with three semicircular steps leading up into the high, square space. This change of level, which is repeated in an even more exaggerated way between the semiprivate and private zones, is far from accidental, as can be seen in an early rendering, in which a tripartite garden, rendered in the fashion of Hassan Fathy, pharoanically inspired gouaches, clearly indicates these horizontal break points and an increasing sense of closure where they occur. The dining room, the kitchen, and the party wing that is perpendicular to it further confirms the purpose of this zone, meant for entertaining important guests, relatives, and close friends. The family quarters located across an open courtyard from this middle zone terminates the line and is really a self-contained atrium house in its own right. A wooden cupola, inspired by one of similar formed design for the Monesterli residence in Cairo by Hassan Fathy, signifies the fragile character of this grouping as compared to the *Qa'a* across the court, casting delicate shadows on the white walls of the bedroom arcades below. This sense of playfulness continues in the central fountain of the atrium itself, which is updated here into a plunge connected by a covered passageway to the swimming pool beyond.

Through such innovation, El-Wakil has shown the possibility inherent in the typologies of the past.

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Notes

CHAPTER 1: THE AMERICAS

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