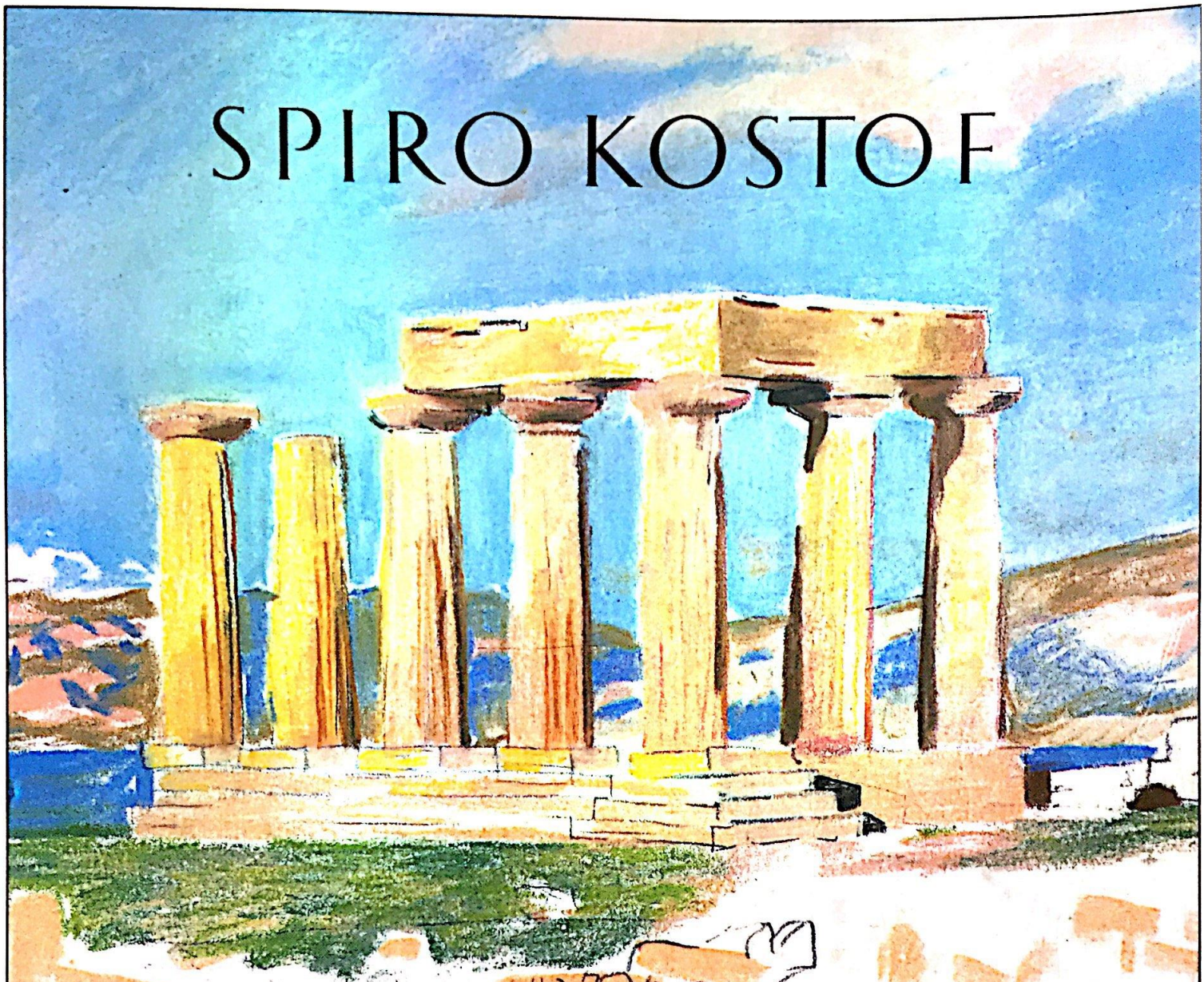
SPIRO KOSTOF



A HISTORY OF ARCHITECTURE

SETTINGS AND RITUALS

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Settings and Rituals

SPIRO KOSTOF

Original Drawings by Richard Tobias

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PREFACE

This book is something of a compromise. It is a general survey of architectural history that tries to reconcile the traditional grand canon of monuments with a broader, more embracing view of the built environment.

It does so by making no strict distinctions between architecture and building, between architecture and urbanism, between high cultures and low. Hagia Sophia and Versailles are here, but so are igloos and nineteenth-century malt-kilns; the ducal palaces of Urbino and Mantua are discussed within the larger frame of the city-form; the Romans share their chapter with their "barbarian" adversaries, the Dacians, and the tribes of the sub-Sahara. I wanted to tell a story—the epic story of humans taking possession of the land and shaping communities through the act of building.

The aims are set out in Chapter 1. All-inclusiveness is not one of them. I had to confine myself to a relatively small number of sites and buildings in order to be able to look at them in some detail. It was important that this treatment of selective places be full. Architectural style comes in of course; that was the core of my training. But I am as concerned with use and structure and urban process, with motivation and ritual sequence. I would not be at all unhappy if the book were to be seen as an offering of cultural history.

Despite its seemingly ecumenical reach, this cannot claim to be a world history of architecture. That task would entail a fair balance in the account of architectural traditions in all ages and on all continents. We are preoccupied with our own Western tradition. Even with the most permissive attitude, other cultures stand as foils to this perhaps inevitable self-absorption. My limited goal was to resist presenting the Western achievement as if it were an insulated and wholly logical progression. We have always been bound up with other lands; and the order we have created gains in understanding when it is assessed in the light of alternate orders. As a symbolic recognition of this interdependence, I have avoided discussing non-Western traditions tidily in their own individual chapters. It seemed to me that the excitement of confrontation might outweigh the obvious advantage of separate linear narratives. So I have brought together medieval Florence and Cairo, Palladio and Sinan.

I have also committed one further breach of historical practice. In order to keep the discussion of one place intact, I have introduced some architects ahead of their strict chronological slot. I hope old hands will not be unduly distressed to meet Giulio Romano at Mantua before they meet Bramante in Rome.

Through the years, Richard Tobias has been a steady collaborator. This is as much his book as it is mine. His drawings go beyond mere illustration. They strengthen and clarify the approach of this historical survey, and they convey information far in excess of the limits of the text.

We agreed on some things at the beginning and stayed with them. Except when they remained diagrammatic, all plans would be oriented toward the north. They would also indicate setting—land contours or neighboring structures. Where possible this setting is original to the building. In cases where we could not reconstruct what was there at the time, say for Chartres Cathedral or the imperial *külliyes* of Istanbul, we settled for the best premodern context we could find. Finally, we wanted to convey the sense of the slow, accretive development of familiar monuments and sites by showing in sequence the principal stages in their planning history. The multipart drawings of Karnak and the Piazza San Marco are examples.

It should be self-evident that a history of this kind reaps the collective effort and wisdom of scholars in several fields. Since the nature of the book precluded the customary apparatus of notes and extensive bibliographies, I must acknowledge my enormous debt to them all here, a debt which in a number of cases approaches dependence. I must also single out at least some among the many colleagues and friends who offered help at various stages of the project: Marc Treib, Andrew Stewart, Walter Horn, Stanley Saitowitz, Hsia Chu-Joe, Ian Robertson-Smith. Readers of drafts include Christian Otto, Richard G. Carrott, Osmund Overby, Christopher Mead, and Henry A. Millon. A most patient and sympathetic review came from Elizabeth M. Brown; her scrutiny improved the book tangibly, and I am deeply grateful to her.

PREFACE

The long process wore out several assistants. I will always remember them with gratitude: Wendy Tsuji, Deborah Robbins, Michael Brooder, Carol Silverman, who valiantly tackled the index, and D'vora Treisman. In the final stretch, Mari Adegran and Susan Shoemaker lent their skills to the completion of some of the drawings. To Douglas MacDonald, I owe the most. He has worked long and hard on sources, illustrations, and the glossary, and ably served as liaison with the publisher. On that side, our main ally was Kathy Kuhtz. My fond thanks also to my editors, first, James Raimes, who took the project through its critical starting phase almost ten years ago, and more recently, Joyce Berry.

To my students, past and future, this book is fondly dedicated: it was written with them foremost in mind.

Berkeley, California S.K.
October 1984

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PART ONE

A Place on Earth

Thomas Cole, *The Architect's Dream*, 1840; detail.

1

THE STUDY OF WHAT WE BUILT

The History of Architecture

A history of architecture is both less and more than a grand tour. It does not have the immediacy of walking through the streets and public places of towns as diverse as Isfahan and London, or stepping into covered spaces that range in mood from the dappled, swarming tunnels of Muslim suqs to the single-minded sublimity of the Pantheon in Rome. (Figs. 1.1, 1.2) That is how architecture is meant to be known. As the material theater of human activity, its truth is in its use.

Although a book such as this cannot stand in for "the foot that walks, the head that turns, the eye that sees," as Le Corbusier once described the experience of architecture, it has its own deliberate advantage. For one thing, the book is a compact world. It lets one shift in minutes from Mesopotamia to Peru. Then, it is panoramic. The reader who leafs through it is not unlike the lone figure in this nineteenth-century painting by Thomas Cole entitled *The Architect's Dream*. (Fig. 1.3) The figure reclines luxuriously on top of a column of classical inspiration; before him, past traditions of buildings are composed grandly, like a hybrid movie set. Time is the river that flows toward him, and on its banks are lined the familiar forms of his professional vision: the pyramids, battered walls, and plant columns of Egypt; Greek temples and Roman aqueducts; and closer still, outlined against the glow, the pinnacles and lance-like towers of medieval Christendom. He is an architect, and what he looks upon is the idealized heritage of his craft. He could draw from this vast and varied wealth, as nineteenth-century architects did, to give shape to contemporary buildings of his own.

Like him, the reader of an architectural history is alone among the built riches of the past, put in order, illustrated, and accounted for. He or she can learn the names of buildings and their makers, and when and how they were made, and other ready information that is not always at our disposal when we travel. A visit to Rome or Istanbul is bound to be confusing. There is so very much to see, and it seems to lie about unsorted, helter skelter. A group of temples from the time before Christ is ringed by recent apartment houses; brick-and-concrete clumps refuse to yield their identity. The historian brings time under control; isolates random scraps and arranges them into a trenchant sequence; sets up relationships among farflung structures, through the hindsight of this day and the collective knowledge of the discipline. What is a ziggurat and how was it used? What sort of people built it? How does it compare with an Old Kingdom pyramid or the stepped platform of a Meso-American temple?

The historian does this, first, by insisting on the recapture of the true physical reality of things built, whether they have since been altered, damaged, or destroyed totally. This is a primary task, akin to archaeology, and makes use of material that is both visual and literary in nature. And then the historian must go beyond this established reality of the buildings to understand what they are, how they came to be, and why they are the way they are.

The Pictorial Evidence

Buildings are often born of images and live on in images. Before there is a foundation trench or a single course of stone, a building has to be conceptualized and its form may be represented in models and drawings. Models of the building in small scale, in clay or wood or plaster, give a full impression in three dimensions of the final product that is being projected. Pictorial views might present the future building's ideal appearance: on commemorative medals, for example, struck at the time of the laying of the cornerstone, or on presentation drawings elaborately rendered in perspective. And there are other, more abstract drawings. *Plans* show in two-dimensional pattern the horizontal disposition of solid parts, like walls and columns, and the voids of enframed or enclosed space. *Sections* slice through the building vertically at some imagined plane to indicate the sequence of rooms in length and the superimposition of floors and roofs in height; they also indicate openings, whether they are physically accessible or not, and so help to explain structure. *Elevations,* using a vertical plane, flatten out one face of the building to indicate schematically the order of its parts.

To the initiate, a ground plan of the church of Hagia Sophia in Istanbul tells at a glance that strings of columns alternate with heavy piers to describe a large square

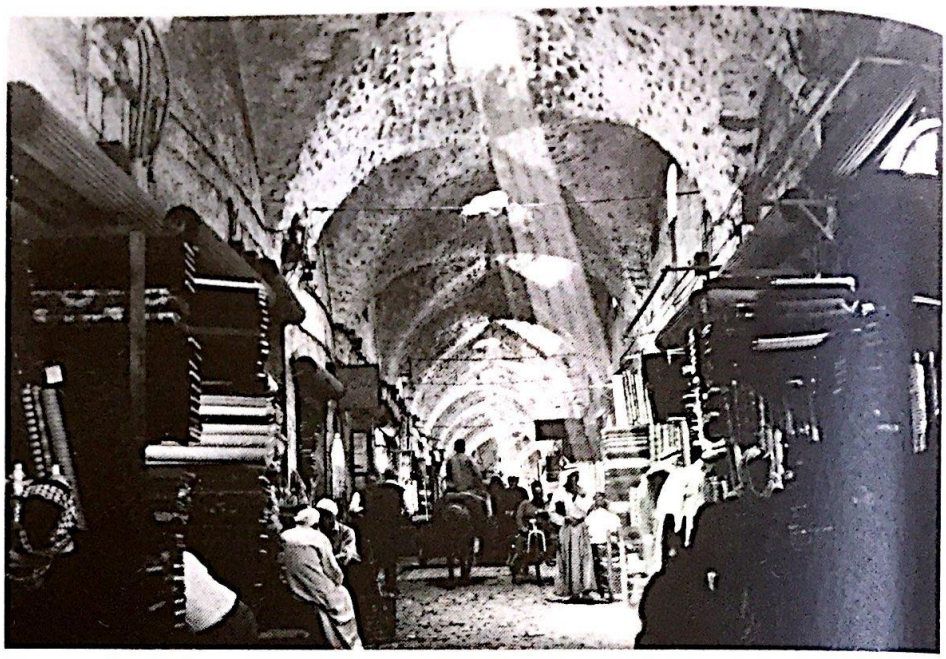


Fig. 1.1 Aleppo (Syria), suq, or covered market; interior.

bay and smaller semicircular spaces beyond—the central core of the building. A longitudinal section through this core makes clear that the columns are disposed in two tiers and that, further up, a system of curved roofs over the smaller spaces builds up to the full dome that covers the central square. (Fig. 1.4) Externally, the relationship of the dome to the upper walls of the square and then, in descending order, to a major half-dome, to two minor ones flanking a large semicircular window, to banks of grilled lower windows punctuated by spurs of a buttressing wall, and finally to gates seen through arched recesses at the ground level—all this can be frugally abstracted in an elevation drawing of the west front.

These particular drawings are newly made; but some version of them was undoubtedly prepared in the sixth century by the architects of Hagia Sophia, Isidoros and Anthemios, to convey to their patron, Emperor Justinian, the form of the church he had commissioned. There are extant architectural drawings from as far back as ancient Egypt and Mesopotamia. Indeed, it is hard to see how any structure but the simplest and the most traditional could be built without the benefit of such preliminaries.

Now these devices are formal. In almost every instance they would have been preceded by dozens of sketches and diagrams as the architect's thought developed from an initial conception of the building to the final solution. When they survive, and are properly put in order, such studies help to document the very *process* of design. Look at the plan of Louis Kahn's National Assembly at Dacca, Pakistan; and at another wisp of form in pencil that started it all. They bracket the elusive but fundamental substance of what we call architecture, a complicated course the historian must traverse to make sense of its tangible end, the building itself. (Fig. 1.5)

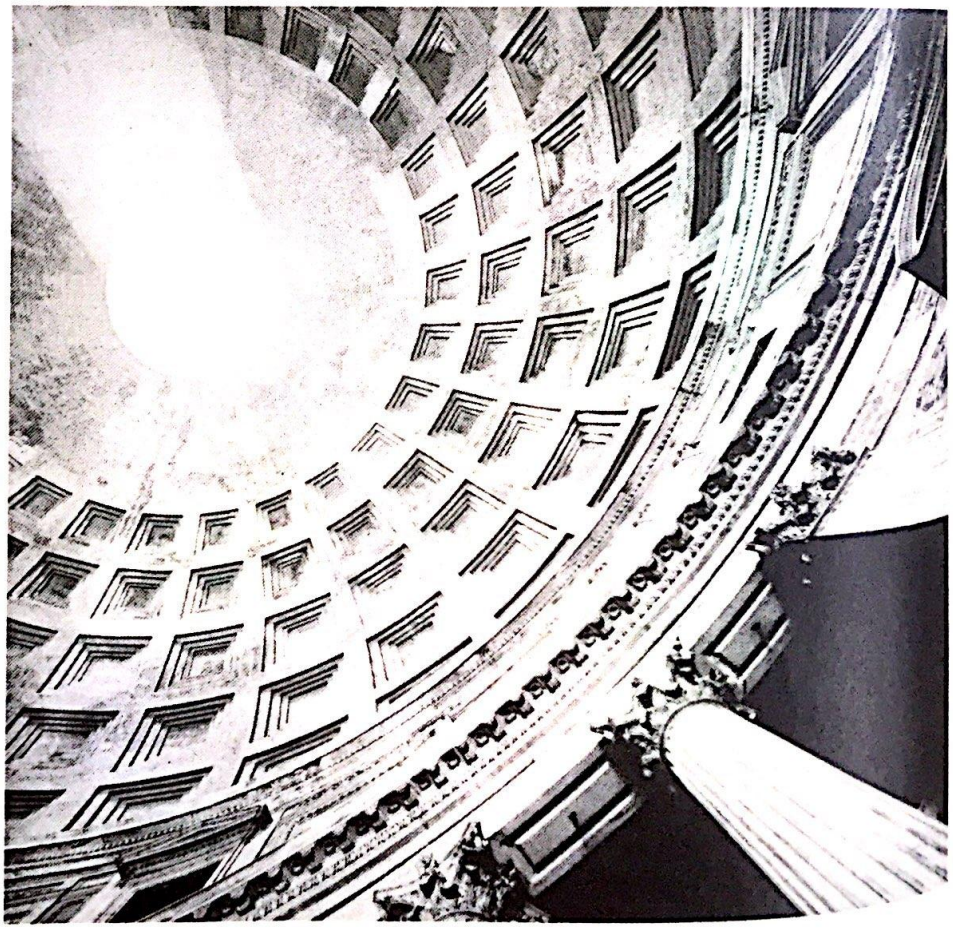


Fig. 1.2 Rome (Italy), Pantheon, ca. A.D. 118–26; interior, view toward dome.

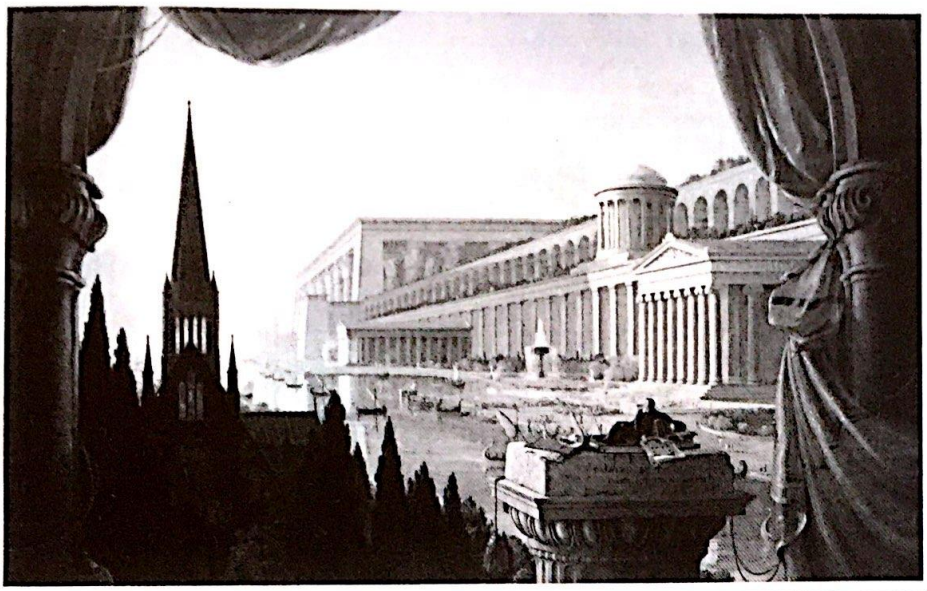


Fig. 1.3 Thomas Cole, *The Architect's Dream*, 1840. (Toledo Museum of Art, Toledo, Ohio)

The point to remember, then, is that graphic and plastic images are indispensable in the making of architecture—and for its understanding after the fact. They are the conventional language through which the architect communicates with his partners in the act of shaping our daily environment. These are the patron or client who employ the architect to mold their architectural wishes, and the many hands involved in building the structure. That same language assists students of architectural history to get to know structures they have never seen or have seen and not comprehended in full, and one of the earliest tasks for them is to learn to read architectural drawings and models with ease.

Once a building is up it becomes a live presence, to be reproduced at will. It might figure on paintings and sculpture in relief, on prints, maps, or photographs. Models of it might be made to serve as votive offerings to a germane cult, for example, or to be sold as mementoes to visitors or pilgrims. For the history of architecture there is valuable information in all of these reproductions. But we have to be cautious in interpreting the evidence they provide, because the conventions of the various media employed are peculiar to themselves. A photograph is a faithful record that registers all incidents of form, however trifling, that fall within the range of its fixed frame. In the hands of a painter the same building may be pictured less clinically, its mass generalized and rendered in sharp, simple surfaces of shadow and light. (Fig. 1.6) This is testimony of a different kind. Yet it can be just as useful as the photograph; for architectural reality has more to it than stick and stone, and the history of architecture more dimensions than just the categorical.

The Literary Evidence

Literary sources, like images, yield much essential insight for our study of architecture. The birth of most structures of consequence assumes the existence of written documents, some of which may come to be preserved by design or accident. At times, patrons may express their wishes to the architect in writing. The architect, in turn, may have passed on written instructions to subordinates. Legal contracts delineate the precise responsibilities of the parties concerned. The erection of public monuments necessitated administrative committees whose trail can be followed in the minutes of their deliberations, reports, and records of payment. Beyond this immediate context, architectural production would have been affected, directly or indirectly, by the towns' building codes, ordinances of building trades and guilds, theoretical treatises, and manuals of construction.

Again, as with visual representations, the building may live in literary sources long past its completion. First, there is self-serving advertisement after the fact. Patrons often sing the praises of their creation in dedicatory or commemorative inscriptions or tablets. It was the function of court historians to extol the building program of their employer. We also have to heed descriptions of past buildings in old travel accounts or in annals and local chronicles. In all of this, historians of architecture need to borrow the philologist's discipline. But language, the agent of expression, is also the hotbed of ambiguity. And the translation of words into the physical substance of architecture is peculiarly open to contention.

We might illustrate this point by focusing on one monument of antiquity, the famous tomb of King Mausolos of Caria at Halikarnassos that gave us the word *mausoleum*. It was considered one of the seven wonders of the Classical world. It disappeared long ago with hardly a trace except for fragments of its sculptural decoration, now housed in the British Museum in London, and odd bits of the structure that were built into the castle of Bodrum which occupies the site. The Mausoleum of Halikarnassos lived on in memory through mentions of it and its creators in later Latin literature, of which the most detailed is a passage from the *Natural History* of Pliny the Elder.

> This is the tomb that was built by Artemisia for her husband Mausolos, the viceroy of Caria, who died in the second year of the 107th Olympiad [351 B.C.]. . . . On the north and south sides it extends for 63 feet, but the length of the facades is less, the total length of the facades and sides being 440 feet. The building rises to a height of 25 cubits and is enclosed by 36 columns. . . . Above the colonnade there is a pyramid as high again as the lower structure and tapering in 24 stages to the top of its peak. At the summit there

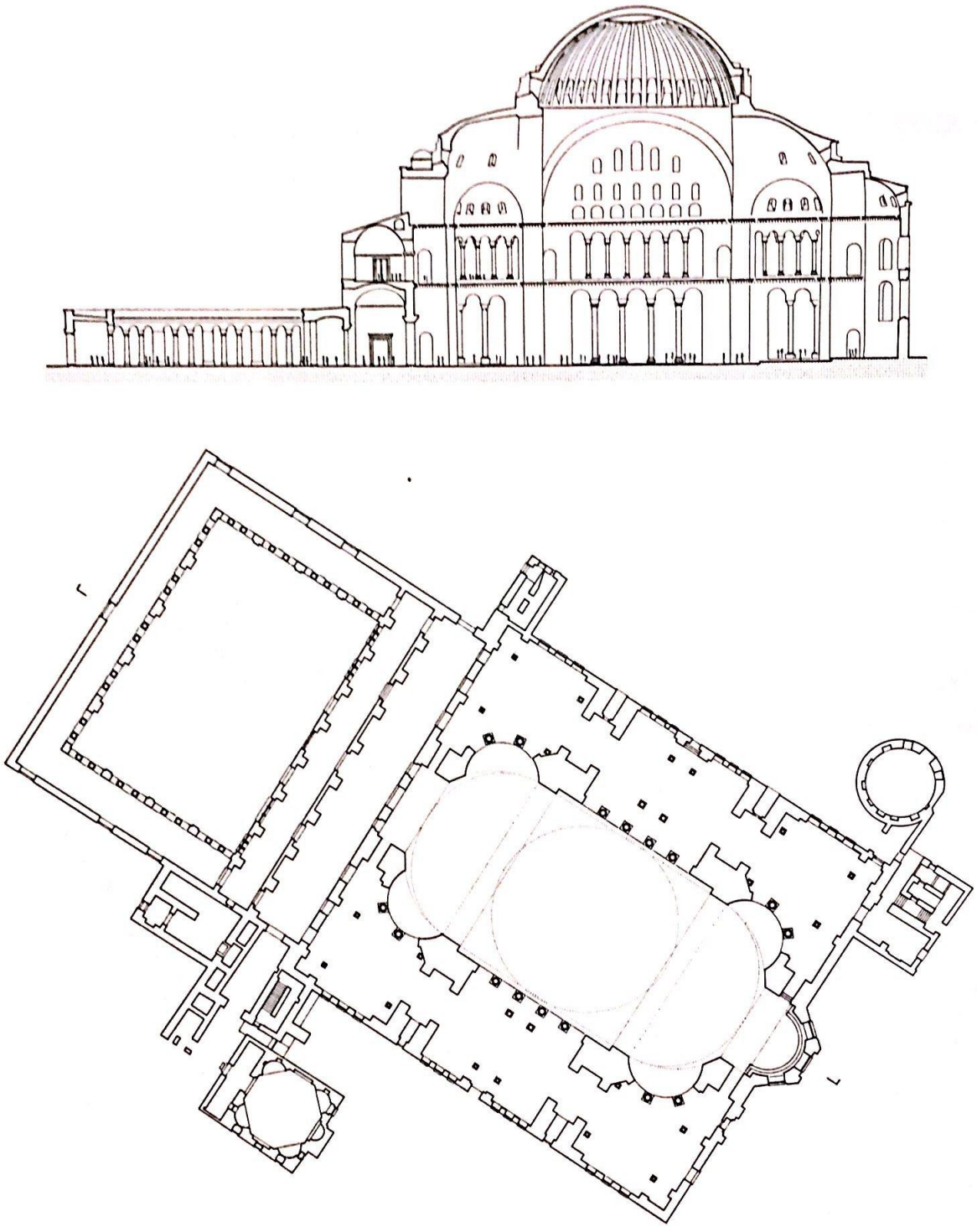


Fig. 1.4 Istanbul (Constantinople, Turkey), Hagia Sophia, 532–37, Isidoros and Anthemios: (a) longitudinal section; (b) ground plan.

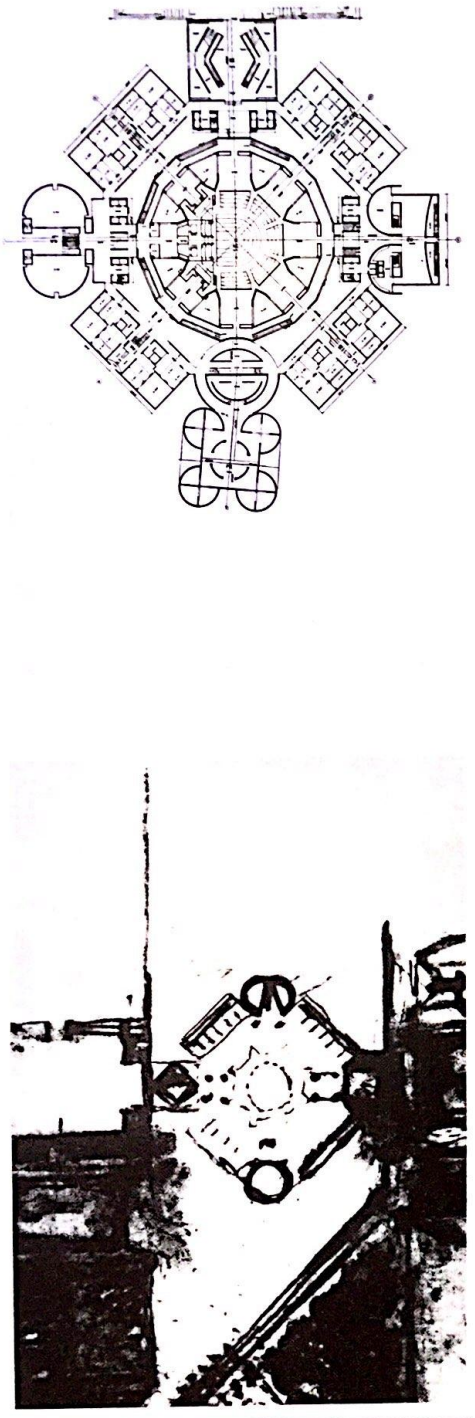


Fig. 1.5 Dacca (Bangladesh), National Assembly Building, 1965–74, Louis I. Kahn: (a) ground plan; (b) sketch plan, 1963.

is a four-horse chariot of marble, and this was made by Pythis. The addition of this chariot rounds off the whole work and brings it to a height of 140 feet.

Recreating the physical appearance of the Mausoleum on the strength of these words is an exceedingly difficult procedure. First one has to establish the accuracy of the words themselves. Pliny lived two thousand years ago. His book came down to us in various texts, in Latin and Greek; these contain disparities or alternate readings because of different copyists—and the interpretation of modern scholars. This is no trivial matter. Dimensions, whether written in Roman numerals or small letters and accents in the Greek manner, are easily miscopied or misread. And yet they have to be the basis of any reconstruction. Transpose the two initial letters of the word and *altitudinem* becomes *latitudinem,* changing the meaning of "a pyramid as high again as the lower structure" to "as wide"; both readings have their adherents.

There were four centuries between Mausolos and Pliny. The description itself may therefore be inaccurate and Pliny may have erred in writing. At least one scholar believes that, when Pliny gave the width of the north and south sides as 63 feet, he really meant to say cubits, a unit of measurement that is one half of a foot longer: there is no other way in which the dimensions of the original foundations as they have been extracted from the site could be reconciled with such a small figure. And of course the passage in question does not furnish all the particulars. It does not say, for example, how high the pedestal was or how the columns that surrounded the building were arranged.

Historians must juggle all these variables and come up with a building that is a fair interpretation of the literary and archaeological evidence—and a credible form architecturally. They must deduce from the one surviving column the style of the bases and the cornice of the surrounding colonnade, relying on the current knowledge of the general development of Greek architecture. It should not surprise us, then, that two versions of the Mausoleum of Halikarnassos as different as the ones we illustrate could be spawned by the same data. (Fig. 1.7)

The Total Context of Architecture

The effort to establish, through the scrutiny of visual and literary documents, what past architecture really looked like will have already involved us with questions not strictly pertinent to physical form. These might include the identity of the patrons, particulars about the motivation for the buildings commissioned, the identity and careers of the architects, the nature of the materials of construction and their provenance, matters of finance, and so on. But even this is not the outermost limit of the legitimate concern of architectural history. We have to push further still, to the broader frame of general history, for those strands or patterns that illuminate the total setting of architectural production.

Architecture, to state the obvious, is a social act—social both in method and purpose. It is the outcome of teamwork; and it is there to be made use of by groups of people, groups as small as the family or as large as an entire nation. Architecture is a costly act. It engages specialized talent, appropriate technology, handsome funds. Because this is so, the history of architecture partakes, in a basic way, of the study of the social, economic, and technological systems of human history. To understand the Carson Pirie Scott department store in Chicago fully, we must know something of late-nineteenth-century American capitalist enterprise, the philosophy of consumerism, and the business ethic; the urban history of Chicago since the Fire of 1871; corporate financing and land values; the genesis of the department store as a novel concept in commercial architecture; the elevator and the early history of steel-frame skyscraper construction. (Fig. 1.8)

This approach should be kept in the foreground as the ideal way to learn about our built environment. If we are to be satisfied with less, as we must, it should be on the condition that we agree on what the *total context* of architecture is. Every building represents a social artifact of specific impulse, energy, and commitment. That is its meaning, and this meaning resides in its physical form. Neither material reality alone nor general background of culture will suffice to explain the peculiar nature of the building. And the task of the architectural

Fig. 1.6a Jean-Baptiste-Camille Corot, *The Colosseum Seen from the Farnese Gardens*, 1826. (Louvre, Paris, France)

historian, in the long run, can be nothing less than the search for the peculiar nature of those artifacts of place that constitute our architectural heritage.

Let us describe plainly at the outset the thinking that will govern our historical inquiry. It is not a universal approach among architectural historians: it need not be. The selection for emphasis among the many specimens of architecture, the arrangement and interpretation of facts known about them, the personal judgment of each historian, the vantage point of the time and philosophy within which he or she operates—all these variables help create as many histories of architecture as there are historians. In that sense, history is manufactured by historians, and any building or person or event in this process can acquire as much weight as is consonant with each historian's purpose.

There are four premises that underlie the scope and treatment of our survey. First, the material aspect of every building should be looked at in its entirety. Second, the building should be thought of in a broader physical framework and not just in terms of itself. Third, *all* buildings of the past, regardless of size or status or consequence, should ideally be deemed worthy of study. And finally, the extramaterial elements that affect the existence of buildings should be considered indispensable to their appreciation.

1. *The Oneness of Architecture*

The tangible presence of a building is indivisible. The structure that holds it up, the aesthetic refinement of its appearance, its decoration and furnishings are all of one piece. We cannot put aside the mosaic scheme of the interior of a Byzantine church on the grounds that, being inessential to the

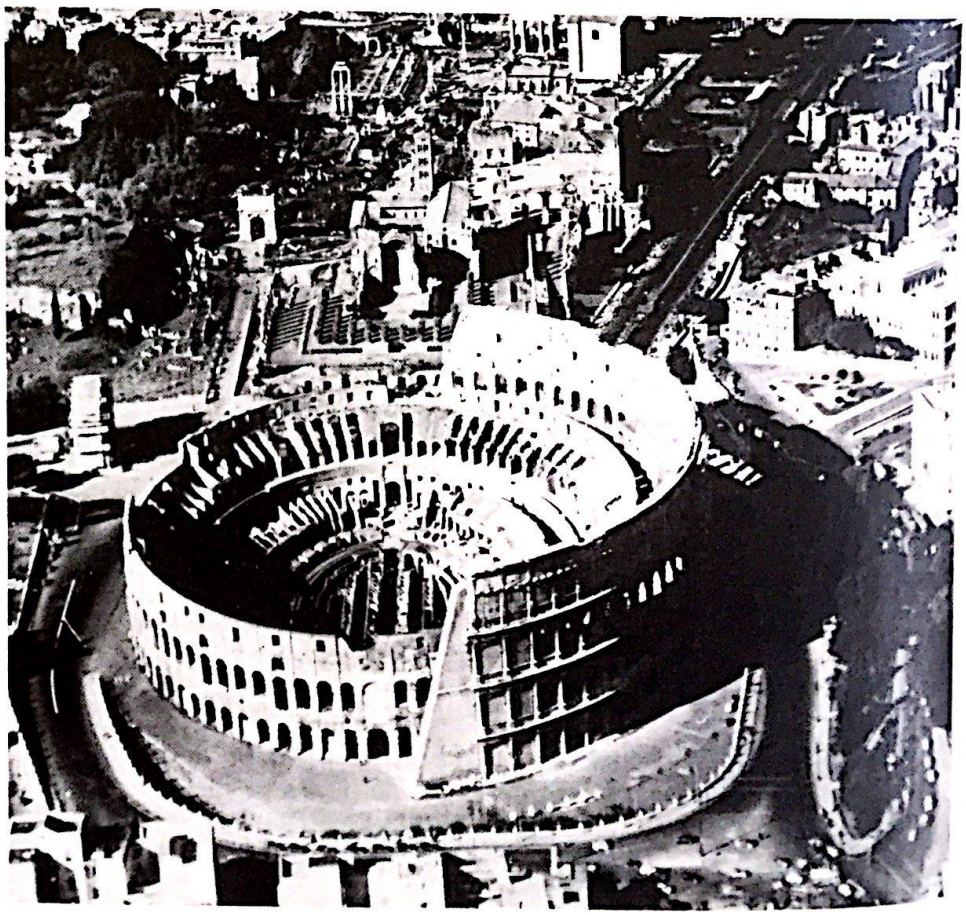


Fig. 1.6b Rome (Italy), Colosseum, A.D. 72–80; aerial view.

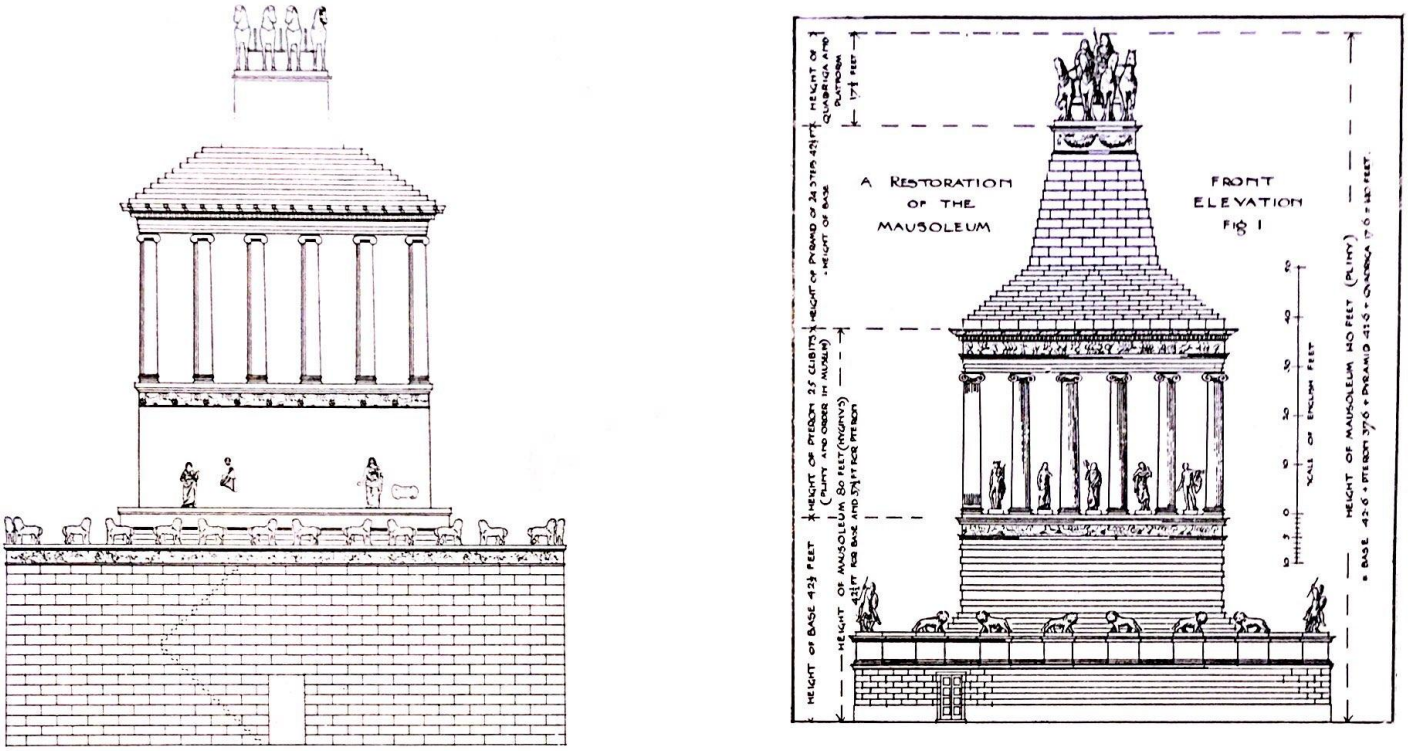


Fig. 1.7 Halikarnassos (Bodrum, Turkey), tomb of King Mausolos, ca. 355–350 B.C., Pythios and Satyros; reconstruction drawings: (a) by K. Jeppesen, 1958; (b) by J. J. Stevenson, 1896.

architectural frame as such, it is best dealt with independently by *art* historians. Not only are Byzantine mosaics physically inseparable from the architectural frame of their buildings, their placement takes advantage of this frame to set up a ceremonial hierarchy of parts basic to the theater of liturgy housed therein, and their subject informs this theater with precise theological meaning. (Fig. 1.9)

For similar reasons, we cannot divorce the structure of a building from the aesthetic conventions that shape its appearance—what we call its *style*. Buildings are neither primarily structural frames, nor primarily envelopes of form: to write a history of architecture from the perspective of one of these in favor of the other would be precisely to deny the physical integrity of the buildings. Preoccupation with structure leads to technological determinism, the kind of thinking that is attempted to explain all major characteristics of the form of the Carson Pirie Scott store in terms of the elevator, prefabrication, and the steel frame. The contrary preoccupation with the elements of design—the interweaving of vertical and horizontal members, the rounded corner at the crossing of State and Madison streets, the rich ornamentation of the entrance pavilion—would tend to equate skin with substance and dilute the fact that Louis Sullivan's is not exclusively an abstract mold of visual order but a construction of enormous scale that has managed to stand up and to remain standing.

And yet here, as in many other buildings, the special excitement of architectural intention resides in the tug of war between the structural and formal systems. One or the other at times may seem to take over openly and condition the final effect the building will have on its users. The Eiffel Tower, for example, seems structure triumphant. By contrast, the simple underlying construct of uprights and lintels transforms the Greek temple, at least superficially, into something approaching pure form. But if for the Eiffel Tower the exposed tangle of metal struts is the better part of the form, for the Parthenon on the Athenian Akropolis the clear statement of form, the exterior colonnade with its gabled ends, is also an appropriate diagram

of the structure. The two buildings may start from opposite impulses, but they reach the same result. Structure and form are basically one and the same. (Figs. 1.10, 1.11)

In most instances, however, the partnership is more intricate. Look again at the church of Hagia Sophia, and you will notice that the impression it conveys to those within is engendered by means of a strong structural skeleton, purposely obscured by the architects. (Figs. 1.4, 11.28) The heavy-set piers detectable on the plan, to mention only one point, are veiled in three dimensions, at least toward the nave, so that only a thin projection of them is allowed beyond the columnar screen that separates the nave from the aisles. As a consequence, it appears that the great dome rests lightly on the lower structure of the building, soaring without effort; while in reality its full weight presses down on those four tremendous masonry piers. But what under close analysis seems at odds—structural fact and aesthetic intention—is in actuality an integral fabric that cannot be judged but as an entity.

2. *The Setting of Architecture*

No building is an isolated object, sufficient unto itself. It belongs in a larger setting, within a bit of nature or a neighborhood of other buildings, or both, and derives much of its character from this natural or manufactured environment that embraces it. The Parthenon does not exist without the emphatic outcrop of rock called the Akropolis on which it perches and the visible range of mountains beyond, which rings the arid bowl of Attica. The setting of Chartres Cathedral or the Carson Pirie Scott department store is quintessentially urban. (Fig. 1.12) The scale and authority of both buildings depend on the stamp of surrounding construction—small-scale residences in the case of Chartres, tall commercial development in the case of the store. Changes in this urban situation during the course of time will promptly affect the character of the two buildings. We must, then, consider past buildings not as permanent bodies in a vacuum but, instead, components of a variegated arrangement subject to constant change. From this perspective the history of architecture may be said to be, in part, the study of the interaction of buildings with nature and with one another.

Fig. 1.8 Chicago (Illinois), Carson Pirie Scott department store (formerly Schlesinger and Mayer department store), 1899–1904, Louis Sullivan (extension, 1906, Daniel H. Burnham and Co.).

The way we experience architecture also works against the notion of buildings as fixed objects. Tools of design such as models and drawings yield a rigid sense of architecture, a sense furthered by the requisite stability of buildings. But our experience of architecture is not one of static images. We move up to a building and through it and our roving eye registers an infinite number of impressions. We might stumble on the building unexpectedly, or approach it from the back or from the sides. We might catch glimpses of it at sunset or in a winter storm or look down on it from taller structures in the vicinity. Trying to account for this arbitrariness, to be conscious of setting, environmental circumstance, and kinetic vision, brings architectural history within the fold of architectural experience, so that buildings of the past are

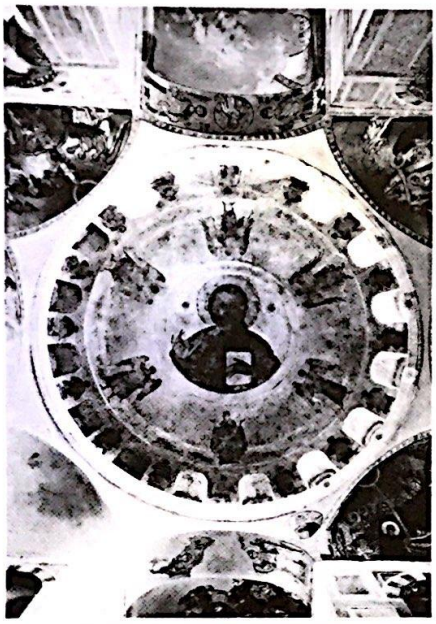
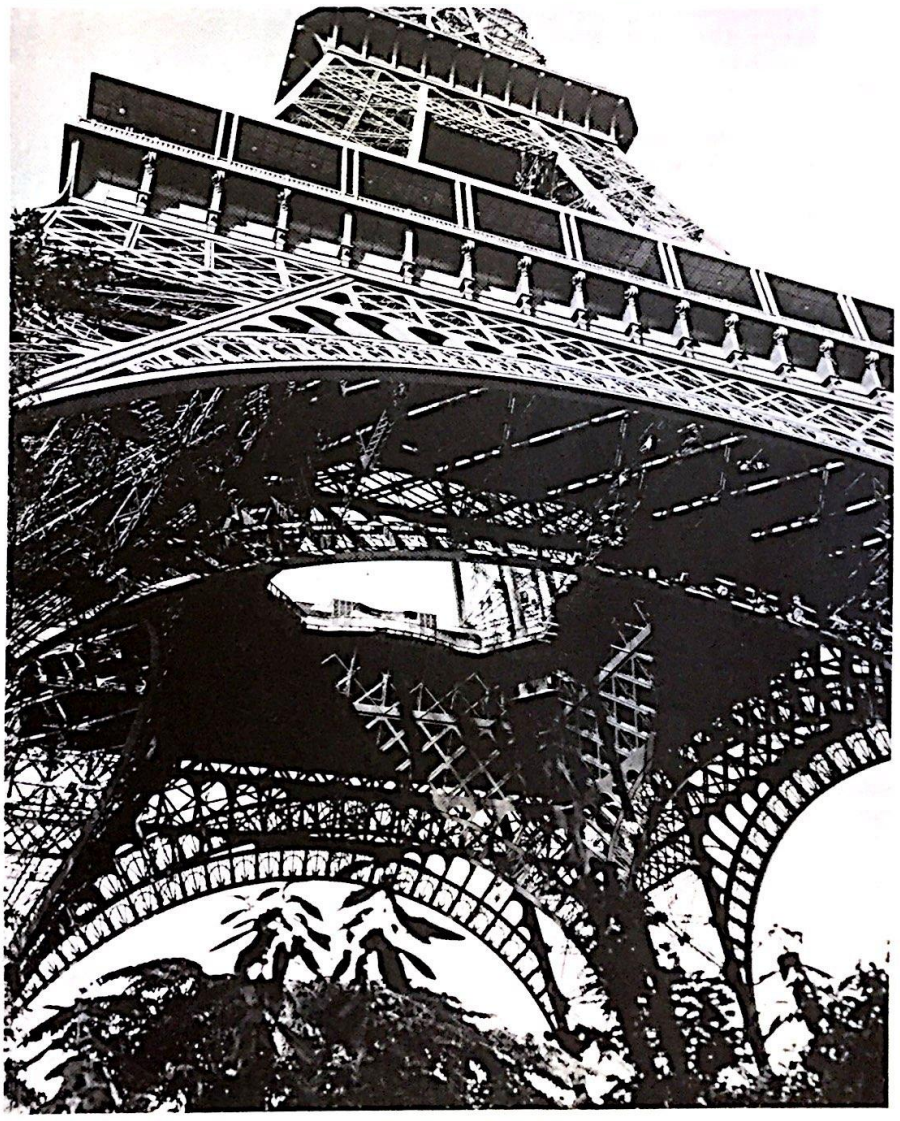


Fig. 1.9 Stiris (Greece), monastery of Hosios Loukas, Church of the Theotokos, ca. 1040; interior, view toward dome.

not reduced to neutral relics but manage to keep some of the flavor of their genesis and subsequent use.

How buildings are depicted indicates how they are perceived. To the serious travelers of the eighteenth century, like James Stuart and Nicholas Revett who took it upon themselves to record the legendary remains of Greece for the first time since antiquity, there are two modes of perception: the topical and the archaeological. (Fig. 1.13) To introduce each monument, they resorted to the picturesque tableau. They show the Parthenon at the time of their visit in 1751, when Athens was a sleepy provincial town within the Ottoman Empire and the Akropolis served as the headquarters for the Turkish governor. The temple stands in a random cluster of modest houses; in it we can see a Turk on horseback and, through the colonnade, the vaulted forms of the small Byzantine church that rose within the body of the temple

Fig. 1.10 Paris (France), Eiffel Tower, 1887–89, Gustave Eiffel; view from below.



during the Middle Ages. This is what the Parthenon looks like today, the authors are saying; and this depiction carries at once the quaint appeal of an exotic land and that sense of the vanity of things which comes over us at the sight of the sad dilapidation of onetime splendors.

But when they turn from romance to archaeology, the task of showing the Parthenon not as it is now but as it was then, Stuart and Revett restrict themselves to the measured drawing. They re-create, in immaculate engravings of sharp clear lines, the original design of the temple in suitably reduced scale and with a careful tally of dimensions. We are confronted again with the traditional abstractions of the architect's trade. Indeed, those architects who, in subsequent decades, wished to imitate the Parthenon as a venerable form of rich associational value could do so readily from these precise plates of Stuart and Revett, without once having seen Athens for themselves. In nineteenth-century Philadelphia, for example, the disembodied facade of the Parthenon is reconstructed as the Second Bank of the United States in an urban milieu that is completely alien to the setting of the prototype. (Fig. 1.14)

Against the engravings of Stuart and Revett, we might pit two pencil sketches of the Akropolis made by Le Corbusier during his apprenticeship travels in the early years of this century. (Fig. 1.15) The close-up view is neither picturesque nor archaeological. It does not show us the ubiquitous tourists scrambling over the site, for example, nor any other transient features of local relevance. Nor is the sketch a reproduceable paradigm of the essential design of the Parthenon. Instead, we see the temple the way Le Corbusier experienced it, climbing toward it up the steep west slope of this natural citadel, and catching sight of it at a dynamic angle through the inner colonnade of the Propylaia, the ceremonial gate of the Akropolis. The long view shows the building in relation to the larger shapes of nature that complement its form: the pedestal of the Akropolis spur that lifts it up like a piece of sculpture and the Attic mountain chain on the horizon which echoes its mass. And when Le Corbusier draws on this experience later in his own work, it is the memory of the building as a foil to nature that guides his vision. (Fig. 1.16)

Fig. 1.11 Athens (Greece), Parthenon, 447–432 B.C., Iktinos and Kallikrates.

This environmental approach is new to architectural history. It responds primarily to the increasing concern within the architectural profession for a sympathetic coexistence between new structures and the older neighborhoods within which they are planted. The move lately has been toward respecting the built fabric of our communities as it stands; avoiding egocentric forms or monumental gestures that would disrupt its tone and quality; striving for the enhancement of physical continuities in our cities; and, finally, using nature as partner in the act of building rather than as adversary. Such an inclusive concept of the environment carries a double promise: solicitude for older buildings of any period and any style; and tolerance for the presence of humbler stretches in the built fabric. Both hold important lessons for the history of architecture.

3. *The Community of Architecture*

This is what our third premise is all about: that all past buildings, regardless of size, status, or consequence, deserve to be studied. It has not always been so. Historians have chosen for the most part to concentrate on buildings of evident substance—imposing public monuments, religious architecture, and rich, stately residences.

The preference is not hard to understand. It is on such important or grand structures that a culture expends its greatest energy. Built of costly, durable materials, they last longer than their immediate environment because they are meant to. They are associated with notable patrons and architects of rank. They are the subject of comment in their time and later, and thus provide the historian with sufficient raw material to make a case for them.

But there is more to it than that. The historian of architecture has effortlessly come to identify with the architect, and, like him or her, has accepted the traditional distinction between architecture and building. Architecture in this polarity is high art, a conscious creation of aesthetic form that

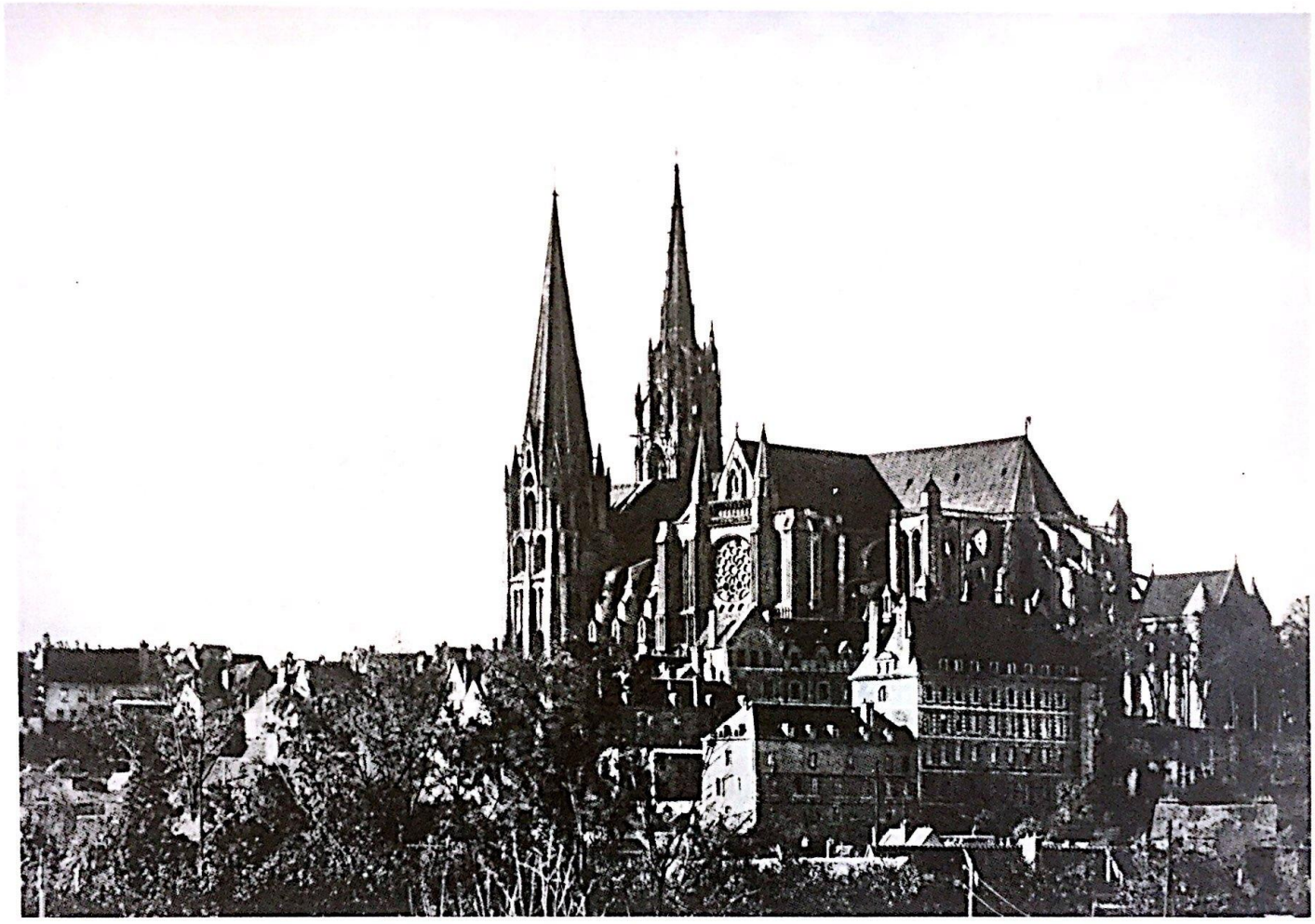


Fig. 1.12 Chartres (France) Cathedral, 1194–ca. 1230; view in urban setting.

transcends the practical requirements of function and structure. This preeminent quality is what Vitruvius, the Roman architect who wrote around the time of Christ, called *venustas* (beauty); he distinguished it from the other two, matter-of-fact components of architecture, *utilitas* (function) and *firmitas* (structure). This architectural trinity is best known to the English-speaking world in the famous phraseology of Sir Henry Wotton as commodity, firmness, and delight.

Now delight, *venustas,* makes building an art, the art of architecture. Delight is secured through the offices of the architect, a professional person whose training and talent equip him or her to enhance what will be built with aesthetic appeal. To insist on this prerogative, architects distinguished themselves in the modern period from engineers, who lay roads and ford rivers with the primary aim of solving technical problems, as well as from builders, merchants of new construction who are motivated by profit. In addition, many buildings come about extemporaneously without the benefit of professional counsel, sometimes even as a grass roots production of shelter by the users themselves.

Since delight, in this scheme of things, is a luxury, and since it assumes the sophistication to feel the need for it and the wealth to afford it, architects have traditionally served the highest strata of society—the state, the religious establishment, the upper classes. Thus, in accepting the dichot-

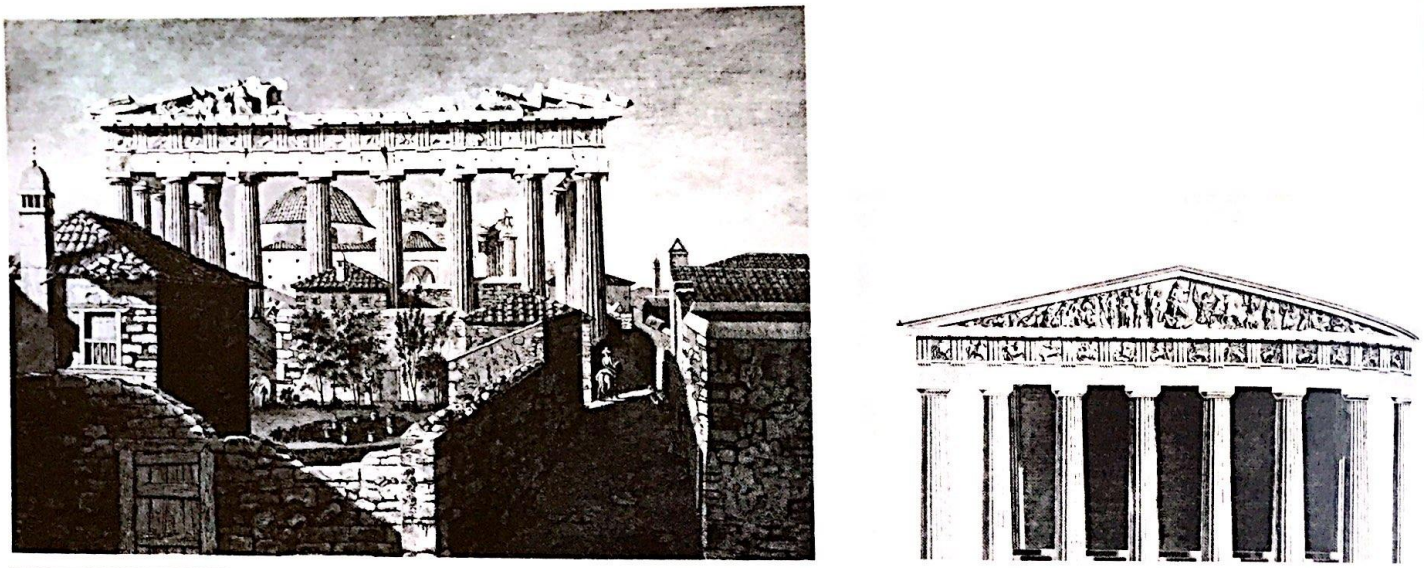


Fig. 1.13 James Stuart and Nicholas Revett, *The Antiquities of Athens*, 1760–1830, Parthenon: (a) contemporary view; (b) measured drawing.

omy of architecture and building, historians have allied themselves with this aristocratic view of our built world. The history of architecture became synonymous with the history of monuments.

For a number of reasons, this view would seem to be needlessly restrictive. Much of what we build does not qualify as "architecture" in this strict sense; nonetheless, these buildings are often imbued with quality. The grouping of a Nepalese village in its natural setting, farmhouses in New England, the anonymous streetscapes of Mexican towns—these structures can delight us though they are created without the help of qualified architects. (Fig. 1.17) Indeed, we have lately all become increasingly attracted to a wide range of vernacular idioms, what has come to be known as "architecture without architects." Its appeal proves how unwarranted it is to claim that even the humblest of structures is un-

Fig. 1.14 Philadelphia (Pennsylvania), Second National Bank of the United States, 1818–24, William Strickland; view, ca. 1868.

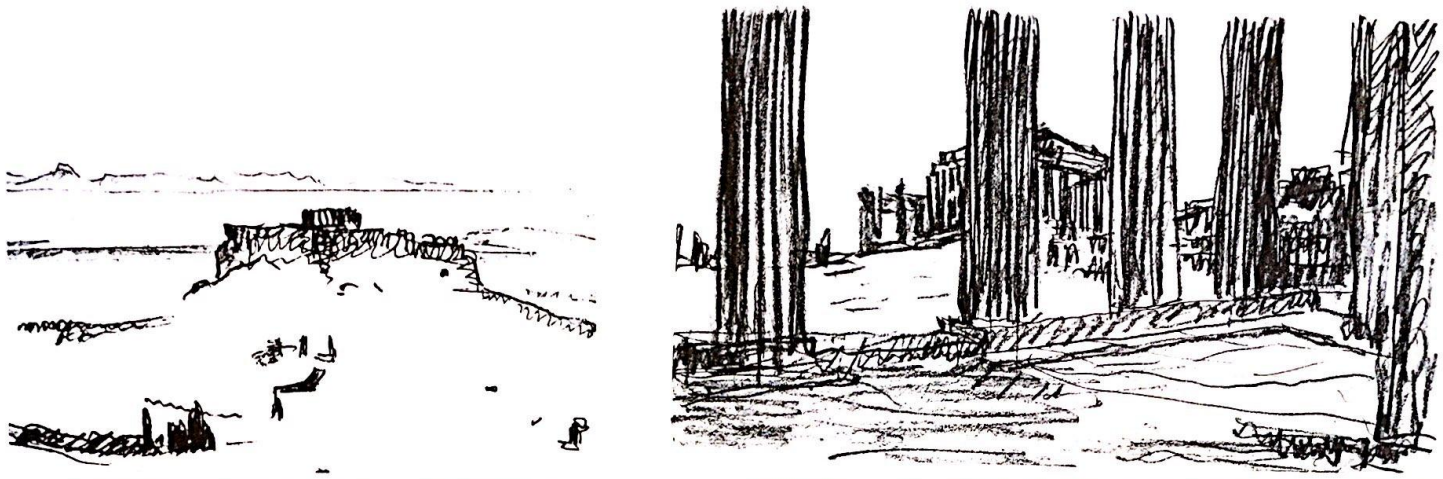
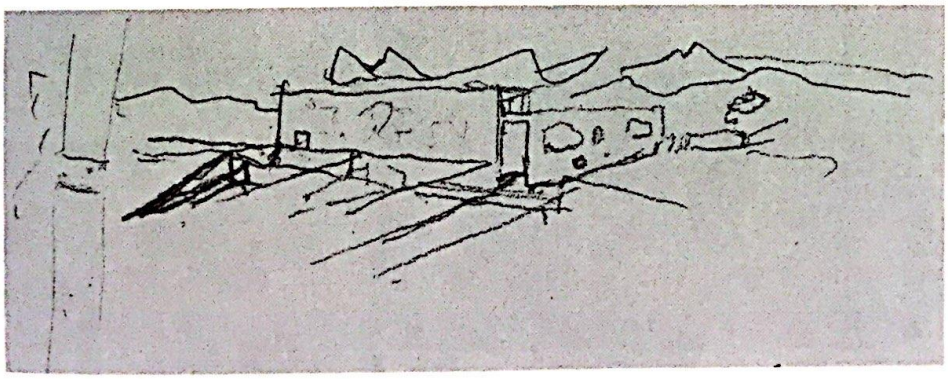


Fig. 1.15 Le Corbusier (Charles-Edouard Jeanneret), sketches of the Akropolis in Athens: (a) distant view; (b) Parthenon as seen through the Propylaia.

touched by aesthetic concern or devoid of aesthetic appeal. To be sure, this is an innocent sort of visual order. There is no conscious theory behind it, no intellectualized system of form. But it demonstrates that delight is an elusive thing that may apply as readily to the random and unstudied as it does to the calculated designs of the professional.

There is perhaps a more basic consideration for resisting the distinction between architecture and building. The general purpose of architectural history is to examine the constructive impulses of distant and recent cultures. As with all investigations of the past, the belief persists implicitly that, through a proper understanding of the act of making places, this most essential skill of all without which life cannot, literally, exist, we come closer to understanding ourselves. When we exhort historians to be objective, we mean not so much that they should be unfeeling or uncommitted, but that their assessments should be full and representative. And so it would be as improper to evaluate the constructive impulse of a nation exclusively through its literate architecture—public monuments and buildings of prestige—as it would be to determine its social character on the basis of its leading personages alone. To the extent that American society at the time of George Washington depended on slave labor, to pick one random instance, the architectural history of the period must include slave cabins as well as Mount Vernon.

Fig. 1.16 Le Corbusier, sketch of Assembly Building, Chandigarh, India, 1958.



The truth is that modest structures in the periphery of monuments are not simply of intrinsic value; they are also essential to the correct interpretation of the monuments themselves. Slave cabins, outhouses, herb gardens, and water vats complete the meaning of the plantation house. This may seem obvious to us because Southern plantations are a familiar institution of our recent past. If they were not and we subscribed to the aristocratic view of architectural history, the neglect of the subsidiary buildings might well have contributed to the misreading of our focal object, the plantation house itself.

Our appeal, therefore, is for a more inclusive definition of architecture and, consequently, a more democratic view of architectural history. The aim is to put aside the invidious distinctions between archi-

tecture and building, architecture and engineering, architecture and speculative development; to treat buildings with equal curiosity whether they are religious in intent, monumental, utilitarian, or residential; to discriminate carefully among styles or conventions of form without discriminating against any of them; and to have a genuine respect for the architectural achievement of cultures regardless of their place of origin and their racial and theological identities.

The last two observations deserve a further word. If historians have been partial to high-class buildings as the subject of their scrutiny, they have not always been impartial in their treatment of *all* high-class buildings. They have turned on occasion into active champions of one style at the expense of another, justifying their preference in terms of aesthetic, structural, or even moral arguments. At one time or another, Renaissance architecture was extolled over Gothic; Baroque architecture was deprecated as excessively gaudy; and the dominant Beaux-Arts classicism of public buildings in America at the turn of the century was minimized in favor of the occasional unorthodoxy of design that presaged new directions.

The historian must attempt to speak of architecture as it was, not as it should have been. We have no further control over what has happened. We have the duty to understand sympathetically how it was and why it happened. To scold the nineteenth century, say, for what it did or did not do is, for the historian, no more than personal indulgence. To insist that it should not be repeated is useful and the proper function of the critic.

History has no alternative but to accept that matters of quality are not absolute, that the terms of quality are set by each period if not by each building. Ornament, for example, has had wider acceptance at certain times in history than at others, but there is no universal law regarding the propriety of ornament in architecture. Vitruvius devotes a learned chapter in his book to "The Ornaments of the Orders." To Adolf Loos in 1908, "Ornament is crime." We should not have to decide between Classical architecture and the work of Loos on the basis of some presumed immutable principle of "correct" design.

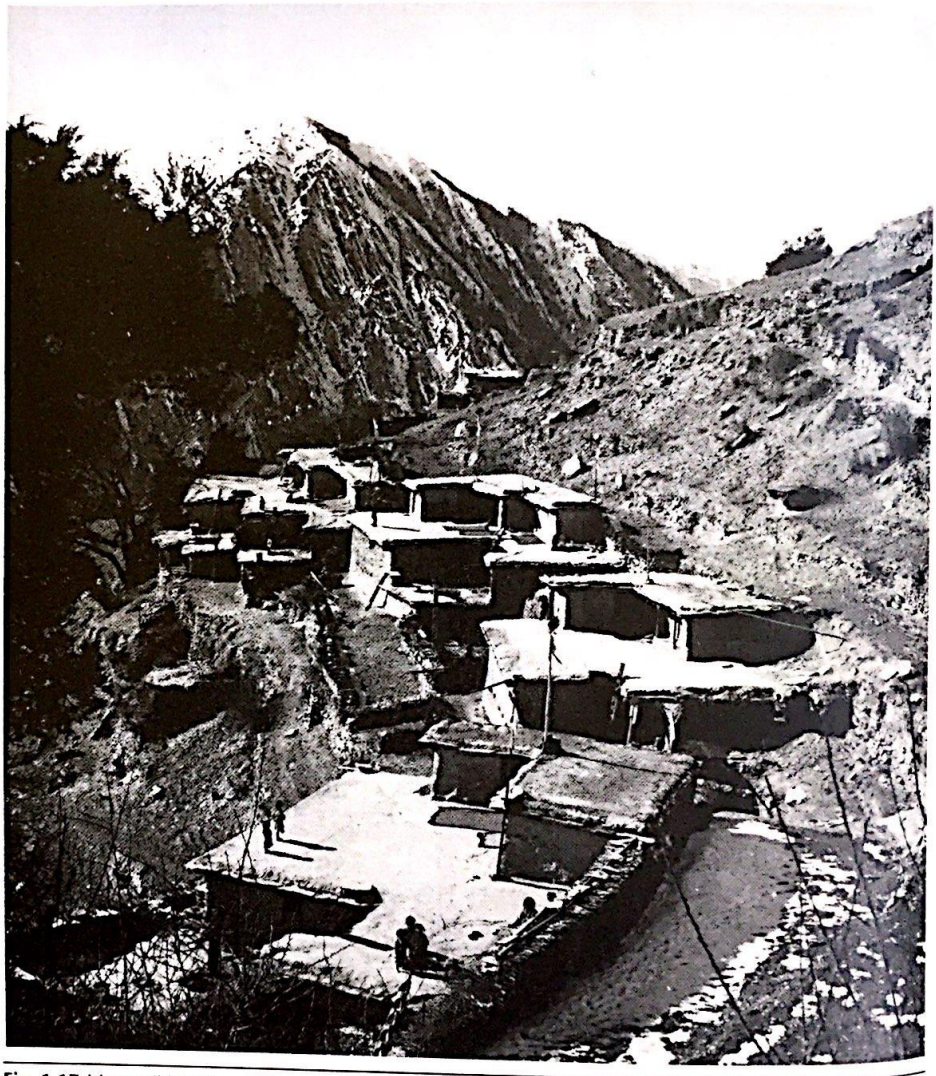
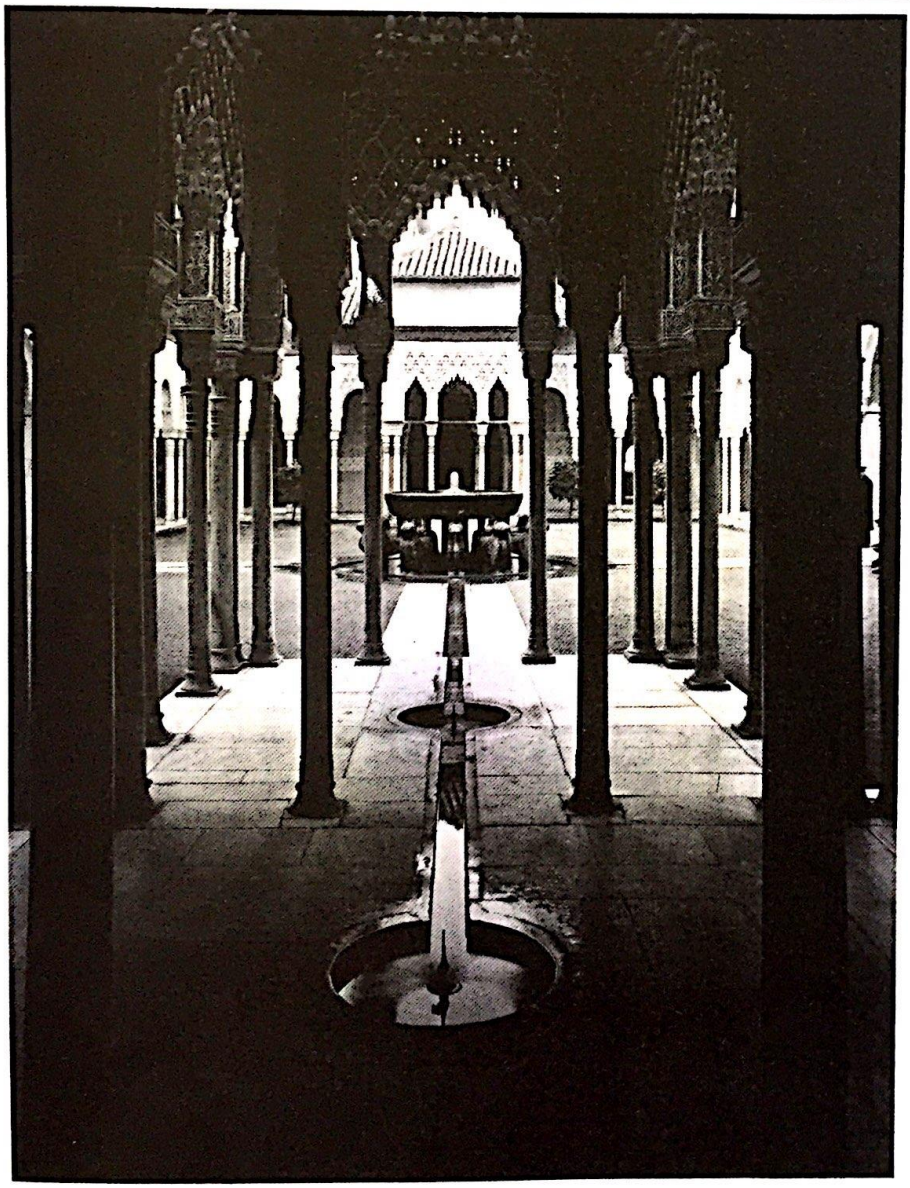


Fig. 1.17 Magar (Nepal), a village.

This is not to say that in writing about the architecture of the past we can forgo the exercise of critical judgment. It means merely that we must first establish the premises that govern a style or the form of a particular building, and then proceed to judge the style or the building in the context of these premises. Whereas the competitive juxtaposition of the Parthenon and Chartres Cathedral would serve no useful purpose, it would be quite legitimate to compare critically the Parthenon with its exact contemporary in Athens, the temple of Hephaistos which overlooks the marketplace. (Figs. 1.11, 7.14)

What we have just said has special pertinence for our attitude toward non-Western traditions of architecture. In our general scheme of things, these traditions have always held a secondary place. This imbalance is natural given the preoccupation of each culture with itself. But it becomes reprehensible if the relative inattention to non-Western achievement is justified

Fig. 1.18 Granada (Spain), palace of the Alhambra, 1354–91, Court of Lions.



in terms of general worthiness—the mentality that says: If it is not well known, it is because it does not deserve to be. In a popular history of architecture one could still read, as late as 1956, the following characterization of non-Western architecture.[1]

> Eastern art presents many features to which Europeans are unaccustomed, and which therefore often strike them as unpleasing or bizzare; but it must be remembered that use is second nature, and in considering the many forms which to us verge on the grotesque, we must make allowance for that essential difference between East and West. . . . These nonhistorical styles can scarcely be as interesting from an architect's point of view as those of Europe, which have progressed by the successive solution of constructive problems, resolutely met and overcome: for in the East decorative schemes seem generally to have outweighed all other considerations, and in this would appear to lie the essential difference between historical and nonhistorical architecture.

Noxious Western chauvinism pervades the tone of this passage. To call the combined effort of China, India, Japan, and the core countries of Islam around the Mediterranean "nonhistorical" is tantamount to removing one-half of civilized architecture from the realm of serious study and relieving us from the burden of understanding it. Among its products, the Eastern world can boast of the Great Wall of China, the *chaitya* at Karli, the imperial mosques of Istanbul—monuments that would surely belie that the East is innocent of good construction. (Figs. 10.25, 10.18, 19.11)

But all this is beside the point. The central purpose of architecture is not victory over matter. Architecture, in the end, is nothing more and nothing less than the gift of making places for some human purpose. Structure in this process is no more essential than texture or decoration or space. The palace of the Alhambra in Granada, as is plain to any student of its fabric, is shoddily built. Nevertheless, by general admission, it ranks among the most alluring of architectural wonders. (Fig. 1.18)

I have tried in this book to do more with

1. The book referred to is Sir Banister Fletcher's *A History of Architecture on the Comparative Method*, first published in London in 1896. The passage we quote is omitted in the revised seventeenth edition, published in 1961.

non-Western architecture than the token chapter or two allotted to it in surveys of this kind. Not only is more space devoted to the subject than is customary, but the content of these alien traditions is brought, at least cursorily, into the discussion of Western traditions. Although the architectural interdependence of East and West is far from being documented exhaustively, or even adequately, cross-cultural chapters throughout the book rely on the artless principle of simultaneity to draw together all significant events of architecture in several cultural areas that coincided at specific points in human history. Our esteem for Chartres Cathedral will be more balanced if we were made aware that this masterpiece of medieval Christianity rose during the same decades in which Indochina saw the specter of the great temple complex at Angkor Wat, the empire of Islam undertook the mosque and mausoleum of Sultan Qala'un in Cairo and the great Seljuk caravanserais of Anatolia, and the Meso-American cultures of the Toltecs and the Maya produced enduring monuments of stone like the ball court and observatory of Chichén Itzá.

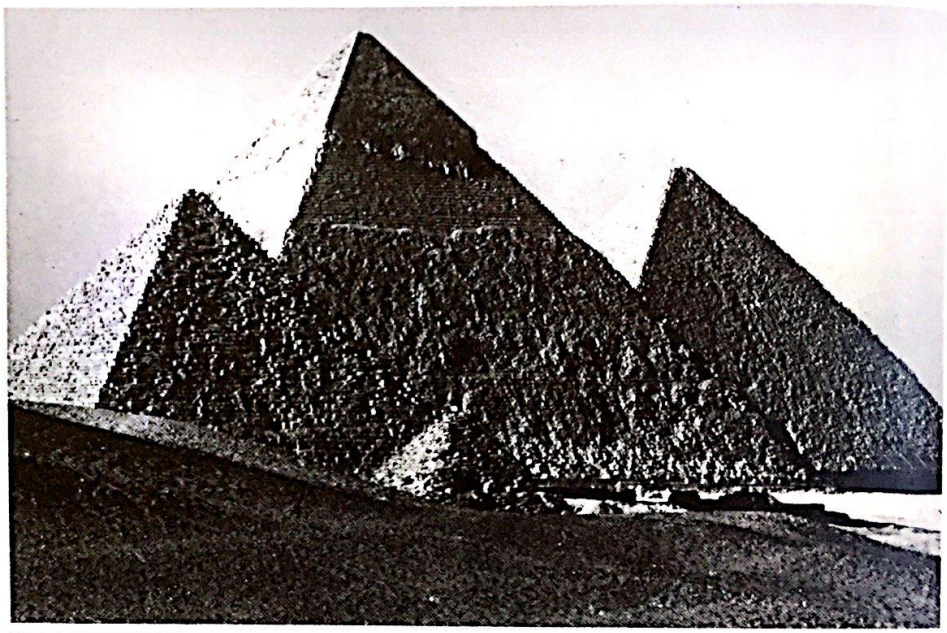


Fig. 1.19 Giza (Egypt), pyramids of Mykerinos, Cheops, and Chefren (nos. 3, 2, and 1, respectively, on Fig. 4.11), ca. 2570–2500 B.C.; view from southwest.

4. *The Meaning of Architecture*

The fourth and final premise of this book concerns the meaning of buildings. Buildings are not only physical presences. To study as fully as we can what they are does not exonerate us from asking why they are there, and why they are the way they are. These questions must be answered, or at least asked, and they must be answered in relation to two extramaterial concepts: *time* and *purpose*.

Time implies sequence. Every building is caught in the web of the fourth dimension. Threads extend from it backward and forward, to other buildings whose existence has touched it or been touched by it. Buildings, to say it differently, are based on buildings. As a building goes up it cannot ignore the millennial landscape of form into which it will soon emerge. Once it is up, it will itself be irrevocable, however long its natural life, as a sound is irrevocable once it has been uttered. The building may delight or disgust us; we may grow to revere it or make fun of it, cross ourselves as we go by it or call it by an unflattering nickname. But we get used to it. It becomes tradition, a fixture in the continuum of form which new buildings are forever replenishing.

This is not to imply a historical determinism of form, whereby each building must be considered the ineluctable offspring of its predecessors. There are many factors that condition sequence, not the least of which is the intention of the patron and the architect. But tradition is there: it is a language, a source, a challenge. It is the great container of architectural experience, and no building can live outside of it. Behind what we call *architectural revivals* lies the desire to emulate the architectural mode of another place and another time, not only to show esteem for the older tradition, but also in order to associate ourselves with the spirit and values that we think were prevalent there and then. The rule of Charlemagne made a conscious return to the architecture of Rome and Ravenna in order to inspire its belief that it was reviving Roman rule; the age of the Renaissance sought to design its own aspirations based on the model of Classical antiquity; and, closer to our time, the nineteenth century went through a whole series of revivals—the Gothic, the Greek, the Egyptian, the Romanesque, the Exotic—each with its own rationale of form and association.

But there is at least one further motivation for sequence: the sheer competitive drive that prompted patrons of architecture, time and again through the ages, to create monuments that would outshine the splendor or outstrip the size of some legendary masterpiece of the past. What is being recalled in these is not the physical form but the fame of the prototype. There is no evident similarity between the temple of Solomon in Jerusalem, as we might reconstruct it from the description of it in the Book of Kings, and Hagia Sophia in Constantinople. And yet it was this biblical splendor that Emperor Justinian had in mind when he stood in the nave of his new church on the day of its inauguration, 27 December A.D. 537, and said, *Nenikika se Solomon*, "I have surpassed thee Solomon." Six centuries later the abbot Suger, obsessed with the reputation of Justinian's

masterpiece which had established itself as the greatest church of Christendom, took this fame as his special challenge in undertaking to rebuild the abbey church of St.-Denis.

Purpose refers to Wotton's commodity, the way in which a building accommodates its prescribed function. Perhaps a better word would be *ritual,* for function tends to undermine and mechanize the concept of purpose. The function of a tomb is to house the dead. But how adequate a purpose is this for the tomb of the Egyptian pharaoh Cheops? Why the stupendous bulk of this pyramid, the megalomaniacal pile of masonry that weighs millions of tons and rises mountainlike to a height of 143 meters (470 feet). Why all this for the tomb of one man? (Fig. 1.19) Why Hagia Sophia, with a dome 33 meters (107 feet) in diameter, swelling to a point some 55 meters (180 feet) above our heads, if all that is really needed is a capacious hall to contain large congregations of Byzantines? (Fig. 11.28)

"All architecture," John Ruskin wrote, "proposes an effect on the human mind, not merely a service to the human frame." Ritual may be said to be the poetry of function: insofar as a building is shaped by ritual it does not simply house function, it comments on it. The pyramid of Cheops ensures the safety and long-lastingness of the pharaoh's corpse and makes tangible to his people the hope that resides in his perpetuity. Hagia Sophia sings the ineffableness of Christian mystery in providing a space of which one user is man and the other user is unseen and unpredictable.

To the extent, then, that architecture is the useful art that lays ready the stage for human activities, the history of architecture is inevitably linked to the pageantry of human endeavors—government, religion, commerce, knowledge and its preservation, justice and its administration. If it is also true that architecture *expresses* human needs as much as it contains the various functions of our daily life, the history of architecture should try, before it is done, to look at buildings as palpable images of the values and aspirations of the societies that produced them.

This final challenge is the most fundamental, but also the most dangerous. It enters the seductive reaches of interpretation where proof is never positive. Reading buildings as the embodiment of the social order that produced them is no easy matter. For one thing, buildings do not always passively reflect society. Sometimes they seek to mould social attitudes, or to spell out what there *ought* to be. Do the pyramids of Giza truly express the absolute power of the pharaoh, or were they built to help create this impression among the Egyptians of the Old Kingdom? For, as Lewis Mumford once observed, it is often the case that "the more shaky the institution, the more solid the monument; repeatedly civilization has exemplified Patrick Geddes' dictum that the perfection of the architectural form does not come till the institution sheltered by it is on the point of passing away."[2]

Architecture is a medium of cultural expression only to the extent that we are able to absorb its messages. And these messages are elicited through the questions that are preoccupying us today. The way we interpret the culture of a period or a nation through its architecture may tell us as much about it as about ourselves.

But this is no grave danger. It is true that for all our quantifiable information about the pyramid of Cheops, for all our knowledge of Egyptian religion and the beliefs of the afterlife, we will never know what that colossus of Tura limestone and granite meant to the pharaoh and his court, to the priests who officiated at his burial rites and his subsequent cult, to the Old Kingdom peasant who tilled the mud banks of the Nile. But we can be sure that they were not indifferent, any more than we are indifferent to the Washington Monument or the Lincoln Memorial.

That much has remained constant in the long history of our built environment: the involvement we feel with the houses we live in, the sanctuaries we pray in, and where we are buried, the quarters of our oppressors and benefactors, the places of our imprisonment and our healing. For this reason if no other, we must conclude the long process of studying the architecture of eras that have gone by with the fundamental and dangerous question: "What did it mean?" In the impossible answer may lie the humanity of past cultures and ours; for it should be "the task of the architectural historian," to quote an architectural historian, "to prove that there is no past in man's concern for the environment of man."[3]

2. Lewis Mumford, *The Culture of Cities* (New York: Harcourt, Brace, 1938), p. 434.

3. Sibyl Moholy-Nagy, *Journal of the Society of Architectural Historians,* vol. XXVI (1967), p. 181.

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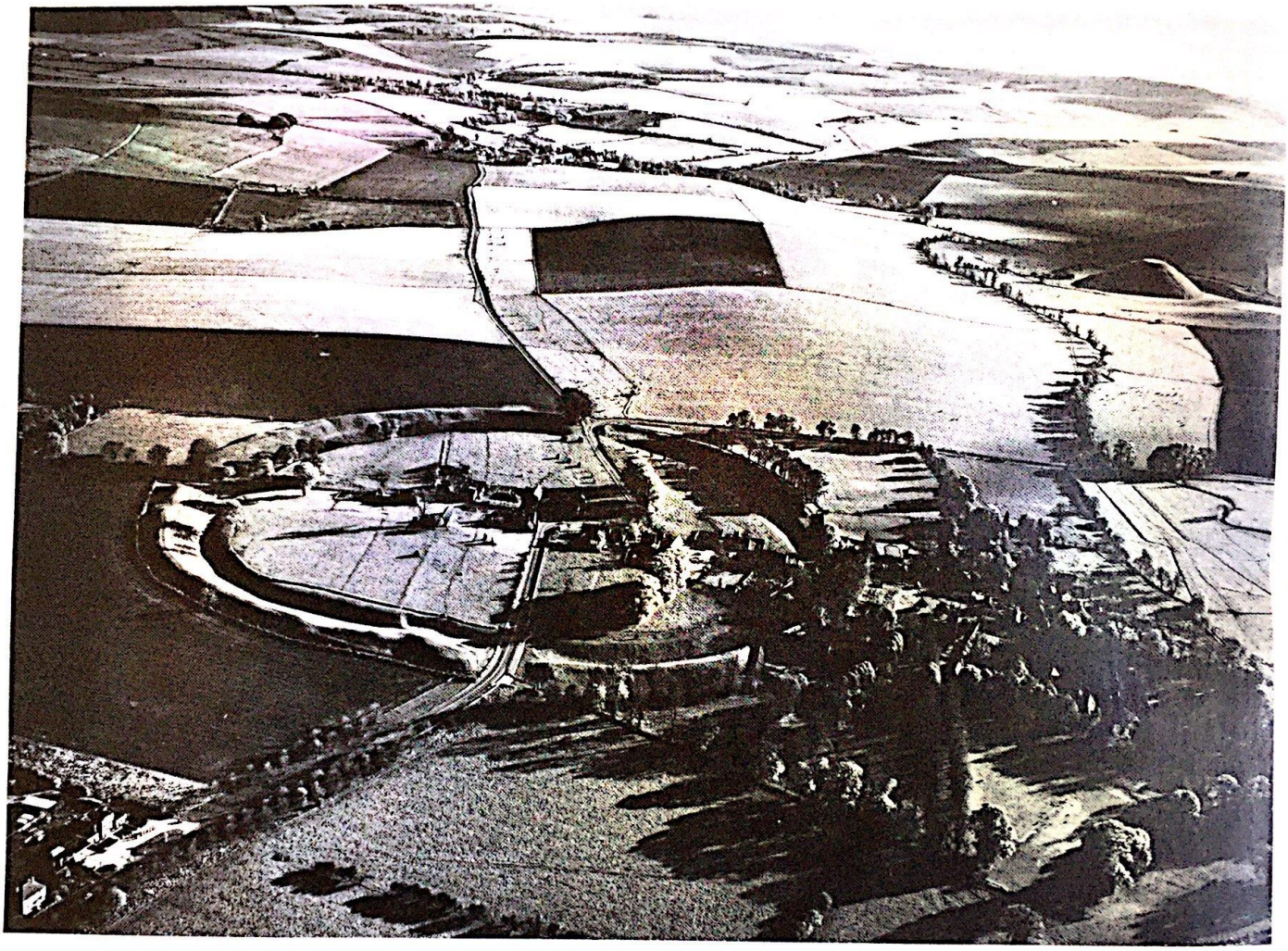


Avebury (England), Neolithic circle, third millennium B.C.

2

THE CAVE AND THE SKY: STONE AGE EUROPE

The Beginning

Where do we start with a history of architecture? When did architecture begin?

Human beings, in their own distinctive form, have been inhabiting the earth for more than one million years. For most of that time they were unaware of architecture, if by that term we want to understand the ambitious creation of an environment separate from the natural order. But if, as we suggested, architecture describes simply the act of making places for ritual use, it was one of the earliest human needs.

Indeed, architecture may be said to have been there from the beginning, in raw form as it were, in the very arrangement of nature. For only if we conceive of the earth as a vast and featureless plain stretching unendingly in all directions would we have the total absence of architecture. Once there are ridges and rivers to divide this expanse, hills to punctuate it, and caves to gouge it, the business of architecture has already begun. That is what all architecture provides, regardless of its complexity. It marks off one area to distinguish it from others. It raises solid masses that blot out as much space as their bulk. And it rears about our heads barriers, to contain sheltered space.

The last of these is the easiest to see. We are accustomed to thinking of architecture as *shelter:* a home to live in ("a roof over our heads," as we say), offices and shops to work in, cool places of worship to step into from the crowded streets of a hot day. The sense of refuge is instinctive. It seems natural to build to attain it.

But architecture is more than protective shells. In seeking to bring about places for ritual action, it must set out to define the boundless, that is, to limit space without necessarily enclosing it in all three dimensions. It does this in two specific ways: through circumscription and accent. In the first, it arrests and patterns the flow of ground. This we might call architecture as boundary; examples are a "plot" of land or a walled town. The second way involves the setting up of free structures that, by their very mass and height, might focus an otherwise undifferentiated stretch of open space—architecture as *monument.*

Boundary and monument both imply a determined marking of nature. Humans impose through them their own order on nature, and in doing so introduce that tug of balance between the way things are and the way we want them to be. Now the first human generations lacked such confidence in their own standing within nature. As they moved about in search of tolerable climate and food, the special environments they gave shape to were tentative and unobtrusive, an architecture of shelter contained in the pleats of the earth.

The shelter, for the most part, was there ready to be used, in the caves that had to be wrested from savage predators such as bears, lions, and the giant hyena. We have proof, however, of huts in the open, like the ones at the encampment of Terra Amata, near Nice in southern France, dating back to about 400,000 years ago. (Figs. 2.1, 2.2) But whether shelter was natural or manufactured, the inhabitants transformed it into architecture through purposeful use. They made of it the stage of their progressively organized life. They turned a spot of earth into a special place.

And here a chief invention, fire, proved to be a great place-maker. It drove the wild beasts from the caves and kept them at bay; it made the home of the moment safe. But beyond this, the burning fire molded an ambience of companionship, a station for the hunter to pause, cook his game, harden his tools, and communicate with his band of fellows. The earliest hearth known to us, at the great cave of Escale in southern France, goes back more than 500,000 years. That may well be our first documented piece of architecture—a bit of nature informed with the daily ritual of *Homo erectus.*

Terra Amata holds the oldest artificial structures of which we have evidence. The site was discovered accidentally in 1966 during construction at the cliff road to Monte Carlo. It was a stone age camp, used for a number of years, it seems, always briefly during the late spring. In a cove by the beach, traces of some twenty huts were found, often disposed on top of one another—on a sandbar, on the beach itself, and on a dune. They were oval in shape and measured about 8 to 15 meters (25 to 50 feet) in length and 4 to 6 meters (13 to 20 feet) in width. Small bands of about fifteen persons built and occupied them for limited hunting forays; the huts then were left to collapse and new huts put up over them, or else nearby, by next year's party.

The huts were made of branches or saplings set close together in the sand as a

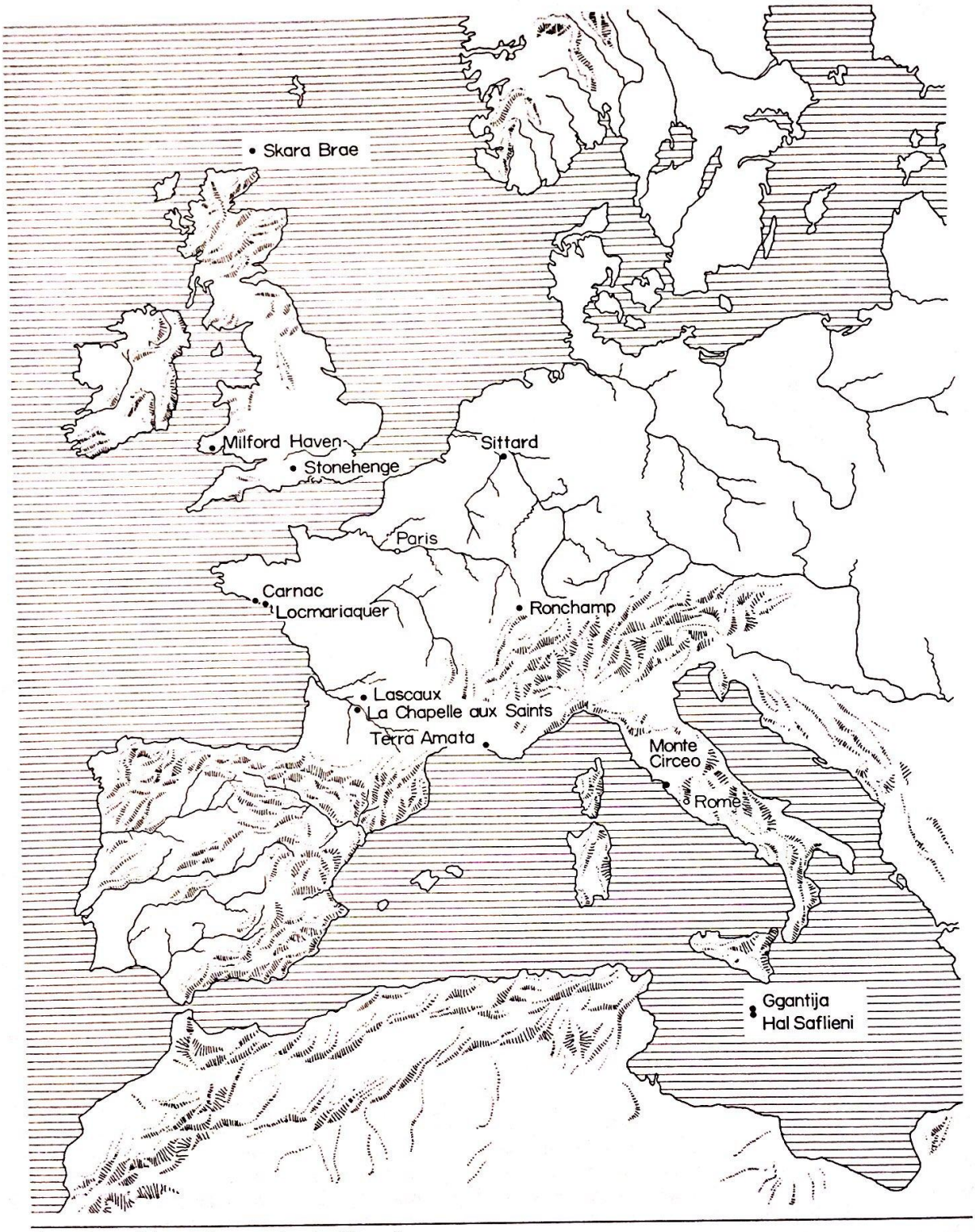


Fig. 2.1 Map: Western Europe, showing Stone Age sites.

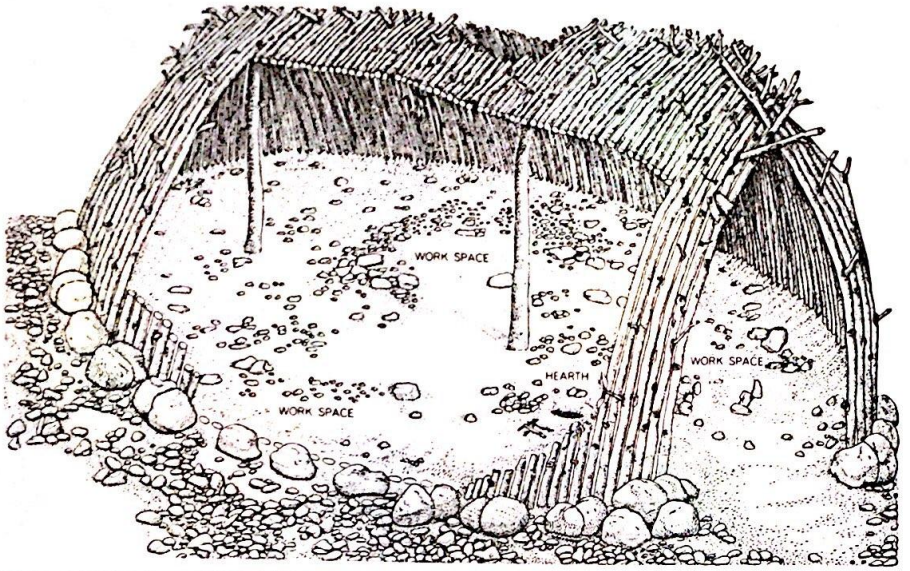


Fig. 2.2 Terra Amata (France), prehistoric hut, ca. 400,000 B.C.; reconstruction drawing.

palisade, then braced on the outside by a ring of large stones. Within, the long axis was lined with larger posts to help hold up the roof—just how we do not know. We do know something about building tools generally. The digging was probably done with fire-hardened wooden spears; the pruning and trimming, with hand axes made of pieces of flint or limestone.

What is significant is the way in which the hunters made use of the enclosed space. The hearth was in the middle, protected from the prevailing northwest wind by a screen of pebbles. The immediate area around it was free of litter, indicating that there the band must have slept. Further out from this social focus of the hut there were work spaces and, in one case, a kind of kitchen, to judge from the large smooth stone that was marked by tiny scratches, most likely resulting from the cutting of meat. In another hut, fossilized human excrement indicates a toilet area.

Old Stone Age Architecture

Both building technology and the ritual use of architecture became increasingly sophisticated as the millennia went by. During the lifespan of the Neanderthals between 40,000 and 100,000 years ago, and of their successors the Cro-Magnon people, stone tools noticeably improved and now included cutting knives, sharp and easy to grasp. The frame of the huts was sealed against the draft by an exterior sheathing of animal skins. At the same time, the hunters' dealings with nature became formalized into what can only be seen as religious observances. What might have been rites to ensure the hunters' quarry left their mark here and there for us to puzzle over. But the hunters were concerned too with their own related destiny. It was not only surviving day after day that mattered. Death was mysterious and frightening and might not constitute the end.

These anxious thoughts, and the cults that grew up to appease them, complicated the concept of architecture. The role of the shelter was pushed beyond mere housing. The cave became a sanctuary. At its mouth the hunter might still live, but the dark inner recesses came to be reserved for ceremonies of life and death and afterlife. The cave at Monte Circeo, a limestone hill south of Rome, contained a unique chamber where a single battered skull was stood in a trench along the farthest wall, with stones arranged around it in an oval ring. At La Chapelle-aux-Saints in the Dordogne region of southwestern France, a burial had taken place. The dead man had been laid out in a shallow grave filled with tools and animal bones. On his chest a bison leg had been deliberately placed, perhaps as provision for the world he had slipped into.

Sometime fairly late during this long search for elemental beliefs, the hunters started using art as a tool of expression. It appears likely that, for the communities that produced the splendid cave murals, engravings, and sculpture, the image did more than stand for what it depicted. Art too was reality. It differed from the physical world in that it was free of erratic movement and the biological dictates of growth and death. The mammoth or woolly rhinoceros, fixed to the wall by the artist in a mixture of ground mineral earths and charcoal compressed into bone tubes, stayed there, the sure target of the disabling spear. These images of magic compulsion, if such they were, reinforced the strange power of the cult and quickened its sense of mystery. As ritual use had transformed caves into religious architecture, so art now made tangible a range of meaning in these hidden sanctuaries of the earth.

The Cave at Lascaux

We can see all this in the celebrated cave at Lascaux. It was discovered on a September day in 1940 by five boys from Montignac out rabbit hunting in the woods nearby—the latest and most remarkable of a group of painted sanctuaries that have come to light in the southwest of Europe since the early nineteenth century. They had been created toward the end of the last glacial period. Europe at that time, about 10,000 to 20,000 years ago, had roughly the same Mediterranean coastline, but the great Scandinavian ice sheet reached out to cover most of Ireland, all of Scotland, and the Baltic. There were smaller glaciers in the Alps and the Pyrenees. Hunters followed in the wake of the herds, across the bitterly cold steppes of central Europe and into the milder climate of present-day France and Spain. They brought with them an extraor-

dinary gift for art and put it at the service of a faith that centered on the animal.

The animal, in the hunter's view of the world, must have appeared strong and independent. (Fig. 2.3) The hunter was the dependent and weak one, moving about after his prey—the reindeer and bison, the deer and the horse—in the hope of luring and killing it. The act itself was paradoxical. The animal must be killed to support the hunter. It was the great adversary, deadly in attack and life-sustaining in death. The hunter must prevail; but his success, he knew, would be bound up with defeat. For the more animals he managed to kill, the fewer of them there were left to kill; and therefore the magic that secured the fall of the quarry must also advance its abundance. And so, in these deep caves of France and Spain, the hunter painted the animal truthfully, in the context of this paradox of life and death, of fertility and extinction. Plentiful game was the boon of fertile nature, whom the hunter represented in sculpture as an ample female figure with giant breasts and hips, and comforting recesses like the cave-shelters of the earth. In her hand this mother goddess sometimes holds a horn, the instrument through which the beast's force is expelled. (Fig. 2.4)

This sort of reasoning, we think, must have motivated the makers and users of caves like Lascaux. The paintings convey, across millennia, a striking sense for the build and habits of the animals represented. The attitude toward them seems reverent. According to one school of thought, the caves are sacred repositories of animal spirit, and the hunter's guarantee of participating in the special power of the animal. The painted image is hope and expiation in one—the hope of drawing the animal to the kill, and expiation for having to kill it. Weapons themselves were often carved into animal forms, and men danced in animal masks. At some time, the very eating of the animal came to be a sacrament.

The artists exploited the natural architecture of each cave and conjured an inseparable whole between this and their own images. There was no attempt to change the given configuration, by dropping the floor level, for example, or expanding narrow passages. On the contrary, the difficulties were scrupulously respected and the artists skillfully set out to complement the peculiar properties of the cave.

At Lascaux, not only were numerous hands busy working on the cave walls, the extensive overlapping of images and the uncertain limits of the cave imply too that the sanctuary was never conceived as a finished thing. We may be dealing with many generations of hunters, each adding its own imprint to the existing design. Both in the making and the presumed benefit of this magical environment, the cave at Lascaux was a community project; and in "community" the present merged with the future and the past.

We enter the cave now, as perhaps one did then, through a hole that was the result of the collapse of a bit of the limestone rock forming the roof of the cave. (Fig. 2.5) About 20 meters (65 feet) in, the path constricts to half its total width, and then opens up dramatically into an oval room, the so-called Hall of the Bulls. A dark ledge here and throughout the cave separates the lower walls from an upper level, which includes the ceiling, and is covered by a thin coat of calcite on which the paint was applied. There was no painting below the ledge.

The far end of the Hall is taken up by a frieze of four immense bulls in thick black outline. Three are in Indian file; the fourth faces them, its huge horns extended across empty space. (Fig. 2.6) The space, in fact, is not altogether empty. Here and all along the remaining walls of the rotunda there is a seemingly random arrangement of smaller animals—horses, deer, and bears. But the confusion is only apparent. It is true that the composition of the walls avoids a single favored focus, and no strict picture frames delineate groupings of images. But there are accents we can detect and visual correspondences even where paintings have been superimposed on others of different date.

The line of the Hall breaks at two points. The first opening, more or less on axis with the entrance, leads into a long gallery that ends in an undecorated tunnel. The floor of this so-called Axial Gallery slopes sharply downward. At one particularly narrow point, a cow of slender build straddles the curved ceiling. (Fig. 2.7) At the farthest end, just before entering the tunnel, a large painted panel shows three horses, one of them

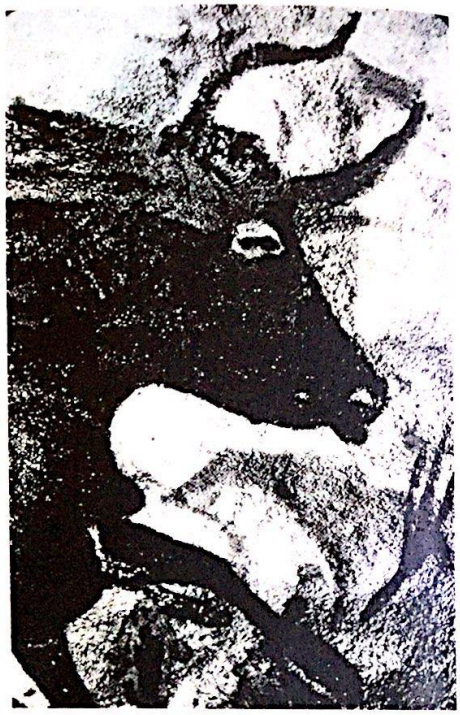
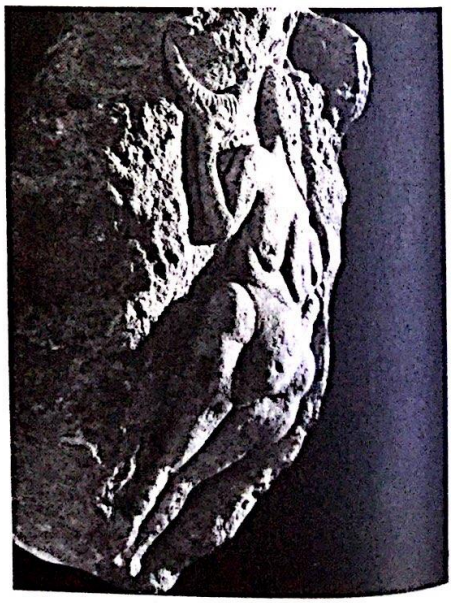


Fig. 2.3 Lascaux (France), prehistoric cave, ca. 10,000 B.C.; interior detail, Axial Gallery.

Fig. 2.4 Laussel (France), prehistoric rock-cut relief, the "Venus of Laussel," ca. 18,000 B.C.; as it would have been seen in its original location. (Musée de l'Homme, Paris)



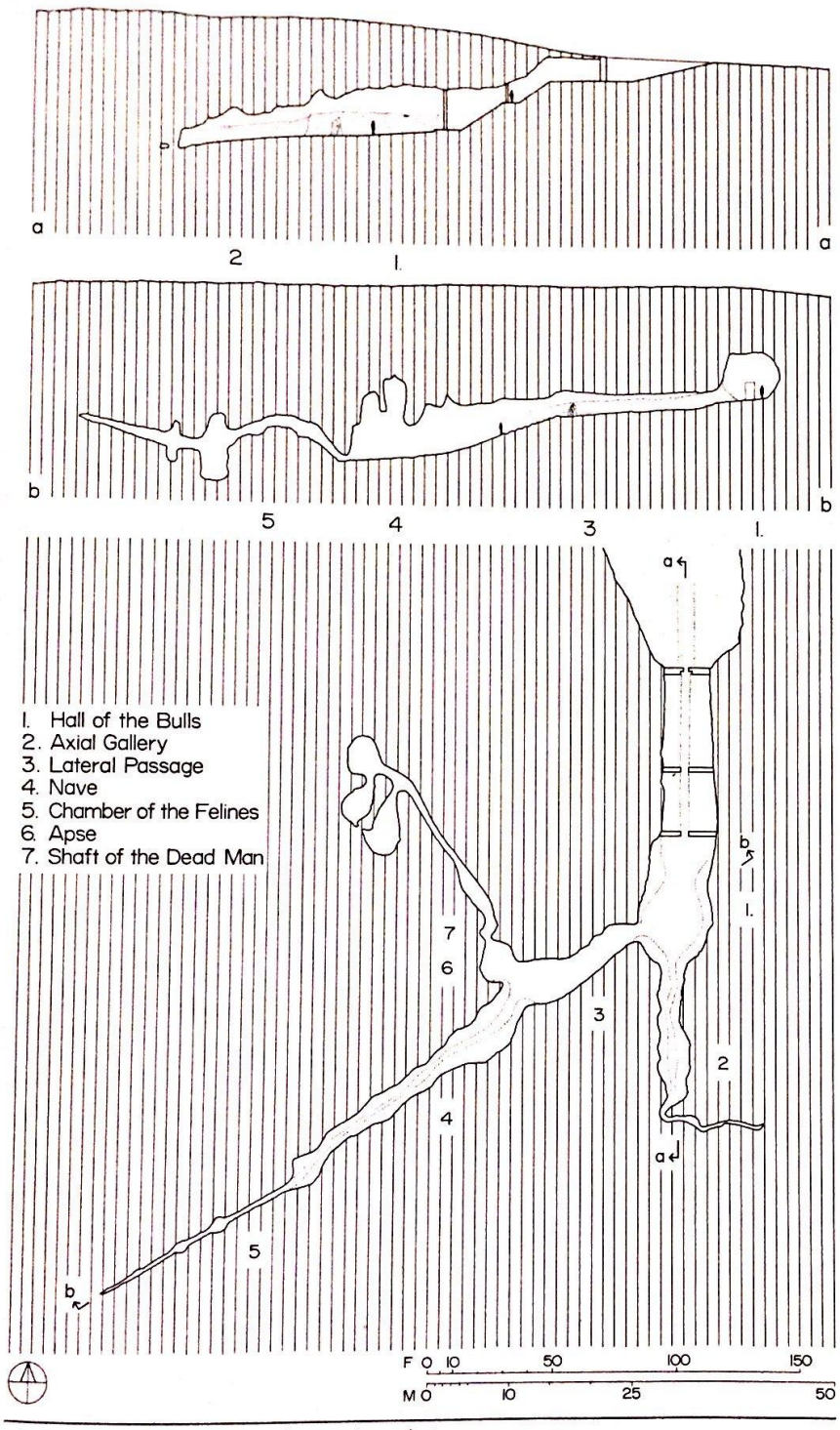


Fig. 2.5 Lascaux cave: top (a–b), sections; bottom, plan.

stumbling over backwards, all four legs in the air. The turn into the tunnel and the exaggerated height of the Gallery at this point heighten the effect of the fall.

The second opening leads to the Lateral Passage. At its farthest end the cave forks. One branch opens out into a vast new gallery, sometimes called the Nave, with a high vaultlike ceiling and a floor that slopes sharply downward toward the back. The animals along the walls have darts depicted on their bodies, but there is no sign of physical pain or collapse. The dramatic skill of the artist and his intimate appreciation of the cave's quirks show to good effect in one corner, toward the Lateral Passage, where a single file of heads of deer in profile is painted just above the ledge. The protrusion of this dark ledge has been worked into the composition. It reads like a body of water through which the beautifully drawn herd is swimming, antlered heads lifted against the current. (Fig. 2.8)

The place of honor belongs to the Shaft of the Dead Man. It lies in the second branch of the Lateral Passage. We come in out of the Passage and into a pouch of the cave called the Apse whose walls are worn through heavy use and marked in every direction. There is a smooth stone at the far end; it forms a lip over a yawning hole, crowned by a small dome. (Fig. 2.9) The bottom of the hole, about 6 meters (20 feet) below the floor of the Apse, must have been reached by means of ropes. The shaft that leads down is too steep to negotiate unaided.

Here, immediately at the base of the shaft, in a small irregular room, there is a painting, the strangest and most affecting of all at Lascaux. (Fig. 2.10) This classic confrontation of man and beast seems to sum up the world view of the prehistoric nomad hunter. The beast is a big wounded bison. The spear is lodged in its strong body; its entrails are coming out. The hunter responsible is himself fatally hurt. He has fallen backwards, gored by the dread horns. He is a small stick figure with a bird's head. Next to him on the ground lie a bird-headed staff and a spear thrower that looks like the ancient Mexican *atlatl*. The hunter, clearly, is the loser in the confrontation. There is nothing pathetic about the beast, which stands proud and triumphant over him even at the point of death.

New Stone Age Architecture

About the time when Old Stone Age hunters were working on the sanctuary at Lascaux, Europe was going through another of the violent changes of climate that had characterized life on the earth since the beginning. It was now a turn of mild weather, a period of warmth that melted the great ice sheets and transformed the European scene of grass- and shrub-covered tundra into stretches of lush forest. The benign climate eased the burden of survival. The hunter slowed down. In many places on the planet, Europe and the Near East among them, he settled and turned to farming and animal husbandry.

It sounds almost too simple in the telling, but what happened was a profound readjustment of humans to nature, and the causes were complicated. To begin with, there were demographic pressures. A swelling population demanded more food than could be secured through hunting and gathering. This meant food production on a systematic basis. To be successful, food production depended on a number of conditions: a settled life, appropriate plant and animal resources, and a technology suitable to the task at hand. Where these conditions prevailed, the new pattern of existence took root. Historians refer to it as the New Stone, or Neolithic, Age.

A fixed place under the sky—that is the Neolithic legacy. The hunter had thought of himself as insignificant in the face of the universal and mystery-filled presence of nature. He was caught up in the flux and flow of life, moving with the herds, courting them, slaying the beasts reverently, and devising magic rituals to ensure their continued abundance. Comfort lay in the depths of the earth. Here, in obscure and womblike caves, the only ray of security in his unpredictable and perilous life was elaborately enshrined. Not security for individuals, or even for single generations, but a kind of timeless unfocused faith in animal spirit, the life-enhancing source.

But the Neolithic revolution shattered this world view, and forged fresh confidence in our ability to tame nature for our own benefit. Humans learned to master the land and the horned beast. The land was marked and tilled, the beast domesticated. There was a new consciousness of the cycles of nature, which is to say of time. The farmer sowed and reaped and sowed again; the rains came and the cold and then it was warm again and bright and things pushed out of the damp earth and grew, and then once more there came the rains and the cold. Eyes turned upward to the source of moisture and heat. The stars and the moon had patterns that could be recognized and foreseen. Life was stable. In the community each man and woman knew what was expected of him or her, as the community itself had a sense of its specific place in the bigger scheme of things.

Fig. 2.6 Lascaux cave, Hall of Bulls.

Architecture, as we would expect, responded to this basic change in social behavior. The concept of shelter, whether as habitation or sanctuary, persisted of course. But what was revolutionary in general attitude was the readiness to rearrange nature. Farmland began to be divided into individual fields; settlements were similarly circumscribed, if not by walls at least by a simple cattle stockade; sacred ground was distinguished from that of daily life. In addition to this greening interest in architecture as boundary, monuments too made their appearance. Stones were raised upright to mark the open land. (Fig. 2.11) Planted deep in the earth like artificial trees, these tall shafts became signposts of permanence, of civilized life. Architecturally, the cave had been shelter, enclosure, cosmic womb. Now the stone pillars looked up, beyond the elemental comfort of the earth, toward the sky and its knowing patterns of the moon and stars.

The giant stones or *megaliths*, so hard to move and stand up and so striking on the edge of the countryside beyond the farms, must have been proud symbols of community. They spoke of an advanced technology and of group effort. Moreover, they served to focus divinity. Like lightning rods, these markers raised toward the sky brought down on them the sway of deities. We are reminded of Jacob setting up his stone as a permanent Beth El, or house of God.

> And Jacob rose up early in the morning, and took the stone that he had put for his pillows, and set it up for a pillar, and poured oil upon the top of

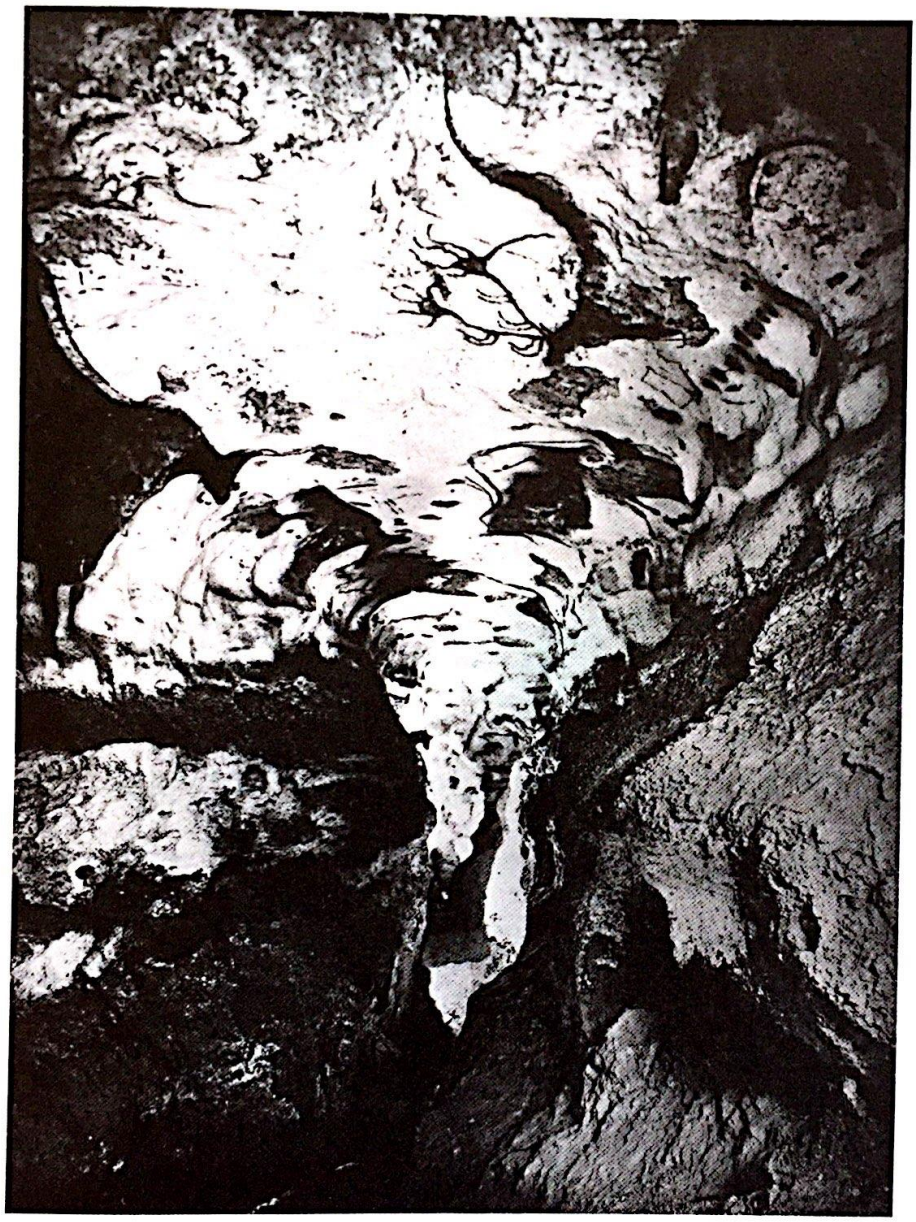


Fig. 2.7 Lascaux cave, Axial Gallery.

it . . . And Jacob vowed a vow, saying "If God will be with me, and will keep me in this way that I go, and will give me bread to eat, and raiment to put on . . . then shall the Lord be my God: and this stone, which I have set for a pillar, shall be God's house. (Genesis 28: 18–22)

Singly or in various combinations, thousands of stone structures were erected throughout Western Europe in the last five millennia before Christ. The megaliths were strewn about in great numbers on the postglacial landscape, along with other debris released by the thawing ice sheets. They could be used on the spot. But the monument builders were not limited to these loose bones of nature. Stone was also laboriously quarried from live rock and sometimes hauled from great distances, by land and by water. The heroic feat was its own reward. It was the utmost the community could do to provide for the sacred.

The Houses

The story of each Neolithic community no doubt began with the search for land suitable for farming and the sustenance of domesticated herds. Often a cultivable patch had to be cleared in the thick of the forest by felling or burning trees. The community would proceed immediately to give itself living quarters and parcel out the farmland.

The settlers normally lived in small individual houses of timber and mud. The timber posts stood in holes dug in the ground and were braced at the top by the roof beams. Boughs were woven through the posts to complete the walls of the house, and the gaps were filled in with mud. The roof was pitched to shed rain and snow, and was covered with thatch or turf. Neolithic villagers along Swiss lakes built their houses on piles, to protect them from sudden floods.

But multiple units of housing were not unknown. Especially in the north, strongly built wooden houses as much as 80 meters (260 feet) long accommodated a number of families, or one extended family, under the same roof. (Fig. 2.12) The hearth was in the middle of the long central space, with a corresponding lantern or louvre cut in the roof overhead to admit light and vent smoke. The aisles on either side of this space were divided into bays and sheltered the animals.

Fig. 2.8 Lascaux cave, Swimming Deer; a detail of the wall paintings in the Nave.

Fig. 2.9 Lascaux cave, Shaft of Dead Man (7 on Fig. 2.5); section.

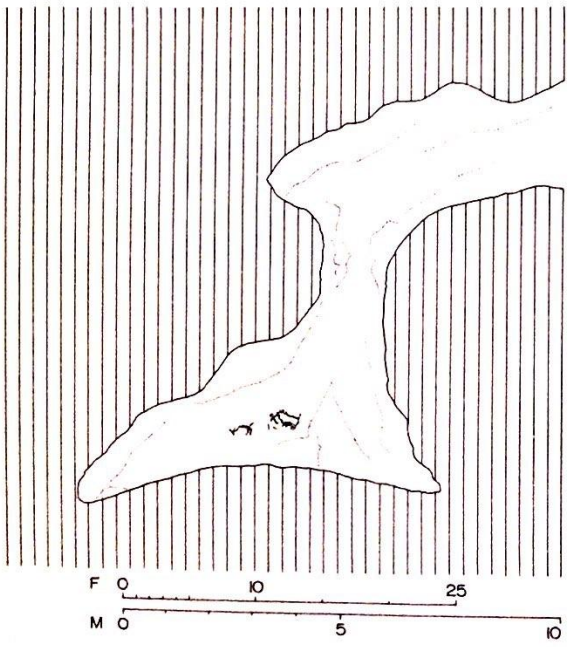


Fig. 2.10 Lascaux cave, Shaft of Dead Man; detail.

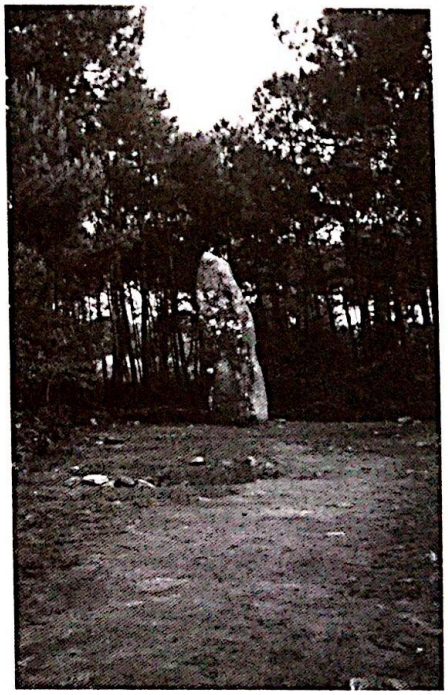
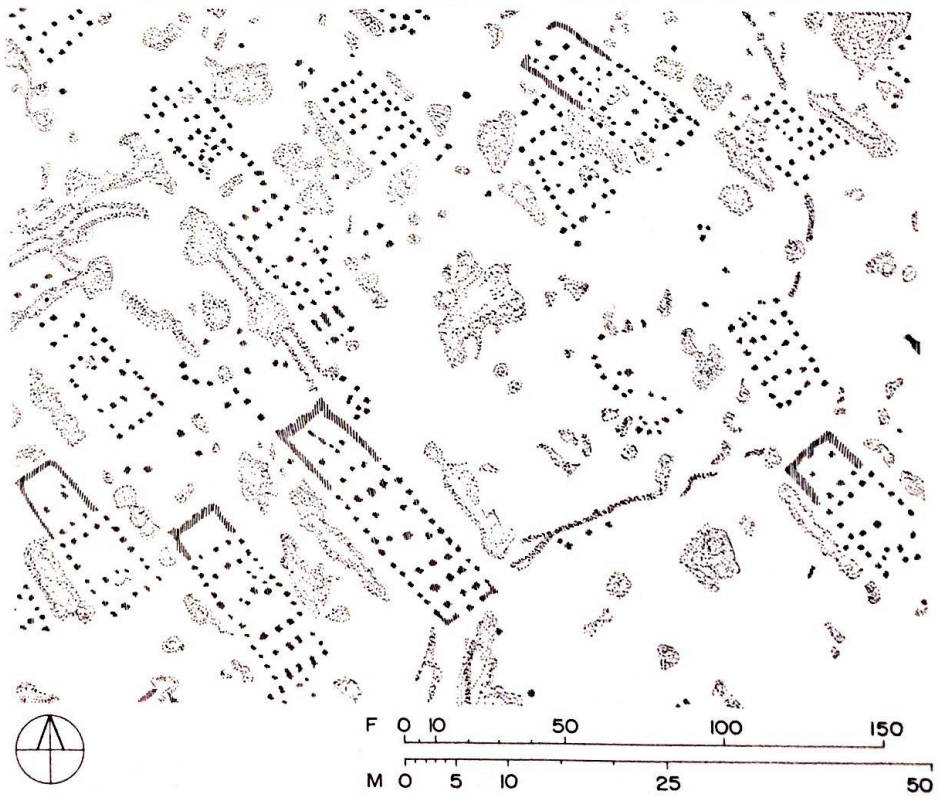


Fig. 2.11 Carnac (France), menhir.

Fig. 2.12 Sittard (Netherlands), prehistoric settlement, fifth millennium B.C.; detail of excavation plan showing the post holes and trenches of timber-built long houses.



One instance of multiple housing is unique. In the prehistoric village of Skara Brae, on a small island off the northern coast of Scotland, ten small stone houses linked up by stone alleys form a compact organism. (Fig. 2.13) Each house has a single room with rounded corners. The stone is native, and the builders availed themselves of it for everything, including furniture. The roofs were probably made of animal skins laid on whalebone rafters.

The Monuments

If society in these early villages of farmers and herders had developed a class structure, it left no trace in the pattern of their dwellings. Larger houses were not built for favored people, nothing to call a mansion or a palace. But life may not have been entirely egalitarian. Social distinction seems implied in the fact that monumental tombs honored the remains of some mortals only and not others.

The common dead were disposed of by burning the bodies or simply leaving them on the ground to rot. The burial proper might have taken place in shallow graves, in natural caves, or in long unchambered mounds called barrows. In Malta, the extraordinary rock-cut labyrinth of Hal Saflieni at the top of a hill has tomb chambers arranged on three separate levels for about 7,000 dead. But a privileged few merited lying in state in impressive stone tombs carved with enigmatic designs. With them were buried artifacts—daggers and axes, vessels of various sizes and shapes, both pottery and stone, and personal ornaments in precious materials like gold.

But upended stones, or menhirs, were the simplest form of megalithic monument. The tallest among them, the so-called Grand Menhir Brisé at Locmariaquer in Brittany, once stood up to a height of 21 meters (67 feet) and weighed an estimated 330 tons. Near the town of Carnac, at the northwestern tip of France, more than 3,000 megaliths of local granite line up for several miles in ten to thirteen rows that run east by northeast toward a circle; before reaching the circle they change their angle of direction. (Fig. 2.14) Alignments such as this and circles are two standard compositions for the great megaliths of Europe.

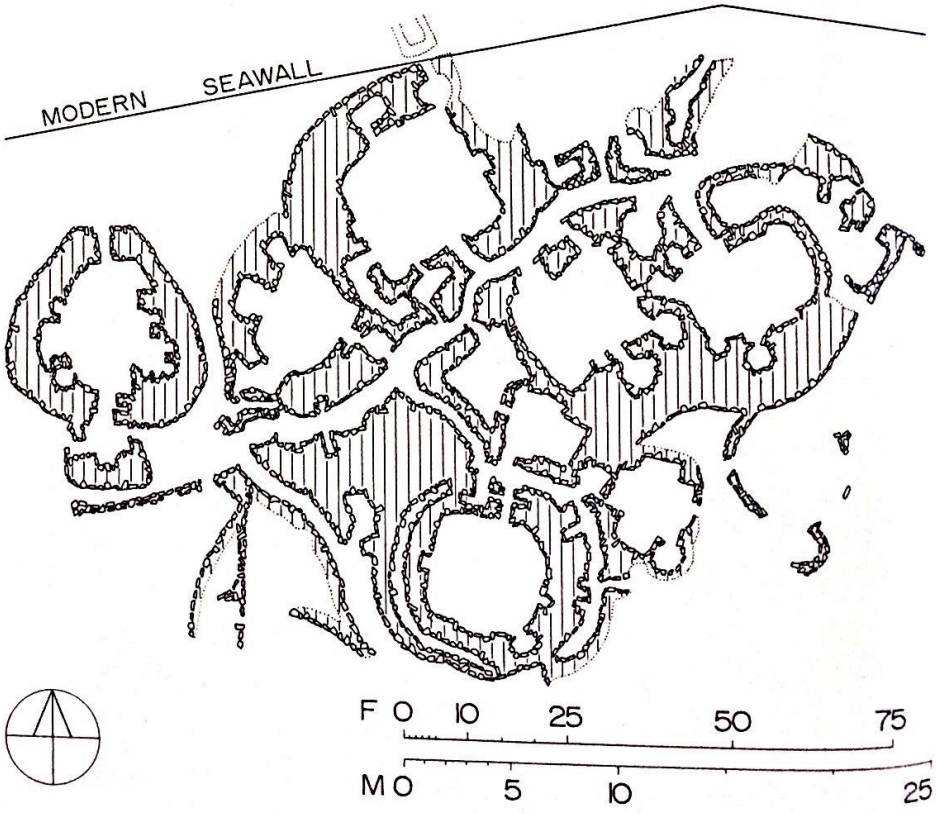
Menhirs, alignments, and circles, unlike tombs, were not intended to enclose space. Menhirs were objects in mid-space; their height and mass made them visible from a distance and encouraged movement toward them. In this sense they can be characterized as *directional* foci and, as such, they represent our first instance of a principle of organizing space which we will encounter in future chapters under many guises.

At the same time, menhirs are also *rotational* foci. Their form, favoring no one aspect over others, invites us to move around them. This too is a principle of spatial organization. Its object is to give people a reference point as they move about an open space. The central monuments of our city squares—fountains, statues, single commemorative columns—exemplify the same principle.

The stone avenues at Carnac with their circle are the built expression of these two architectural possibilities, the directional and the rotational, inherent in the setting up of a menhir. Alignments and circles, then, outline what is implied. They are examples of architecture as boundary in that they define spatial organization without fully enclosing the spatial forms in question.

But there is more to them than boundary. The large strung stones aggrandize the act of circumscribing. They make of the boundary a monument. In other words, they confound, or rather combine, two of the three classes of architecture with which this chapter began. We can call the alignments of Carnac "monumentalized boundaries," or perhaps even "linear monuments." They afford an intermediate

Fig. 2.13 Skara Brae (Scotland), settlement, third millennium B.C.; plan



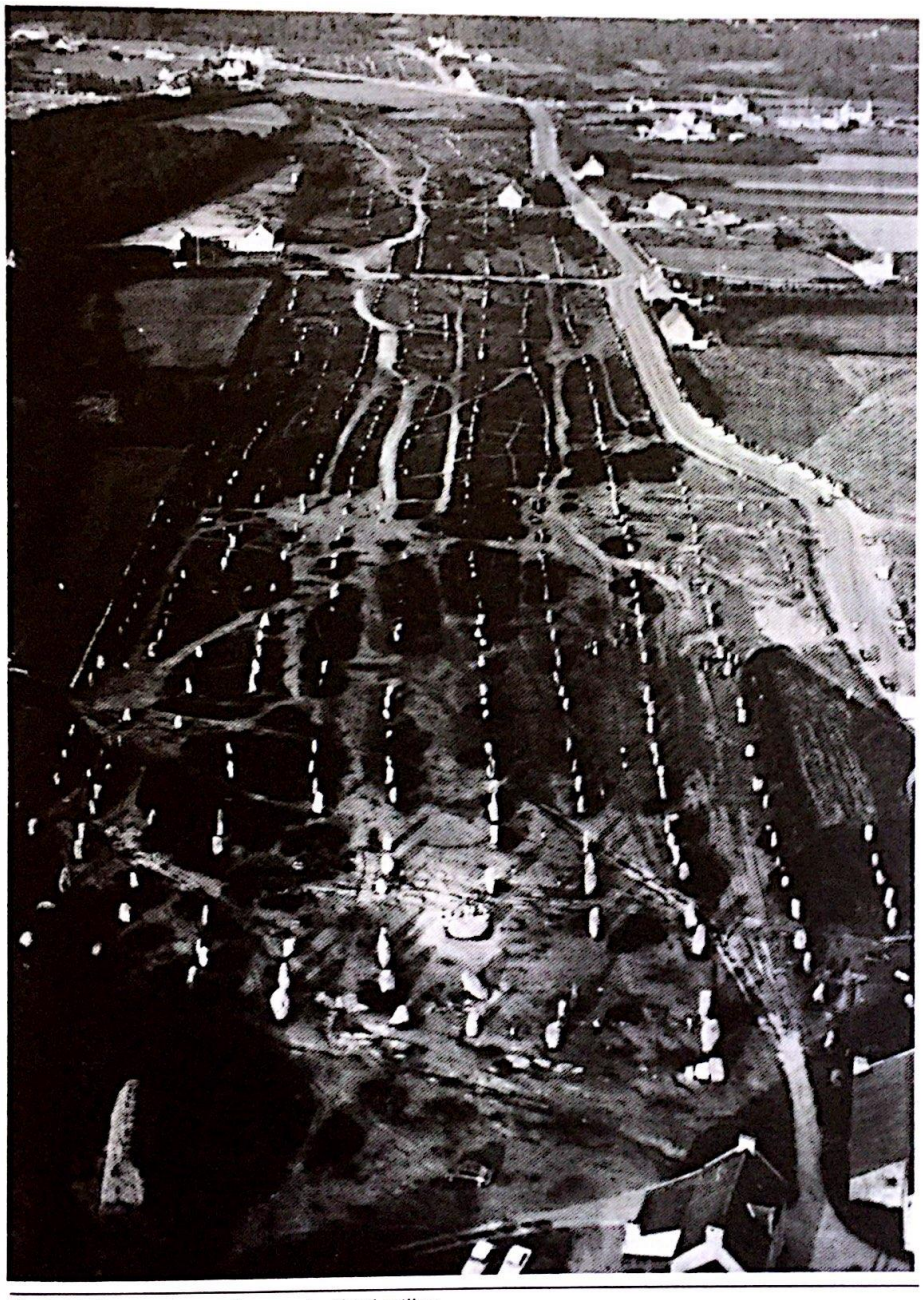


Fig. 2.14 Carnac, stone alignments, third millennium B.C.; aerial view.

architectural experience between openness and enclosure, between boundless space and a wall. It is an important experience in much of the built environment we will be studying. We might want to think of the stone avenues of Carnac as the conceptual ancestor of the Classical colonnade. (Fig. 12.22b)

The Tombs

In contrast to the menhirs and their groupings, Neolithic stone tombs were designed as closed spaces. The basic form, but not the commonest, is a simple boxlike chamber made up of several upright slabs for walling, with a more or less flat stone on top. (Fig. 2.15) The term *dolmen* should probably be restricted to this type. The other two generally recognized types are more elaborate. The so-called Gallery Grave is a stone corridor closed off by a number of capstones laid in a row. (Fig. 2.16) The bodies were buried along the walls which sometimes converged toward one end in the form of a V. The Passage Grave is similar, but the corridor here culminates usually in a rounded burial chamber. Its walls are made of boulders piled up in irregular courses, a technique called cyclopean masonry. As the structure rises beyond a certain height, successive courses are made to project inward, narrowing the circumference of the chamber until the space is totally sealed off. This is called corbelling. (Fig. 2.17)

Everything else in the construction of the tombs depends on the balancing of large slabs—vertical slabs set on end for the walls and horizontal ones that bridge them across space. The differences between this megalithic technique and cyclopean masonry are evident. The latter relies on the cohesion of many boulders of varying size; it builds by accumulation, and through the careful fitting of the boulders the mason can bring about a fairly tight fabric. Megalithic masonry works with far fewer and larger units. The principle is not unlike building a house of cards, but each "card" weighs tons and the lifting and balancing of it demand massive effort and precise know-how. Moreover, since the fitting of such huge slabs is itself formidable without laborious shaping and dressing, the structure has an uneven mesh, with chinks among the upright slabs and capstones tilting at rakish angles. The

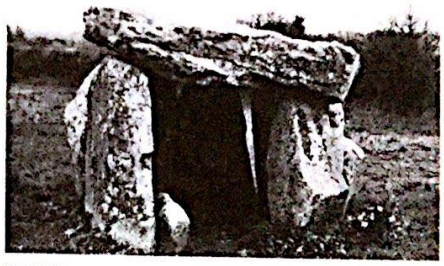


Fig. 2.15 Locmariaquer (France), dolmen, third millennium B.C.

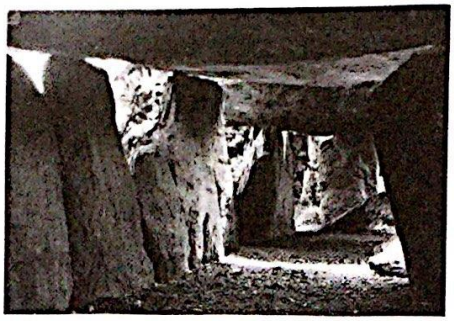


Fig. 2.16 Essé (France), gallery grave, third millennium B.C.; interior view.

Fig. 2.17 New Grange (Ireland), passage grave, third millennium B.C.; interior, view into corbelled vault.

capstones are allowed a generous overhang beyond the edges of the walling.

But in most cases, if not always, the completed tombs would have been submerged under artificial mounds. They mattered, in the main, as interior spaces, houses of stone for the special dead in the ancient embrace of the earth. Exposed, today, they seem to have risen with awkward courage out of the soil and steadied themselves ponderously. In their stark abstraction, they remind us of the primary urge in all architecture, the struggle to stand up against the pull of gravity. Architecture as shelter must encapsulate space in two senses, laterally and in height. The medium of one is the wall, and the wall is the prerequisite for the medium of vertical confinement, the ceiling. The ceiling must be held aloft in defiance of the force of gravity. The heavier the ceiling is, the sturdier the walls must be. Stability in architecture resides in the studied equilibrium of load and support. And the accidental drama of megalithic tombs as they stand denuded in the landscape illustrates stability on the verge of being upset. We have a foretaste here of a standard privilege in architecture, the exaltation of necessary relationships. That is why Le Corbusier's chapel at Ronchamp is a worthy modern successor to a dolmen. (Fig. 28.16) Both gestures of stone celebrate the act, if not the *joy,* of lifting.

Le Corbusier must have known at first hand the megalithic tombs of France. They were real to him as he saw them, deprived of their blanket of earth and battered by time. The inspiration was direct. But if the tombs help us to see with knowing eyes the bold chapel at Ronchamp, this strong statement of form by an established modern master, unconventional and even jarring for its time, in turn awakens us to the strength of "primitive" architecture such as that made by our prehistoric ancestors. In a parallel way, the formal experiments in the early work of Picasso and Braque seized on the aesthetic provocation of primitive art and through this common language of form taught us to see and value alien things like the masks of Africa and Archaic Greek sculpture.

The Temples of Malta

To conclude our discussion of Stone Age Europe, let us look at two roughly contemporary buildings, one on the small island of Gozo near Malta and the other in the Wiltshire downs of southern England. They are both sanctuaries. Each one took a long time to build because the builders, not content with their initial vision, re-formed and amplified it repeatedly. Taken together, the two sanctuaries illustrate the range of religious expression in Europe by the late third millennium B.C. They typify the complementary impulses of Neolithic communities: reverence for the cave and its ancestral memories on the one hand, and the newfound order of the sky on the other. The double temple at Ggantija speaks eloquently of "chthonic" matters—the earth and its mysteries, the dead and the appeasement they require. Stonehenge, in the flatland north of Salisbury, charts the heavens.

The complex at Ggantija, or "Tower of the Giants," is not unique. (Figs. 2.18, 2.19) It is one of a number of prehistoric temple structures peculiar to the Maltese islands. They were built of local stone, using a mixture of megalithic and cyclopean techniques, between the early part of the third millennium B.C. and the early second. Their massive walls consist of a double shell filled with earth and rubble. The exterior shell uses coralline, a hard limestone that can withstand weathering. In the hills, coralline fissures both horizontally and vertically, supplying natural building blocks—slabs as well as boulders. The larger pieces among them were brought to the site on rollers, probably spherical balls of limestone. No attempt was made to dress the rough-hewn blocks before they were set up. It is clear that the exterior was considered incidental to the central concern of the temple; it was merely a stout curtain that wrapped itself around the sanctuary without suggesting much of its inner organization.

The experience of the temple was con-

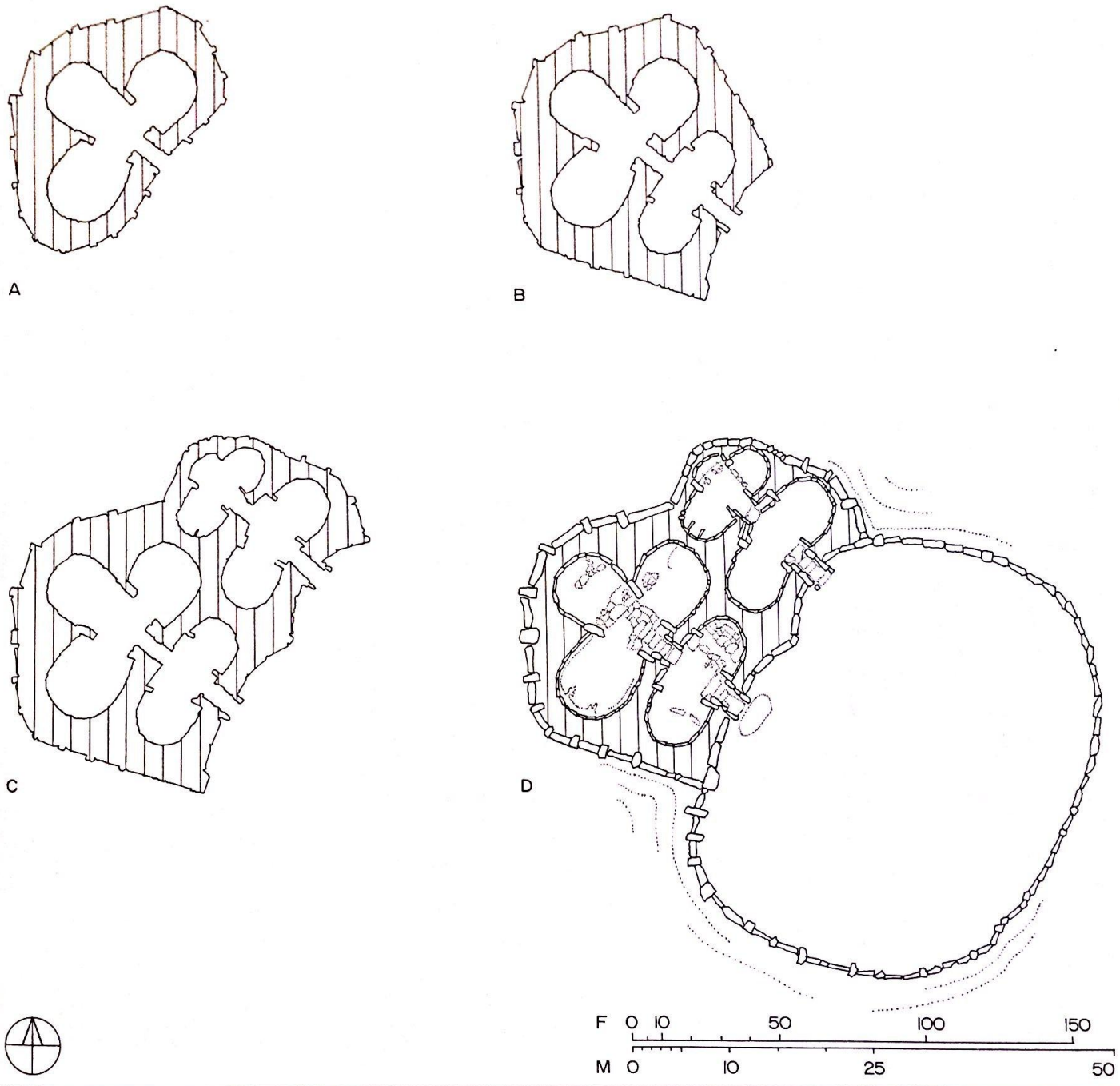


Fig. 2.18 Ggantija (Malta), temple complex, third millennium B.C.; conjectural stages of development: (**A**) beginning phase, large southern temple; (**B**) phase two of large temple, with added pair of curved chambers toward the east; (**C**) the smaller temple added to the original core; (**D**) final plan with circular forecourt.

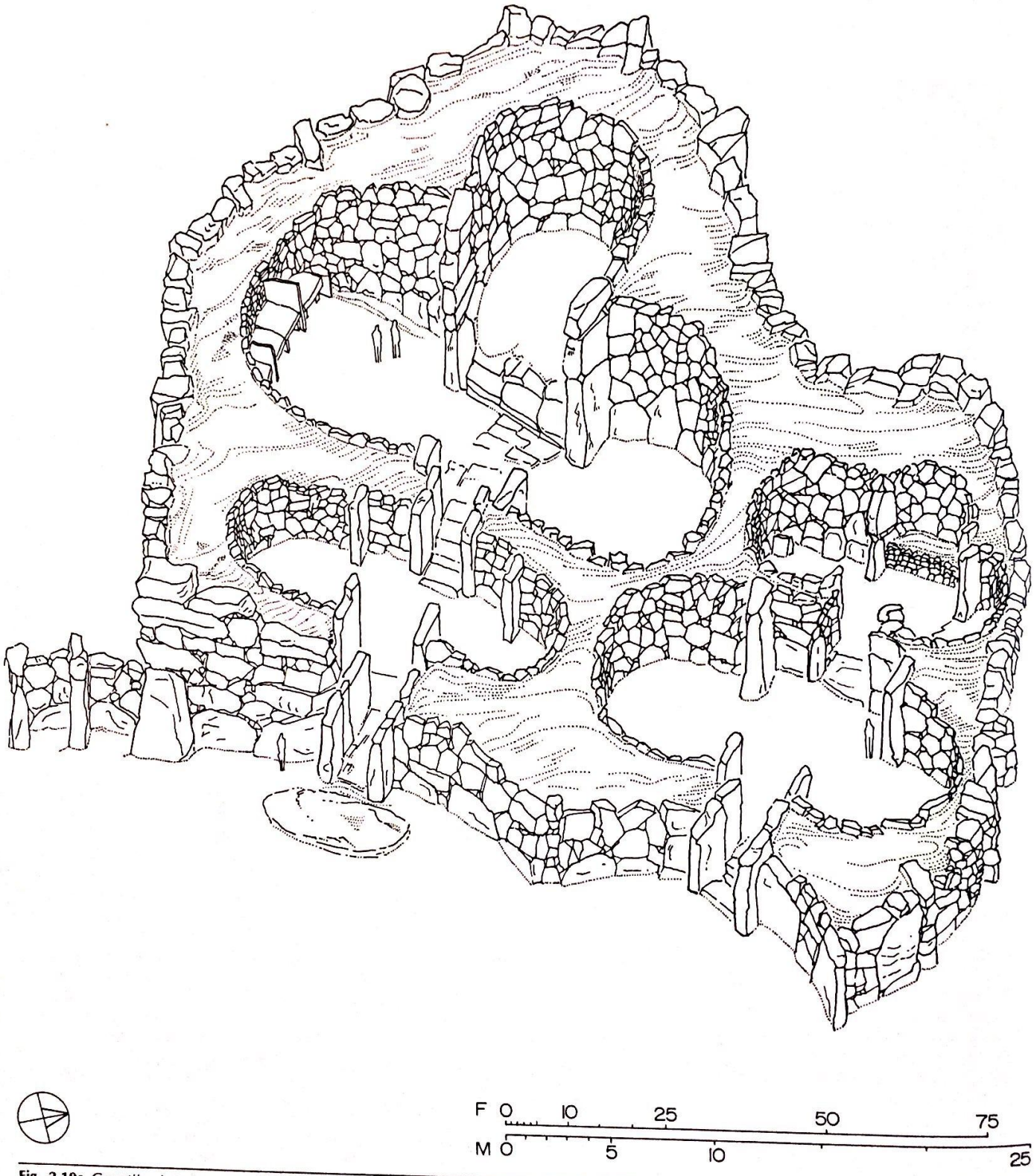


Fig. 2.19a Ggantija, interior, oblique view; reconstruction drawing.

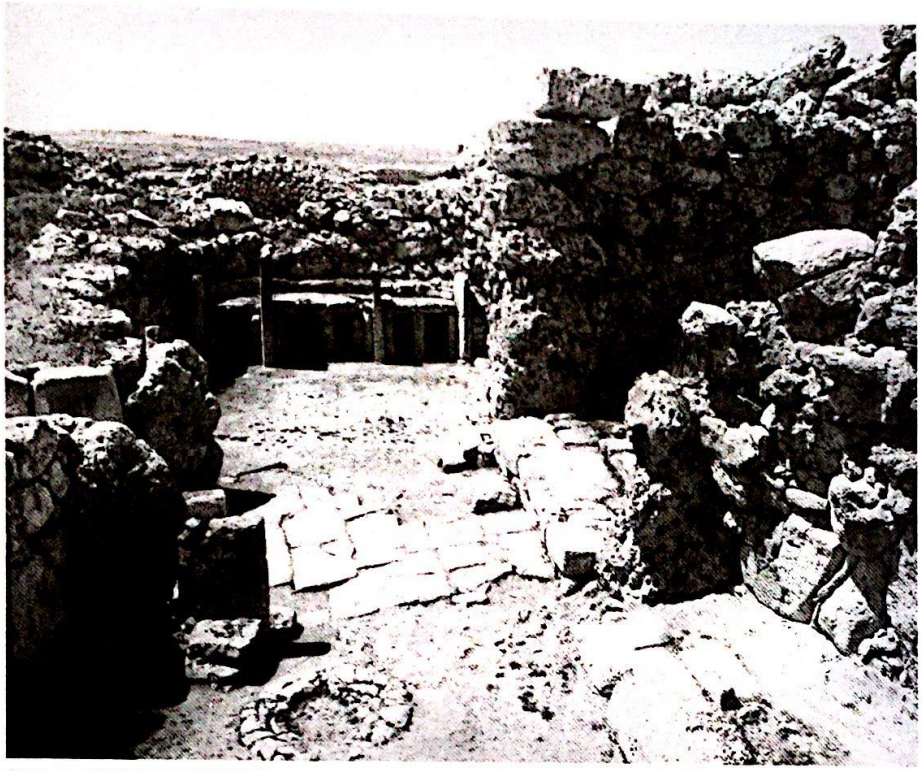


Fig. 2.19b Ggantija, larger temple, southern apse of west trefoil; interior view. (Cf. Fig. 2.18, D.)

centrated on an enclosed space furnished and decorated in accordance with the needs of an intricate cult. Here the coralline shell was carefully dressed with stone mallets and picks of horn or antler tines. The surface was then finished laboriously by means of small flint blades. Globigerina, a soft warm limestone deep yellow in color, was used for the permanent fittings.

In some ways the Ggantija complex reenacts Paleolithic cave sanctuaries. From an architectural standpoint, however, there is one notable difference. Lascaux was a natural form, humanized by the art and ritual of its bands of hunters. The sequence of chambers was predetermined and could only be interpreted through the gift of the artist. This was true of each one of the painted caves. They were accepted as they were found, and then defined ritually. There are, therefore, in one sense, as many different types of Old Stone Age sanctuaries as there are painted caves.

Ggantija is a wholly manmade form, which is to say it is thought out and reproduceable. As such, it is the first true *building type* we are encountering. A building type is an architectural form that is invented for a specific purpose and achieves a general validity, both visual and ritual, through its repeated use. The ziggurat is a building type, and so are the pyramids of Egypt, the Classical temple, the baptistery, the Renaissance palace, the skyscraper, and the railroad station. The list is really relatively small. Although creativity for some people implies the freedom to invent forms, history recognizes a stricter economy of basic forms and, within these limits, a much subtler definition of creative design.

For, of course, there is nothing mechanical or stifling about building types. Their "invention" is neither precipitous nor final. The full form comes about through long experimentation and continues beyond that to be refined, modified, or even purposely perverted. But it remains the basic outline against which the architect works; and being a constant, deviations from it can be judged readily and can become especially meaningful. By reinterpreting the form of the building type one can make a statement about the cultural content with which it is identified.

The cultural content of the Maltese temple as a building type includes the cave of the Old Stone Age hunter. The inwardness of Ggantija, with its staged sequence of constrictions and spatial releases, recalls the passage through Lascaux. The inner shape itself, a double set of curved receptacles, stands as the architectural metaphor for the obese mother goddess of the caves. This lady of fertility continues to be represented in sculpture, as a standard cult image of the Maltese temple. And the horned beast is there, too, again both literally and metaphorically. Animal sacrifice was a main observance of the local cult: remains within the temples and the choice of animals as a subject of temple art testify to that. But, abstractly, the crescentlike facades in front of the double temple at Ggantija suggest great horn gates, a hint strengthened by physical evidence from the larger temple to the south, where below the threshhold slab the horns of a sacrificial bovid were found along with potsherds and an offering bowl.

The other major ingredient in the cultural content of Ggantija is the Neolithic tomb, and specifically the native rock-cut graves for collective burial, like the catacomb of Hal Saflieni. At that catacomb the simplest unit was a kidney-shaped chamber, sometimes subdivided by rock partitions, sometimes joined with others via corridors. These hollowed out pouches undoubtedly inspired the paired curves of Ggantija and its relatives, and did so for a good reason. At some early point it seems likely that the two functions, the burial of ancestors and the propitiation of their spirits, were housed in the same architectural envelope. Elsewhere in prehistoric Europe the separation did not come about; the rites

of the dead were celebrated in front of the tomb since the rest was submerged by the burial mound. But at Malta a distinct building type, linked in form to the collective tombs original to the island, absorbed the ritual functions of the ancestor cult, together with related practices, and became a specialized house of worship. (Fig. 2.18)

The Ggantija complex consists of two separate temples of different date enclosed by a continuous outer wall. The larger temple to the south is the earlier, and even that is probably not all of one piece. The west trefoil seems to have come first. This clover-leaf scheme, closely resembling rock-cut tomb formations, must have been the opening stage in the creation of the Maltese temple as a building type. The eastern pair of curved chambers seems to have been an afterthought. When it was added to the initial trefoil, perhaps to accommodate an enlarged repertory of religious practices or bigger crowds of worshippers, the building type assumed this new configuration for its standard design.

Two further changes of consequence took place before the mature temple form was complete; both are illustrated by the smaller temple of Ggantija erected toward the north. First, in terms of size, the order of the two sets of curves was reversed, with the outer set now being the wider. Second, the culminating apse of the trefoil was reduced to a shallow niche in which, at later sites, a single pillar would be enshrined.

The site is a hillside. The temples face downhill. Before their two monumental entrances, the "gates of horn," a circular platform of stone was laid out at some point as a common forecourt, braced by a retaining wall to avoid slippage. Each temple is composed of a long axis, running from the entrance to the back niche and flanked by two pairs of curved chambers of different size. The axis is not of uniform width. Between pairs of chambers, it acts as a small court, its space distinguished from those of the chambers by parapets of globigerina. The narrow points of passage have slabs of fine workmanship and on either side of the one farthest from the entrance two dolmenlike altars are set up. Beyond this point, the south temple picks up a cross-axis. The curved end of one of the lateral chambers is fitted with altarlike slabs and, across the court, at the entrance to the opposite chamber, a circle of stones must have served as a ceremonial hearth.

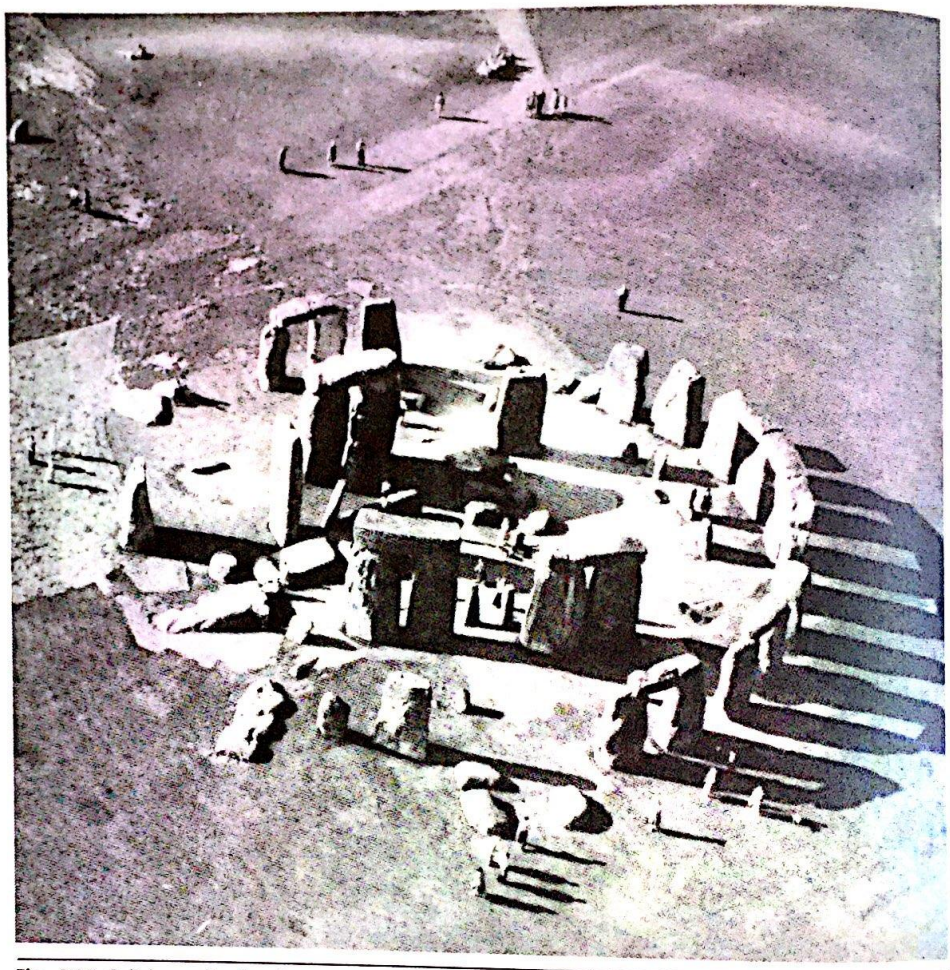


Fig. 2.20 Salisbury (England), Stonehenge, ca. 2750–1500 B.C.; aerial view.

Whatever the units of composition, the prevailing sense of Ggantija is one of deep containment. It is the natural quality of curved interior shapes to envelop us totally. In this, Ggantija as an architecture of shelter contrasts with the Gallery Grave as shelter. (Figs. 2.19a, 2.16) There the ceiling is flat and the juncture with the walls is made at right angles. The space is crisp and boxlike. The experience of Ggantija, a folding space that engulfs the user, is different. There is here no strict distinction between wall and ceiling since the transition from one to another is a curve. The effect is akin to one special feature of Neolithic tombs, the round burial chamber at the end of a Passage Grave. (Fig. 2.17)

Actually, the curved shapes in Maltese temples hold a place midway between the flat-roofed tunnels of megalithic tombs and the round chambers of Passage Graves with their corbelled vaults. The spans at Malta are too wide for complete corbelling. The walls are projected inward at the top, but only up to a certain point; beyond this the gap was bridged, we think, with flat slabs. And since

an 8-foot span is the maximum opening a single slab can bridge without the aid of central supports below, of which there is no trace, it is very likely that the culminating portions of the ceilings were fashioned of wood.

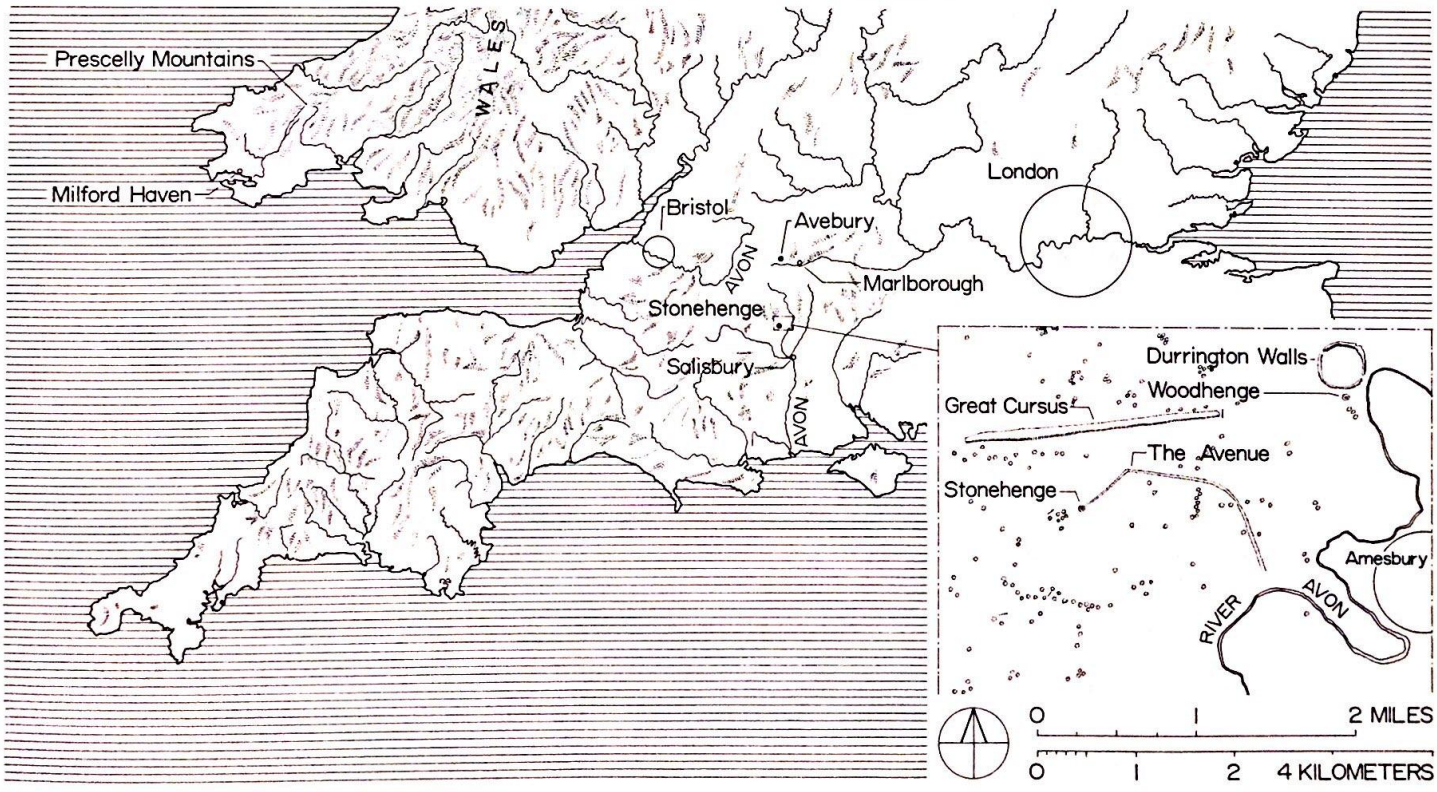
In these deep sanctuaries of Malta, a brilliant Neolithic people carried on its sacred rites of pacifying the dead and assuring fertility. The details escape us, but rams and pigs were slaughtered for the gods and libations were poured into holes that maintained contact with the underworld. Here, too, oracles may have been spoken to through tiny windows in otherwise sealed rooms that kept out the profane. The sick and the crippled came to sleep in the wonder-working embrace of the temple, in the hope of being made whole: we have outward signs of their faith in the sculptured figurines of reclining women and the votive portraiture of hurt or distorted human images. And the earth comforted and healed them until, all of a sudden, about 2000 B.C., the devout culture of Malta was rudely disrupted by invaders, and the temples were abandoned to their ruin.

Stonehenge

Stonehenge, the most famous of Neolithic monuments, is a temple to a different faith. (Fig. 2.20) The haunting circle in the chalk uplands of southern England is not altogether free of the dead. The so-called Aubrey holes just within the bounding earthwork hold proof of cremation burials, for example. But this was probably a secondary function. The early Britons who built and rebuilt Stonehenge over a time span of one thousand years had, from the start, extraterrestrial intentions. Their involvement was with the sun and the moon; their aim, not to communicate with powers of the underworld, but to recognize and celebrate heavenly events. Or so at least many scholars believe.

The final design of Stonehenge is frankly singular. Yet the great horseshoe in the middle was not always there, and the stones that now circumscribe it were not always so disposed. And there was a time at the beginning when there were no central stones at all but only the earth embankment in the midst of the chalk plain of Wiltshire. In these various guises, Stonehenge interlocks with a number of neighboring structures. (Fig. 2.21) There are, first, the large earth circles like the one at Windmill Hill, their circular ditches interrupted by frequent causeways. Were these stockaded cattle pounds, or were they, as their stra-

Fig. 2.21 Map: Southern England, with inset of Stonehenge vicinity.



tegic sites would suggest, temporary gathering places for nomadic tribes of herdsmen in times of general celebration? At any rate, they are older than Stonehenge—the oldest surviving structures in England. Then there are circles marked by uprights: either stones, as at Avebury 27 kilometers (17 miles) north of Stonehenge, with two huge interrelated circles; or else wooden posts, as at Woodhenge, closer still, about 3 kilometers northeast. Over 900 stone circles are known today all across the British Isles—in northeast Scotland and Ulster, in Cornwall and Wales.

At Stonehenge, the first stage of building produced the earth circle, 97.50 meters (320 feet) in diameter, that remained constant through all subsequent rebuildings. (Fig. 2.22) It must have been described by an immense compass, probably a stretch of oxhide rope attached to a wooden peg at the circle's center. To mark the circumference, a ditch was dug through the solid chalk, with the usual tools—digging sticks, picks of antler, and shoulder bones of oxen for shovels. The dazzling white earth was piled up on two banks. The circle was broken at one place only, in the northeast quadrant. There, beyond two small uprights that flanked the break in the circle, a tall pillar, of a distinctive grey sandstone from Marlborough called sarsen, was erected. It stood just off the centerline of the break, next to a wooden gateway of four posts, and it stands there still tilted to one side.

The point of this arrangement was first surmised in the eighteenth century. A person standing at the center of the white circle on the morning of the summer solstice, the longest day of the year, and looking in the direction of this so-called Heel Stone, would have seen the sun rise a little to the left of its imposing mass, on axis with the break. It must have been a simple but profound experience, and it happened in a simple but bold-spirited setting of boundary architecture—a round embankment on the broad plateau of Salisbury Plain, at the confluence of many lines of hills along whose ridgeways the people came for the great day.

This seems to have been all that was done in the opening phase of the monument, except for four station stones inside the chalk palisade that describe a rectangle perpendicular to the axis of the midsummer sunrise, and the ring of 56 Aubrey holes, already mentioned, that may have been meant to hold uprights but were filled up again soon after being dug. The date of this first scheme, known as Stonehenge I, is now thought to be around 2750 B.C.

Then, perhaps several centuries later, the sacred site became the scene of an ambitious new building campaign—Stonehenge II. Pairs of chalk banks, like those of the circle, defined an 8-meter (35-foot) wide avenue along the crucial northeast axis. It ran on straight for a while, and then curved right to reach the river Avon a short distance away. A narrow embanked enclosure about 3 kilometers (1.75 miles) long to the north of the sanctuary seems to belong with the avenue. It is known as the Cursus.

In the middle of the circle a double ring of bluestones began to be set up, with a marked entrance in line with the avenue. What is remarkable about these bluestones is not their size, although they weighed up to 5 tons each, but where they were brought from. As it happens, this particular rock formation is to be found in one place only in all of England, the Prescelly Mountains of Wales. Unless the bluestones were deposited in the area by glaciers, the feat was amazing. The shortest possible route involves a distance of almost 500 kilometers (300 miles). That would entail hauling the bluestones first to Milford Haven in the west of Wales, then moving them by sea to the mouth of the Bristol Avon and, then, by a series of rivers with brief overland hauls in between, reaching the general area of Stonehenge. It seems probable that the avenue of Stonehenge II commemorates the last stretch of portage. (Fig. 2.21)

For all this, the stones were put aside shortly, even before the rings were complete, for a third rearrangement of the precinct—Stonehenge III. Now sarsen megaliths several times larger than the bluestones were brought in from nearby Marlborough, perhaps on a movable track of oak rollers. The naturally irregular blocks had to be cut first, at their place of origin, to uniform size, a procedure that may have included alternate heating and cooling to split the rock along the desired lines.

Within the great chalk circle, the sarsens were tilted with prodigious effort into a ring of pits, straightened, and stabilized. To consolidate the sarsen circle at the top, curved lintels were placed over each pair of uprights, cut and fitted together so that they would form an integral crown about 6 meters (20 feet) off the ground. The design was completed by a sarsen horseshoe inscribed within, composed of five separate trilithons—that is, groupings of three slabs, two upright ones and the crosspiece that bridges them. The horseshoe opened up toward the avenue and the sacred path of the midsummer sunrise. (Fig. 2.22, C)

The sarsen circle and horseshoe of Stonehenge III are remarkable pieces of architecture. Monumentalized boundaries like the alignments of Carnac differ from them because at Stonehenge the spatial units were cast into total frames through the added definition of the lintels. But the difference is more fundamental. For the builders of Stonehenge III, architecture implies a welding together of units that would read as a single sustained artifact. Of course, Ggantija and the megalithic tombs, too, were complicated assemblages of stones. But as architecture of shelter, they molded interior spaces where incidents of detail were not crucial to the enveloping impact of the stone fabric. The stone core of the tombs let stand imperfections of joining. At Ggantija, dressed stones and slabs of decoration heightened surface appeal as an *applied,* rather than inherent, effect of the structure.

The refinements at Stonehenge belong inseparably to the structure. We have here a skeletal construct, like a stone dance. The care of the detail is important, not so much for its own sake, but for the convincing grace of the construct. For ponderous though the specter of Stonehenge undoubtedly is in the openness of Wiltshire under the vast arc of the sky, the rough-and-tumble look is tempered intentionally with sophistication. The sarsen stones, for one

Fig. 2.22 Stonehenge, plan of four stages of construction: (A) Stonehenge I, ca. 2750 B.C.; (B) Stonehenge II, later third millennium B.C.; (C) Stonehenge III; (D) Stonehenge IV, ca. 1500 B.C.

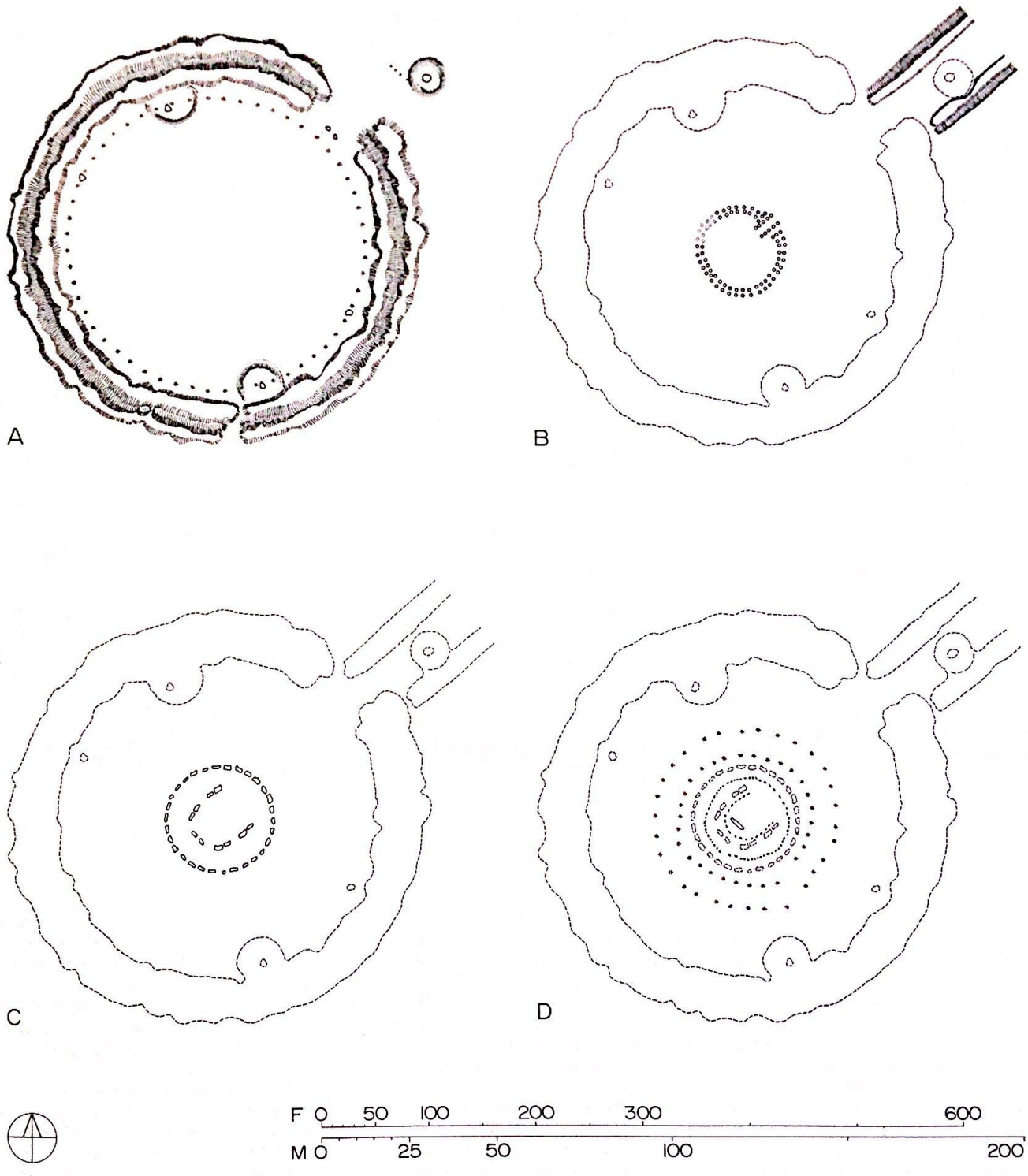

A
B
C
D
F 0 50 100 200 300 600
M 0 25 50 100 200

Fig. 2.23 Stonehenge, midsummer sunrise over Heel Stone.

thing, were leveled with heavy stone mauls and smoothed by grinding. Uprights were tapered toward the top, to make them look sprightlier under their burden. For similar visual spruceness, each lintel widened out upward and gently curved inward on the two circumferential surfaces. Those lintels had to be curved along their entire length, so that, joined tightly together as they are in a woodworker's technique known as tongue-and-groove, they would produce a smooth arc both within the circle and without. At the top, the uprights were slightly dished, and the lintels made correspondingly convex, to avoid slipping. Also, a little knob of stone was left projecting at the top of each upright, so that it could be inserted into a matching hole in the lintel. This too is a familiar system of joining used in cabinetmaking, called mortise-and-tenon—perhaps to recall the wooden prototypes of Stonehenge.

The precinct was reorganized one final time. The bluestones, which were already being moved back into the monument during the building of Stonehenge III and set up in front of the horseshoe trilithons, now were also interposed between the horseshoe and the sarsen circle. Further out beyond the circle, two fresh rings of pits were dug, perhaps for holding stones—the so-called Y and Z holes. This last arrangement came about possibly as late as 1500 B.C. (Fig. 2.22, D)

Was Stonehenge, in these final incarnations, solely intent on commemorating midsummer's day? In the opinion of several scholars, it never was. Always, there had been broader cosmic implications. To put

it simply, Stonehenge was an open-air observatory where a wide range of astronomical phenomena could be predicted with marvelous precision. So much so that one recent student of the monument refers to it as "a Neolithic computer." According to this theory, the 56 Aubrey holes may relate to the 56 days' difference between five solar years and five lunar years; the 59 Y and Z holes, to the 59 days in two lunar months; the 19 bluestones within the horseshoe, to the 19-year cycle of the moon, crucial for the prediction of eclipses; and so on.

Even were this true—and much of it has been disputed—we must be careful not to confuse our own modern demands on science and the more elemental needs of prehistoric farmers and herders for celestial indicators of the seasons. Furthermore, we must not confuse function and ritual, as we have distinguished these in our introductory chapter. Function in architecture is a prosaic program. It is an abstraction in that it applies to an *activity* without reference to human involvement. Ritual is the transcendence of function to the level of a meaningful *act*.

It may indeed be true that Stonehenge was designed to plot and anticipate some alignments of the sun and the moon. That would be its function. But the meaning of Stonehenge resides in the ritual. It is this that humanizes this calendar of stone and earth in the open countryside; it is this that explains the prodigies of engineering and labor that went into its making. Function did not demand the choice of bluestones and grey sarsens and their transport from long distances away. For the effectiveness of this "Neolithic computer," any convenient stones would have been satisfactory. The materials and the size of the project were urged on these early peoples of the British Isles so that the structure could be a celebration of celestial events and not merely a method of predicting them. To this end, the painful sophistication of detail was countenanced—the stamp on uncouth rock of the civilizing will of humans.

Stonehenge was a sacred center of community for the tribes that used it—a monument to their social cohesion apparent both in their spirit of labor, when they toiled together to set up the megaliths, and during their ritual gatherings, when an eclipse or a spectacular rising of the sun, having been predicted by the priestly powers, would summon the community to converge on the precinct to witness the event in unison. (Fig. 2.23) Public architecture at its best aspires to be just this: a setting for ritual that makes of each user, for a brief moment, a larger person than he or she is in daily life, filling each one with the pride of belonging.

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Jericho (Israel), wall showing superimposed layers, ca. 7000 B.C. and later.

3

THE RISE OF THE CITY: ARCHITECTURE IN WESTERN ASIA

The Urban Revolution

Behold the bond of Heaven and Earth, the city . . .
Behold Nippur, the city . . .
Behold the kindly wall, the city . . .
. . . its pure river
. . . its quay where the boats stand
Behold the Pulal, its well of good water
Behold the Idnunbirdu, its pure canal . . .

This is the opening of a Sumerian myth about the moon-god Nanna, and it dates from the beginning of the second millennium B.C.—the time of the third rearrangement of Stonehenge. There are two noteworthy things about this bit of poetry from Mesopotamia. First, it is a written record: a distant culture speaks to us through it directly. This is a very different relationship to the past than the one we had established with the Britons of Salisbury who could reach us only through the mute testimony of their stones. And second, the passage sings rapturously of a thing called the city, set on a river, serviced by canals, blessed with good freshwater.

So at the very same time in history, in two separate corners of the ancient world, different patterns of community were in existence. While Neolithic Europe carried on a stone-using peasant economy well into the second millennium B.C., in two spots of the Near East there were contemporary *literate* cultures that knew how to work metal, organize food production as an industry, and keep written records of their transactions and beliefs. They had left their Neolithic past behind them long before Europe and had gone on to forge a complex society of great technological achievement and material wealth. With these two literate cultures, Egypt and Mesopotamia, history proper is said to begin, as distinct from the document-free *prehistory* of the Stone Age. Writing helps us to draw the line between civilized and "barbarous" societies, and for this reason, among others, we have customarily called the Near East "the cradle of civilization."

The word "civilization" derives from the Latin *civitas,* which means city. This gives us the other accepted characteristic of civilized humanity—that it has for its theater of activity an intricate artifact, the city, that sets it apart from the basic life of the village or the pastoral tribe. To be civilized is to be urban; civilization, in this strict sense, is "the art of living in towns." Traditionally, the molding of the city as a social and material concept is credited to the same cradle of civilization that invented writing, specifically to the southern region of Mesopotamia, Sumer, sometime in the early fourth millennium B.C. (Figs. 3.1, 3.8)

If boundary-fixing and stone monuments represent the architectural response to the Neolithic revolution, the ingenious fabric of the city corresponds to the second major upheaval in the human scheme, the urban revolution. How was this fabric wrought? What were its components? Physically, what is it that differentiates the city from the village?

The city is an involved organism under constant change. (Fig. 3.2) In its living mesh, public structures are bonded to the places where people live, and these, in turn, are bonded to each other, in a rich artifice of contiguity. The city presents us with a new set of environmental ideas, such as the street, the public square, the defensive wall and its gates. It crowds our discussion with a score of building inventions—for example, the canal and the granary, the palace and the bath, the market, the bakery, shops, restaurants, and libraries.

The urban revolution differs from the Neolithic revolution in one essential way. It does not affect the basic relationship of people to nature, as the passage from hunting to food production certainly did. Agriculture and animal husbandry survive as the principal modes of subsistence in the urban period. Even trade cannot be credited exclusively to the rise of cities. Of course, both agriculture and trade were intensified and regimented within an urban economy: the one, profiting from irrigation, crop rotation, and the use of fertilizers, to produce a surplus of food; the other, enlarging its scope to include, besides pottery and stones like obsidian, the metals required by the new urban technology and the consumption of luxury goods. But this is more a matter of disciplined efficiency than a radical turn in the exploitation of nature. The city, above all else, typified a *social* process. The revolution it brought about was embodied in the interaction of people with each other.

Since this is so, we should not be surprised that recent archaeological discoveries have shown the city to have emerged long before the fourth millennium B.C., in

areas identified with the Neolithic age. The settlement at Jericho about 9,000 years ago was a well-organized community of about 3,000 people, in contrast to the normal Neolithic village with its population of several hundred. Çatalhöyük in southern Anatolia, a 13-hectare (32-acre) Neolithic settlement of the seventh millennium B.C., with shrines and quarters for specialized crafts, a clever residential layout, and the production of wall paintings, textiles, copper and bone artifacts, patently merits being called a town.

One further corrective should be offered to our thinking about the urban revolution. It is possible to make entirely too much of the city. It appears that in correlating urbanism and civilized history, we have imbued the city with positive qualities the absence of which, at least by implication, has tended to downgrade other social organisms. The term urban has turned into a value judgment; rural or pastoral, in contrast, carry with them a note of regression or conservatism.

This bias is unfair. To hold that civilized life cannot exist outside of cities belittles the genuine achievement of much nonurban culture and may distort the view of a total environmental order where the cities and the countryside are locked in mutually fructifying intercourse. It is not enough to grant the truism that cities, for the most part, could not survive without the sustaining labor of peripheral fields and pasture. There were moments in history when the urban and pastoral modes of life were competing high cultures. There were moments, too, when the collapse of an urban civilization ushered in, after a period of painful adjustment, an equally viable social structure that made do without cities. Because of our preconceptions about the putative superiority of cities, we have too easily seen these nonurban sequels as the inevitable troughs between the peaks of human genius and enterprise. We are given to calling them the Dark Ages. But if we restrain our enthusiasm for the glamor of cities, we might profitably reassess the contribution of the centuries that came after the destruction of Bronze Age city-states in Greece, for example, or the time after the deterioration of Mediterranean urbanism that accompanied the fall of the Roman Empire.

Stirrings of Urban Consciousness

The chemistry of early cities relied on three active properties: people, productive resources, and ambition. The city-form aspired to be compact and versatile. And the future of this proud amalgam of people and buildings could be secured only through faultless defense and aggressive progress.

A city presupposed a concentrated population, beyond the intimate congress of farming homesteads and tribal families. The land it occupied had to be able to do more than feed its crowds. Food surplus ensured a stable way of life against the fitful behavior of nature; it also supplied a source of wealth to pay for importing what the city needed and did not have. Alternatively, the city might derive its strength from some raw or crafted resource, such as animal fur or metal, attractive to markets beyond its limits. In either case, the city proved that it could not, as the village could, remain self-contained. The local interaction among its people, complicated by numbers, was only one dimension of its social mobility. Outside, there were other centers of closely controlled resources that envied it or replenished its wants. To defend itself against the envious and still carry on trade, the city formed a larger sphere of social contact.

The citizenry was forced to organize itself in a way that could contend with the diversified tasks of its supple existence. The population fissured into specialized groups. Besides the great peasant mass, some were trained to fight, others to build. There were full-time craftspeople of metal and stone, as well as priests and merchants. And specialization went hand in hand with social stratification. Some groups administered the urban territory that stretched far beyond the

Fig. 3.1 Map: Western Asia, 8,000–700 B.C.

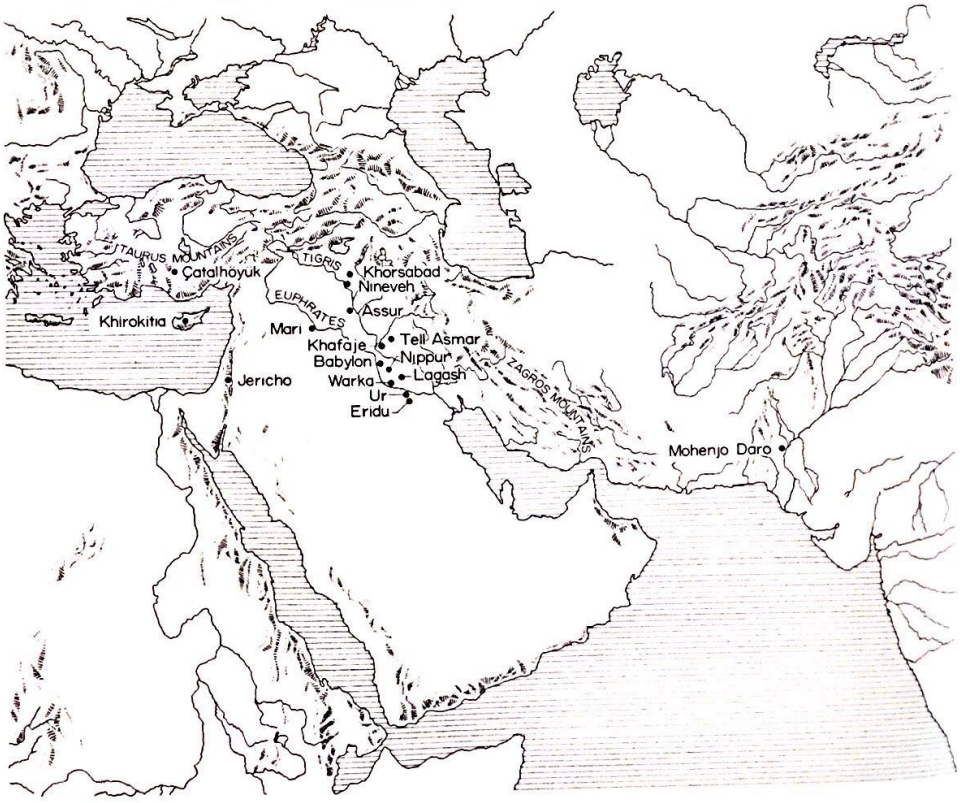


Fig. 3.2 Hamadan (Iran); aerial view.

confines of the city, controlling the principal resources of production. These citizens had a reserve of power that they had come by in the course of time and, through it, they held sway over the rest of the population. But below them the citizenry was not on equal footing. Certain tasks carried less prestige than others. The chance for acquiring wealth was uneven, and the rich held a definite advantage over those less favored in the social hierarchy.

The city-form, compact and versatile, reconciled the demands of privilege with the pressing need for unity. The powerful must have stages for the ceremonies of their office, and these must be of a scale and level of grandeur that would impress both the citizenry and foreign embassies. For power manifests itself through architecture perhaps more easily and universally than through anything else. The rich must have residences whose fancy trappings and ampleness in the thick of the urban fabric would plainly bespeak their station. At the same time the city-form contained the human base of this exalted peak and furnished it with a sense of enhanced iden-

tity. The gods looked after the entire citizenry, both the humble and the high; the temples solemnized pious community. The ring of walls expressed the fears and the strength of a common fate. Even the opulence of the rich redounded all the way to the simple peasant, for the peasant could boast of belonging to the community that displayed such wealth.

Jericho

Precisely how it all started is unclear. Revolution implies a sudden break, but it may have been in several places at once, and with varying motives, that the idea of the city gradually took root. At this stage of our knowledge, we must assign the origin of the city-form to western Asia; and Jericho would seem to qualify as the earliest surviving town.

The site today is a great mound near the oasis of the modern town, on the left bank of the river Jordan. It holds a series of Jerichos, each built on the ruins of its predecessor. This clinging to a place of birth will prove a durable habit for cities. Time and again until our own day, cities ravaged by conquest or natural disaster will elect to rebuild on their ashes, fully aware that they will be vulnerable anew. In large measure it is tradition, the genius of the place, that accounts for this stubbornness. The ground is hallowed. It has the imprint of time-honored cults and generations of inhabitants. Besides, there is invariably a tangible advantage to the site that prompted occupation in the first place.

In the case of Jericho, this was a reliable source of freshwater that now gushes from the place called Elisha's Fountain. The life-giving value of such a spring, in the desert of the Dead Sea, is obvious. Here by the welling water, where their quarry came to drink, hunters had pitched their tents on bedrock and reserved a small plot of land as a sanctuary; and here, within a thousand years, the transition had occurred to a settled life based on agriculture. The first permanent settlement had solid domed houses of mud-brick, with an entrance porch and curved walls, probably in imitation of the round tents of the nomadic hunters. The floor was sunk below the ground level and was reached by means of wooden stairs. Underneath it, the dead lay buried.

The date of this activity is about 7500 B.C. The settlement covered about 3 hectares (8 acres) and must have therefore been uncommonly populous. (Fig. 3.3) Moreover, once it had reached its optimum spread, the settlement was fortified by a fine stone wall of cyclopean masonry that guarded the people and their precious substance, the spring water, for more than a thousand years. The fort was overseen by a massive round tower, also of stone, built against the inside of the wall. (Fig. 3.4) In its hollow core, a staircase of single stone slabs had been constructed, either to man the tower or else to reach the source of the spring, perhaps both. That water had something to do with the curtain of defense is suggested by the fact that the tower was intimate with a series of mud-brick enclosures, unlike any of the houses, that have been interpreted as water cisterns.

About 6500 B.C., this Neolithic stronghold, perched between eastern nomads and the fertile plains of Palestine, was successfully overrun. The houses were now rectangular, with slightly rounded corners. They were arranged around courtyards where the cooking took place. Each house consisted of several rooms, interconnecting through wide doorways. Sitting among the houses were several buildings set aside for worship; they shared features of residential architecture, such as rounded doorway jambs.

Like the townspeople they displaced, the newcomers were also compelled to use earth as their main building material, but they went to some pains to improve its look. Stone was in short supply; what little could be found within easy portage was used for defenses, the substructure of houses, and for other extraordinary purposes. A shrine in a private house features a dressed pillar of volcanic rock set on a stone pedestal in a semicircular niche. It brings to mind the pillar in the terminal apse of Maltese temples.

The rest had to make do with mud, which has advantages as well as drawbacks. It is of course easier to work with than stone, since it requires no cutting and dressing. But mud has its own problems. Although it is eminently plastic, it has to be shaped somehow and stiffened so that it will stand. Second, it has to be protected from dampness. And because it is a drab material that yields lackluster surfaces, the urge is keen to do something more with it—whitewash it, liven it with color, or modulate it for effect. One clever expedient is to devise a sheathing that both protects and embellishes—for example, sheathing like tile that will be hard, water-resistant, and colorful. But the invention of tile lies several thousand years ahead in time. The polished reddish plaster of Jericho used on the walls and floors is itself a notable antecedent.

There are several ways to build with earth, all of them ancient. The crudest is to mix together soil, water, straw, reeds, leaves, and whatever else of this sort of material comes to hand and pile it up to form a wall—the technique known as "cob." The wattle-and-daub technique makes use of an upright frame of wattling, on both sides of which the wet mud would be applied. But the two most satisfactory variants of earth

Fig. 3.3 Jericho (Israel), first settlement, ca. 7500 B.C.; site and excavated portion of wall; plan.

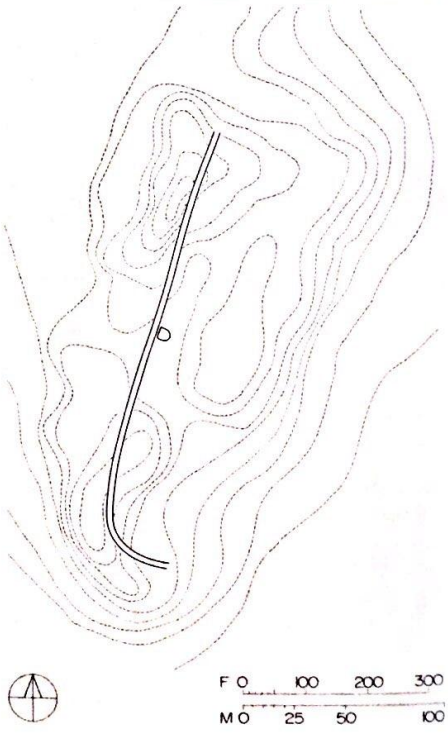


Fig. 3.4a Jericho, tower built against side of settlement wall.

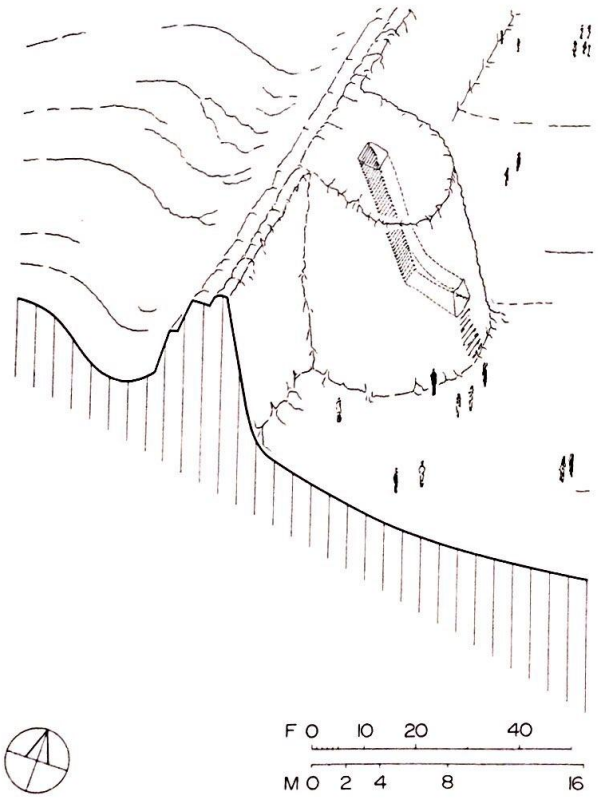


Fig. 3.4b Jericho, wall and tower; section/perspective view.

Khirokitia understood this. Steady repair and alteration of the main street during its protracted life show that the community was not innocent of "civic" duty. Again, maintaining their communal artery free of encroachments took vigilance, a general understanding, and social maturity. At the same time, the zealous safekeeping of this public trust tended to sharpen the disparateness between public and private property. The size and shape of the houses at Khirokitia give no hint of a developed social hierarchy; yet *spatial* hierarchies might well be engendered by the design of the community, so that houses right on the main street or adjacent to the halting place might begin to seem privileged and therefore more desirable than others.

Çatalhöyük

Çatalhöyük in the Konya Plain of south Anatolia is the largest and most complex Neolithic settlement to be excavated. And it rests on a new rationale for the city—trade. Besides hunting, a progressive variety of agriculture, and stockbreeding, this town of perhaps 10,000 people would seem to have controlled the trade of a valued commodity, obsidian, the principal sources for which were further north. The black volcanic glass, the best material of the time for cutting tools, fed a brisk local industry and supplied the wherewithal for foreign commerce. The town could afford to obtain numerous luxury items, such as marble, flint, sulphur, pumice, calcite, and alabaster. All of this went to enhance the daily routine and personal appearance of the townspeople.

But there was another important skill present in Çatalhöyük, the working of metal. Lead and copper were shaped into ornaments and small tools such as awls and drills. The raw material was to be found in the Taurus range, the mountain chain that frames the Anatolian plateau on the south side. Prospecting, then, was one of the many activities of the town along with a primitive form of metallurgy, or at least the knowledge of smelting. This is very early indeed for such technical knowledge; metallurgy would not be practiced fully until the cultures of Mesopotamia and Egypt mastered it beginning in the fourth millennium B.C.

The spread of metal has a mixed impact on the history of architecture. The direct application of metal as architectural ornament starts in Mesopotamia; in building construction, not until Classical antiquity. But the indirect effects of metal on the manufactured environment are already evident at Çatalhöyük. The desire to obtain and work this uncommon material could in itself sustain towns that mined it, traded in it, and knew how to fashion it into sumptuous art. To the traditional crafts embraced by the village—stone-carving, pottery, weaving—metal added others that fitted into the nascent townscape with its manufacturing establishments and stalls of sale.

The small part of Çatalhöyük that has so far been excavated covers a residential quarter. (Fig. 3.7) If the rest of the enormous site were to be cleared, one might come across the environmental traces of the intense bustle of its many crafts that left hundreds of artifacts in the soil. There would be the shops of the basketmakers and weavers; of the merchants of animal skin, leather, and fur; the makers of copper mirrors and jewelry. Perhaps there would also be a public market in the midst of the urban fabric, where the townspeople would go to look for stone and shell beads, flint daggers and sickle blades, bone ladles and belt hooks.

The settlement was neither fortified like Jericho nor open like Khirokitia. The buildings were grouped into tight quarters so that a continuous, blank wall of construction faced the countryside: no doors or windows on this side were allowed in the houses. Streets were unknown. The quarter opened up with an occasional courtyard, which also doubled as lavatory and rubbish dump. Entry to the houses was normally through a hole in the flat roof reached by a wooden ladder. Since the hearth and oven were directly below the hole, the entry was also a smoke stack. Small windows below the eaves on at least two sides of the house brought in additional light. The plan is consistent. Each house had one rectangular room, with a narrow storage space along one side and built-in platforms along two walls, one each for the men and women of the household.

The construction method is novel. A timber framework of posts and beams divides the walls into a series of vertical and horizontal panels that are then filled in with mud-brick and plastered. This is the prototype of so-called half-timber construction. In the shrines, laid on the same basic scheme as the houses, the individual panels were decorated with plaster reliefs and paintings dealing with the cult of the mother goddess. The imagery itself looks back on the Old Stone Age past. A bull represents the goddess' constant companion, and stylized heads of bulls and rams in the form of low pillars figure as cult objects. And there is, here and there, a debased version of hunt magic, in lively scenes of animal baiting.

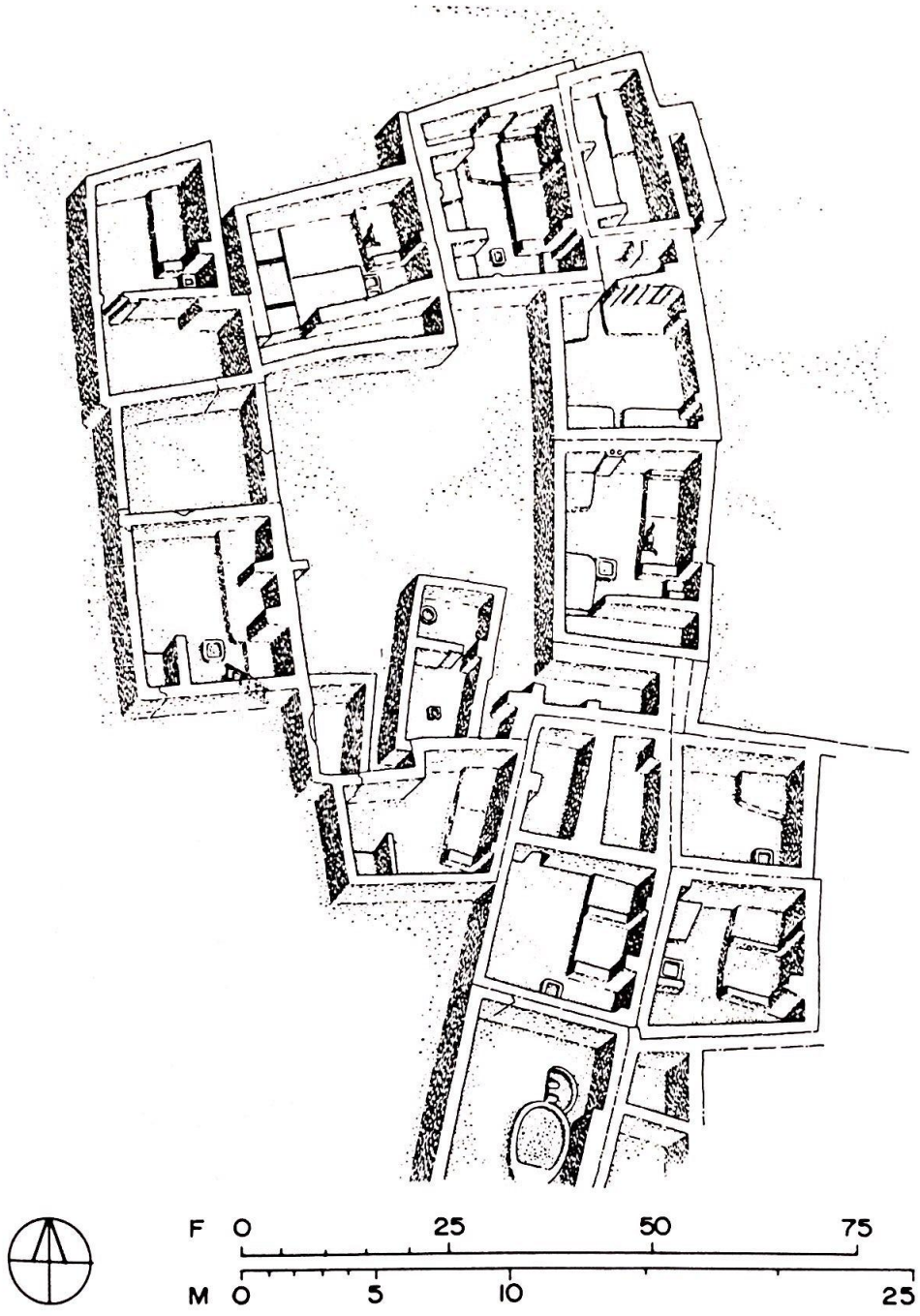
So Çatalhöyük contains it all—it is a telescoped view of human history from the Stone Age hunter to the city dweller. In its ambience, the wildness of the horned beast is at home with no less than three forms of wheat and two of barley; and side by side with the hunter and the sophisticated farmer lives the specialist in metalwork, as well as the merchant with his eyes abroad.

The Cities of Mesopotamia

The stirrings of an urban consciousness that were first felt in Palestine about 7500 B.C. seem to die out by the year 5500. When again we encounter the city some fifteen centuries later, in the "land between rivers" (which is what Mesopotamia means), it shows up in full force and blossoms with unprecedented intensity. (Fig. 3.8) We are now dealing with a concentrated urban culture sustained by a written tradition. So while it is undeniable that the city-form got its start in the Neolithic ambience of the eastern Mediterranean, nothing like the cities of Mesopotamia had ever been seen before in human history.

The history of Mesopotamia is long and tangled. In architectural terms, we are unable to trace a neat, orderly development through the known fragments. As Henri Frankfort, the foremost student of Mesopotamian architecture, has warned us, the story is marked by "promising starts that lead nowhere" and by a tenacious adherence over the millennia to a limited repertory of formal types. In our own brief sum-

Fig. 3.7 Çatalhöyük (Turkey), Neolithic settlement, seventh millennium B.C.; reconstruction view of residential area.



mary, we might therefore suspend a strict chronological account in favor of a few critical environmental contributions that can be isolated for special focus.

Four broad segments of chronology will suffice to govern our discussion.

1. The first is the so-called *Protoliterate Period,* from ca. 3500 to 3000 B.C. During this time, the towns, which had probably evolved from agricultural villages, acquired their battlements of ringwalls; and the temple and the ziggurat began to gain architectural definition. The first written documents made their appearance. Political authority resided in an assembly of male citizens that selected short-term war leaders.

2. When the role of these leaders was retained in times of peace as well, kingship, first elective and then hereditary, became established. With it rose the monumental palace, an administrative center which employed a large retinue of bureaucrats and entertainers and occupied itself with raising and supplying an army and maintaining the defensive system of the city. This period, roughly 3000 to 2350 B.C. is called *Early Dynastic.*

3. The next few hundred years, up to about 1600 B.C., might loosely be referred to as the *later Sumerian* period. This period saw the rise of empire, the collective rule of several city-states through the might of a sovereign king. The first part of the period is dominated by the Third Dynasty of Ur whose prodigious building activity includes the ziggurat of Ur-Nammu, the high point of that building type.

4. One last period is interesting, *the Assyrian,* from about 1350 to 612 B.C. The northern region of the two rivers now flourishes at the expense of lower Mesopotamia. We know the Assyrians by their imposing state reliefs and their palaces, like the one at Khorsabad.

The Layout of Cities

There is not enough at the lower levels of explored mounds to give us a total image of the Mesopotamian city before the Early Dynastic Period. By then, a dozen or so cities containing from 10,000 to 50,000 people prospered, both in lower Mesopotamia or Sumer and further north in Babylonia. The cities were enclosed by a wall and surrounded by suburban villages and hamlets.

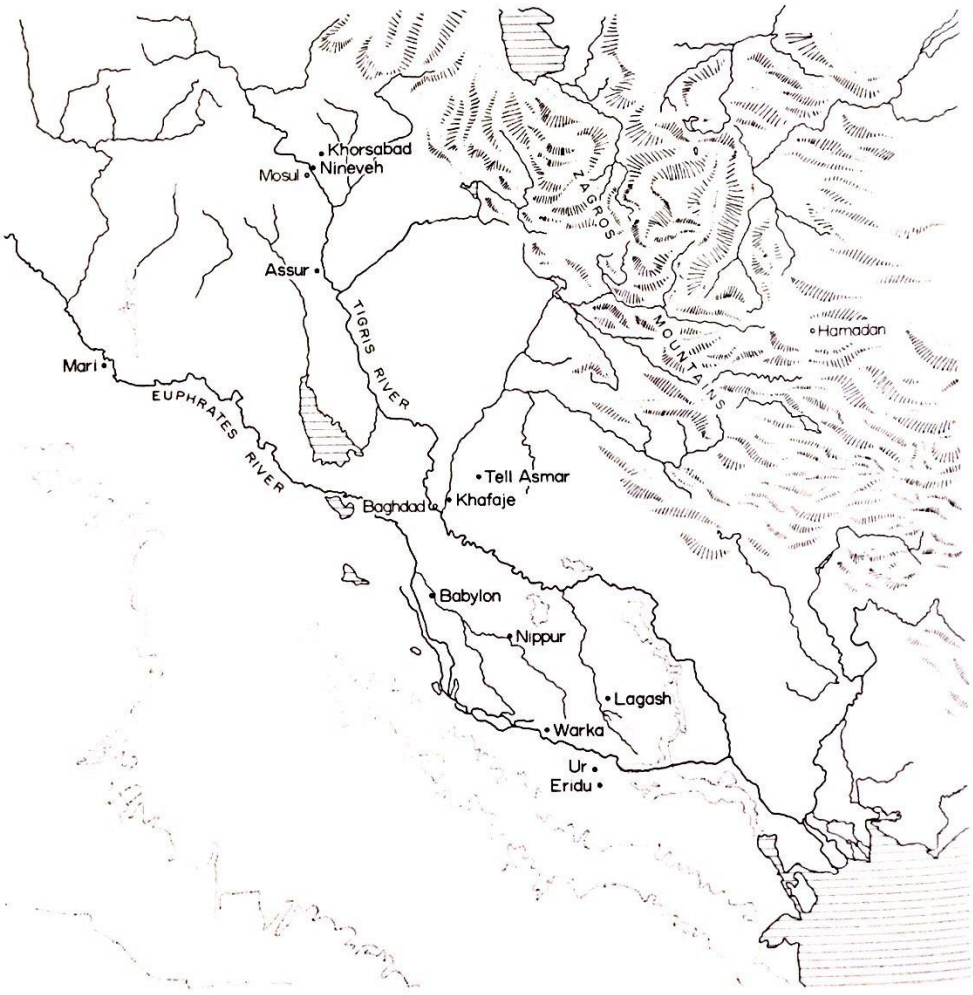
(Fig. 3.9) The two monumental centers were the ziggurat complex with its own defensive wall, overseen by a powerful priesthood, and the palace of the king. Lesser temples were sprinkled here and there within the rest of the urban fabric, which was a promiscuous blend of residential and commercial architecture. Small shops were at times incorporated into the houses, but the norm was to have structures devoted exclusively to commercial or industrial use interspersed throughout the city. In the later Sumerian period at Ur, an example of a bazaar was found: a concentration of little booths along a narrow passage, probably sheltered by awnings, with doors at either end that were closed at night. At Tell Asmar, a large building once thought to be a palace has recently been reinterpreted as an industrial complex housing a number of concerns, such as a tannery, a small-scale ironworks, and, at a later date, textile weaving exclusively.

Traffic along the twisted network of unpaved streets was mostly pedestrian. The ass, that classic beast of burden, navigated easily enough. At Ur, one sees on occasion a low flight of steps against a building from which riders could mount, and street corners were regularly rounded to facilitate passage. Street width, at the very most, would be 3 meters (9 feet) or so, and that only for the few principal thoroughfares that led to the public buildings. These would be bordered with the houses of the rich. Poorer folk lived at the back, along narrow lanes and alleys. It is hard to imagine much wheeled traffic in this maze, though both service carts (with solid wheels) and chariots had been in use from an early date. The ill-made tracery of public ways resulted undoubtedly from the ancient occupations of the city sites. Once walled, the land became precious, and the high value of private property kept public space to a minimum. Ample squares or public gardens were very rare.

The houses were grouped into congested blocks, where party walls were common. (Fig. 3.10) In fact, though the constituent unit was the single-family dwelling, it is difficult to see the block as anything but a raveled agglomerate forever adjusting to the pressures of changing use. On the blank face of their tablets, architects designed perfect house plans, rectangles divided neatly into orthogonal rooms around a central living space. But the reality of a living town played havoc with the conceptual order of the architect. The building lots were not of uniform size. Each house was compelled to fit into a predetermined space, more often than not irregular, in the tangle of its block. Furthermore, it was the custom not to clear an earlier house fully before starting to build over it, but rather to make use of the ruins as a foundation; as a result, the plan of the older house had a direct bearing on the shape of its replacement, which pushed like a fresh shoot from the older roots in the soil.

The houses, before they collapsed or were abandoned, renewed themselves in various ways as the daily life of their occupants or the rhythm of the streets dictated. Since refuse was dumped in the public space outside the front door, the level of the streets rose perceptibly. At Ur, the townsfolk kept abreast of this phenomenon by raising the threshold of the single door that customarily led into the house and

Fig. 3.8 Map: Mesopotamia.

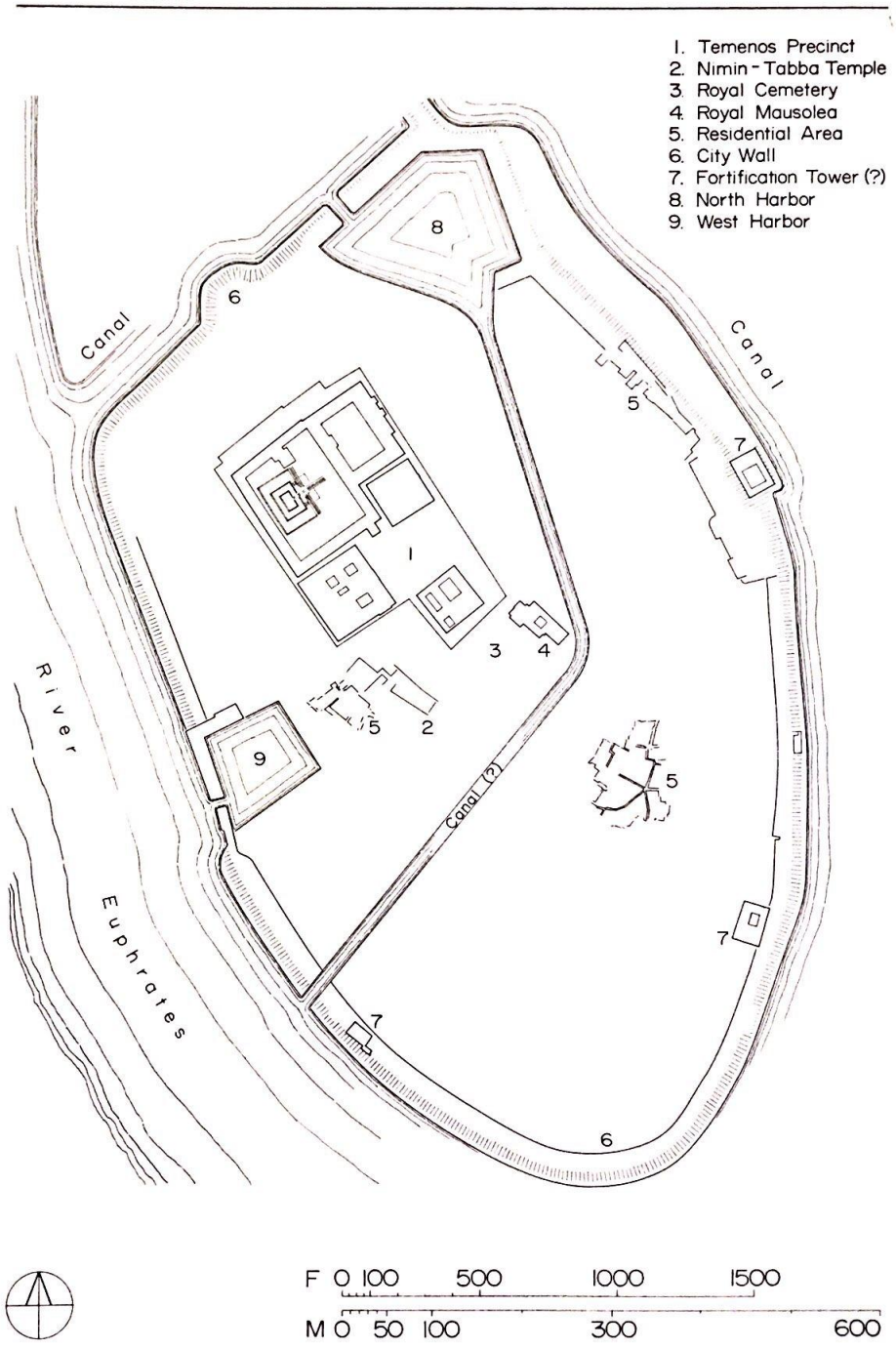


by adding inner steps as required to reach the original floor. When in time the ground storey threatened to be buried below street level, the house would be pulled down to the ceilings of the ground storey, and a new floor would be built on these ceiling beams to match the current height of the street. The replaced ground storey was often pressed into service as a family vault. Furthermore, the house might be altered through suitable remodeling to ready it for a new function, as when Mr. Igmil-Sin of Ur, headmaster of a boys' school, adapted the courtyard and guest room of his house (on what Sir Leonard Woolley has nicknamed Broad Street) into classrooms, or when No. 1 Bakers' Square was entirely redone as a smithy. Nothing about the city-form, in short, was fixed and finished at any time, any more than the human body is fixed and finished at any time during its existence; architectural metabolism constantly transformed the makeup of the cityscape that was held together by the stiffer skeleton of streets and ramparts.

The houses were, for the most part, one-storey structures of mud-brick, with several rooms wrapped around a central court. There were usually no outside windows, no attempt to contribute to a street architecture. The family turned within. The only opening to the outside, the front door, revealed nothing when it was opened but a small vestibule with a blank wall directly ahead. You entered the house proper through a door to one side of the vestibule.

The wealthier classes of Ur lived in ample houses of a dozen or so rooms, arranged on two storeys, and whitewashed inside and out. The ground storey was set aside for the servants, who were generally domestic slaves, and for guests; the family lived upstairs. A typical plan had a wide and shallow reception room on the far side of the court for visitors, a main lavatory on the side of the court facing the guest room, and, next to it, the staircase for the upper floor. (Fig. 3.11) At one corner was the kitchen. The court had four wooden posts at the corners that held up a continuous wooden gallery giving access into the upper rooms. (Fig. 3.12) The roof sloped gently inward, projecting beyond the gallery to protect it from rainwater which was directed, by

Fig. 3.9 Ur (Iraq), schematic plan of city in second millennium B.C.



means of gutters sticking out of an inner coping, onto the paved court below and from there to the subsoil. These were comfortable, even gracious, houses, with a minimum of simple furniture moved about easily as needed: folding chairs and tables, mattresses, chests of wood or wickerwork to store clothes, colorful rugs on the floors, and plenty of cushions strewn about. The domestic arrangements have much in common with modern Arab houses in the Middle East.

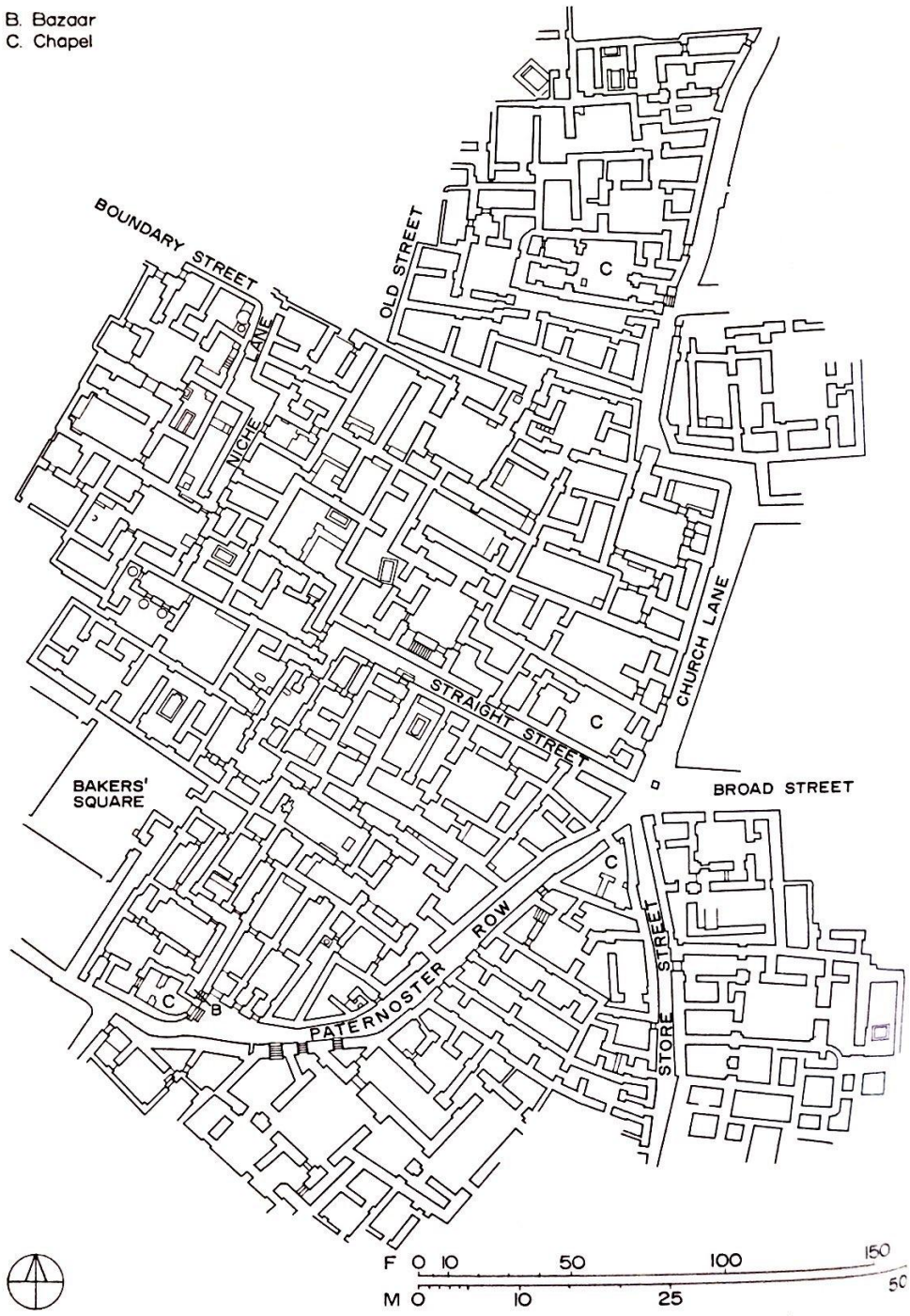
Temples and Ziggurats

A map of Nippur on a clay tablet from about 1500 B.C. gives a graphic rendition of the public aspect of the city. (Fig. 3.13) To the left, the double line of the Euphrates River is evident, the lifeblood of the plain, whose low banks and moderate course made navigation possible and whose flooding, when tamed, turned dust into fertile mud. Alongside it, we can see the double line of the city wall, the crown of sovereignty. In the middle, we find a canal, the imperative of advanced irrigation and the index of an organized and self-reliant community. Then, to the right of the canal, the most important symbol of all, the temple of the god or goddess who watched over the city.

The temple constituted the heart of the Mesopotamian city. Small, freestanding shrines, we know, already existed in the farming villages in preurban days. They had two standard features that were to be retained: a niche of epiphany, perhaps already at this time marked by the statue of the deity or an altar, and a table for offerings. By 3500 B.C. these shrines had become codified into monumental temple forms and fitted into the urban scheme.

One among the many gods ranked supreme, a deity who was thought, quite literally, to own the city. All the townspeople devoted their lives to his or her service, and the ruling powers were thought merely to exercise stewardship over the divine estate. The fields and their produce belonged to the deity. The seeds, draught animals, and implements of tilling were supplied by the temple, and the harvest was stored on its grounds for distribution to the community. Craftsmen, organized in guilds, offered part of their output to the temple,

Fig. 3.10 Ur, residential area southeast of the royal mausolea in the twentieth century B.C.; plan.



and so did fishermen with their catch and builders with their labor. The temple complex was the hub of an economic system that has been described as "theocratic socialism." (Fig. 3.14) With its own wall around it, it formed the last bulwark against the city's enemies; when it fell, it was all over for the city, and the patron deity, deprived of a home, would wander aimlessly, as one inscription puts it, like the bird that flies about with no place to alight.

There were two ways in which this temple differed from others in the city. It stood on a tremendous platform called the ziggurat, and being free of the pressures of density in its ample precinct, its form could afford to be both regular and open. It seems that standard temples as well as ziggurat temples grew out of a common archetype. We have a glimpse of this prototype at Eridu, considered in Mesopotamian history to have been the birthplace of kingship. There, a series of temples was built on sand dunes over the years. (Fig. 3.15)

The earliest to leave a trace was a small, thin-walled rectangular enclosure with projecting piers within. Two circular tables for burnt offerings stood outside. When this was overwhelmed by wind-blown sand, or perhaps purposely buried, a similar structure was stood over it, but with some crucial modifications. One side of the rectangle broke out into a projecting bay containing a podium or altar; a second podium, most likely an offering table, stood in the middle. A door led into the enclosure from the side opposite the altar bay.

The next phase was an oblong scheme with a central nave disposed longitudinally and flanked by subsidiary rooms somewhat in the manner of aisles. The corner rooms formed projecting bastions. A cross-axis was set up by an oblong room in the middle of each aisle. These acted as vestibules to doors cut into the long sides of the tem-

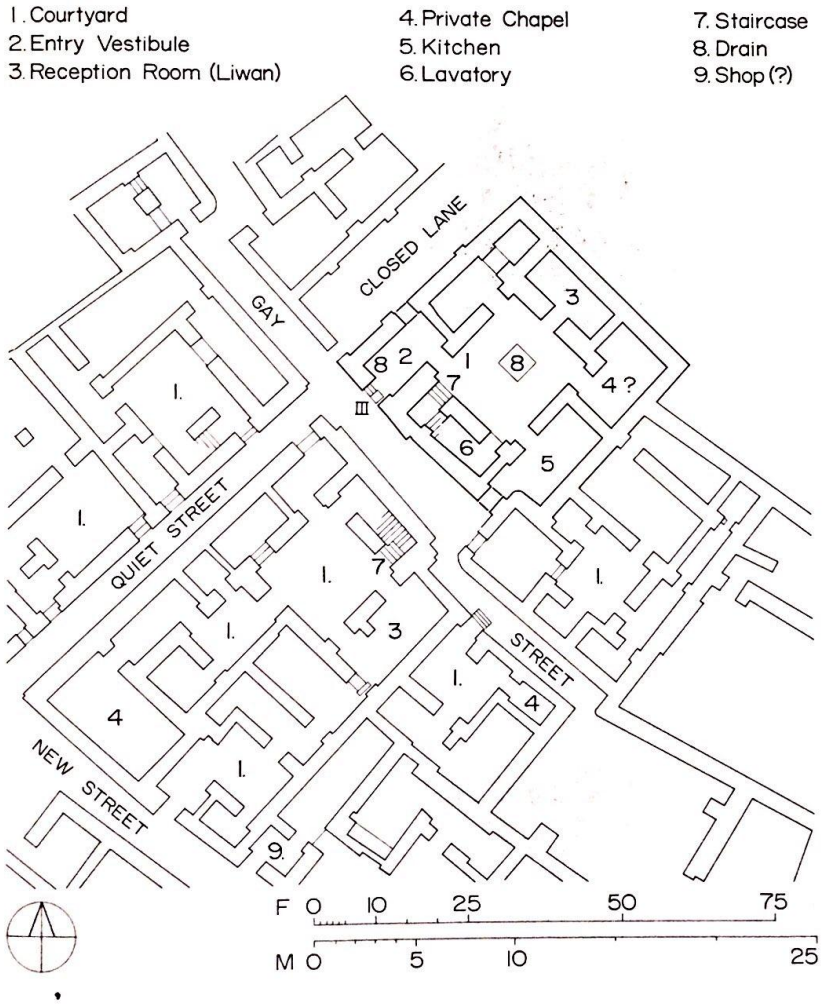
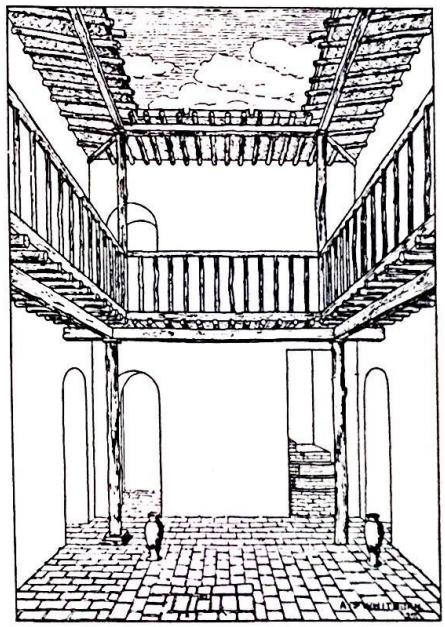


Fig. 3.11 Ur, residential quarter between the ziggurat precinct and the West Harbor; plan. Number III Gay Street is the plan of the upper-class house shown in Fig. 3.12.

Fig. 3.12 Ur, Number III Gay Street, court; reconstruction drawing.



ple, of which one, to the southeast, was approached by a formal stair. There was also a double entrance on the short side opposite the altar. The walls were now thick and buttressed all along the exterior periphery. Inside, spur walls and buttresses were spaced in relation to the ceiling beams and rafters that would rest along the tops of the walls.

At this point the temple form began to diverge. At Warka (Uruk), the biblical Erech, we have an early classical example of the ziggurat temple, while the development of the standard temple can be followed in three successive buildings in honor of the moon-god Sin at the northern town of Khafaje.

At the White Temple of Warka, dating from the Protoliterate Period, the corner bastions were dropped, and the exterior outline was neatly pleated in a uniform arrangement of buttresses that created wall niches and reveals. (Fig. 3.16) Clearly, the initial structural logic of this distinctive feature of Mesopotamian temple architecture had already been transmuted into a system of aesthetics. What started as a support for the mud-brick walls became, in addition, the means of their plastic articulation.

The White Temple sat on an artificial mountain, or ziggurat, of irregular outline, rising 12 meters (40 feet) above the featureless plain. The ziggurat had swelled to grandiose proportions in stages by absorbing the frames of earlier temples, which in accordance with local practice would be filled solid after serving their time, to be used as terraces for the replacement structure. The walls of the ziggurat were sloped and striped with diagonal fluting. Access to the top was by means of a stair and ramp built against the northeast face. The temple stood toward the southwest, unencumbered by parapets. Its four corners pointed toward the main directions of the compass, the standard orientation for religious architecture. Whitewashed and lofty, it would be visible for miles around above the ring of the city walls—a landmark that placed Warka in the vast stretches of fields and marshes and announced its divine patronage.

The case of the urban temple was different. Dedicated to lesser deities, it was built closer to the living space of the city and was surrounded by common structures. Sin Temple II at Khafaje, roughly contemporary with the White Temple of Warka, illustrates the result of this crowded condition. (Fig. 3.17) The temple proper was sealed tight on three sides and could be entered only through an irregular forecourt. Cult observances carried out in the open air at Warka were here relegated to this odd space. One of the aisles of the tripartite temple plan now housed a narrow staircase leading up to the flat roof, a usable space in the summertime. At Sin Temple V, a later stage of the same building, the stair was removed from this aisle, perhaps to discourage excessive traffic through the temple, and set up outside along one wall of the forecourt. Additional courts contained the bread ovens associated with the daily meals of the deity, and offices and storerooms lined up along the south side.

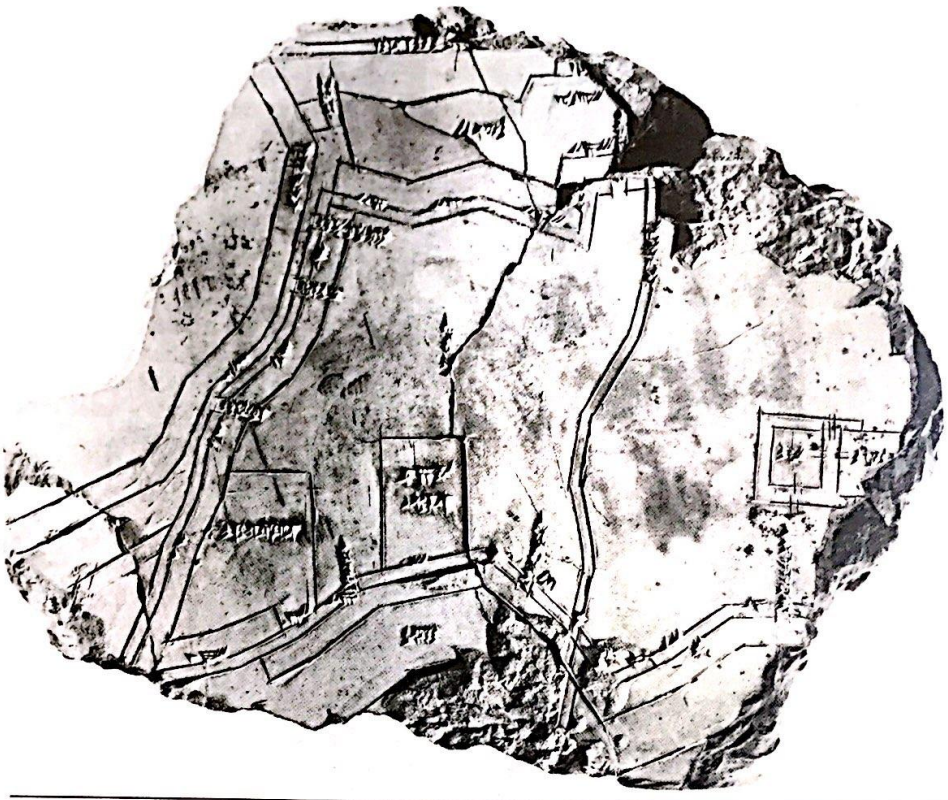


Fig. 3.13 Nippur (Iraq), ca. 1500 B.C.; map on clay tablet.

These practical adjustments to the urban fabric affected the experience of the temple. Rather than being an object in midspace with openings on three sides, as was the White Temple at Warka, the temple now became the innermost of a series of enclosed spaces with a single entrance in one of its long sides. By the time of Sin Temple VIII, in the Early Dynastic Period, the one main entrance to this introverted complex was flanked by massive blocks of masonry and approached by a monumental staircase; the courts were consolidated into one functional space; and the temple was tightened further through the suppression of one aisle and the rigid reordering of the

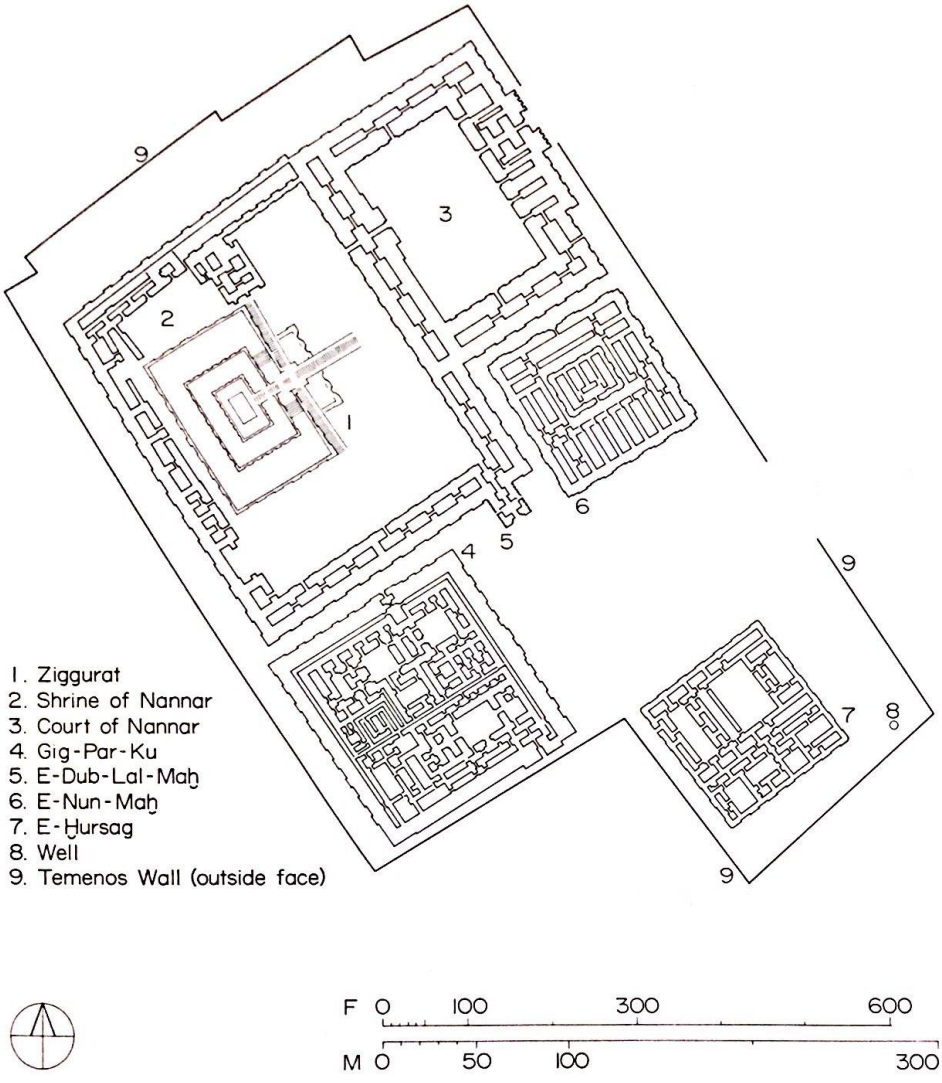


Fig. 3.14 Ur, ziggurat precinct, Third Dynasty (2113–2006 B.C.) and later; plan.

other so that it formed a single antechamber to the holy of holies.

The urban temple, now formalized, would retain this program even when, as with the nearby Temple Oval at Khafaje, the demolition of houses opened up a large enough area for a major temple precinct. (Fig. 3.18) The court of the urban temple had a well and circular basins for ablutions. Workshops, bakeries, and storage rooms arranged themselves on four sides, while the temple was lifted on its own platform at the far end. In front of the court, there was a more public area with the offices of the temple administration to one side. A high wall wrapped around the entire precinct, which had to be entered through a single substantial gate flanked by towers. Here at this fortified gate the transition was made from the profane world of city streets into the sacred world of the temple complex. The worshipper's axial progress moved through the outer and inner courts toward the elevated sanctuary, in a controlled experience of augmenting privilege and sanctity.

The experience of the ziggurat temple, in contrast, rested on reverential climbing. Godhead in the urban temple resided in a remote and guarded sanctum at the end of a planned sequence. In the ziggurat complex, godhead was lifted up above the city, hovering between the heavens and the daily sea. In nature, this intermediate territory was represented by the mountain. It was in the mountain that the earth and the sky were united. Earth deities dwelled inside it, and the deities of the sky could make its summit their halting place. The very form of the mountain suggested a setting of reconciliation between the two prime motives of prehistoric religion, the comfort of the earth and heavenward aspiration. Rooted in the depths of the earth, the cradle of life and death, the mountain thrust upward like solid prayer to a region that the sun's path circumscribed and the stars populated. It married in its shape the dark cave below and the dome of heaven above. It became the traditional stage of communion between gods and chosen mortals. In every religion of the past, processions of pilgrimages make their way up these natural ladders; they were, and still are, among the most elemental rituals of faith.

The ziggurat was conceived as a substitute mountain. (Fig. 3.19) The Sumerians who galvanized the first towns of Mesopotamia had come down from the mountainous north, probably from the area around the Caspian Sea. In the mud plain of the south, the need to re-create the natural architecture of their homeland must have been keenly felt. This atavistic urge is evident in the naming of ziggurats: one of them, for instance, is called "House of the Mountain, Mountain of the Storm, Bond between Heaven and Earth."

The essence of the ziggurat is that it be high. At its skirts will be arrayed the full

panoply of theocratic socialism—storerooms and workshops, offices and priestly quarters, and a temple where the statue of the deity will stand for his or her epiphany, since the unshielded radiance of divinity is not commonly bearable. Up above, he or she will appear in person to those entitled to witness the deity's full glory. The ziggurat is a ladder, then, as much for the deity's descent into the city as for the ceremonious climb of human servants—the king and the high priest and the pure virgin whom the male god would have chosen for himself and whose union with him would bring about, for one more year, fertility and abundance in the land. The ziggurat temple was, among other things, a marriage bed. We recall the Greek historian Herodotus' description of the ziggurat at Babylon.

> On the topmost tower there is a spacious temple and inside the temple stands a couch of unusual size, richly adorned, with a golden table by its side. There is no statue of any kind set up in the place, nor is the chamber occupied by anyone but a single native woman . . . who is chosen for himself by the deity out of all the women of the land. They also declare that the god comes down in person into this chamber, and sleeps upon the couch.

The commission to build the temple came from above. Precise measurements were spoken to the king in secret. We have the account of King Gudea of Lagash and how he first realized that something was expected of him when the Tigris refused to rise during the normal period of inundations; how the god then told him in a dream that he wished to be established, a clear reference to the preurban period when nomads and farmers would consecrate a forest or a mountain or a cavern to the gods in return for the use of the remaining land. When this land was made to carry cities, and the cities became magnificent, a new house for the gods had to be undertaken. We encounter similar feelings in the nomads who

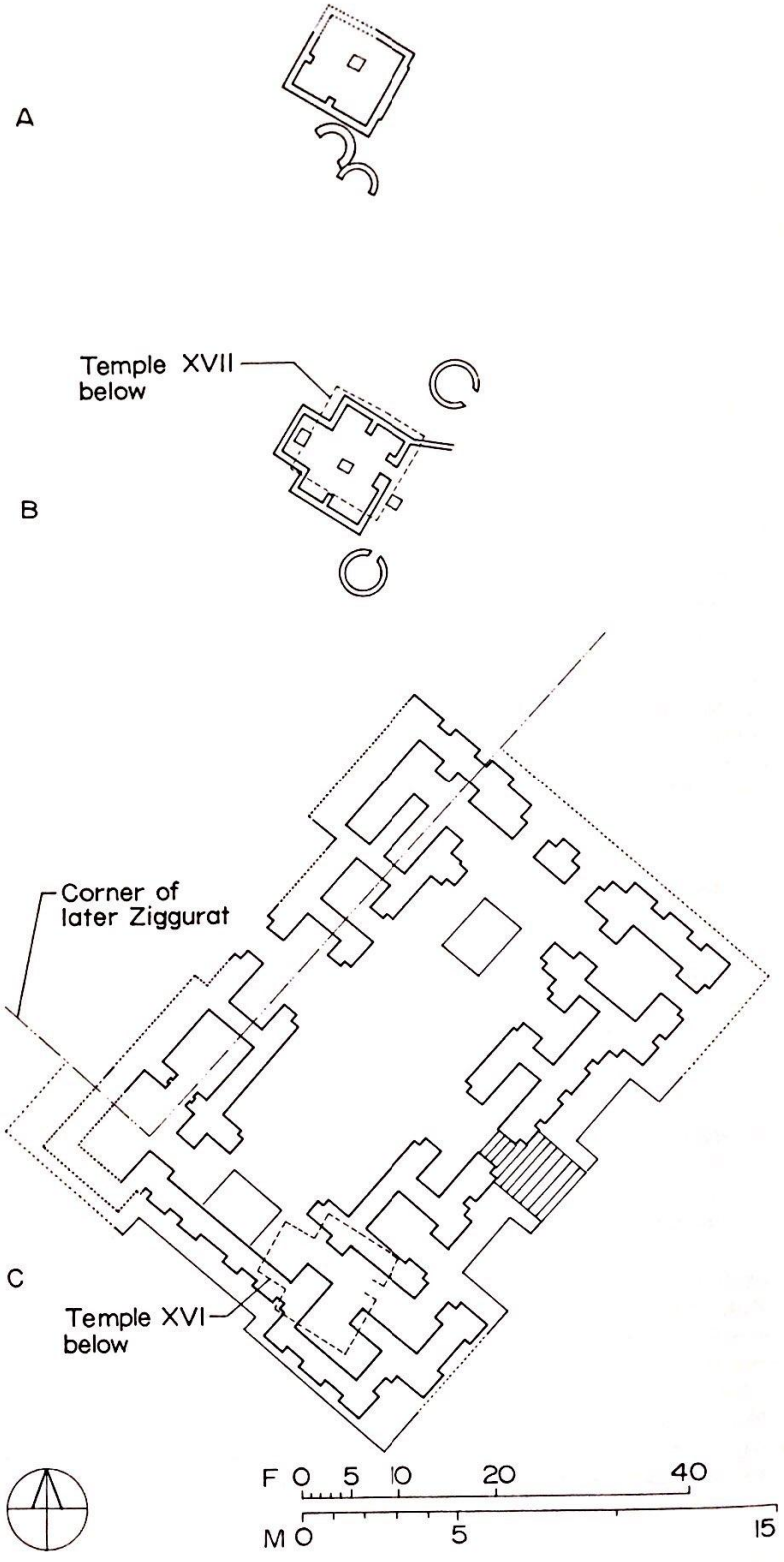


Fig. 3.15 Eridu (Iraq), ground plans of superimposed temples: (A) Temple XVII, ca. 5000 B.C.; (B) Temple XVI, ca. 4900 B.C.; (C) Temple VII, ca. 3800 B.C.

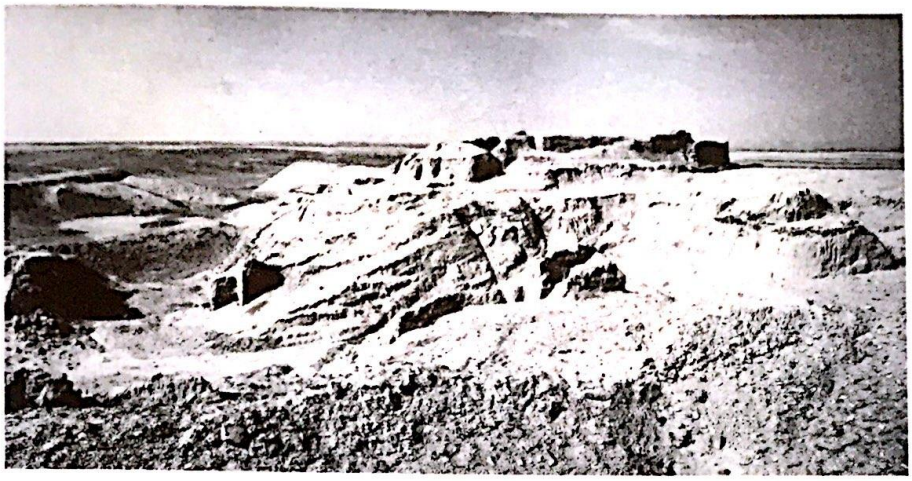


Fig. 3.16a Warka (Erech or Uruk, Iraq), "White Temple," present state.

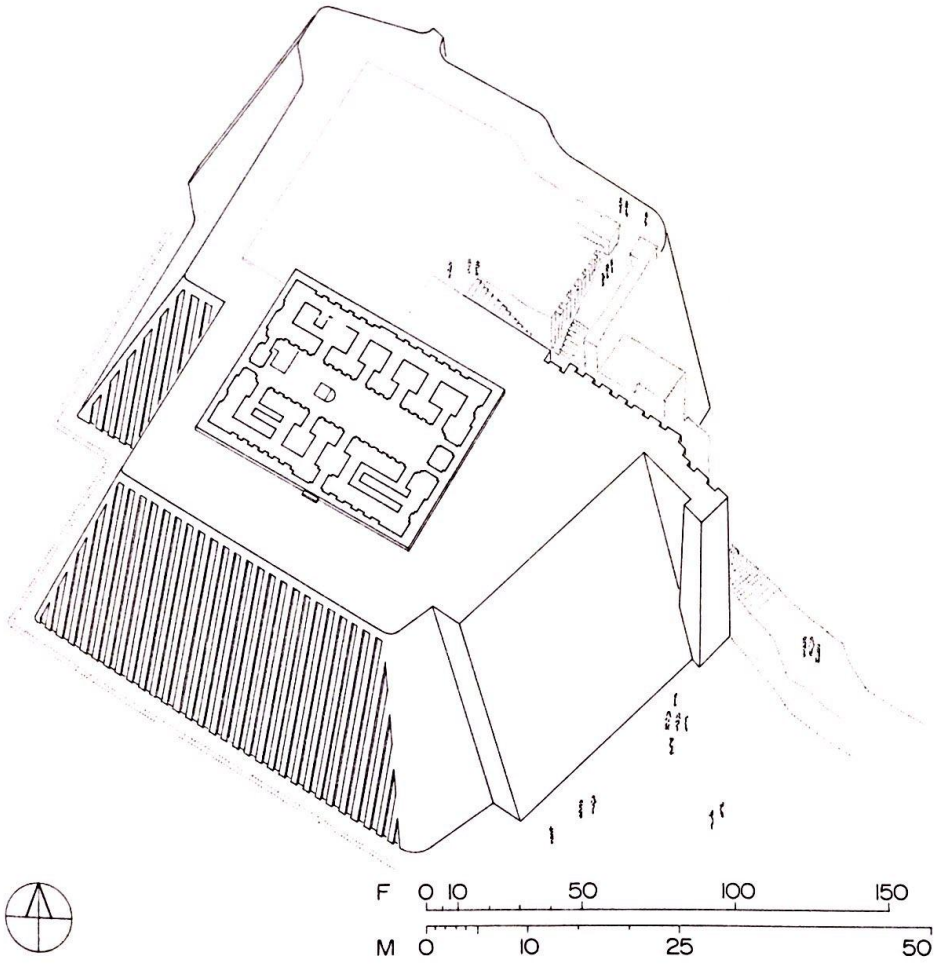


Fig. 3.16b Warka, "White Temple," 3500–3000 B.C.; axonometric drawing of ziggurat with temple plan.

now lived in an architectural environment, as reflected in the Old Testament; King David, to obliterate the deplorable contrast between his luxury and God's houselessness ("See now I dwell in an house of cedar, but the Ark dwelleth within curtains." II Samuel 7:2) announces the founding of a temple that would be a permanent sanctuary for the hitherto portable, peripatetic Tabernacle.

But what form should the house of god take? Gudea was given appropriate instructions. He then alerted his people to gather materials. The city was purified. At the site of the future temple, the soil was swept away until native rock was reached; offerings were laid out; the foundation trenches were filled with purified earth. Then the piling began. The king himself and his family led the community in this ritual of labor. A later Sumerian relief from Ur depicts King Ur-Nammu's involvement in temple architecture. (Fig. 3.20) At the top, the king is pouring libations before an enthroned deity who is shown holding measuring rod and line. In the next register, the king is carrying builders' tools on his shoulders—pick and compasses and mortar basket—assisted by a priest and led by the god. Below this relief the construction of the temple was begun; a ladder remains from the otherwise destroyed scene. We have a late cuneiform tablet that testifies to the king's active role.

> The Lord Marduk commanded me concerning Etemenanki, the staged tower of Babylon . . . that I should make its foundations secure in the bosom of the nether world, and make its summit like the heavens. . . . I caused baked bricks to be made. As it were the rains from on high which are measureless or great torrents, I caused streams of bitumen to be brought by the canal Arahtu. . . . I took a reed and myself measured the dimensions. . . . For my Lord Marduk I bowed my neck, I took off my robe, the sign of my royal blood, and on my head I bore bricks and earth.

The word "staged" is accurate. In contrast to the ziggurat at Warka with its single stair, later ziggurats were usually towers

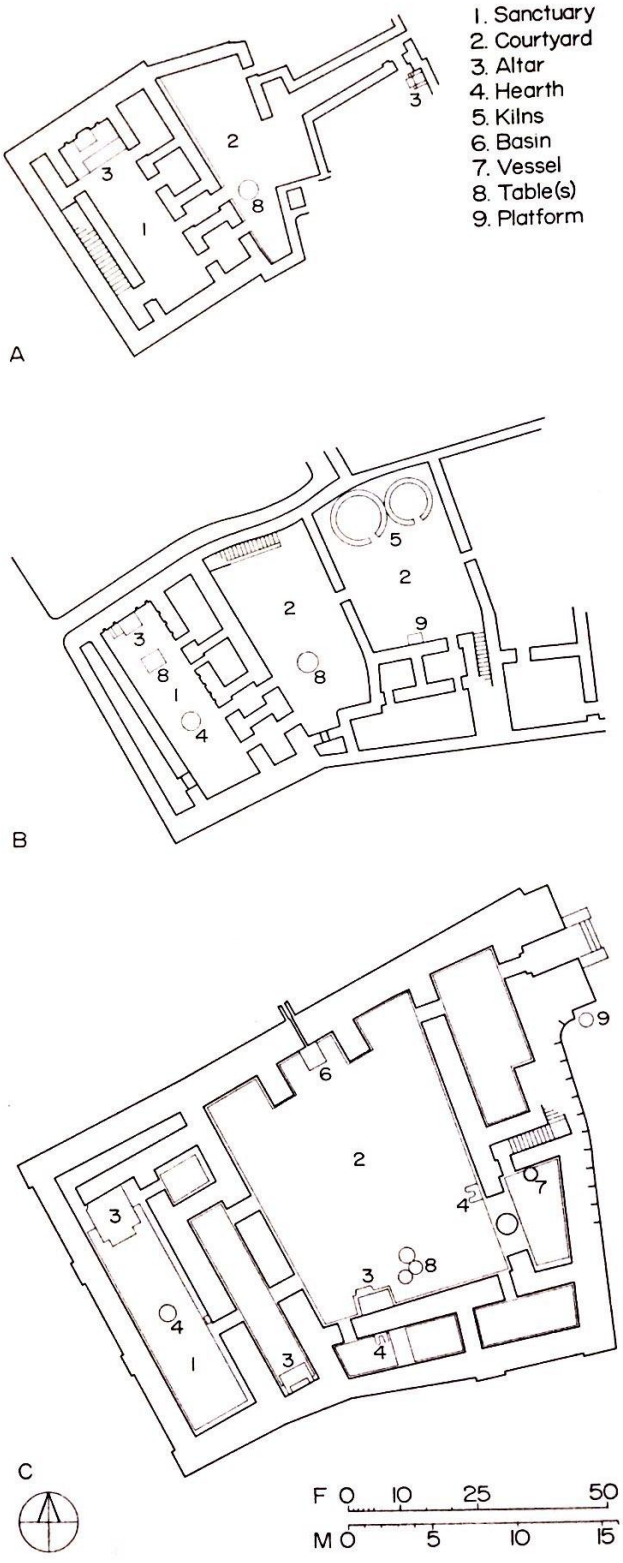


Fig. 3.17 Khafaje (Iraq), ground plans of Sin temples: (A) Temple II, ca. 3000 B.C.; (B) Temple V, ca. 2900 B.C.; (C) Temple VIII, ca. 2750 B.C.

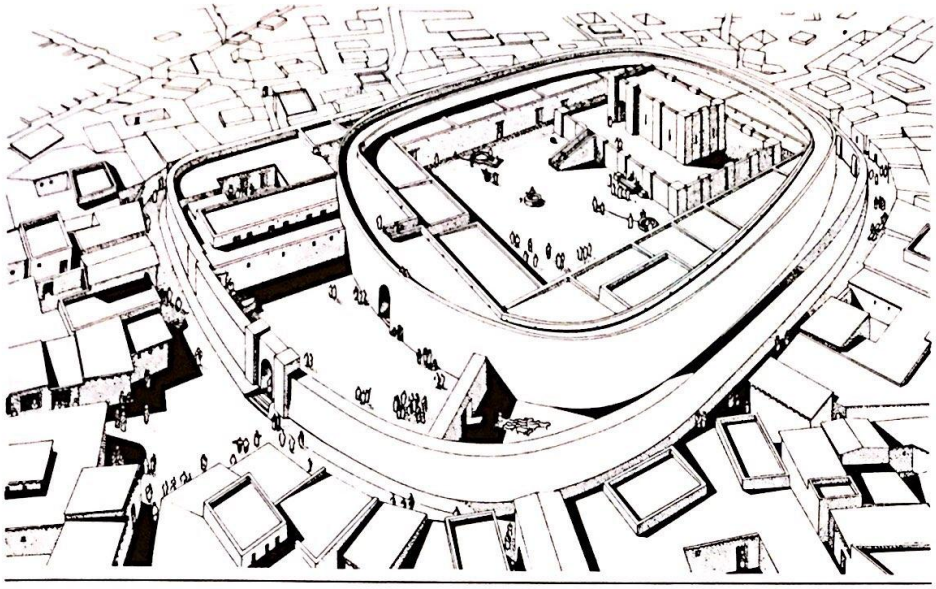


Fig. 3.18 Khafaje, Oval Temple, ca. 2650–2350 B.C.; reconstruction view.

with several distinct terraces. The most famous among them, the great ziggurat of Ur-Nammu at Ur (ca. 2000 B.C.), was a stepped pyramid in three stages. (Fig. 3.21) The core was of mud-brick, and the thick facing of baked brick was set in bitumen mortar. The approach was on the northeast side. Here, three staircases led upward: one of them set at right angles to the building, the other two leaning against the wall. They converged in a great gateway from which a single flight of stairs ran straight up to the door of the temple. None of the lines of the ziggurat is straight. The sloping walls are, in addition, slightly convex. The wall line on the ground plan is similarly curved outward. These calculated diversions were intended to correct the look of stiffness and enervation that strict rectilinearity tends to induce in structures of this size.

We must complete the picture of the Mesopotamian ziggurat with color and some vegetation. At Ur, it seems evident that the upper terraces were planted with trees that formed verdant hanging gardens. Since exposed soil at these points allowed dampness to seep into the core causing the mud-bricks to swell, narrow slits or "weep-holes" were regularly cut through the baked-brick casing to drain the interior and prevent deformed walls. The color was supplied by tiles. The earliest trace we have of this refinement is at Warka. Glazed bricks come much later; they were widely used in the Assyrian period, the technique having been brought over from Egypt where it had long been known.

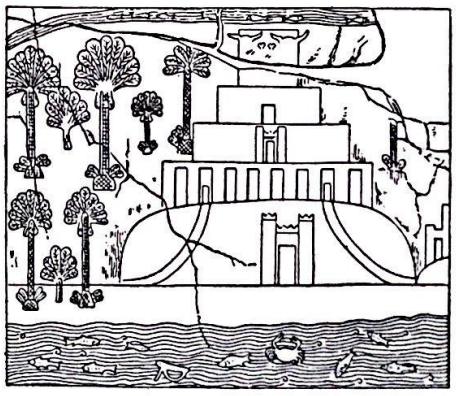
Once the ziggurat and its temple were complete, the remaining question was: Would the god be pleased with it and come to reside there? It is the anxiety that King Solomon feels when the Temple he had built was ready for use: "But will God indeed dwell on earth? Behold the heaven and heaven of heavens cannot contain thee: how much less this house that I have builded" (I Kings 8:27). The hope is in rigorously upheld ritual. One false step on the part of the people or their rulers, any gross irreverence or neglect of the proprieties, and god will abandon the city. The Mountain of Heaven, venerated and ascended in humility, will remain a beneficent tower reaching up toward divinity. Used for sinister purposes, to reach the gods rather than reach up to them, it will turn into a tower of enormity. To the inhabitants of Mesopotamian cities, the ziggurat had always been a ladder of humble reverence, a way to come into contact with the superhuman power that held the secret of their destiny. To the Jews who arrived on the scene with their own jealous Lord God, it was sacrilegious. The ziggurat of Babylon became, for them, the Tower of Babel, an overweening structure that God had no alternative but to interrupt. (Fig. 3.22)

Palaces

This view of the Tower of Babel is of course that of a rival religion that sees in the ruins of the culture it is displacing the just deserts of a wanton community. But internal re-evaluation of the ziggurat in the course of Mesopotamian history is also evident. From being the undisputed center of the city at the beginning, the ziggurat in time lost some physical prominence to other focal points of the urban fabric, the principal one being the palace of the king. At one end of Mesopotamian history, the king lives in the precinct of the god and may in fact be the same person as the high priest. At the other end, during the Assyrian period, the ziggurat becomes a mere adjunct to the king's palace, which now completely dominates the cityscape. (Fig. 3.23)

The stages of such a development are not clear, if indeed they constituted a methodical process. At Ur, the famous ziggurat of the Third Dynasty described above had

Fig. 3.19 A ziggurat as depicted on an Assyrian relief from the palace of Assurbanipal of Nineveh, seventh century B.C. (Fragments in the British Museum, London, and the Louvre, Paris)



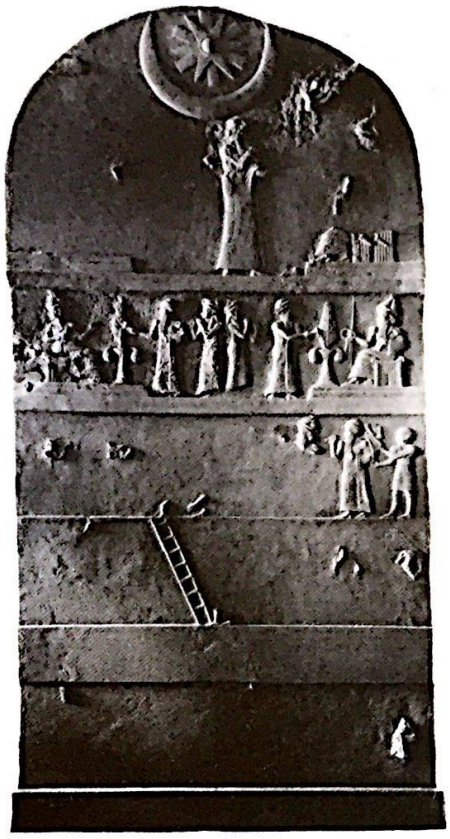


Fig. 3.20 Stele of Ur-Nammu (2113–2096 B.C.), from Ur. (University Museum, University of Pennsylvania, Philadelphia)

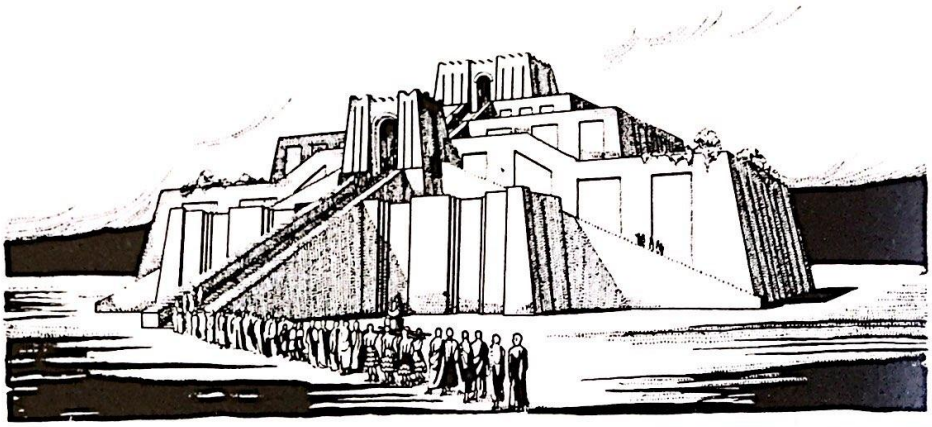
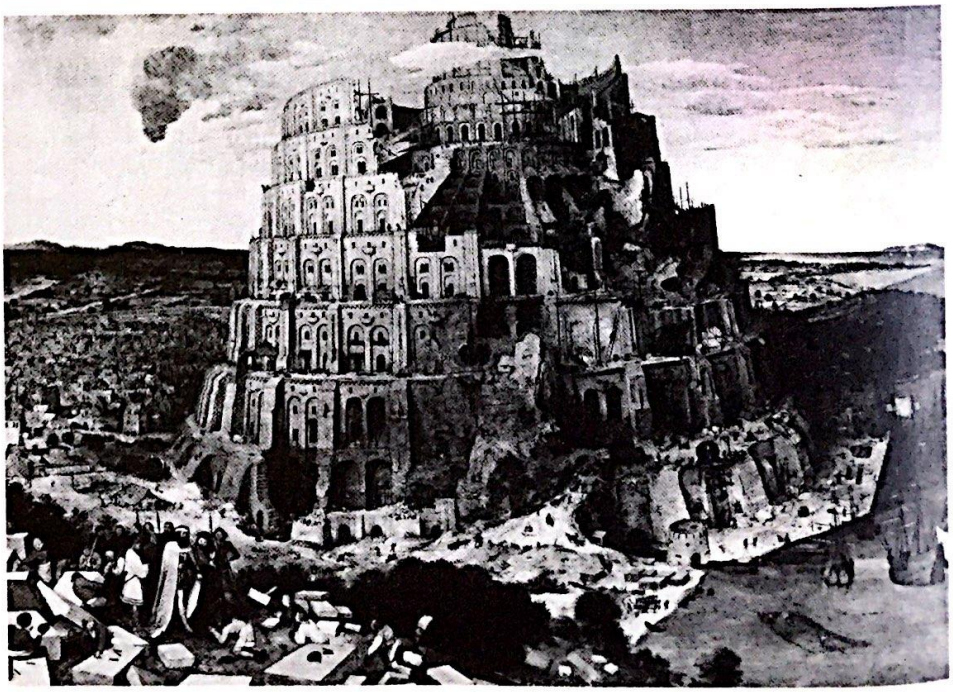


Fig. 3.21 Ur, ziggurat of Ur-Nammu; reconstruction drawing.

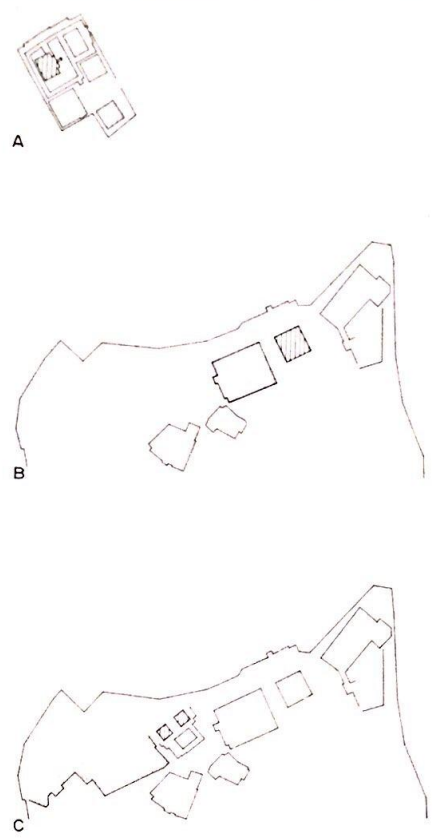
Fig. 3.22 Pieter Brueghel, *The Tower of Babel,* 1563. (Kunsthistorisches Museum, Vienna)



within its precinct walls two residential buildings. (Fig. 3.14) The larger, called Gig-Par-Ku, seems to have been a priestly residence; it is just below the walled enclosure of the ziggurat proper. The other, further east, is the royal palace, a square building divided into three distinct sections. At Mari, about 1750 B.C., the proportions are reversed. The palace, an enormous building of some 260 rooms and courts, overwhelms the ziggurat complex to its southeast.

The plan at Mari is organized around three main courts. (Fig. 3.24) The first of these, capable of holding hundreds of

Fig. 3.23 Sketch plans showing the relationship of ziggurat and royal palace: (A) at Ur, ca. 2000 B.C.; (B) at Assur, ca. 1800 B.C.; (C) at Assur, ca. 1200 B.C.; and (D) at Khorsabad, ca. 700 B.C. The darker hatching indicates palaces; the lighter hatching, ziggurats.



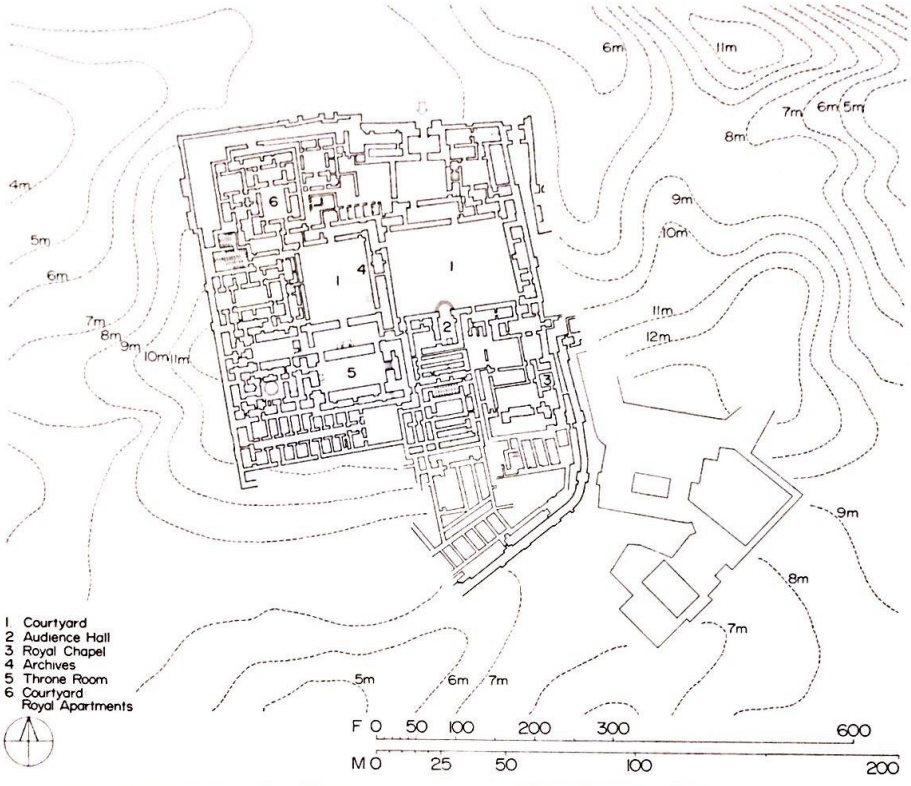


Fig. 3.24 Mari (Tel Hariri, Syria), royal palace, ca. 1750 B.C.; ground plan.

functionaries and petitioners, was approached through a devious, nonaxial path from the only outside gate at the northeast corner. Semicircular stairs on the south side of this vast court led up to what may have been an audience hall. The public sector of the palace centered around the second court, immediately to the west. Its walls were decorated with paintings representing scenes of sacrifice and the investiture of the king of Mari by the goddess Ishtar. The palace archives were kept in a room between the two courts. On the south side of the second court was the Throne Room approached by a magnificent set of stairs. The private living quarters of the royal family occupied the northwest section of the palace. Around a small court, with walls painted to imitate marble encrustation, it is possible to recognize bedrooms of lavish design and the king's own hall. Adjacent to these royal apartments was a service wing containing kitchens and bathrooms (one of them displays two terra-cotta tubs and a "Turkish" lavatory), as well as a school for scribes with rows of benches still intact.

It is not difficult to see the layout of the palace as an elaboration of the private house. The organizing principle of a central court surrounded by rooms is the same; so is the tightly sealed periphery with the single door from the outside and the nonaxial entrance path. (Fig. 3.11) But the size, mixed program, and security of the palace

limit the comparison. Hundreds of rooms have to have access to natural light. The movement of servants and troups must be kept separate from the royal path; the king's intimate life must be separate from his public presence. And in its frame, the palace must be able to accommodate a variety of functions related to the king's double existence as a family man and head of state. In all this, the palace behaves as a microcosm of the city, with its walls, residences, temples, offices, schools, barracks, workshops, and so on. But it has little of the physical dynamism of the city-form, little of its vital untidiness, little of the social flexibility of streets. It is a regimented city, a vast rectangle divided and subdivided into units of orthogonal geometry, large and small, open and closed, ornate and plain. And the strict relation on paper of one cluster of these units to the next bespeaks a hieratic code of behavior on the part of the thousands of users within. (Figs. 3.10, 3.24)

The next complication in the relationship of ziggurat and palace was that the ziggurat multiplied. At the Assyrian capital of Assur the main ziggurat had stood alone next to the Old Palace. But a double temple to Anu and Hadad (Heaven and Storm) between two square ziggurats rose in time next to the larger New Palace. (Fig. 3.23, B and C) What is more, the ziggurat in Assyrian hands became hard to climb. Means other than stairs and ramps began to be employed, at the cost of the symbolism of the Ladder of Heaven. The two ziggurats of Anu and Hadad were presumably accessible only from the temple roof. At the same time, the classic hierarchy of a deity as the overlord of the city and the king as the steward of the divine estate had been upset as early as 2000 B.C. Some kings, for example those of the Third Dynasty of Ur, were deified in their own lifetime and were adopted as patron deities of vassal cities.

The final debasement of the ziggurat occurs at Khorsabad. This city was a royal Assyrian foundation, begun in 706 B.C., and abandoned, unfinished, shortly afterward. (Fig. 3.25) It covered 2.5 square kilometers (almost one square mile). There were two arched gates on each side of the square, guarded by stone demons in the form of human-headed bulls. On the northwest side one of the gates had been replaced by a

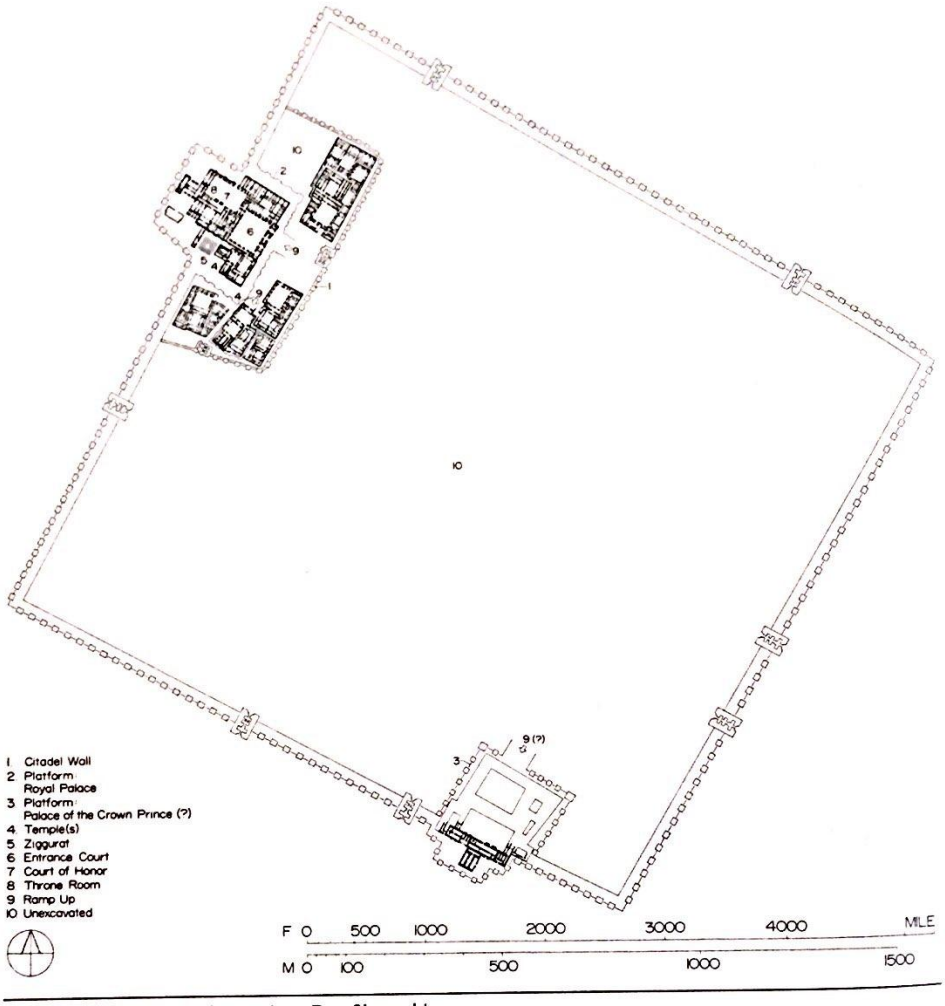


Fig. 3.25a Khorsabad (the ancient Dur Sharrukin, Iraq), Assyrian city founded by Sargon II (721–705 B.C.); plan.

bastion that served as a platform for the royal palace. Rather than being surrounded by the fabric of his city, the king now had his back to the city walls. The citadel that contained the palace, ostensibly a point of last defense against an outside enemy as the ziggurat complex once had been, can also be construed as a ring of protection around the ruling monarch to ward against internal uprisings.

The palace at Khorsabad is similar in general layout to that at Mari. The administrative court of honor is here at the top of the plan, with the great Throne Room on the left. The entrance court is associated with a number of temples grouped along the west side. They were all served by a single ziggurat that was like no other example of this Mesopotamian building type. Small and laced with recesses and crenellations, it looked more like a fancy reliquary than the robust manmade mountain

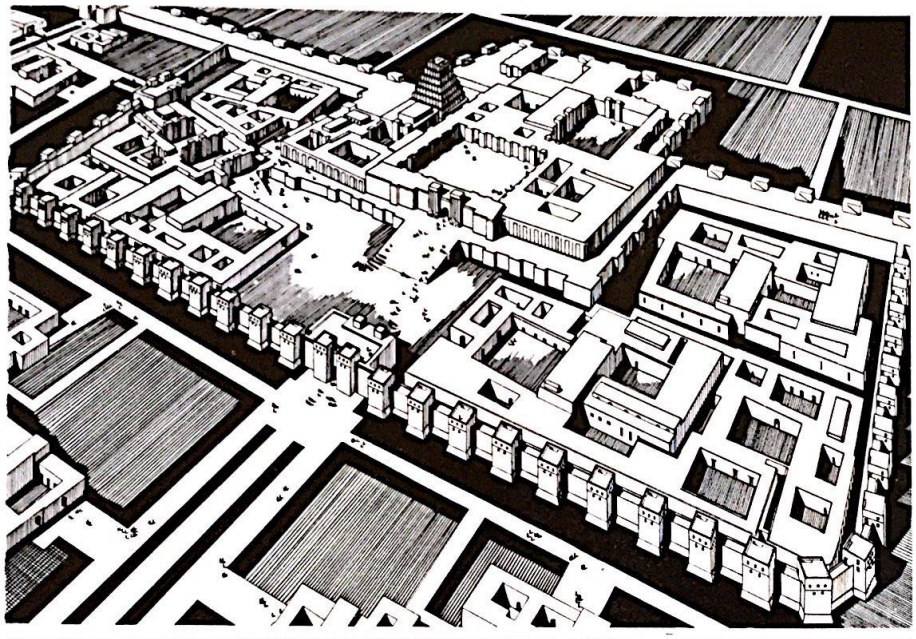


Fig. 3.25b Khorsabad, citadel with royal palace; reconstruction view.

of the cities of the plain. A continuous ramp wound around the exterior, from the base to the summit.

The approach to the palace was through the city, past the citadel gate, and across a large open square. A broad ramp which could accommodate chariots ran up from the square to the main gate of the palace. One passed through it, crossed the first court, and through a small passage at the northeast corner was ushered into the court of honor. This was an impressive, indeed terrifying, waiting room for those who had been granted a royal audience. The walls were revetted with stone slabs carved in relief. They showed the king and his courtiers, over life size, all facing toward the Throne Room. Once admitted through one of its three doors, the petitioner or ambassador stood in the brilliantly painted space of an oblong room. The throne, as at Mari, was set against one of the narrow walls. Its base was of stone and carved upon it, as a suitable warning to those within who might contemplate rebellion and to enemies without, was a relief showing King Sargon, the founder of Khorsabad, "in his war chariot above the bodies of the slain while soldiers piled up pyramids of heads before him."

The Throne Room at Khorsabad is a fitting testimonial to the warlike Assyrian kings who had ruthlessly forged an empire out of the city-states of Mesopotamia and struck terror among neighboring people. With the slow erosion of urban integrity and of the allegiance of the city to a single superior deity, the palace as a building type arrives here at its grim apogee. It had started out as an accessory to the ziggurat—the administrative headquarters and official residence of a pious king who supervised grain distribution, the maintenance of dikes and canals, and the preventive rites against floods and outside attacks. But the palace grew at the expense of the ziggurat, as an increasingly autocratic sovereign ruled heavy-handedly over both church and state. And it developed, finally, into a theater of absolute power and intimidation, the symbol of a city whose piety now existed in the shadow of a fierce war machine.

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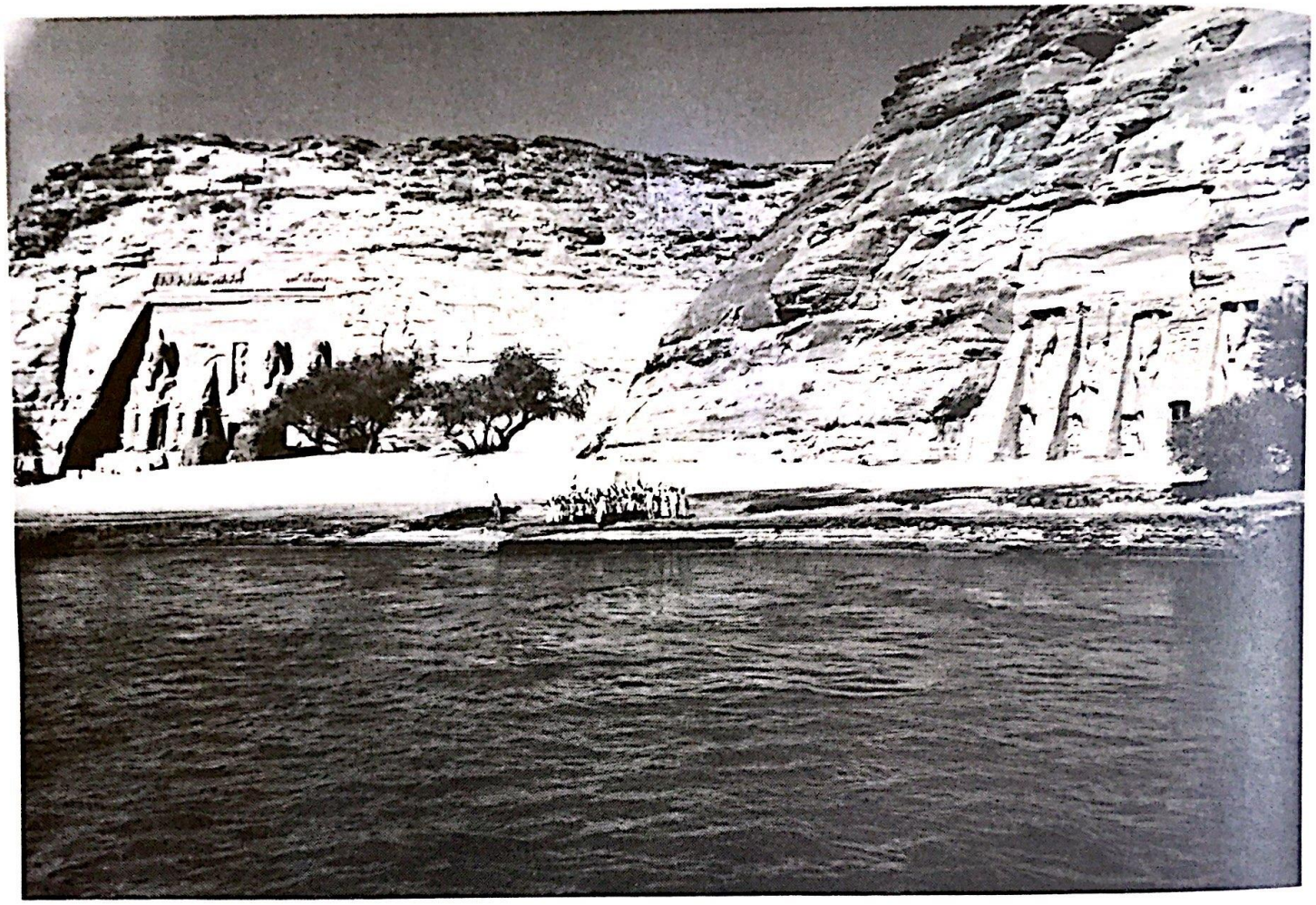


Abu Simbel (Egypt), rock-cut temples, ca. 1250 B.C.

4

THE ARCHITECTURE OF ANCIENT EGYPT

The Land of Egypt

The ancient Egyptians were in all likelihood an indigenous people, though they were not as isolated from the rest of the Mediterranean world as it has sometimes been claimed. From the beginning they traded with the communities of Western Asia across the Sinai Peninsula, and with the Libyan tribes to the west across the Delta. They imported cedarwood from Lebanon and exploited the gold mines of Nubia (Ethiopia) to the south.

As in Mesopotamia, the story begins with the village life of farming and animal husbandry, in the highlands above the Nile Valley, which was transformed in time into a sophisticated pattern of river settlements based on controlled irrigation. The political authority that rose in the Land between the Rivers to oversee the network of canals and dykes functioned through a number of independent cities. Neolithic village life along the Nile developed instead into two broad polities: Lower Egypt, which included the whole Delta area until the neighborhood of Memphis, and Upper Egypt, southward from this point as far as Aswan. Each had a separate ruler and a separate capital—Pe (Buto) in Lower Egypt and Nekhen (Hierakonpolis) in Upper Egypt. (Fig. 4.1) Then, at the start of recorded history, King Menes of Upper Egypt invaded the north and unified the country, an event which made a deep impression on the collective memory of the people of the region and became the pivot of political, and hence architectural, symbolism.

This unification and the setting up of a capital at Memphis coincide with the very end of what we had called in the last chapter the Protoliterate Period, that is, about 3000 B.C. By this time some basic schemes had already surfaced in the vernacular idiom of reeds and mud—for example, the battering of walls and plant-based uprights—that will become standard features of the monumental architecture to follow. One of the most characteristic aspects of Egyptian culture is conservatism, or rather the balance it always sustains between innovation and tradition.

During the Early Dynastic Period in Mesopotamia, Egyptian building displayed great advances. Beginning with impressive palaces and tombs in brick which leaned on the vernacular idiom and aggrandized it, the country developed an articulate stone architecture, the great examples of which, at Saqqara and Giza, we soon will be looking at. Egyptologists refer to this stretch of time as the Archaic (or Thinite) Period, roughly 3000 to 2665 B.C., and its sequel the Old Kingdom, down to about 2150 B.C. It is marked by the emergence and consolidation of absolute kingship. The indestructible monuments that still tower over the riverscape south of modern Cairo were intended to commemorate the rule of the pharaoh, divine and all-powerful, and to ensure the perpetuity of his cult. (Fig. 4.10)

This unchallenged central power was dissipated toward the latter part of the third millennium, but was reinstituted, after a spell of political and social chaos, in a more tempered guise. In the period called Middle Kingdom, about 2250 to 1570 B.C., power was shared by provincial governors, or nomarchs, and the priesthood of important deities. In the bewildering crowd of local gods and goddesses, each with his or her own geographical sphere of authority, the royal cult in the Old Kingdom had stood out as the national religion that absorbed collegiate divinity and transmitted its hope to the masses. Now the pharaoh had to acknowledge the power of some priestly fraternities to act as intermediary between the people and the protagonists of the official pantheon, headed by the sun-god Re and the trinity of the netherworld, Osiris, his wife Isis, and their son Horus. The king's funerary settings came first to accommodate his divine colleagues more generously and, in time, their own temples loomed large on the banks of the Nile.

The actual flourishing of monumental temple architecture in Egypt, as distinct from environments of royal burial and attendant practices, belongs to the so-called New Kingdom, especially between 1600 and 1300 B.C. (Fig. 4.20) This period opened with the expulsion of an alien invasion force, the Hyksos people, out of the Delta, which involved Egypt in a new policy of conquest. A vast Egyptian empire came to embrace much of the Sudan and subject states in Palestine and Syria.

There is no neat correlation in the development of the first two literate cultures of the Near East; no historical coincidence of their high points and nadirs. In the structure of their physical setting, in the building materials they used, in political organization and attitudes toward life and death, the two regions are also not comparable. Although both were river environments disciplined early by a network of canals and dykes, Egypt's single river was never tur-

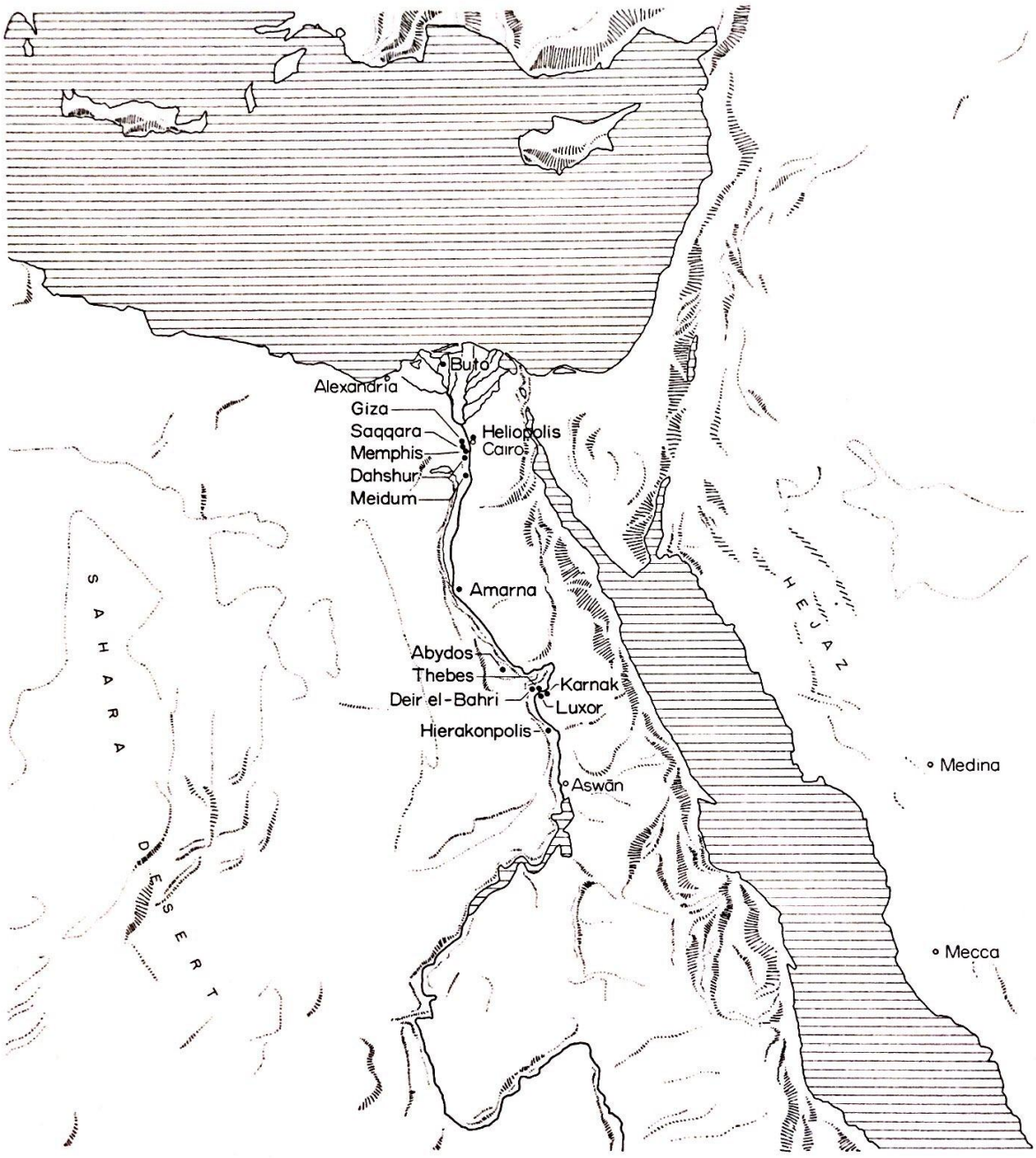


Fig. 4.1 Map: Ancient Egypt.

bulent like the Tigris and Euphrates. It was a temperate, steady line of water, navigable throughout, and subject to unfailingly regular and benign flooding. From July to October the low-lying banks were inundated, the waters leaving their deposit of rich black silt which could be sowed with little plowing. This narrow strip of valley, the Black Land, was rigidly divided into fields, the boundaries of which had to be re-established after every period of flooding. Egypt's early mastery of geometry and its affinity for the right angle (curved walls or circular buildings are almost unknown in the ancient architecture of Egypt) owe a debt to this annual survey.

The Nile in fact was the great axis. For 500 miles it stretched, the country's liquid spine, a band of blue and arable green hemmed in by parallel lines of cliff in Upper Egypt, and fanning out further north to form the broader frame of the Delta. Beyond, to east and west was the Red Land, the desert, death. Except for the Delta folk, most Egyptians knew no circular horizon. Things ran along the Nile, mostly north and south, or at right angles to it, in the direction of the rising and setting sun. Orthogonal planning came naturally both in the field division of the Black Land and in the design of cities. We have only to compare the tangled layout of later Sumerian Ur with the strictly orthogonal "pyramid city" of Sesostris II (1897–1878 B.C.) at El Kahun, its main streets running precisely north-south, to grasp the difference between Mesopotamian and Egyptian order. (Figs. 3.10, 4.2) This difference is between an organism that grew loosely through time in response to patterns of mixed use, and the predetermined plan of El Kahun, laid down at one time, with standardized buildings grouped into special zones—brick row houses, often

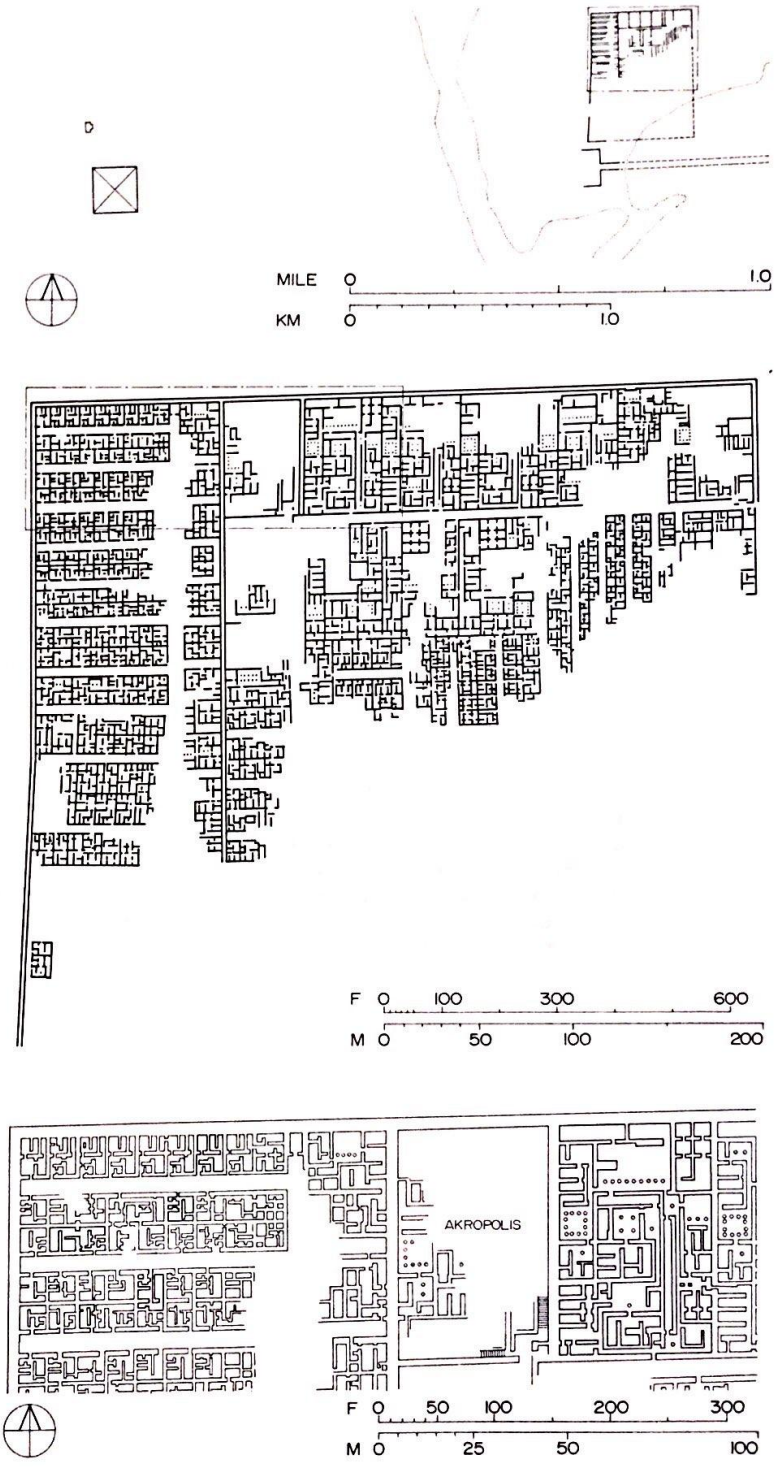


Fig. 4.2 El Kahun (Lower Egypt), the workers' town at the pyramid site of King Sesostris II (1897–1878 B.C.). Top, site plan, with pyramid indicated at the far left and the valley temple with its causeway at the far right, just below the town; middle, plan of the excavated section; bottom, a detail plan of the northwestern strip, showing workers' housing to the left—the darker lines indicate house types—and the ampler quarter for government officials to the right.

back to back, for the workers and craftsmen, a quarter of large mansions for government officials, and the enclosed compound for the king next to the northern wall.

This is not to say that Egypt was without its organic urban clusters, especially in older cities like Thebes or Memphis, of which unhappily very little has survived. But geometric master plans are unique to Egypt at this early date. There were the so-called pyramid cities created by individual pharaohs, like Sesostris II, to house the work force of their burial complex, the priesthood of the royal cult, and tenant farmers; and the string of planned fortress towns built in Nubia by the kings of the Twelfth Dynasty. The earliest hieroglyphic sign for "province," or *nome*, was a rectangle divided into four by intersecting lines; the sign for "town" showed a circular enclosure around an orthogonal street system or a dominant cross-axis. Even a seemingly random arrangement like the capital of King Akhenaten, Amarna, reflects its sensitivity toward the river axis by having three main arteries that run in line with the bank curve. (Fig. 4.3)

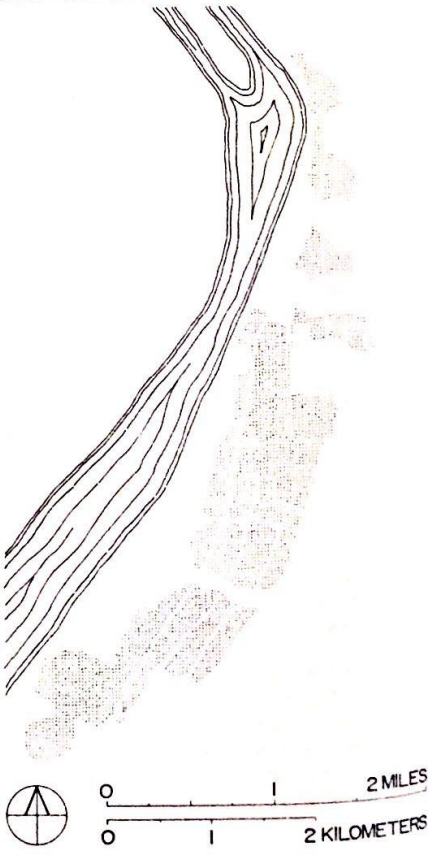
The linear stretch of the land is perhaps evoked in one other aspect of the built environment. Egyptian design conceived of major architectural programs as a series of episodes along a predetermined path. The pyramids of Giza appear today like three splendid objects in mid-space at the desert edge. In fact, they were the culmination of an architectural sequence that began at the west bank. New Kingdom temples were themselves channels of passage like the river along which they stood. (Figs. 4.20, 4.22) The great pylons may have encapsulated this correspondence by their form—a central trough above the entrance and massive flanking towers, like the rock cliffs that bounded the river valley. The clustered columns of the courtyards and halls, with their plant-inspired capitals, conjured up Nile groves.

Once again, the comparison with Mesopotamian temple precincts is instructive. (Figs. 3.14, 4.19) At the ziggurat compound of Ur, a number of independent buildings, each with its own boundary wall, is grouped tidily, but with no unifying axes. The ziggurat itself has three approach stairs that meet at a single gateway some way up the northeast slope. At Karnak, the temple of Amon marshals all its component units along a straight path, and a cross-axis that takes off halfway down the middle of the south flank leaves the precinct of this central group to line up with the Mut complex to the south. Even within the experience of a single temple unit, Khafaje on the one hand and Luxor on the other, the headlong course of an Egyptian axis is distinctive. (Figs. 3.18, 4.18) Not only is the Mesopotamian axis bent, but the terminal sanctuary space, an oblong transversely laid in relation to the directional line of the approach toward it, slows down the momentum of the sequence. At Luxor we are pulled deeper and deeper toward the core of divinity as the spaces along the axis constrict beyond the courts and the level rises, heightening through physical means the wonder and privilege of heading toward the holy of holies.

In one sense, everything along the banks was linked to everything else by the Nile axis. That was the major highway of the country. It brought together the villages of Upper Egypt and the cities of the Delta; it carried northward the granite of far-off Aswan, and the fine limestone of Tura upriver to southern building sites; and for the lowly fellah it provided food and also the building material for his house and boatmaking needs—reeds and plants, and silt for daubing walls and striking brick. The river's majestic calm and the reliable periodicity of its behavior must have projected a settled, eternal order. The Nile flooded when it was expected to, several crops were raised, then came the dry season, and then, with unfailing regularity, the Nile flooded again, as it had for centuries, and the cycle was repeated. Such ageless patterns have no foreseeable end and present no choices. It is not surprising that the Egyptians of antiquity should stake their all on a belief in unruffled stability, on a world view in which death was not a final thing but merely the passage to another region where, speaking not too metaphorically, the Nile flooded and crops were raised and the dry season came and people did what they always did and had about them what they always had: the pharaoh according to his station, the humble fellah according to his. One's tomb was like one's house, but built to last for eternity; its forms logically recalled, through direct imitation or in symbolic shorthand, the architecture of ordinary residences, palaces, and even city walls. Funerary art, in a literal-minded way, provided magical replicas of the buried person's wants and possessions.

In this, too, Egypt is very different from Mesopotamia. When King Ur-Nammu dies, there is sorrow and weeping throughout the land. The "wail of Sumer" reaches him after many days in the dim and sad netherworld. The walls of Ur which he started are left unfinished; the new palace is unpurified; his wife is left behind and he can no longer press her to his bosom. The Egyptian Book of the Dead has no such worries about death.

Fig. 4.3 Amarna (Upper Egypt), the new capital of King Akhenaten (1379–1362 B.C.), Eighteenth Dynasty; diagrammatic plan of layout, showing the relationship to the Nile and the course of the main streets.



O King N! You are not gone dead, you are gone alive . . . you go in, you come out while your heart is glad in the favor of the Lord of Gods. It so happens that you live again. . . . Your soul will not be kept away from your body. . . . You receive what is upon earth. You have water, you breathe the air, you drink to your heart's content.

Not surprisingly, for the first fifteen hundred years of its existence as a high culture, Egypt was obsessed with the preservation and provisioning of the dead body. It lavished its finest efforts to that end, on the theaters of the afterlife. It put up monumental tombs, often built of lasting stone (which, in contrast once more to Mesopotamia, was plentiful), and decorated them prodigiously. Much Egyptian ritual, as well as the development of a masonry architecture unsurpassed in technical skill and the evasive ingenuity of its design, was motivated by the belief that the corpse must be spared disturbance and its material needs must be supplied, so that it could continue to function normally forever. And no corpse was more privileged in this respect than that of the god-king.

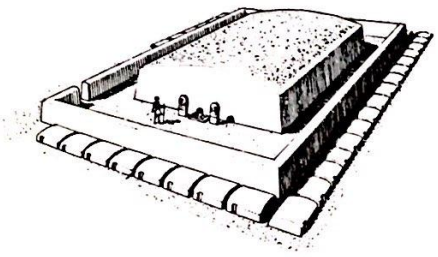
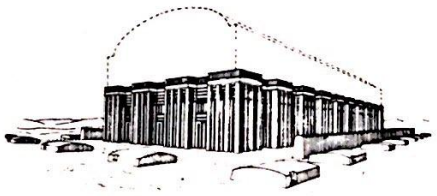


Fig. 4.4a Abydos (Upper Egypt), royal tumulus tomb of First Dynasty (ca. 3100–2890 B.C.); reconstruction drawing.

Fig. 4.4b Saqqara (Lower Egypt), mortuary complex of Queen Herneith, First Dynasty; reconstruction drawing.



The Burial of Kings

At first, after the unification of Egypt and as a consequence of it, the pharaoh was given a double burial. As lord of Upper Egypt, he was buried symbolically at Abydos, 300 miles south of Cairo, a site sacred to the god of the Underworld, Osiris, and the ancestral home of the early kings. The actual body was laid to rest at Saqqara.

The cenotaphs of the early pharaohs at Abydos consisted of a subterranean chamber roofed in timber and topped with a heap of sand contained within a brick shell. (Fig. 4.4) Stelai were set up outside to mark the place for offerings, and beyond a low precinct wall the king's family and members of the court were buried in mastabas, small tumulus graves with a casement of brick. At Saqqara the royal tombs were more complicated. The burial pit, cut into native rock, comprised, in addition to the burial chamber, a number of subsidiary rooms holding the owner's valuable possessions. On this system was erected a large rectangular structure, as much as 9 meters (30 feet) high, with an intricately panelled brick exterior coated with white lime-stucco and painted with geometric designs. This superstructure enclosed rooms where supplies were stored for the use of the deceased. The recessed exterior and the layout of the rooms were meant to stand for the actual palace of the king; consonant with the old Lower Egypt custom, the king was considered buried under the floor of his house.

Two other features make their appearance during the 250-year development of these early dynastic tombs at Saqqara: a small mortuary temple on the north side, and a wooden boat alongside the tomb to carry the pharaoh across the heavens. For everyday he would accompany the sun-god Re on his voyage from east to west and at night in the opposite direction, through the Underworld.

Zoser's Pyramid Complex

The Saqqara tomb of one early pharaoh, Zoser, that dates from about 2680 B.C., is remarkable in several ways. (Fig. 4.5) It is larger and more elaborate than any before it—a vast scheme, and exceptionally not organized on the Egyptian principle of axial sequence. Its architecture develops the most insistent symbolism of the pharaoh as the sole ruler of Upper and Lower Egypt: there are twin tombs, double-court buildings, matching mock palaces. And all this is done in stone—the first interpretation of the brick, timber, and plant forms of Egyptian architecture in the hard medium of Tura limestone.

The structure actually constitutes a technological revolution. This prodigy of masonry construction seems to have no parents. Tell-tale features announce the infancy of its technique. The blocks used are small throughout, more in the measure of brick than cut stone. Uprights, molded in emulation of tree-trunk pillars or bundles of reeds, are not freestanding but always cautiously engaged to walls, and like them built of regular masonry courses rather than of stacked up drums.

Even so, the achievement was epochal and was credited by antiquity to the architect Imhotep. His name is inscribed in one of the rock-cut galleries of the stepped pyramid where he is referred to as being "first after the king of Upper and Lower Egypt." He was revered later for his great wisdom as an astronomer, magician, and healer, and as healer he was deified. In this we have one more fact that sets Egypt apart from Mesopotamia. We know of no Mesopotamian architect by name. The credit for conceiving public buildings and for supervising their construction went to the king. In Egypt, the execution of sacred or prestigious public works elevated the office of the architect instead of forcing it into obscurity. We know something of his working methods from a handful of architectural drawings that have survived. The design process would appear to have combined a simple overall geometric system and the use of a set module to derive the dimensions of the building.

The stepped pyramid which contained Zoser's body stood on high ground in the middle of a vast rectangular terrace about 550 by 275 meters (1,800 by 900 feet). The high wall with recessed paneling around the terrace and the bastions that imitate towered gateways make it probable that Im-

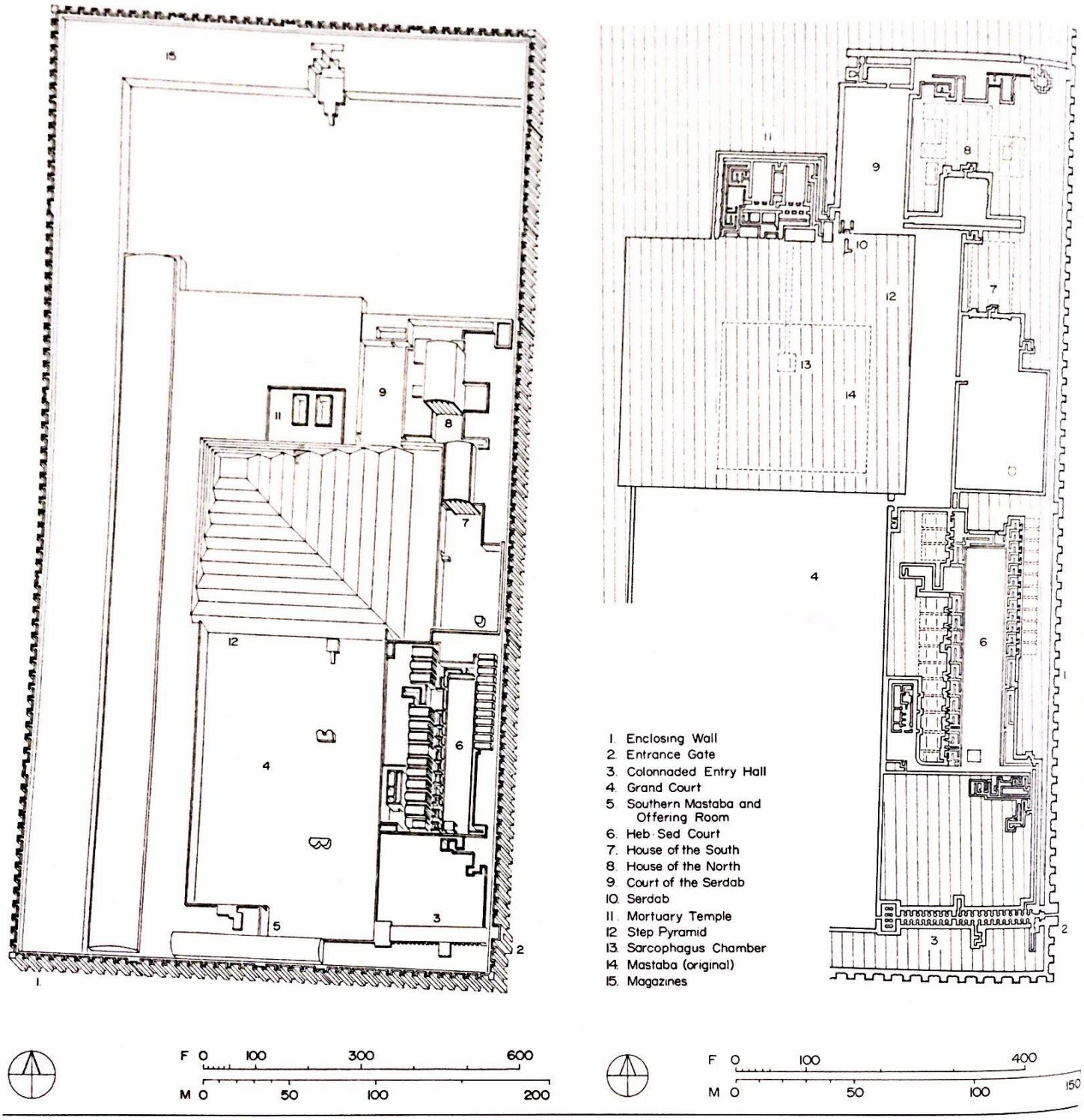


Fig. 4.5 Saqqara, mortuary complex of King Zoser, Third Dynasty, ca. 2680 B.C.: (a) oblique view; (b) partial plan.

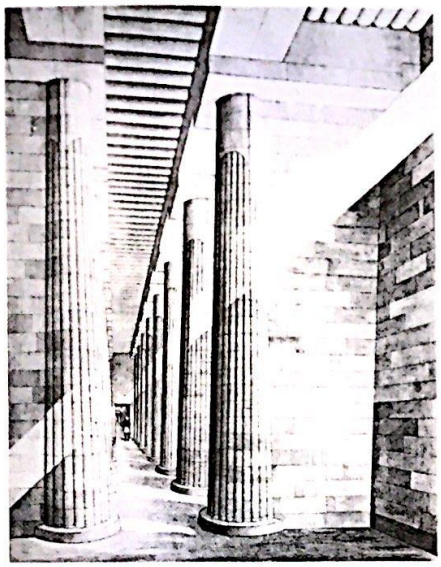


Fig. 4.6 Zoser complex, entry hall (no. 3 on Fig. 4.5); reconstruction drawing.

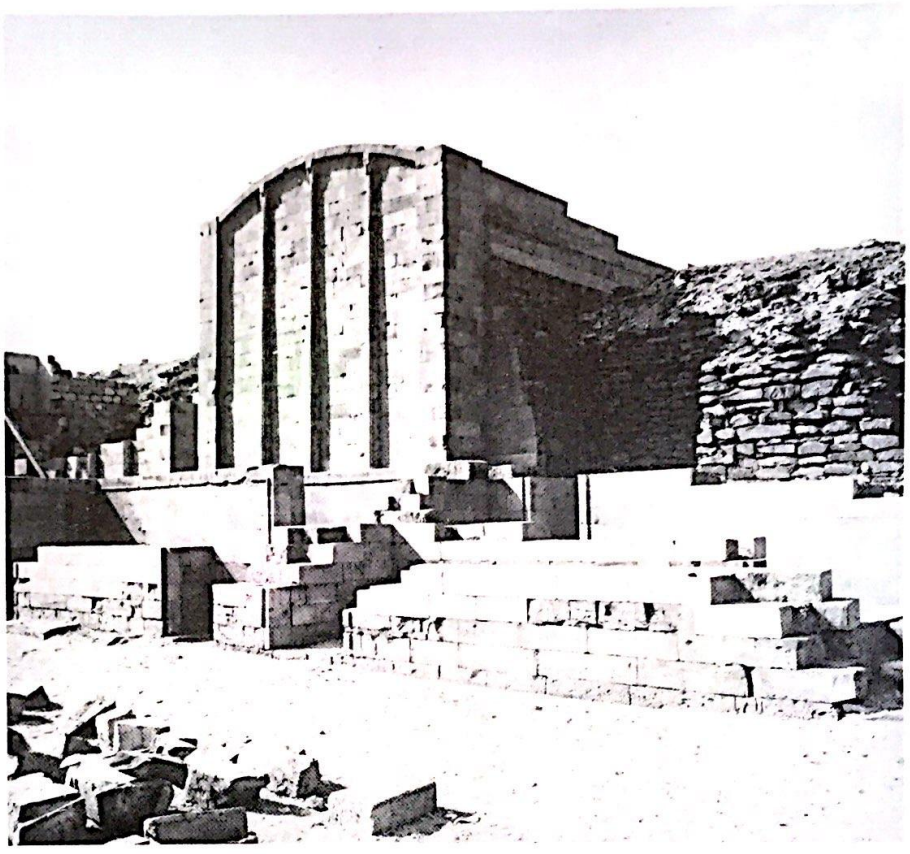


Fig. 4.7 Zoser complex, dummy chapel in Heb-Sed Court (no. 6 on Fig. 4.5).

hotep wanted to conjure the walled city of Memphis, not just the royal palace.

The only real entrance is at the southeast corner of the enclosure. It leads into a long corridor lined with two rows of half-columns engaged to spur walls. (Fig. 4.6) The columns carry a stone ceiling, cut to resemble rounded logs, which rises higher than the roof of the flanking compartments allowing for clerestory slits. This is probably the earliest known case of clerestory lighting. The shafts of light here may have fallen on statues set in the compartments representing, possibly, head deities of the *nomes* or provinces of Egypt, or Zoser himself, or perhaps double statues of Zoser and a *nome*-god. At any rate, the number of these compartments is so close to the standard number of forty-two provinces that it has been suggested that the central space between the colonnades stood for the Nile, with the sudden doubling of the columns at the end opposite the entrance evoking the spread of the Delta.

Beyond the corridor lies a large court, at the southwest corner of which is a building of nearly solid masonry; it probably served as the offering room for a large mastaba hidden within the western enclosure wall. This secondary tomb may have represented the usual royal cenotaph at Abydos, or else the actual burial place of the king's entrails, which were customarily removed from the corpse before mummification. Or it may have been a dummy tomb for the symbolic sacrifice of the king during the Heb-Sed, a jubilee festival that celebrated the reconsecration of his reign. This festival included a race that proved the king's renewed vigor and was probably associated with fertility. He ran it accompanied by "the priest of the souls of Nekhen," namely, the prehistoric kings of Upper Egypt, and carrying a flail, the implement that is used to thrash grain. Two hoof-shaped markers in this court may have had something to do with this ritual race.

A second important ceremony, the reenactment of the king's coronation, is provided for in a lower court, north of the entrance corridor. The area is entered skirting an unusual, curved wall. On either side of an oblong court stand dummy chapels dedicated to the *nome*-gods of Upper and Lower Egypt. (Fig. 4.7) As in real life, so too in his death the king would have to obtain their consent, one by one, for a new term of office; he would then be crowned, on separate daises at the short ends of the court, with the cone-shaped white crown of Upper Egypt and the caplike red crown of Lower Egypt.

A pair of smaller courts further north stood before two buildings representing the king's "white" and "red" palaces. The

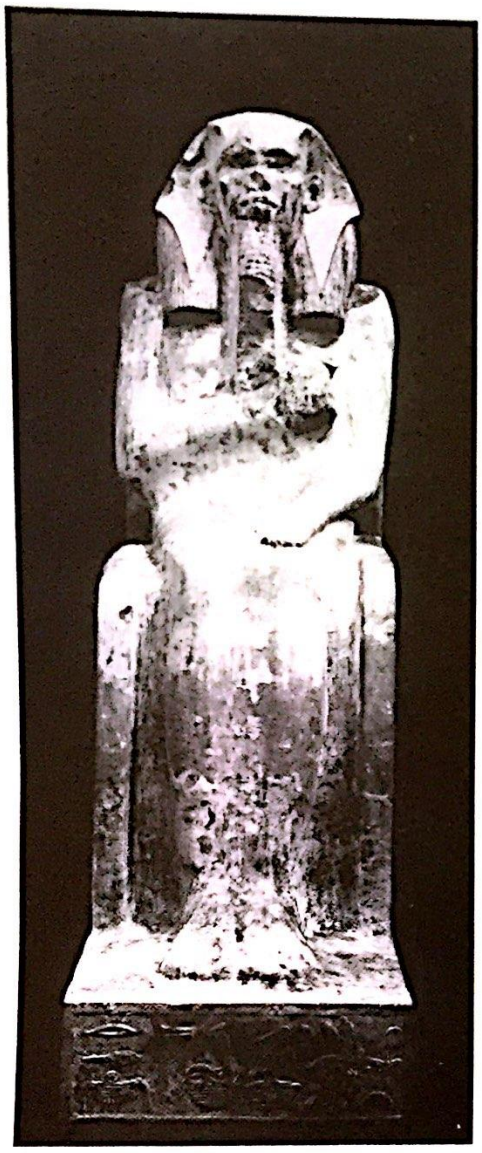


Fig. 4.8 Statue of King Zoser in *serdab* (no. 10 in Fig. 4.5); now moved to the Egyptian Museum, Cairo.

identification of the two buildings is found in the attached chapels whose columns carry lotus and papyrus capitals, two plants which were the emblems of Upper and Lower Egypt, respectively. The lacing of lotus (or lily) and papyrus plants around a stake driven into the ground was a high-point of the coronation ceremony.

The stepped pyramid lies to the west of this double palace. Along its north side were the mortuary temple, where the offerings were presented, and the *serdab*, a small room holding a seated statue of Zoser and built of solid masonry except for two holes to enable the image to look out. (Fig. 4.8) This statue and others around the complex were considered reliable substitutes for the dead body in the event of its destruction. The body lay beneath the pyramid, in a granite sarcophagus chamber, or rather a shaft, cut through virgin rock and entered from the top through a circular opening. Initially, a simple stone mastaba was placed over it. This mastaba, enlarged three times in the course of construction, became the lowest stage of a four-stepped pyramid. Then the pyramid in turn was enlarged toward the north and west, and the stages increased to six, bringing the total height to 62 meters (204 feet).

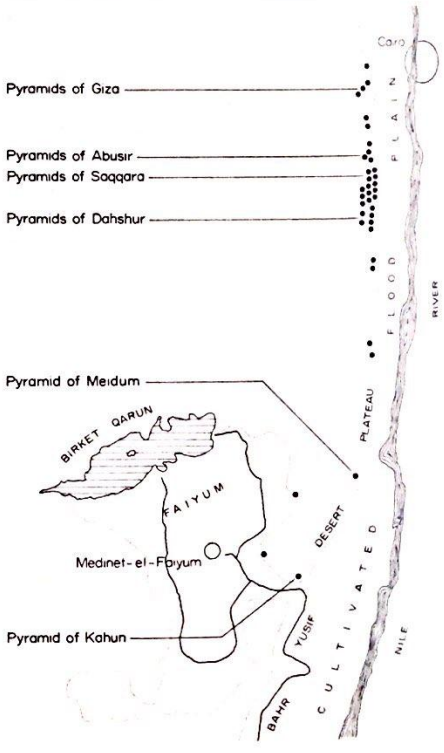
What prompted the transformation of the traditional mastaba into this unique pile of stone? We do not, of course, know for certain. What is obvious is that the object was something more than rendering the tomb securer—the desire to monumentalize the tomb, for example, to have it stand out above the perimeter wall and be scaled against the expanse of the west bank. But these six unequal stages also gave a sense of climbing, of aspiration, an effect visually close to the Mesopotamian ziggurat. The difference is obvious and ritually significant. At Saqqara there were no manageable stairs for human ascent, and nothing at the top—no shrine or architectural climax of any sort to be reached. It was a structure that sublimated the holy person of the king and lifted him heavenward to the realm of the sun-god Re.

The pharaoh's relationship to Re was intimate: that of a son to his father. By the end of the Old Kingdom, the two were completely identified with each other. The main cult center of Re was at Heliopolis, just north of Memphis, and the most sacred relic of his temple there was a pyramid, or cone-shaped stone, the *benben*, symbolizing the primeval mound on which the sun-god first revealed himself at the creation. The conclusion is inescapable that the stepped pyramid stood for this mound of creation whose summit was the resting place of the sun. In addition, it was probably thought of as the staircase of divine ascent, which a spell in the Pyramid Texts says was to be laid out for the king, "so that he may mount up to heaven thereby."

The Pyramids of Giza

To etherialize the staircase and to make the royal tomb a worthy symbol of the sunlight that brings Re and his son the pharaoh together—these aims may have been the cosmic reasons for the subsequent attempts, costly and laborious, to transform Zoser's staged scheme into a true pyramid. The process took time and some experimentation. Zoser's Saqqara complex and the famous pyramids of Giza are separated by more than a century. In between, transitional solutions were tried at Meidum and Dahshur. (Fig. 4.9) An initial stepped pyramid at Meidum, 30 miles south of Memphis, had its sides filled in at some later moment and the whole encased in shining

Fig. 4.9 Map: The distribution of pyramids in Lower Egypt.



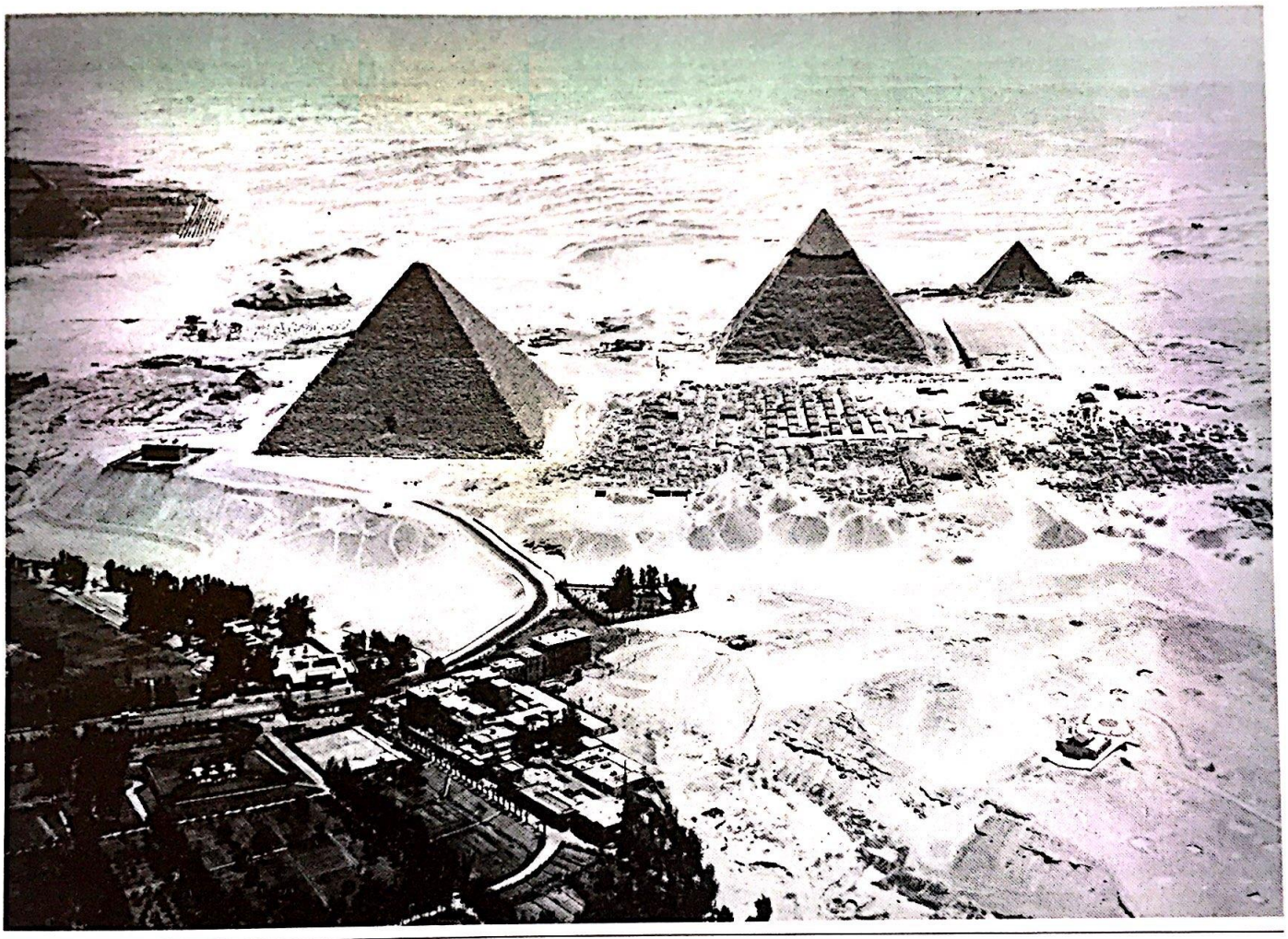


Fig. 4.10 Giza (Lower Egypt), pyramids of Chefren, Cheops, and Mykerinos, Third Dynasty, ca. 2570–2500 B.C.; aerial view from the north. (See also Fig. 1.19.)

Tura limestone. Furthermore, the arrangement of the subsidiary buildings set the pattern for all the later, true pyramids, including those of Giza. This arrangement was now strung along an axis, in contrast to the self-contained layout of Zoser's compound. The mortuary temple was moved to the east side. From here, a sloping causeway reached out to a valley temple closer to the river and connected with it by a canal. The dead body would be brought by boat to this building at the edge of the sown, washed and purified; then it would be embalmed (or perhaps its prior embalmment re-enacted) and subjected to a magic rite called "The Opening of the Mouth" that enabled the king to speak once more and to enjoy offerings. At Dahshur, there were two pyramids, probably built by the same king, Sneferu. Both were planned from the start as true pyramids. One was executed that way; the other, the so-called Bent Pyramid, seems to have been completed in haste after the king's death, with the original 52° angle of incline (which later became standard) reduced abruptly halfway up toward the summit.

At Giza, there are three separate pyramid complexes, the latest, that of Mykerinos, being the smallest. (Figs. 4.10, 4.11) The oldest of the three, that of Cheops, son of Sneferu, has the largest pyramid, 137 meters (450 feet) high at present and another

10 meters originally. But the pyramid complex of Chefren is the best preserved, with its extraordinary valley temple intact, and, next to it, the noble form of the Sphinx, a recumbent leonine body welded to the portrait-head of the king wearing the royal headdress, perhaps the best-known monument in the world. Directly in front of the Sphinx, to the east, was a temple dedicated to Harmakhis, an aspect of the sun-god; arranged around a rectangular court paved in alabaster was a continuous cloister that held twenty-four columns, probably an allusion to the sun's daily journey, and two axial niches, east and west, that marked the journey's axis. The temple was entered from the east by two doors.

The same entrance scheme holds for the better-known valley temple next to it. (Fig. 4.12) Between its two doors probably stood the *serdab* for the king's statue. Going in, one encountered, first, a long vestibule and, then, a T-shaped hall set in an enormously thick casement of masonry. It, too, had an alabaster floor which reflected the light that came in through slits set in the upper parts of the walls and the underside of the flat roof. Against the walls stood twenty-three statues of Chefren, representing the deification of individual organs of his body. The walls, which have a pronounced batter, were faced with red granite from Aswan, both inside and out; of granite too were the massive piers and the flat roof they supported. The masonry, for once, does not emulate natural forms or mean anything else, but is content to display its own superb geometry and the clean abstraction of its square uprights and lintels.

From here the body was transferred to the mortuary temple via the covered causeway built on a rock-spur that bridged the depression between the Sphinx group and the pyramid. The walls of the causeway were sure to have been decorated with paintings and reliefs whose subjects, judging from a later example that survived, would include

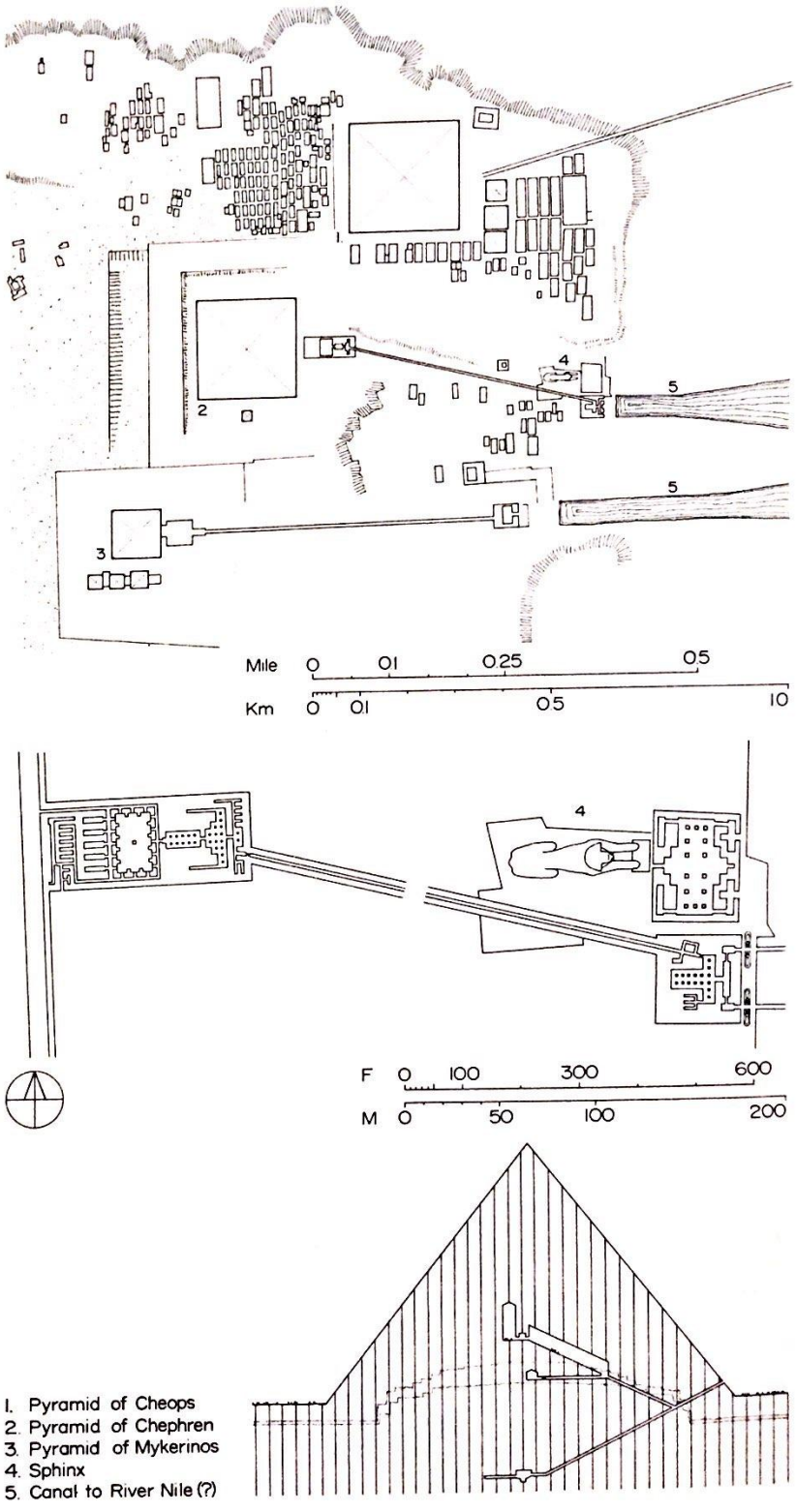


Fig. 4.11 Giza, the pyramid group: top, general site plan; middle, detail plan of the Chefren complex, showing the mortuary temple, the causeway, the valley temple, and the Sphinx with the attached temple of Harmakhis; bottom, a section through the pyramid of Cheops (the dotted lines indicate stages of construction).

Fig. 4.12 Giza, valley temple of Chefren; interior.

the actual construction of the project, such as the transport of columns and architraves, the craftsmen fashioning objects of gold and copper, the tilling of the royal estates, processions of servants bringing provisions to the tomb, and hunting and fishing.

The mortuary temple began with a T-shaped entrance hall of two separate units; an open court followed, which was surrounded by a cloister, and on its west side five narrow openings, each with a statue of Chefren, could be counted, possibly representing the five official names assumed by the king on his accession. Beyond this court, which also had statues against the broad piers that defined it, only priests could proceed. At the innermost sanctuary, they would lay down daily offerings for the sustenance of the royal body that lay beyond, in the heart of its stone mountain.

The pyramid of Chefren is relatively simple within. That of Cheops, the Great Pyramid as it is known, has a more ingenious arrangement. It was surrounded by wooden solar boats in pits (one of these boats was found in 1954), three small pyramids for Cheops' immediate family, a mastaba for his mother Hetepheres, and to the east and west of the enclosure wall, an orderly cemetery for his court, the comparatively minute mastabas lined in strict parallel rows like ranks of soldiers at attention.

The entrance into the pyramid is on the north face, a little east of center. (Fig. 4.11) From here a corridor descends through the core and into native rock. It ends in a chamber that was to contain the body before the decision was taken to bury it within the pyramid proper. The Queen's Chamber, a misnomer that endures, was constructed for this purpose exactly midway between the north and south sides, not far from ground level, and the Ascending Corridor was cut to reach it from the initial corridor, beginning at a point about 18 meters (60 feet) from the entrance. Then there was another change of plan, possibly to thwart spoilers and thieves. The Grand Gallery was run as a continuation of the Ascending Corridor, a splendid passage of polished limestone that rises in seven sections corbelled forward. It led to the King's Chamber, the final resting place of Cheops. Built entirely of granite, this Chamber had a curious superstructure of five compartments above its flat ceiling, to relieve some of the weight that must rest upon it.

There are no extant Egyptian records that tell us of the construction methods of the Giza pyramids, and no scholarly agreement on any aspect of the subject. Did the core rise first, with the aid of a colossal earth ramp, or a system of such ramps, that rose with it, and the casing of Tura limestone applied subsequently, working downward? Or were the casing stones placed first, beveled to the exact incline angle and set on a truly level plane, and this frame then filled with the core blocks? Were hard stones like granite quarried at this early age, or only loose boulders used as they were found lying on the ground? Did the conveying of these blocks, a single one of which might weigh as much as 200 tons, involve wheeled vehicles at all, or only sledges dragged over a way paved with balks of timber?

Whatever the exact details, the feat was epic. It entailed clearing and leveling the site perfectly on the desert bed; surveying this site with measuring ropes of palm or flax fiber to obtain a perfect square; exactly orienting the four faces on the cardinal points without the help of magnetic compasses; quarrying millions of stone blocks and transporting them on the Nile and over land, sometimes for hundreds of miles; lifting them to heights that could exceed 120 meters (400 feet), and this without pulleys; and dressing them meticulously with stone and copper tools.

Then, there is the question of labor. A regular work force of skilled masons and craftsmen and their assistants, housed near the pyramid, was undoubtedly occupied full-time during the span of construction. Additional men were probably levied to transport the blocks between late July and late October, when the Nile flooded and the population was largely idle. But we should refrain from seeing the pyramids as the repressive fruit of slave labor. The satisfaction that ancient communities derived from working on monuments of propitiating and hopeful faith, like Stonehenge or the ziggurats, may be difficult for us to understand in the age of labor unions. It was real nonetheless.

Fig. 4.13 Deir el-Bahri (Upper Egypt), the mortuary temples of Mentuhotep, on the left, ca. 2050 B.C., Eleventh Dynasty, and Queen Hatshepsut, on the right, ca. 1500, Eighteenth Dynasty; view from the northeast.

And the pyramids of Giza were monuments of hope. Today we are fascinated by their size, the precision of their masonry work that eschews the use of mortar, their recondite air. But to the kings of Egypt and the Old Kingdom millions who accepted them as divine, the pyramids were the sole efficacious link between themselves and the realm of the gods, not abstract curiosities. They reproduced architecturally a cosmic truth that called to mind the creation and its eternal guarantee, the rising and setting sun. In several statements of the Pyramid Texts, the earliest preserved body of religious literature carved on the walls of royal tombs, the pharaoh is described as using the rays of the sun, in place of a staircase, to ascend to Re: "I have trodden these thy rays as a ramp under my feet whereon I mount up to my mother Uraeus on the brow of Re." Heaven strengthened the rays of the sun, we are told, to facilitate this ascent.

It seems likely, then, that the Giza pyramids—these awesome masses of stone—were monuments to something immaterial and gossamer, the rays of the sun. They were the visible proof for the people who tilled the benign land that the universe was ordered, their well-being and safety vouched for. To us, stripped of their reflective limestone casing and the gold overlay of their capstones, the pyramids seem relentlessly earthbound, broad-based and massive, stone mountains. But to their own audience, they were luminous arrows emanating from, and leading the way to, the sun. More than two thousand years before Christ, these shimmering specters of the desert that focused the long band of water and field that was Egypt proclaimed the truth of the promise: "I am the light of the

world. . . . He that believeth in me, though he were dead, shall never die."

The Time of the Gods

The Giza pyramids were never surpassed nor rivaled, since indeed the theocratic absolutism of a Cheops or Chefren remained unreachable. Then, the gods were afraid of the king: "He is the Great Mighty One that has power over the mighty ones. . . . His duration is eternity and his boundary everlastingness." After the term of the three Giza kings, their immediate successors felt it necessary to enhance their pyramid settings at Abusir with separate sun temples in honor of Re. Laid out like the pyramid complex itself, with a small chapel by the water and a causeway, the main feature of these temples was an open court containing an obelisk mounted on a podium, the sacred symbol of the sun-god. While the integrity of the royal tomb that had spoken at Giza of the oneness of Re and pharaoh was thus being sundered, the tomb's scale shrank and the quality of its workmanship deteriorated. At the same time, the mortuary temple was growing bigger and was beginning to compete with the form of the pyramid proper.

In the Middle Kingdom, when stability was restored after a century of social turmoil that undid the old order, the pyramid came to be engulfed by the mortuary temple, if it was there at all. The pyramid did not even hold the real tomb, which had moved elsewhere within the complex. The emphasis had clearly shifted from the visual glorification of the ruler to the pious rites of the burial cult, and these were now dominated more and more by the new chief deity of the national religion, the sun-god Amon who had transcended and absorbed the authority of Re. By the time of the New Kingdom, the pyramid was no longer a royal prerogative. Debased and popularized, it continued to dot the cemeteries for centuries, well into the Christian era.

Deir el-Bahri

We can appreciate how far funerary architecture had evolved since the days of the Giza kings if we look at the arrangement of Mentuhotep's tomb, a Middle Kingdom prince from Upper Egypt instrumental in ending the civil war and reuniting the country about 2050 B.C. At the time of Mentuhotep, the capital was at Thebes, and the burial compound was within the west bank necropolis, situated against the stately cliff-bay of Deir el-Bahri. (Figs. 4.13, 4.14) The valley temple is now gone, as is the unroofed causeway, lined with statues of the king, which once led to the main group below the bluff. The group consisted of three elements: a large forecourt planted with tamarisks and sycamore figs; a terrace, cut out of the rock, on which the mortuary temple stood; and a narrower unit further west, made up of a court and a hypostyle hall, which was lodged into the cliff.

The temple was a square building faced externally with colonnades, except on the cliff side. It was approached by a massive ramp that cut through a double colonnade; the colonnade masked the terrace embankment on the side that faced toward the forecourt. In the center of this outward-looking temple square was a solid stone platform that probably supported a pyramid; or else the platform itself, without a pyramid, may have emulated a primitive Theban sanctuary of this form believed to have been the primeval hill-abode of the local god Montu. In either case, the king's share of this central space was marked only by a cenotaph. His real tomb lay deep in the cliff, approached by a long underground tunnel that started in the small court behind the temple and ran under the hypostyle hall. The hall was really a remarkable room that held eighty octagonal columns arranged in ten rows. It is the ancestor of the multicolumned transverse hall of the New Kingdom temples in which the central row of columns in line with the longitudinal axis is taller than the rest to admit clerestory lighting.

It is of course significant that cliff burials had been common in Thebes for local nomarchs. It is also significant that the entire scheme of Mentuhotep was oriented toward the newly started temple of Amon across the river in northern Thebes, the modern Karnak. The king's architecture hoped to satisfy the provincial aristocracy and the priesthood of Amon, the partners of his authority.

This landscaped, terrace architecture was adopted in the larger and better-preserved undertaking next to it, that of Queen Hatshepsut (1503–1482 B.C.). We are dealing with a much later period, more than five hundred years in fact—a monument of the New Kingdom. Obviously indebted to its older neighbor, it takes the compromised supremacy of the pharaoh a step further. The pyramid is absent from the Queen's funerary complex. The royal person was not less prominent in her own tomb architecture than the divine presence of Amon. Partly this has to do with the special circumstances of Hatshepsut's accession. She was the first woman to wrest the male throne of Egypt, and she held onto it for twenty years. This unusual and precarious position created the added urgency to demonstrate nearness to the gods. Beyond the search for legitimacy, however, the surrender of royal ascendance to the high deity of Thebes, and thus, to a degree, also to his powerful priesthood is unmistakable. By now the temple precinct at Karnak had grown to impressive proportions, as we will soon see. The way to the Queen's funerary complex started there. (Figure 4.15) Indeed, the great god issued from his temple during the Feast of the Valley to visit the mortuary temples of the earthly kings that were now lined up along the west bank facing him. He crossed the river on his barge as the dead came out of their graves to greet him. The mortuary temples were built large, to provide for these divine visits.

Hatshepsut's express instructions to her architect Senmut were to create an earthly palace for Amon reminiscent of the myrrh terraces of Punt, the mythical homeland of the gods. A difficult expedition was sent out to Punt, now probably what we know as Somaliland, to bring back myrrh trees for the terraced gardens of "the paradise of Amon." The story of the expedition is depicted on the walls of the colonnade of the second terrace, between a chapel of the jackal-headed Anubis, lord of cemeteries, and another of Hathor, the cow goddess associated with both love and death. This colonnade consists of two rows of square pillars. Immediately above it is an unusual colonnade, with great painted statues of the Queen in the guise of Osiris standing in front of square pillars. It forms the facade of the temple proper, a large hypostyle hall with an inner sanctuary cut deep into the cliff.

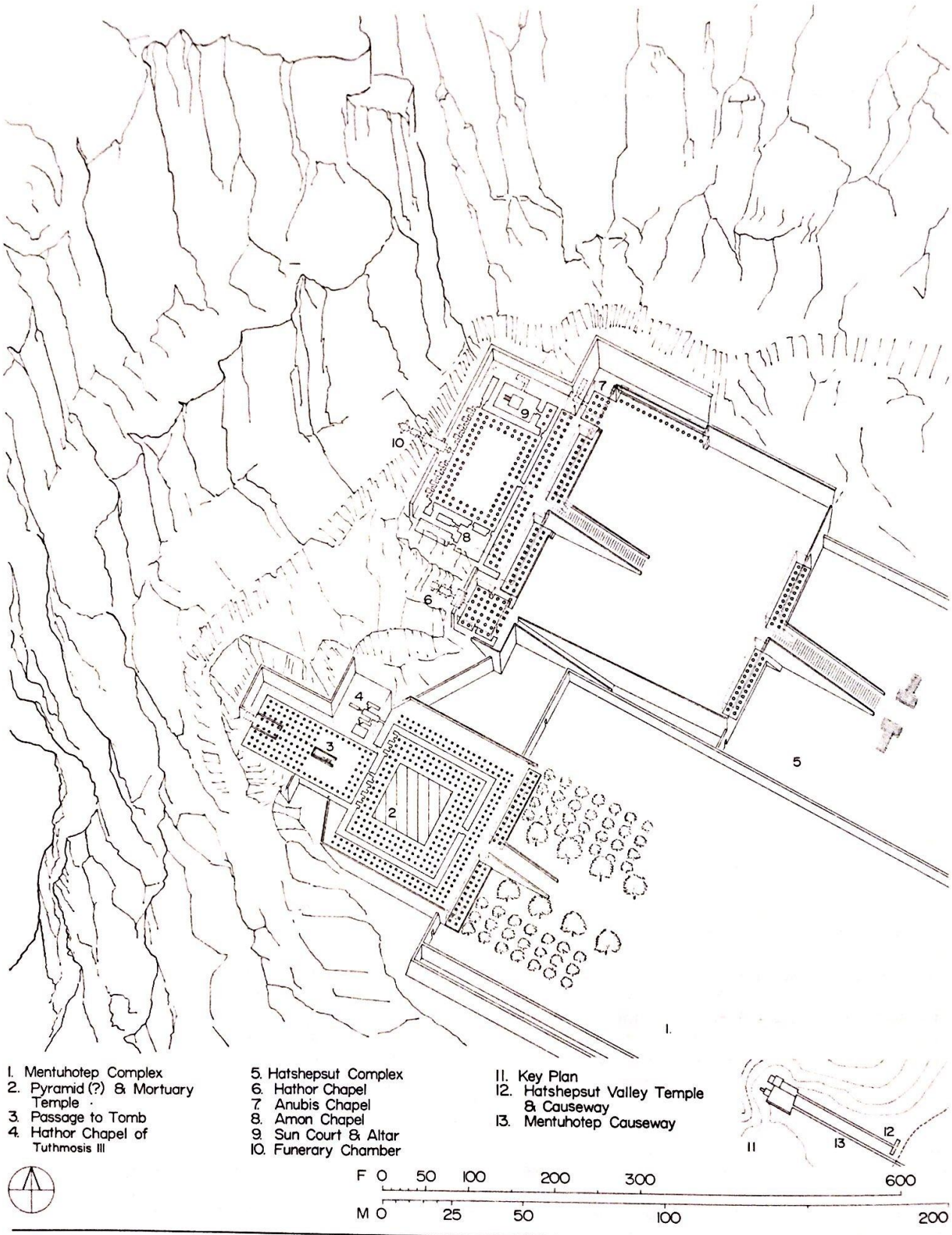
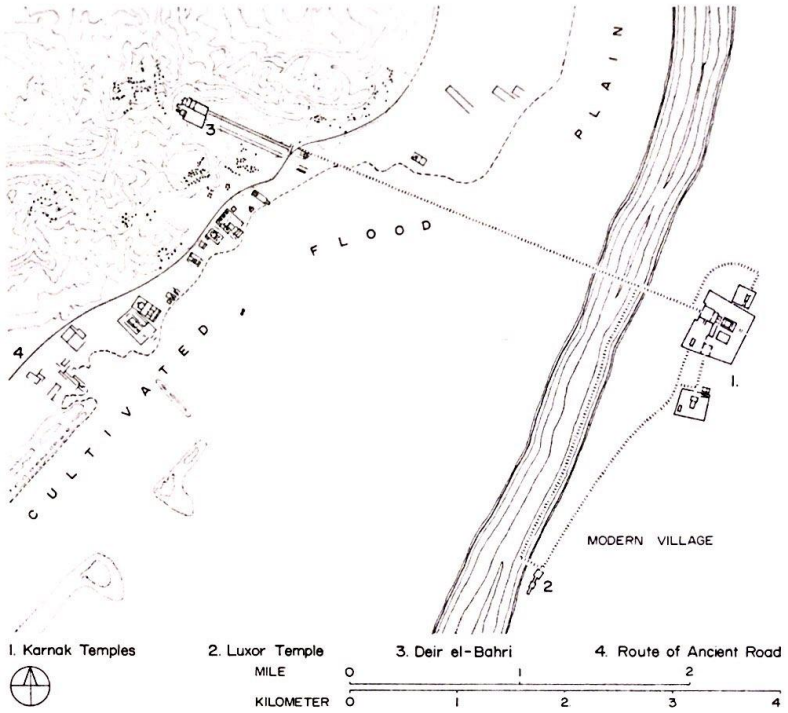


Fig. 4.14 Deir el-Bahri, temples of Mentuhotep and Hatshepsut; axonometric drawing with plans at selected levels.

Fig. 4.15 Thebes (Upper Egypt); general site plan.



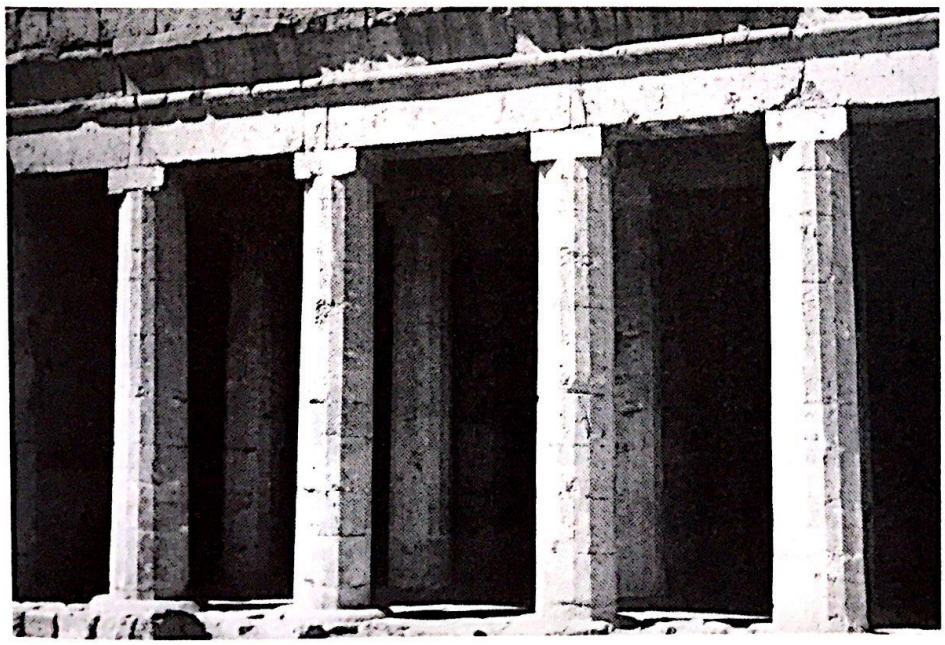


Fig. 4.16 Deir el-Bahri, Hatshepsut complex, lower terrace colonnade; detail.

The lowest of the three terraces is also faced with a colonnade, this one with an outer row of piers and an inner row of sixteen-sided columns. (Fig. 4.16) A straight axis runs through the entire staged layout, leading from the valley temple to the forecourt first by means of an avenue of sphinxes and then by ramps up the first two terraces. But the effect is hardly one-dimensional. The interest in such terraced architecture lies in how features sink and reappear as one climbs along its axis. The regulating line of Egyptian sequences, often laid out in the flat land, was now made to rise toward the bounding cliff-screen of western Thebes. The Egyptian stone masses grandly set in vast open spaces at Saqqara and Giza—stone-built structures played against the land—were here welded to the rockscape as if nature were an extension of Senmut's design.

Karnak and Luxor

In Thebes itself, "the Mistress of Every City," Amon, was supreme. The New Kingdom capital par excellence, Thebes had raised itself from a modest provincial existence to being the center of government and the national religion. Amon was installed here in splendor as the principal deity of the land and the divine strategist of the policy of expansionism that saw Egyptian armies triumph against the cities of Syria and Palestine and, under Ramses II (1304–1237 B.C.), against their great rival, the Hittites of Asia Minor. War booty and the tribute of subjugated peoples poured into Thebes and was put to use to glorify the name of Amon and his royal wards with a monumental environment worthy of this golden age. The victorious kings continued to build funerary settings for themselves on the west bank and to enlarge the layout of the original Middle Kingdom temples of Amon at Karnak and Luxor on the east bank.

The residential area may have been primarily in the west, between the river and the row of funerary temples. The houses, of varying size and splendor, are not now retrievable, but from representations of them and information gleaned from other excavated sites we have a fair idea of their character. (Fig. 4.17) Modest residential streets held row houses whose main features were a court, a broad hall which

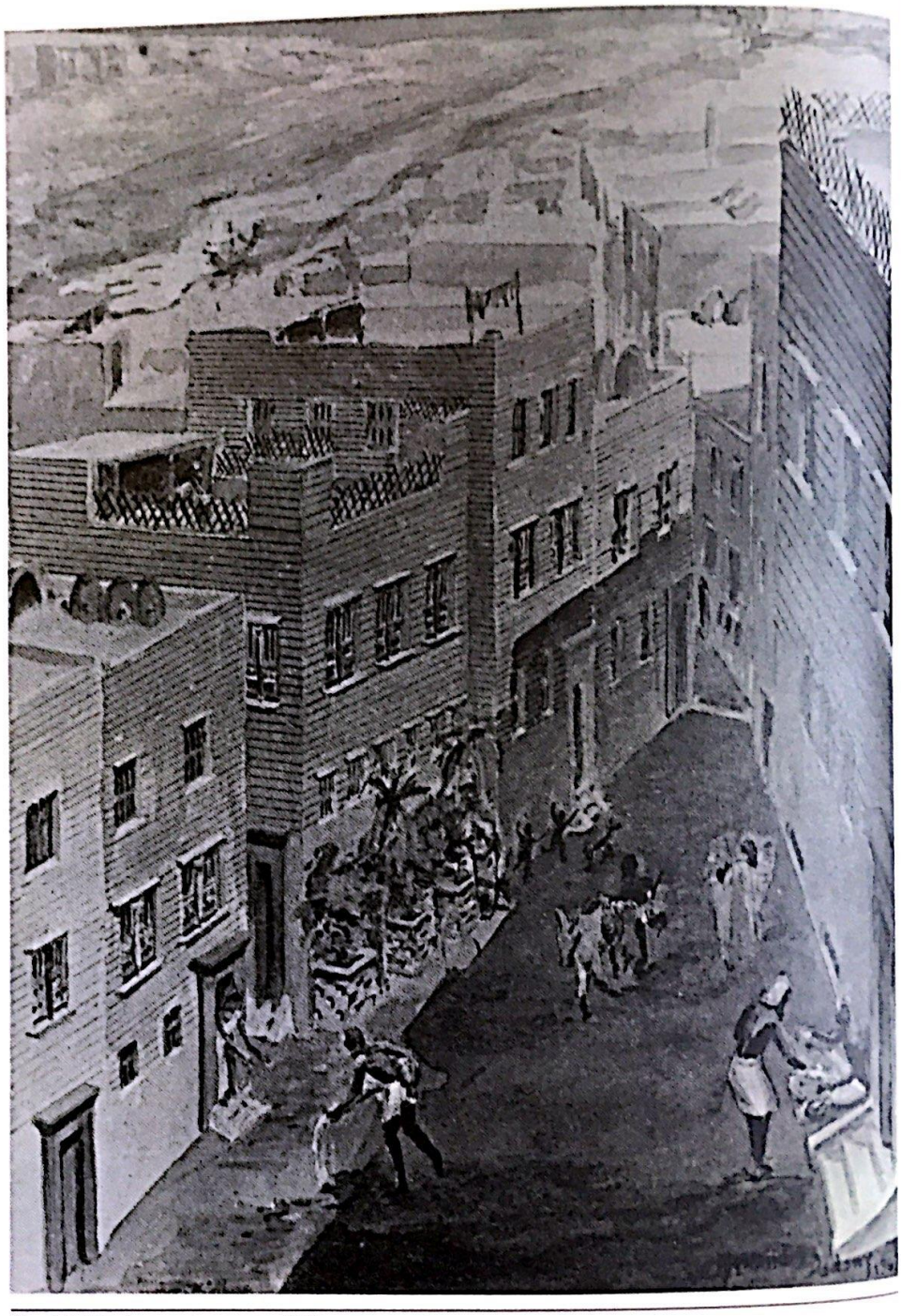


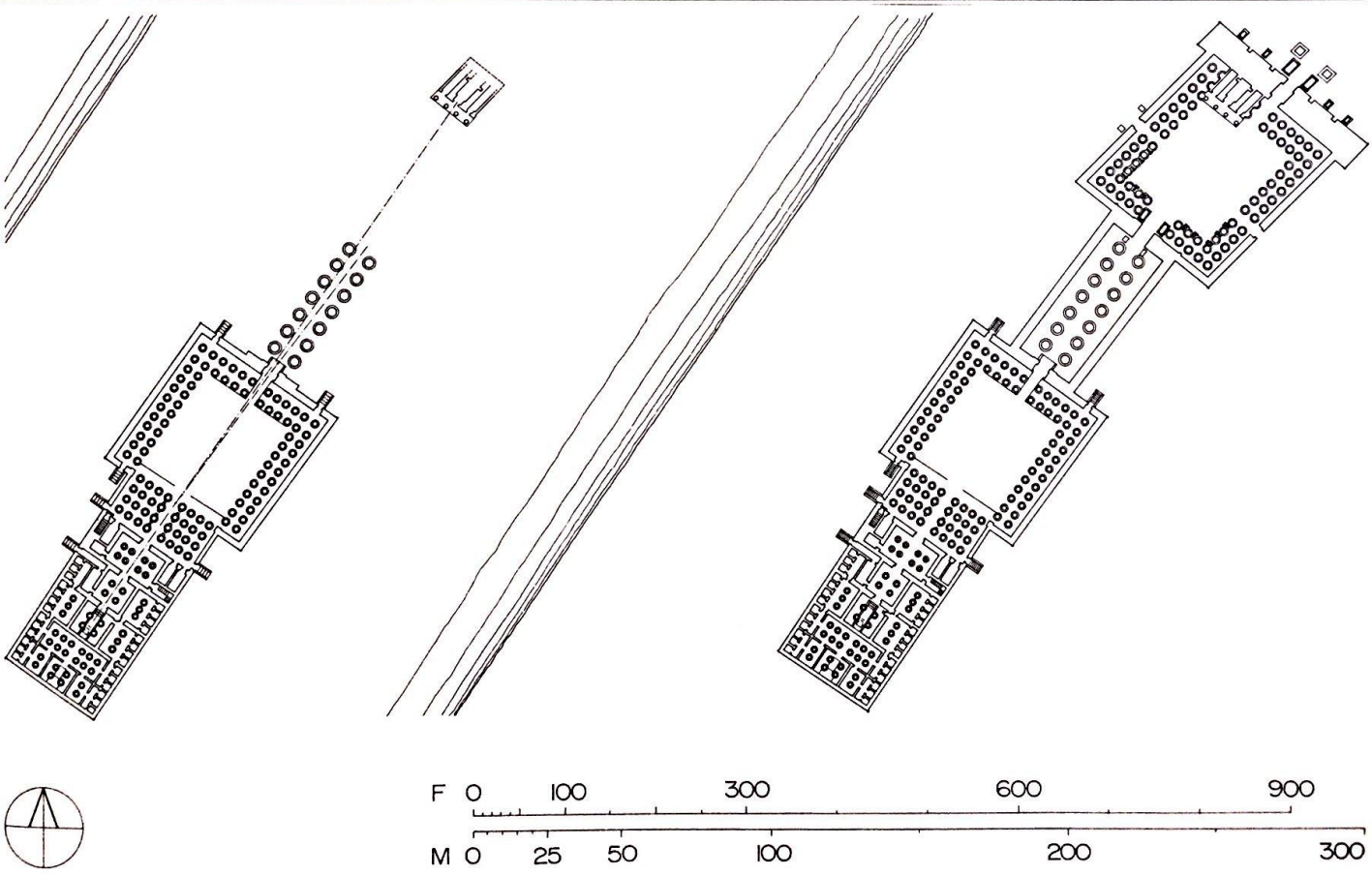
Fig. 4.17 Thebes, a street, ca. 1500 B.C.; reconstruction, perspective drawing.

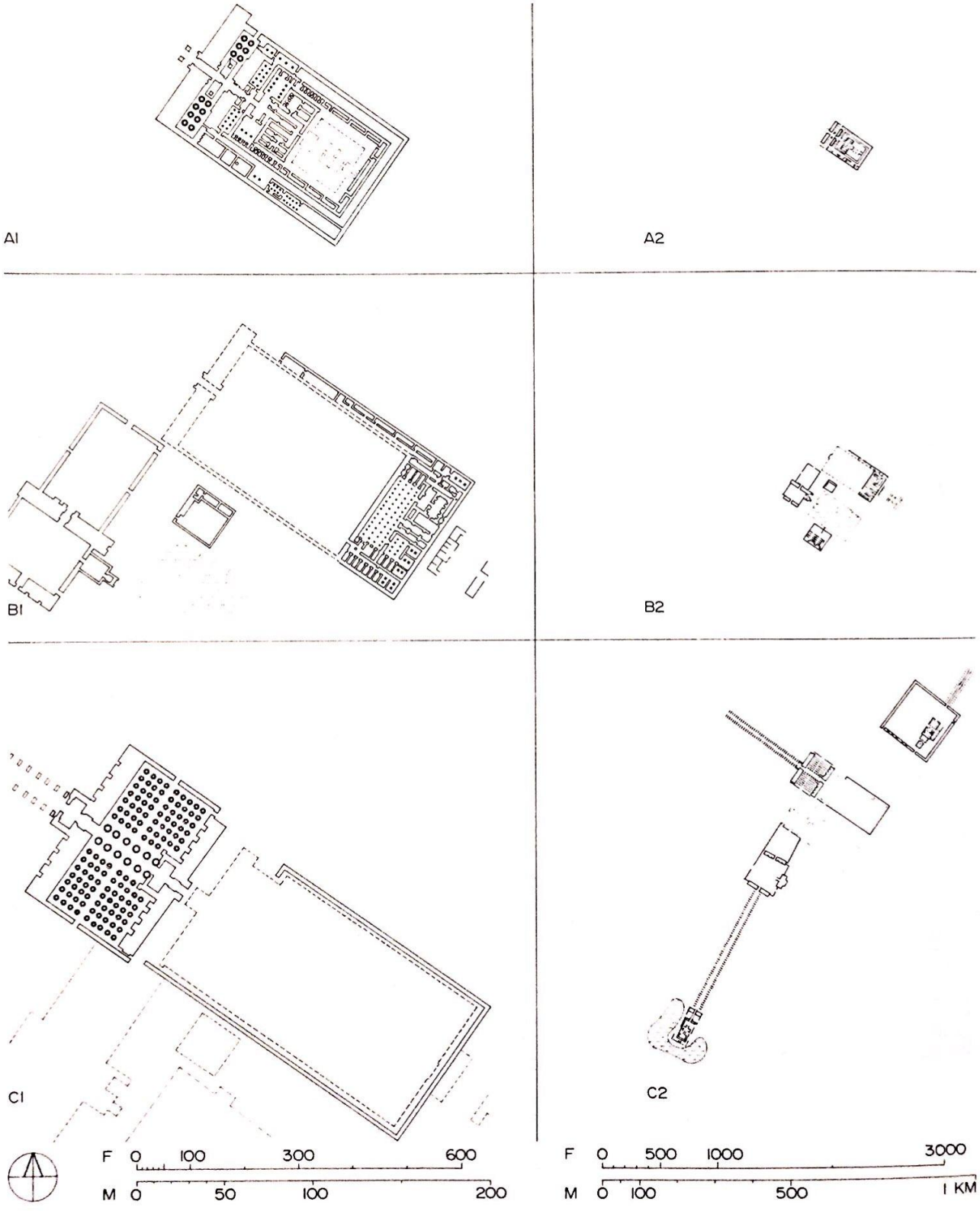
served as the main living space, and at the rear a kitchen with an independent staircase that led to second-storey bedrooms and the terrace above. Richer families might have a basement for weaving looms and might use the terrace to store grain in bins. Facades were brightly painted and topped by balustrades of interwoven palm fronds; windows had mullions and transoms, and tracery in the lower half. It was an outgoing street architecture, not involuted and street-shy as were the houses of Mesopotamian cities. On the edges of town and the surrounding countryside, villas set on large independent plots had their own gardens and outbuildings such as granaries and chariot houses. The broad hall, rising higher than the periphery and thus provided with clerestory lighting, was a shared feature of wealthy and more modest houses; so was the shaded portico on the south side of the court taking advantage of the prevalent north breeze.

The two temple compounds on the east bank, Karnak to the north and Luxor which was known as Amon's "southern harem," had their own mud-brick enclosure wall. They were linked with one another by an avenue of ram-headed sphinxes. Between the two enclosures stood the palaces and administrative buildings. The temple compounds and their dependencies sheltered the attendant staff, thousands of workmen ceaselessly adding and altering, hundreds of thousands of cattle, orchards, boats, and workshops—for these New Kingdom sanctuaries were social and economic centers whose administrators wielded power consonant with the wealth of their holdings.

The great temples at Karnak and Luxor as we see them today were the product of many hundreds of years' work that gradually extended the original axis and enhanced the periphery. Earlier cult temples, which are to be distinguished from mortu-

Fig. 4.18 Luxor, temple of Amon, Mut, and Khonsu; plans of two main stages of its development: left, the temple at the time of Amenhotep III (1417–1379 B.C.); right, with the additions of Ramses II (1304–1237 B.C.).

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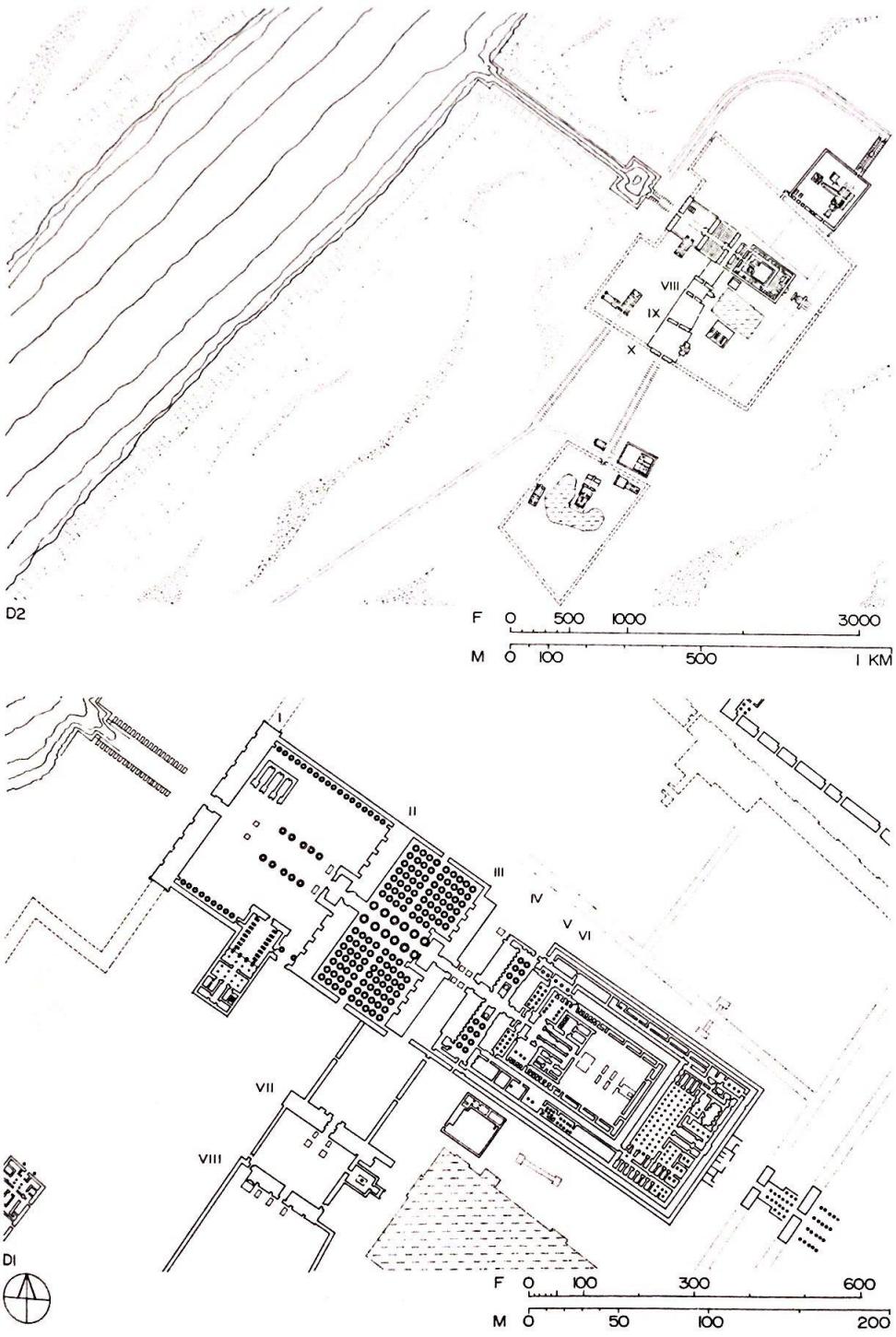

ary temples and the special open-air temples of the sun like those at Abusir, have left scant remains. They were modest in scale and of no standard disposition. They differed from the others in the fact that they invariably housed the statue of a deity, a small wooden figure often sheathed in gold. The Middle Kingdom temples of Karnak and Luxor, impossible to reconstruct today, belonged to this category.

The standard New Kingdom temple may have been originated under Amenhotep III (1417–1379 B.C.) for the first replacement of the early temple at Luxor. The type comprises three parts: the inner sanctuary for the cult statue, the boat that transports it to other temples, and vessels and implements relevant to its care; the hypostyle hall; and an outer forecourt for the public, entered through a pylon. The tripartite scheme is not unlike the layout of the typical Egyptian house, with a reception vestibule and court at the front, the broad living room in the center of the house that parallels the hypostyle hall, and the private apartments at the back that parallel the sanctuary. The New Kingdom custom of honoring the deity by adding to his or her temple came to mean multiple pylons and courts in solemn progression, so that moving along the axes of Amon's temples at Karnak and Luxor one trod both a ritual path, from the most public spaces to the holy of holies, and a historical path, from the most recent reigns, the Ethiopian and Ptolemaic dynasties, through the New Kingdom, to the oldest foundation that marked the site as sacred.

Fig. 4.19 Karnak, temple of Amon (**D1**) and its site (**D2**), at the end of its long history. The main stages of this development can be followed in the preceding drawings. The left-hand column shows the main additions to the temple itself; the right-hand column records the appearance of peripheral structures: (**A**) the complex at the time of Tuthmosis I (1525–ca. 1512 B.C.); (**B**) the addition of the Festival Hall and the small temple to Amon-Re-Herakhty at the time of Tuthmosis III (1504–1450 B.C.); (**C**) additions during the next one hundred years—the new hypostyle hall for the temple of Amon, and the completion of the subsidiary temple groups of Montu (to the northeast) and Mut (to the southwest).

Amenhotep III's temple at Luxor, dedicated to the Theban triad—Amon, his wife Mut, and their son Khonsu—consisted of an elaborate inner sanctuary, a hypostyle hall open in its entire width to a large forecourt, and beyond the pylon of this forecourt, a processional colonnade—two parallel rows of huge papyriform columns, fourteen in all, lining the main approach to the temple. (Fig. 4.18) On axis with the inner sanctuary, some distance to the north of the temple, stood a small shrine in granite built several decades earlier by Tuthmosis III (1504–1450 B.C.). This axis, set by the original Middle Kingdom temple, undoubtedly paralleled the river bank. Beginning with the forecourt of Amenhotep III's temple, however, the axis was noticeably bent eastward, in order to bypass the Tuthmosis shrine and pick up the line of the avenue of sphinxes leading to the northern compound at Karnak.

A century and a half after the completion of Amenhotep's temple, Ramses II added a northern court to it, with porticoes on all four sides. In front of its massive pylon he set up colossi of himself and two obelisks flanking the entrance gate. This court was shaped as a parallelogram to account for the bent axis of the temple, and it incorporated the Tuthmosis III shrine on the inner face of the pylon.

At Karnak the site seems to have been hallowed since the Old Kingdom. Of the Middle Kingdom temple, some remains can be recognized toward the rear of the present complex. (Fig. 4.19) Under Tuthmosis I (1525–c. 1512 B.C.) the architect Ineny enclosed this temple within a perimeter wall; he added an entrance court surrounded by columns and statues of Osiris and preceded by a pylon (V), a hypostyle hall with cedar columns, and another pylon (IV) marked externally by two obelisks. The habit of setting up this ancient symbol of the sun-god Re of Heliopolis, who had now been absorbed by Amon, may have started here. Ineny describes his services in full on the walls of his tomb.

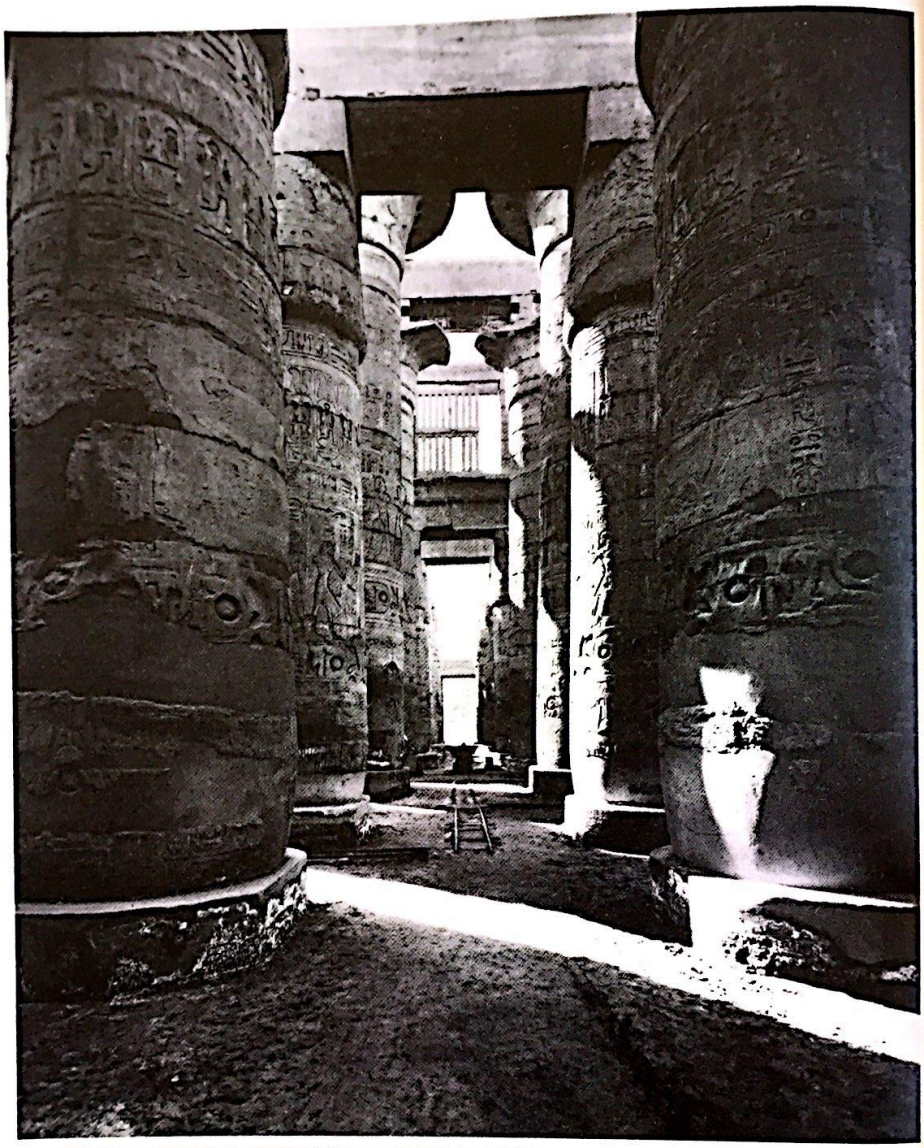

Fig. 4.20 Karnak, temple of Amon, the great hypostyle hall.

I supervised the great monuments that he caused to make in Karnak, erecting a hall with columns, erecting great pylons on its two faces, in the beautiful white stone of 'Ayn, erecting august flagstaffs at the double doorway of the temple. . . . I supervised the erection of the great doorway "Amon is the One Mighty of strength" whose great door leaf is of Asiatic copper, and upon which is the shadow of Min modeled in gold. . . .

Shortly thereafter, to the east of the new temple, Tuthmosis III constructed a Heb-Sed jubilee complex, the Festival Hall. The long reign of this warrior king had been dominated at its start by his formidable stepsister and wife Queen Hatshepsut. Her stamp at Karnak can still be seen in the two obelisks she had put up in the hypostyle hall of Tuthmosis I, which necessitated the re-

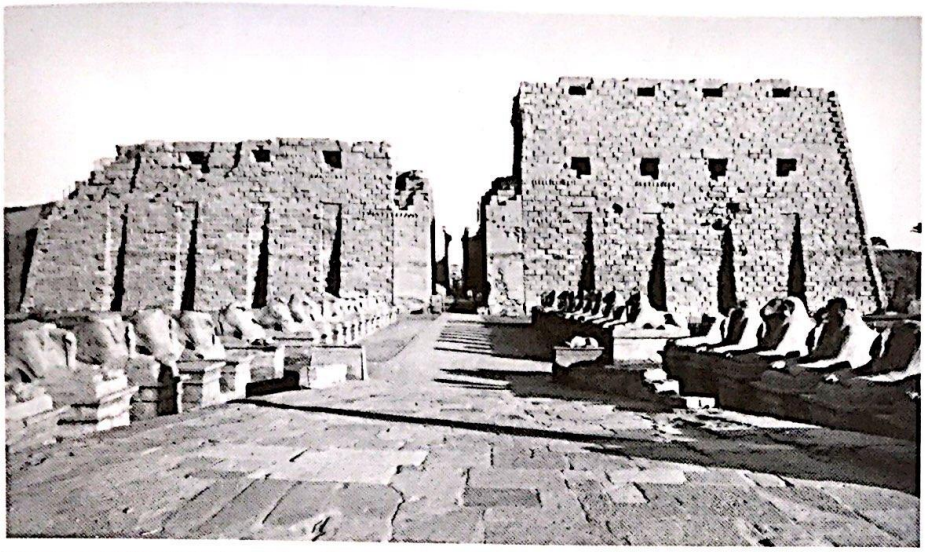

Fig. 4.21 Thebes, the avenue of ram-headed sphinxes leading from the Nile to Pylon I of the Amon temple.

moval of its wooden ceiling. Behind the Festival Hall her husband also provided for a small temple to the rising sun, Amon-Re-Herakhty, with an eastern gate facing the Theban sunrise. The Karnak axis was now a full record of the solar path. The easternmost gateway was "the Upper Door of the Domain of Amon," the station for the rising sun at the first hour. It progressed through the Herakhty temple and across the Festival Hall where two chambers, to the northeast and southeast, housed the terrestrial and solar aspects of the eternal cycle of rejuvenation. At the point in the inner sanctuary of the main temple where Amon's cult boat stood, the sun reached the ninth hour, entering the "Field of Reeds"—the region where those blessed in death lived in perpetual spring. In the transverse hall between Pylons VI and V, the sun was at the tenth hour; at the hypostyle hall, at the eleventh hour. Beyond Pylon IV the daily path was completed with the setting of the sun at the twelfth hour. To celebrate in the open this solar course, Tuthmosis III had a rectangular Sacred Lake dug south of the temple and parallel to it, looked over by a giant granite scarab representing Khepri, the sun growing toward noon.

In the next century the temple axis at Karnak was extended westward with two new pylons (III and II) that held between them a new hypostyle hall, one of the most remarkable achievements of Egyptian architecture. At the same time, two subsidiary temple groups were developed to the north and south of the Amon complex, dedicated to the original local deity of Thebes, Montu, and to Amon's consort Mut, respectively. Between the Amon complex and the northern group of Montu stood a sanctuary to Ptah, the god of the old capital of Memphis, a Middle Kingdom structure of brick and wood rebuilt in stone by Tuthmosis III. The southern group of Mut, with its own trapezoidal girdle wall, was connected with the Amon temple by means of a processional way that entered the central precinct through a pylon in the south enclosure wall and passed through three more pylons before reaching the Amon temple at a point just east of the new hypostyle hall.

The main processional way started at Luxor and ran straight until a point close to the Mut compound. There it forked, with one prong going southeast to the entrance of this compound and the main prong continuing toward the central group. Where it met the enclosure wall of this group, Ramses III (1198–1167 B.C.) raised a small temple to the remaining member of the Theban triad, Khonsu. One last processional avenue ran from a landing dock on the Nile to the principal western entrance of the Amon precinct.

The purpose of these sphinx-bordered monumental alignments came to the fore during the Feast of Opet when the holy family left their official residence at Karnak for a visit to the "southern harem." The object was the yearly mystical marriage of Amon and Mut. It was a solemn, colorful occasion. The royal house, the priesthood of the various deities, and the common people who arrived from all over participated in a staged pageant which used the river, the temples themselves, and the processional avenues for a peripatetic service that assured the land's fertility. The cult boats of the three gods were taken out of their chapels and carried through the temples to the landing dock where they were loaded on resplendent Nile boats for the short sail to Luxor.

Amon's boat was kept in the central chapel of the Karnak sanctuary, flanked by two courts of offering. After prescribed rites at which the king presided, thirty priests wearing hawk and jackal masks carried the boat on their shoulders, first through the hall of records, passing between two massive granite pillars which were decorated in high relief with the heraldic plants of Upper and Lower Egypt, the lily and papyrus. On Pylon VI, which they crossed next, the warrior king Tuthmosis III was shown worshipping Amon "at the ninth hour." Beyond a transverse vestibule and Pylon V, they passed between the obelisks of Queen Hatshepsut in the old hypostyle hall and then through Pylon IV and its two obelisks that had terminated the initial New Kingdom temple of Tuthmosis I and his architect Ineny.

It was at this point that the congregation may have waited to hail the boat as it entered the great hypostyle hall. (Fig. 4.20) Light filtered through the stone window gratings of the clerestory into the central unit, a nave marked off by huge sandstone columns with papyrus capitals on which the ceiling rested, and two aisles whose lower columns supported the clerestory. The for-

est of columns on the two sides of this central unit and the boundary walls beyond were decorated with scenes showing the pharaoh in the presence of deities. It was in this hall that New Kingdom pharaohs were crowned, hence its designation as "the Hall of the Two Crowns." But it was also known as "the resting place of the Lord of the Gods . . . the place of appearance . . . at his annual feast."

The sailboats which were to transport the holy family were probably helped along with ropes pulled by members of the procession moving along the avenue of sphinxes. (Fig. 4.21) There were six way stations before Luxor, each marked with a chapel. Upon arriving at the temple, the procession filed through the pylon of Ramses II, passing between the two obelisks (whose alignment with the entrance was not exact, probably in order to conceal their unequal height through the effect of perspective) and two seated colossi of the ruler. (Fig. 4.22) More statues of him were to be seen on the south side of the forecourt. The shafts of the papyriform columns and the walls themselves, both inside and out, were crowded with scenes in sunk relief. On the outside they had a martial character. The famous battle of Qadesh against the Hittites (1300 B.C.) occupied the face of the pylon. Within, the subjects dealt with the Feast of Opet, showing sacrificial scenes and the procession itself—members of the royal family and priests bearing offerings, the sacrificial animals gaily beribboned and painted, and a file of priestesses about to pass through the pylon.

Past the forecourt, the space narrowed and dimmed. Probably leaving behind some of the congregation, Amon's train moved between the two rows of columns towering above it as through a shady grove. (Fig. 4.23) The capitals, in the form of open papyrus, flared out toward the top, at a height of about 15 meters (50 feet) from the floor, enhancing the sense of overhead shelter. The long directional passage and the bright daylight glowing at its end propelled one forward. One emerged into the brilliant sun of the next court as into a clearing. The open space was bordered on three sides with double rows of columns with papyrus-bud capitals, their ceilings painted blue like strips of sky on which were emblazoned the name crests of the pharaoh. The

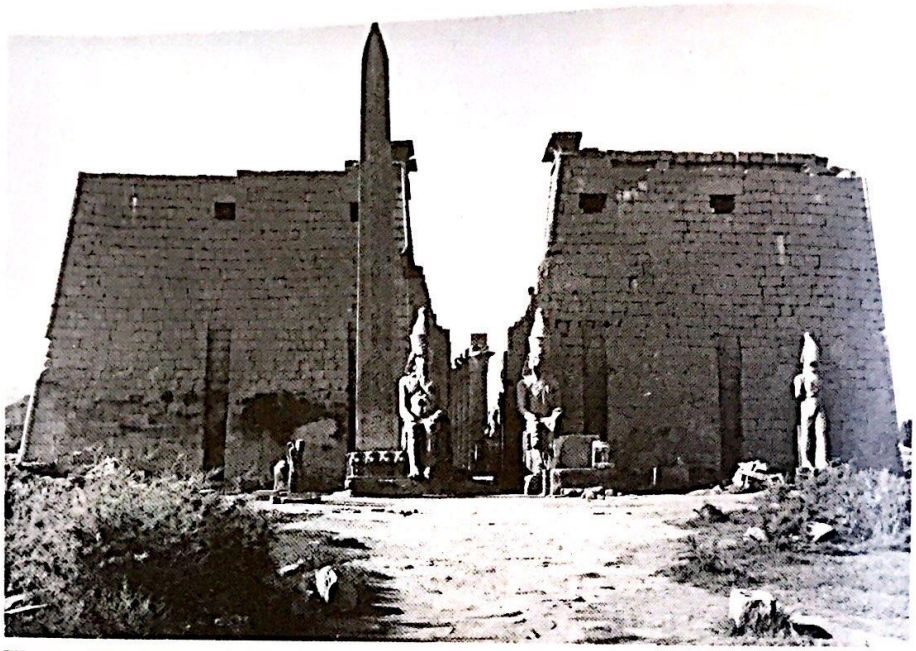

Fig. 4.22 Luxor, Ramses II pylon. The pylon originally had six colossal statues of Ramses and two obelisks of granite flanking the entrance. The right obelisk was taken to France in the early nineteenth century and now stands in the Place de la Concorde in Paris.

fourth side led directly into the hypostyle hall, its entire facade open toward the court. The trapezoidal shape of the court strengthened the perspective toward this facade. Inside the hall, where thirty-two columns were lined up in four transverse rows, the feeling was of a crowding and closing up.

Once more, as they had started at the inner sanctuary of Karnak, the priests alone now carried the sacred burden beyond the hypostyle hall, leaving it through a single doorway in the rear wall. The ground rose under their feet, the ceiling height fell, daylight was left behind. They passed through a small transverse hall and then through two square rooms one after the other, the southernmost being the repository of the cult boat. The statue of Amon was deeper in, in a room behind the boat chapel and separated from it by a transverse vestibule. A single beam of light fell upon it from a slot in the ceiling. A seated image of enormous proportions, the statue would be daily administered to by its priesthood, fed and clothed, and appeased ritually. For in the contentment of Amon rested the land's hope for the benevolence of its rulers, the glory of its armies, and the continued plenty of the Black Land.

Survival of the Egyptian Temple

The primacy of Amon and his priesthood was never successfully challenged in the New Kingdom. A religious and political revolution by Amenhotep IV or Akhenaten (1379–1362 B.C.) that attempted to replace Amon with the cult of the sun-disk Aton did not outlast the king's reign. Architecturally this iconoclastic period is famous for the capital of Akhenaten, Amarna, built in neutral territory between Upper and Lower Egypt. A vast and lavish city, it was razed after Akhenaten's death as the setting of heresy. What we can glean from the foundations and the illustrative content of the

Fig. 4.23 Luxor temple; interior view from the forecourt of Amenhotep III, looking back toward the inner face of the pylon of Ramses II.

extraordinary art in its tombs is that the vocabulary of pylons, obelisks, and courts was still relied on, but the main stress now was on a succession of pylon-fronted courts, with open-air altars for sacrifices. Since it was now the sun-disk itself that was worshipped rather than a cult image, no need was felt for inner sanctuaries.

With Amon's restitution, the priesthood grew in strength at the expense of pharaonic supremacy. After the deterioration of the New Kingdom, the pharaoh came to be seen as nothing more than an earthly ruler, the chief of national administration. The priesthood of Amon, on the other hand, became hereditary and extended its dominion beyond religious matters, into the political sphere. In this late period, roughly the first millennium B.C., Egypt was for the most part under foreign domination. The country endured a Nubian or Ethiopian rule for two centuries, and then a century of Persian rule. In the later fourth century B.C. it became part of Alexander the Great's Greek empire and was governed by the house of the Ptolemies, until the arrival of the Romans on the scene.

Through all these changing regimes, public architecture changed little. The New Kingdom temple type continued to be produced, with no significant modification, under the benevolent approval of alien rulers anxious to gain the support of the conservative Amon priesthood. We have a handful of very well-preserved late temples—that of Horus at Edfu, for example, the double temple to Haroeris and the crocodile-god Sobek at Kom Ombo, the Hathor temple at Dendera, and the incomplete temple of the ram-headed god Khnum at Esna. Finely made and predictable, they seem timeless components of a vast setting of ritual. Their very repetitiveness is effective, parallelling as it does what has been called "the grand monotony" of the Egyptian landscape.

It is a passionless, temperate, stately architecture whose premise is the premise of all ancient Egypt: rhythms of faith and nature made permanent and ever durable. The buildings transcend their multiple authorship and the single events their decoration may extol. And since it is single events, single actions, single reigns that time is measured by, these stupendous programs of Upper Egypt create their own immutable order beyond time, an eternal stability imposed on the flow and flux of life. It is only when we identify through captions, among personages in Egyptian costume rendered in the immemorial style of Egyptian art, Julius Caesar or the Emperor Trajan on some Ptolemaic temple wall that we realize how late in history we are, how retardative this architecture is. For by the time of Caesar the Mediterranean world had been reshaped through the force of Classical culture, the benchmark of our Western achievement.

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Alaca Hüyük (Turkey), Sphinx Gate, mid-second millennium B.C.

5

BRONZE AGE CITIES: THE AEGEAN AND ASIA MINOR

Classical culture is the handiwork of Greeks, and the long process of fashioning it begins early, perhaps about 1700 B.C. The Greek-speaking people associated with this initial phase of the story, the Mycenaeans, do not appear to have been a native race. A warlike stock, they moved into mainland Greece and the nearby islands of the Aegean probably from western Asia Minor, and by about 1600 B.C. were in firm control of this region. They built a number of independent citadel towns famous in later legend—Pylos, Tiryns, Mycenae itself—and were using a form of early Greek that modern scholarship has named Linear B.

The exploits of these Mycenaeans were sung by Homer in the *Iliad* and *Odyssey* several centuries after their civilization had ceased to exist. But before their day was over, the Mycenaeans had managed to become an overseas power of consequence. They had trading posts as far away as Sicily and military colonies along the coast of Asia Minor. And when a great Mycenaean force was being assembled to besiege Troy sometime toward the close of the thirteenth century B.C., "eighty black ships," Homer tells us, came from "Crete of the hundred cities." (Fig. 5.1)

Crete, the largest island in the Aegean, had prospered as a high culture for some time prior to the organized presence of the Mycenaeans on the Greek mainland and had influenced the Mycenaean faith and vision before being conquered by them about 1450 B.C. This brilliant Cretan culture was very different from that which took hold in Mycenaean Greece. The language in use, the so-called Linear A, remains undeciphered, but it was certainly not Greek. The settlers who altered the modest Neolithic structure of this important island and produced, around 2000 B.C., an urban pattern dominated by large royal palaces may also have come from Asia Minor. Critically situated in the southern Aegean, Crete became a way-station of the Bronze Age, linking the Greek coastland with Egypt and Mesopotamia.

Asia Minor

It is Asia Minor, then, or Anatolia as it is also called, that has claims to being the first homeland of European civilization. For several thousand years precocious Neolithic settlements like Çatalhöyük (see Chapter 3) had dotted the central plateau of this land-bridge between Europe and Asia and the seaboard that defines it on three sides. The lavish treasures in their tombs betray a level of sophistication not to be expected from the unprepossessing half-timbered houses, a construction technique, by the way, that still persists today and may have always been thought particularly suitable for this earthquake-prone country.

Then, toward the very end of the third millennium B.C., successive waves of an Indo-European people began sweeping into Asia Minor from the west. They mingled with the indigenous population and in time forged a single state out of the scattered Neolithic villages. These people are called Hittites and their best-known capital was Hattusas, the modern Boğazköy, some distance to the east of Ankara. The Hittite state was a great imperial power from about 1600 to 1200 B.C. The towns, some quite large, were forcefully situated in the sere Anatolian hinterland; they had redoubtable defenses, paved streets, monumental public buildings, and drainage channels. A network of good roads welded them together and made possible regular communication with neighboring states. To the southeast, the kingdom of Assyria maintained smooth trade relations facilitated by a string of its own merchant colonies near major Hittite towns. Finally, to the southwest the Hittites dealt with Egypt.

Hattusas

A look at Hattusas will give us a fair idea of the Hittite environment. The strength of their architecture was to accept the raw design of the land as the better part of building. This entailed not only using natural configurations for purposes of defense or advantageous siting, but wresting a kind of manly dignity from the rugged terrain. The image of the fortified city in this martial state mattered as much as the effectiveness of its defensive apparatus. The walls must not only be secure against attack, they must also look formidable so that they would discourage would-be aggressors.

Hattusas sits dramatically on a spur of

Fig. 5.1 Map: The Mediterranean in the second millennium B.C.

rocky hills at the end of a wide and fertile valley. The original town clung to the north slope overlooking the valley, with a flat-topped rock to the southeast as its citadel. A century or two after it became the Hittite capital, perhaps about 1400 B.C., an enormous new crescent of fortifications was thrown around the exposed hillside to the south, so that the entire circumference now measured about 7 kilometers (4 miles) in length and enclosed an area of over 120 hectares (300 acres). (Fig. 5.2)

Defense and intimidation here were not solely manmade. The very gorges leading to Hattusas, the cliff against which it crouches, were agents of defense. Rocks and boulders were piled up, often unfinished, with such virile effect that it seems as if the city were rooted in the primordial landscape, an extension of the natural order. (Fig. 5.3)

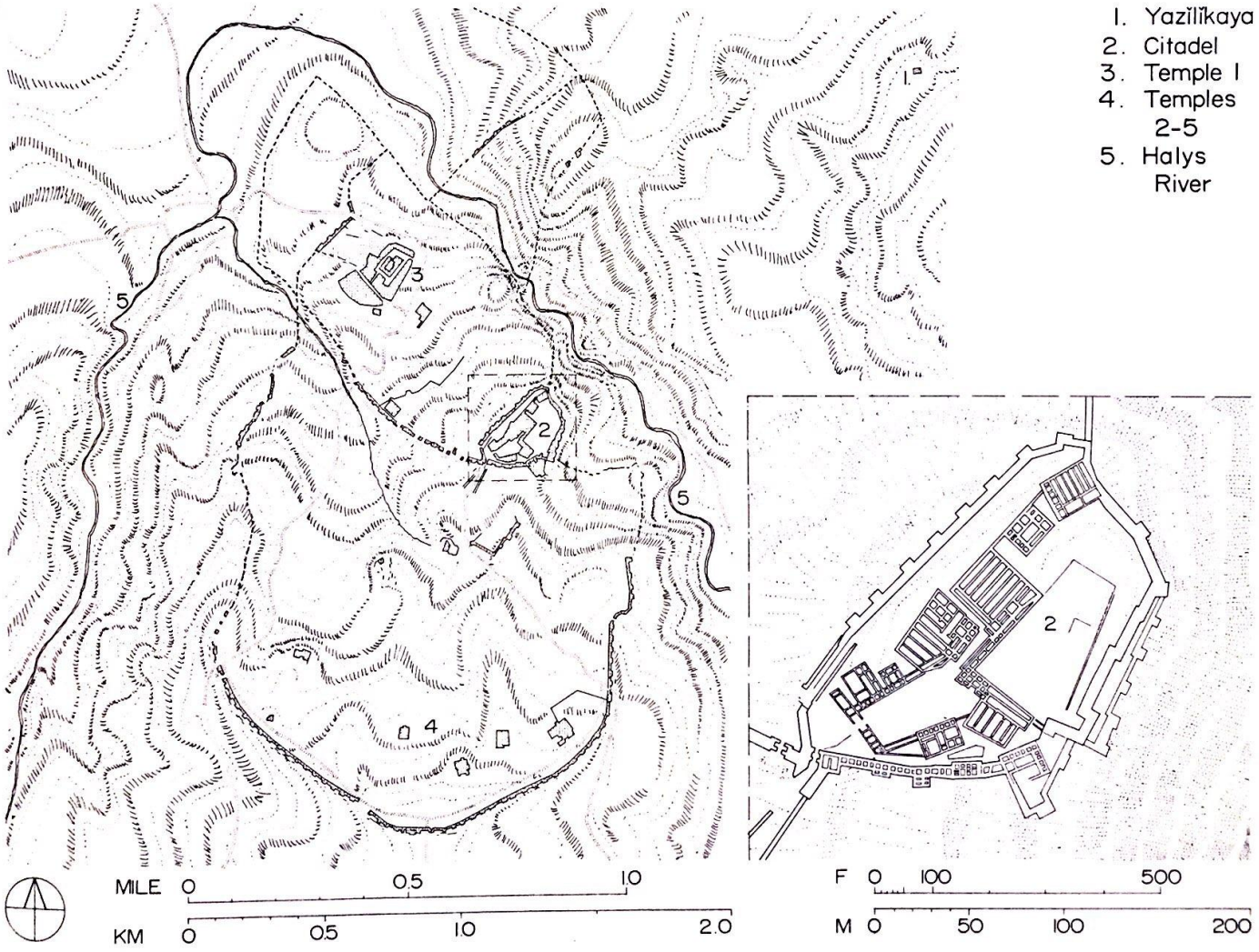
The walls skillfully followed the land contour. They were built on a huge embankment of earth and consisted of a double shell of cyclopean masonry, partitioned with cross-walls and filled with rubble. The superstructure, made of mud-brick reinforced with timber beams, has left no trace. Both this main curtain and a lower apron wall further down were punctuated by projecting rectangular towers at intervals of about 30 meters (100 feet). Having breached the apron wall, the attacking force would have been confronted by the embankment, which was faced with dressed stones too slippery to scale. This system of smooth artificial slopes, called *glacis* by the Romans, was used to break the momentum of a charge. It was also applied to the ramp that skirted the main wall and forced a lateral approach toward the gates, easily covered by archers placed above. At one point

a long tunnel from within the defenses debouched at the very bottom of the embankment, below the apron wall, between two stair ramps that led to a single gate. It was clearly intended for surprise sorties and was lined with huge stones that formed a rudimentary corbelled vault. (Fig. 5.4)

The gates had flanking towers and two portals, the outer set deep within the wall, the inner flush with it on the town side. The portals were made of two monoliths corbelled over so as to form an elliptical archway. On these tremendous jambs of the outer portals animal figures—lions and sphinxes—were carved in very high relief.

The residential arrangement was typical: irregular and contiguous houses grouped around courts. The administrative complex of the citadel was also loosely planned. It consisted of a number of independent buildings strung along the edges of the flat-topped rock, with no discernible formal composition. Some of the buildings were themselves of an irregular outline. This was

Fig. 5.2 Hattusas (now Boğazköy, Turkey), Hittite capital, ca. 1900–1200 B.C.; general site plan and inset of citadel.



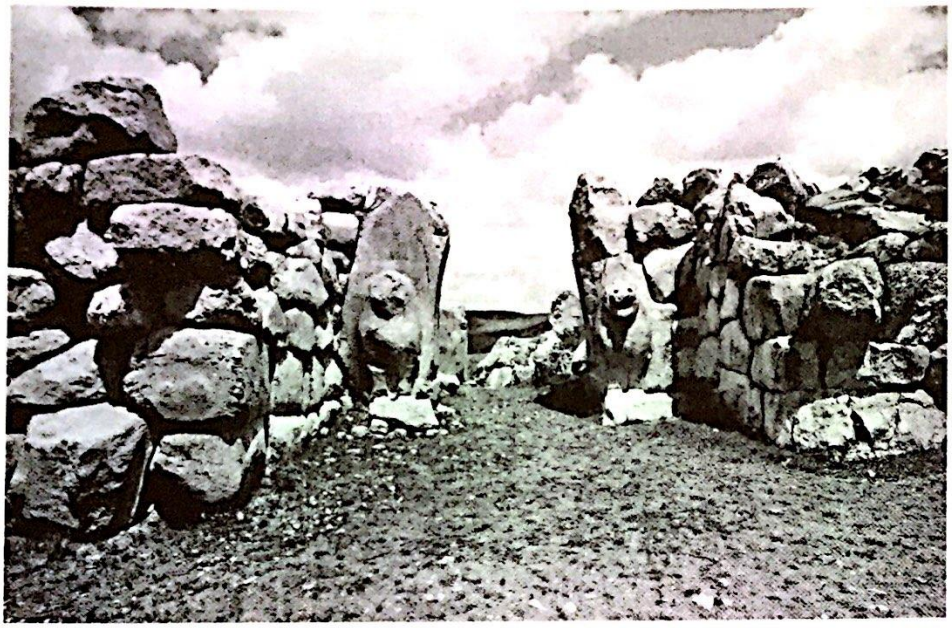


Fig. 5.3 Hattusas, the walls along the southwest side of the city, with the Lion Gate, fourteenth century B.C.; close-up view.

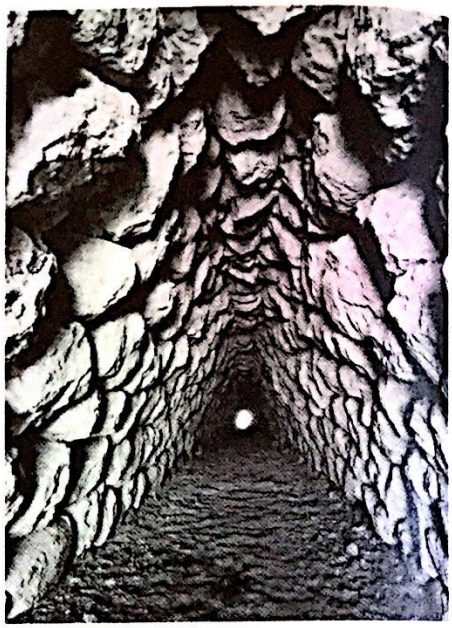


Fig. 5.4 Hattusas, underground tunnel leading to a postern gate, fourteenth century B.C.

also true of the temples, the most impressive remains at Hattusas. Four of them, with no standard orientation, seem to have been arranged perpendicularly to a paved main street which wended its way through the new town and may have lined up with a natural sanctuary across the ravine, now called Yazılıkaya. The fifth and largest temple, known as Temple I and dedicated to the powerful weather-god whose cult was widespread in Anatolia, was in the old town. It was entirely surrounded by storerooms and repositories, many filled with earthenware storage jars. (Fig. 5.5) Hittite temples, like those of Mesopotamia and New Kingdom Egypt, were economic entities. They owned vast estates that they let to farmers for a ground-rent in kind. Yet the layout of the Hittite temple is distinctive and differs from its contemporaries at Thebes or Ur in at least three respects.

First, the court around which the temple was organized was not conceived as a formal space framed by uniform cloisters, in the manner of the Egyptian court. (Fig. 4.18) The column, for one thing, is unknown in Hittite architecture. The standard portico on piers always defined one or two, in some exceptions three, sides of the court, and even then not uniformly. The court, in other words, had four sides of divergent design. Second, the sanctuary was bathed in light that poured through two windows flanking the cult statue and also through side windows. This luminous holy of holies makes a surprising contrast to the dimness and secrecy of the cult chambers in the normal Egyptian temple sequence. In fact, unlike the sealed exteriors of both Egyptian and Mesopotamian temples, the entire periphery wall of Temple I was perforated with ample windows, starting just a few feet above the ground and framed by pilasters. Third, the sanctuary was approached in a roundabout way, through a series of vestibules not directly opening out to the central court. In Temple I the sanctuary is like an annex to the main structure, jutting out from it off axis. Hittite documents reveal that on important feast days the king sat here, after the proper ablutions in the court, for a ceremonial meal, surrounded by courtiers and priests.

The irregular outline, the asymmetry, the court with the four discrete elevations—these should not be thought of as picturesque effects nor be considered the result of careless accretion. Such buildings differ from the organic tangle of cities like Ur in that their creation did not always stretch over a long span of time and their ownership and pattern of use were much more single-minded than what prevailed in city blocks. But they were no more without a rational order than were organic city plans, and the basis of this order was common to both: the expression of the built structure as the sum total of distinct functions brought together with no concern for the two principles of geometrically ordered compositions, bilateral symmetry along an axis, the principle that governs the design

Fig. 5.5 Hattusas, Temple I dedicated to the weather-god, ca. 1400 B.C.; ground plan.

of Egyptian temples despite their protracted development, and the strict rectangularity of outline that disciplines the palace of Mari or the city blocks of El Kahun. (Figs. 3.24, 4.2) The crux of the matter is whether an abstract architectural order is given priority and allowed to control, from above as it were, the organization of the general layout, or whether site and function will shape the building, with such outline and elevation as the reality of land contours and the congress of various functional units might produce.

The special quality of Hittite design—its grasp of natural forms and its studied balancing of the civilized and the elemental—is best brought out in Yazılıkaya, the sanctuary in an outcrop of rocks where a spring must have originally marked, in this dry land, a sacred grove. To reach it you climbed toward the northeast, beyond the ravine, leaving the town and its hubbub behind.

Passing through the gatehouse, you went up two sets of stairs and entered the temple court with its fountain pavilion. The main hall was ahead, but a porch on the left led down to the first gallery, a vast limestone hall open to the sky and paved with turf and flowers. Here a solemn gathering of the Hittite pantheon was taking place. (Fig. 5.6) Two great processions, male divinities on one wall and female ones on the other, converged toward a single isolated rock. On it the great sun-goddess Arinna (Hepatu) was seen standing on the back of a panther, as did her son immediately behind her. (Fig. 5.7) She faced her consort, the elder "Weather-god of Heaven," as he was called in the name-sign he carried. His feet were planted on two mountains that had human form, an image that has a long history going back to Mesopotamia.

A narrow cleft to the right as you faced this awesome rock-theater led into the second gallery, probably the holy of holies. Here a strange dagger-god plunged himself into the rough base of the cliff, and King Tudhaliya IV was shown next to him in the reassuring embrace of his tutelary god Sarumma.

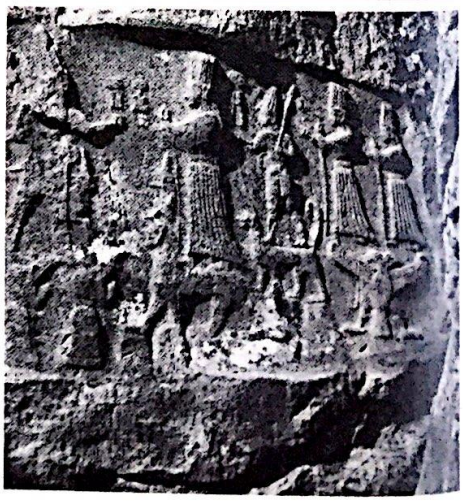
Fig. 5.6 Hattusas, the open-air sanctuary of Yazılıkaya northeast of the city (no. 1 on Fig. 5.2), ca. 1350–1250 B.C., main gallery; general view.

Beycesultan and Troy

Between the Hittites and the Cretan-Mycenaean world lay western Asia Minor—a string of principalities of which two have particular interest for our architectural study: a settlement at modern Beycesultan, close to the source of the Meander river; and further north, at the entrance to the Dardanelles, a mound called Hissarlık, long identified with the city of Troy whose 10-year siege by the Mycenaean Greeks, as told in the *Iliad,* is one of the most celebrated episodes of history. The recently excavated palace at Beycesultan recalls the great palaces of Minoan Crete, while a building form here and at Troy, known in the modern literature by the Homeric term *megaron,* shows up as the central feature of Mycenaean citadels and will form the basis, as we will see in the next chapter, of the later Greek temple.

The main characteristic of these two settlements, as well as of Cretan-Mycenaean towns, is that they lack religious buildings of public scale. Most of the built structure was residential and administrative. Ritual

Fig. 5.7 Yazılıkaya, main gallery; detail of the rock-cut frieze, showing the sun-goddess Arinna (Hepatu) and her court.



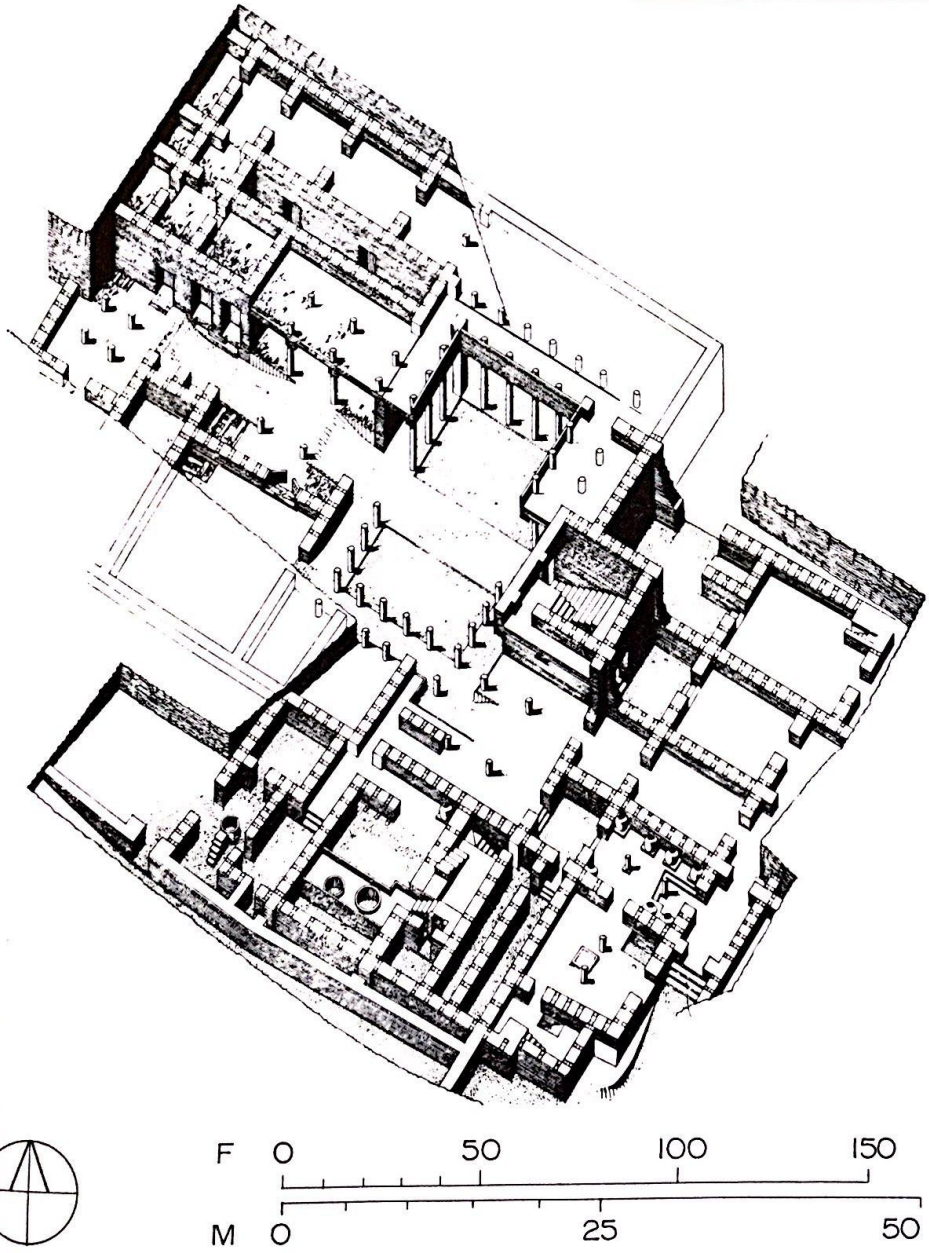


Fig. 5.8 Beycesultan (Turkey), Bronze Age palace, ca. 1800 B.C.; reconstruction drawing.

observances were accommodated within these structures and in occasional shrines not very different from ordinary houses, without the need for monumental temples of the sort that still highlighted the archaeological landscape of Mesopotamia, Egypt, and the Hittite empire.

The palace at Beycesultan lies on the eastern of the two summits which the town occupied. It was a large building (some eighty chambers have been excavated), organized around a rectangular court with a surrounding gallery, or a series of balconies, supported on wooden columns. (Fig. 5.8) The half-timbered construction was elaborate, and in some ways peculiar. The fill was rubble at foundation level, mud-brick above. No dressed stone was used anywhere; the dominant craft was that of the carpenter and not the mason. The panels of the half-timbering were strictly rectangular, as would always be the case in Asia Minor until relatively recent times when diagonal struts were introduced to increase the rigidity of the framework.

The practice of strengthening stone or mud-brick walls through the insertion at regular intervals of rows of runner beams, held in position by cross-ties, is quite ancient in Asia Minor. At the palace of Beycesultan the scheme was amplified with rows of vertical posts that enframe the masonry uniformly from the foundations to the roof. In addition, and independently of the thickness of the walls, freestanding posts against the inner wall face were also employed, presumably to support some element of the upper story which contained the principal apartments.

A unique feature at Beycesultan is the system of foundations. The first stones were laid on a bedding of tree trunks lined up traversely to the direction of the wall. The trunks projected beyond the wall faces and became the lower component of a sub-pavement passage on either side of them. This costly device appears to have been intended as a system of ventilation or winter heating, one of the earliest examples of environmental controls in the history of architecture.

The date of the palace is about 1800 B.C. It was destroyed by fire and was overlaid several centuries later by a different palace complex that had extensive stabling facili-

ties—evidence that the horse as a draught animal and mount was greatly valued. The chief residential unit of the palace was now a *megaron*. This term applies to a large, barnlike, single-storey structure comprising a rectangular hall with a circular central hearth and a front porch formed by the prolongation of the side walls. The ends of these walls were specially treated using single, three-quarter columns. Indeed, the megaron had been a standard unit for important residences within the town as far back as the later third millennium B.C.

At Troy, evidence of the megaron is even earlier. The mound of Hissarlīk sits to the north of an ample plain, with Mount Ida in the background. No fewer than nine superimposed cities have been sorted out on the site. We should rather speak of citadels, for the area covered by these settlements was very small, 2 hectares (5 acres) at its most expansive. Unless there was a larger outer town (and some evidence for this does exist), it would be hard to see how archaeological reality could support Homer's account of the great city of Priam and Hector, which was to house an army of 50,000 Trojans and allied troups.

The Homeric city is believed to coincide with the seventh of the nine layers, counting from the bottom up. It was only a little more than a half-century old when it fell to the combined armies of the Mycenaean commonwealth under the command of Mycenae's King Agamemnon.

The first layer goes back to about 3000 B.C. (Fig. 5.9) This earliest settlement, known as Troy I, already had a strong set of walls of sun-dried brick on a massive rubble substructure. The walls had a pronounced batter, the device for buttressing tall masonry planes by raking them which was regularly used in Egyptian architecture. The plan of one complete megaron emerged from the tangle of the dig. It was about 18 meters (60 feet) long, inclusive of the porch, and 7

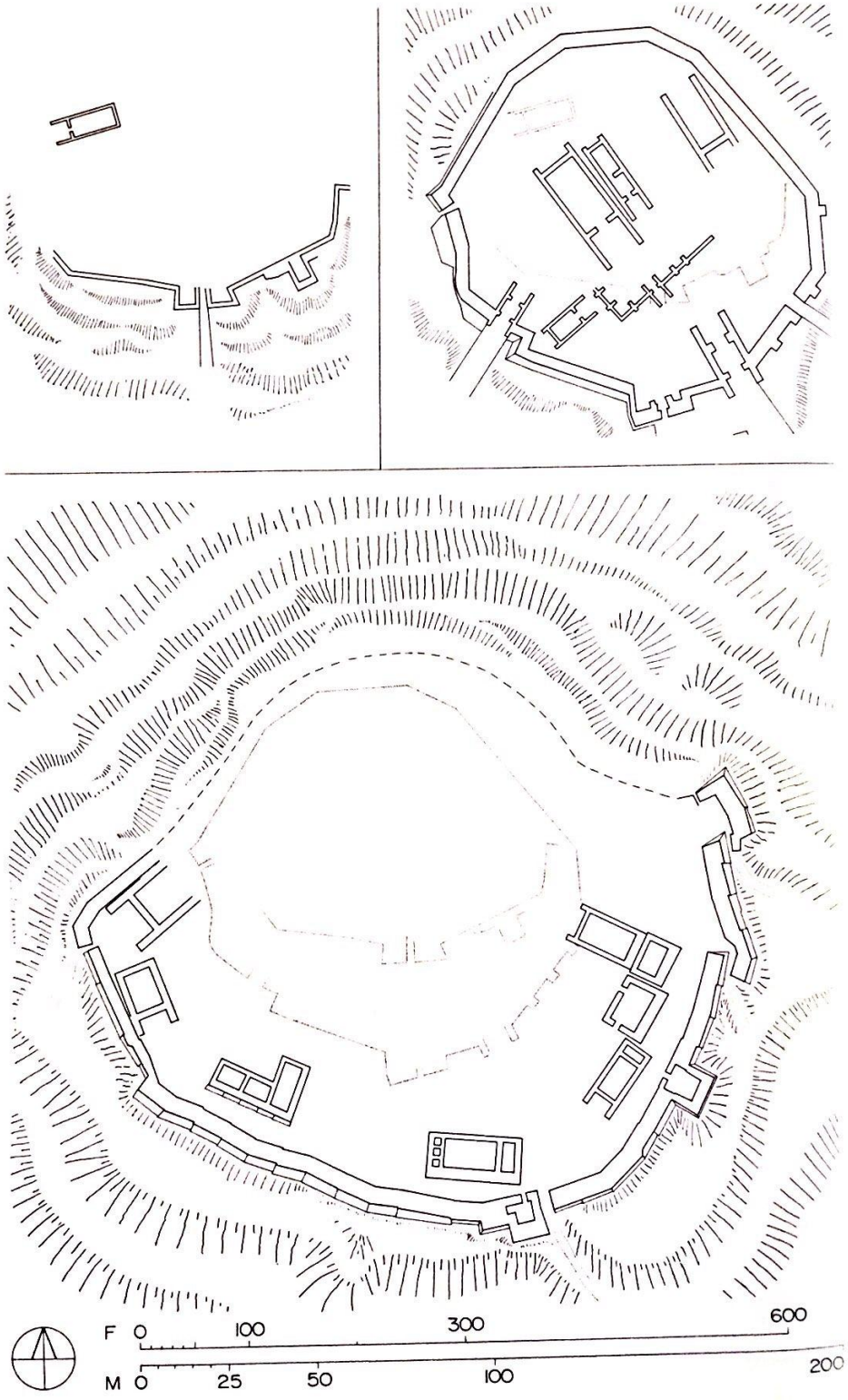


Fig. 5.9 Troy (now Hissarlīk, Turkey), three superimposed levels of occupation, simplified plans: Troy I, ca. 3000 B.C. (upper left); Troy II, ca. 2500–2200 B.C. (upper right); and Troy VI, ca. 1800–1300 B.C. (bottom).

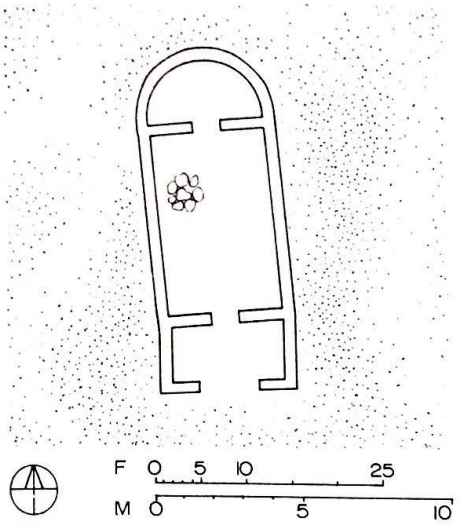


Fig. 5.10 Korakou (Greece), "hairpin megaron," a house of the first half of the second millennium B.C.; ground plan.

meters (23 feet) wide. The main room contained raised platforms for beds, a stone-paved central hearth, and a smaller hearth for cooking against the back wall. The flat roof was made of small boughs or reeds supporting a coat of clay, and clay was also applied to the inner face of the walls. The floor was raised periodically to cover the accumulated refuse and carpeted in places with rush matting.

The megara of Troy II, including the very large one next to the royal palace which probably served as the council chamber, differed from this norm in one important respect. The side walls were prolonged toward the back as well, forming a shallow back porch to which, however, no access could be had from the main room. The purpose of this false porch was probably to allow the flat roof to extend beyond the back wall face and thus protect the sun-dried bricks from damaging rain. For this same purpose the ends of the side walls were given a wooden facing. It may be from such practical beginnings that the special architectural treatment of these ends developed, leading to the columnar design of them at Beycesultan.

The defensive gateways of the citadel of Troy II have a similar arrangement of front and back porch between which lies a small court enclosed by two sets of doors. A gatehouse of the inner circuit around the palace area dispenses with the court and uses a single set of doors between the deep front porch facing away from the palace and the shallower one at the back. The open space that reaches from here to the council megaron was formalized along two sides by a veranda built against the inner face of this enclosure wall. Spurs of masonry projecting from the wall alternated with wooden columns on stone bases. When seen from the open space, the effect was of a porch of columns and piers reminiscent of later Cretan practice. The conscious planning of this urban corner is remarkably advanced for its time in the context of Asia Minor, although not so in Egyptian or Mesopotamian terms.

Troy VI was the most prosperous phase of the citadel. Its main buildings were informally arranged along the inner periphery of the walls, as in the layout of the citadel at Hattusas with which it is roughly contemporary. But although the walls are of fine construction, Troy was already dated. The single thick line of these walls compared unfavorably with the more advanced system at Hattusas. Furthermore, a curiously retrogressive aspect of Troy VI is that the use of the megaron seems to have been abandoned. The rectangular buildings that take its place all had internal supports and upper stories.

Mycenaeans and Minoans

When we next encounter the megaron, it is on the Greek mainland, as the central feature of Mycenaean palaces. The building probably came to Greece from Asia Minor along with the main Mycenaean stock, but there are sporadic occurrences of it in eastern Europe. At least one related house type of the pre-Mycenaean period in Greece could be considered a native archetype; this is the so-called "hairpin megaron," a U-shaped structure the curved end of which was walled off to make a back room. (Fig. 5.10) The roof, however, appears to have been ridged rather than flat. In the small settlements of Bronze Age Greece, this type was probably reserved for chieftains; its presence suggests an aristocratic society already at odds with the simpler open village of Neolithic times. The common people lived in houses of several different types, both rectangular and circular, set next to each other indiscriminately. The settlements were at first defenseless. Later, at a time still prior to the arrival of the Mycenaeans, small fortified towns make their appearance, their simple walls buttressed within by the continuous backs of a ring of houses.

The great citadels of Mycenaean lords date from around 1400 B.C., several centuries after the migratory wave that brought this people into Greece. (Fig. 5.11) They represent the first major architectural episode of Greek culture. The preference was for strategically located, defensible eminences with a good supply of water. (Fig. 5.12) At the summit stood the palace of the king. Its defenses took in an open common, to serve in time of danger as shelter for the people of the township who lived for the most part on the unwalled slopes. As in Hittite sites, the fortifications exploited the lay of the land and were built in heavy cyclopean masonry of boulders piled up with rugged effect. Southern Greece is a rough-and-tumble territory of intricate shores and small, rocky, obstreperous mountains—a difficult land where aromatic scrub and the hardy olive tree are the only vegetation to prosper effortlessly. On this raw theater of nature the Mycenaean lords imposed their rule.

The megaron dominated the palace complex in size and determined its axis. (Fig. 5.13) It commonly faced south and was entered through a front porch; between the porch and the hall was a set of guardrooms. In the hall, a large hearth of stuccoed clay focused this ceremonial place. Here libations were poured and sacrificed animals burned. The smoke escaped through the open sides of a lantern with an impervious top over the hearth, an arrangement which also admitted light. The lantern was supported on four columns at the corners of the hearth. Sometimes, as is the case at Pylos, an entire gallery level between the ceiling and the clerestory lantern would surround the hearth opening.

Next to the hearth stood an offering table, and the king's throne was set across the way, in the middle of one of the long sides, flanked by painted guardian griffins. The floor was stuccoed and laid out in squares, each square painted with a different abstract pattern in several colors. On the walls were fresco representations of musicians (it was in such megara that Homer's ancestral bards sang their lays), hunting scenes, and the like.

Pylos

Perhaps the most instructive Mycenaean palace is that of Nestor in Homer's "sandy Pylos." The defensive system of the Mycenaeans, however, is best observed at the citadel of Tiryns, which is planted on an outcrop of limestone rising out of the plain of Argos, like a sturdy ship headed for the nearby sea. And for a sense of the entire Mycenaean community with its gates and tombs and artifacts, none can compete with Mycenae itself. "Well-built Mycenae," Homer calls her, and "Mycenae rich in gold"—two epithets fully confirmed by the excavations that started a hundred years ago with Heinrich Schliemann. It was his discovery of the site and the fabulous gold treasure of its tombs that heralded the exposure of this early Greek culture and the authentication of Homeric myth as history. Something of the initial excitement of Homeric poetry proved true comes across in the jubilant telegram that Schliemann sent to the king of Greece in December 1876:

> It is with extraordinary pleasure that I announce to Your Majesty my discovery of the graves which, according to tradition are those of Agamemnon, Cassandra, Eurymedon and their comrades, all killed during the banquet by Clytemnestra and her lover Aegisthus.

To take Pylos first, the older palace was probably the separate building to the southwest of the complex. (Fig. 5.14) The main hall was not a full megaron. The approach was at a right angle from a large entrance hall that had a facade with two wood columns between antae, and one peculiarly placed column within. This orthogonal order of a hall-of-state sequence may have been standard in a first phase of Mycenaean palace design, and its memory may account for the placement of the throne to one side of the otherwise straight axis in the later megara.

In the main palace building at Pylos, the axis begins with a gatehouse consisting of two units; each had a single column in the middle of its open end that aligned with the common entrance in the cross-wall which separated the units. The double gatehouse was followed by an inner court, on the north side of which rose the two-column portico of the megaron proper. A doorway with a sentry box to one side led to a vestibule, and through a second guarded doorway one entered the throne room with its flame-decorated hearth. The axis ended at the blind north wall of this room.

Surrounding rooms were served by a corridor ring around three sides of the megaron. To the right and left of the vestibule, stairs led to the upper floor. These surrounding rooms included three magazines to the north for storing oil, and along the flanks, pantries for dishes and drinking cups. The women's quarter occupied the area above the eastern rooms. The double gatehouse was flanked, to the west, by the archive room where hundreds of Linear B tablets were unearthed, and to the east, by the queen's apartments, these grouped around a large hall with its own hearth and a walled court matching that of the king's immediately to the north. Neither of the

Fig. 5.11 Map: The eastern Mediterranean in the second millennium B.C.

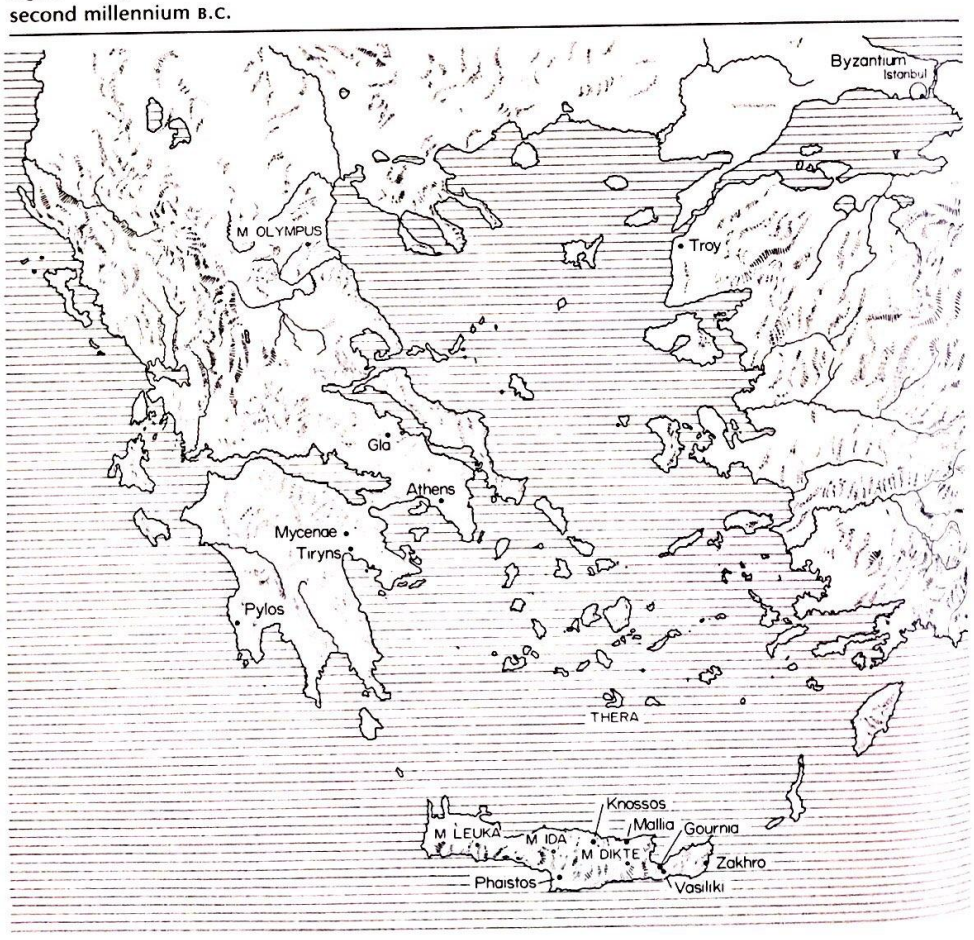


Fig. 5.12 Mycenae (Greece); aerial view from the west.

small courts could be entered from the outside, thus ensuring the privacy of the royal couple. To the east of the courts a main spout delivered the palace water which was carried here by a wooden aqueduct from a spring about one kilometer away across the valley. On the northeast edge of the hill, a large building served as a wine magazine; and to the southeast, a building of several rooms seems to have been the palace workshop where spare parts for chariots were kept and repairs of metal and leather goods were carried out.

Tiryns

The construction of Mycenaean palaces was of rubble throughout, strengthened by a massive framework of horizontal and vertical timbers. Outside, the principal walls were faced with fine limestone. The practice of using stone as a thin veneer for walls of inferior material might have been learned from the Cretans who relied on such facing, in their case, alabaster, to produce a sense of opulence.

By contrast, the defensive ring was built of cyclopean masonry. Enormous blocks of irregular shape were packed with smaller stones and clay. The circuit at Tiryns, as it looked after three centuries of revisions and additions, comprised two parts: the close for the commons to the north, entered from the lower town through a gate at the

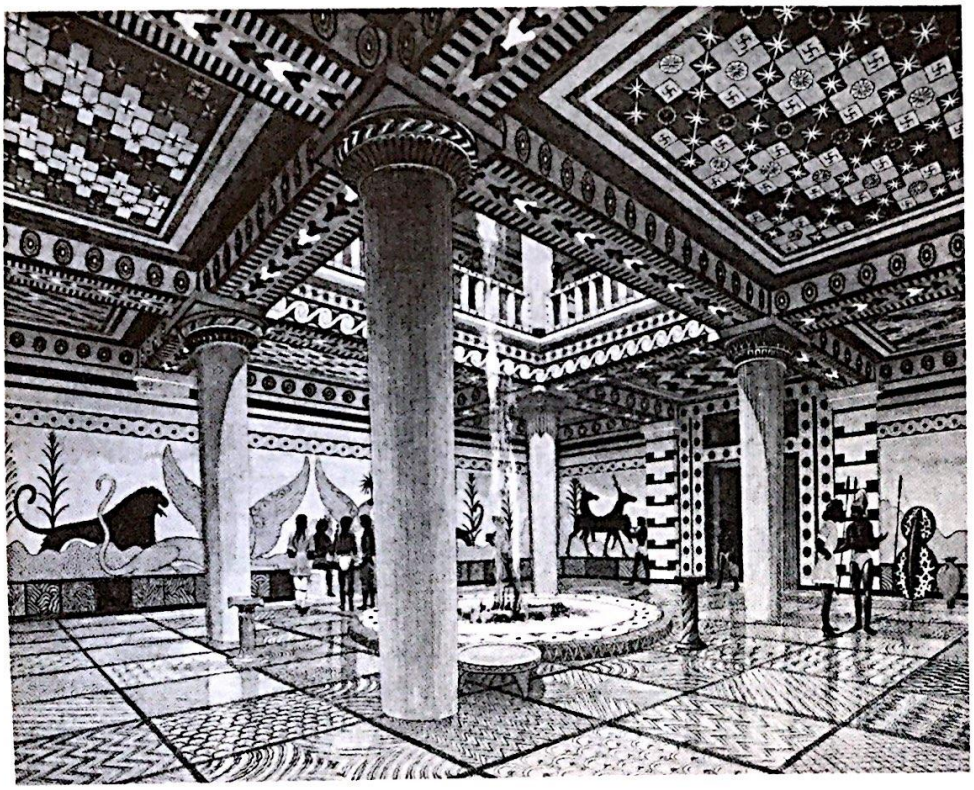
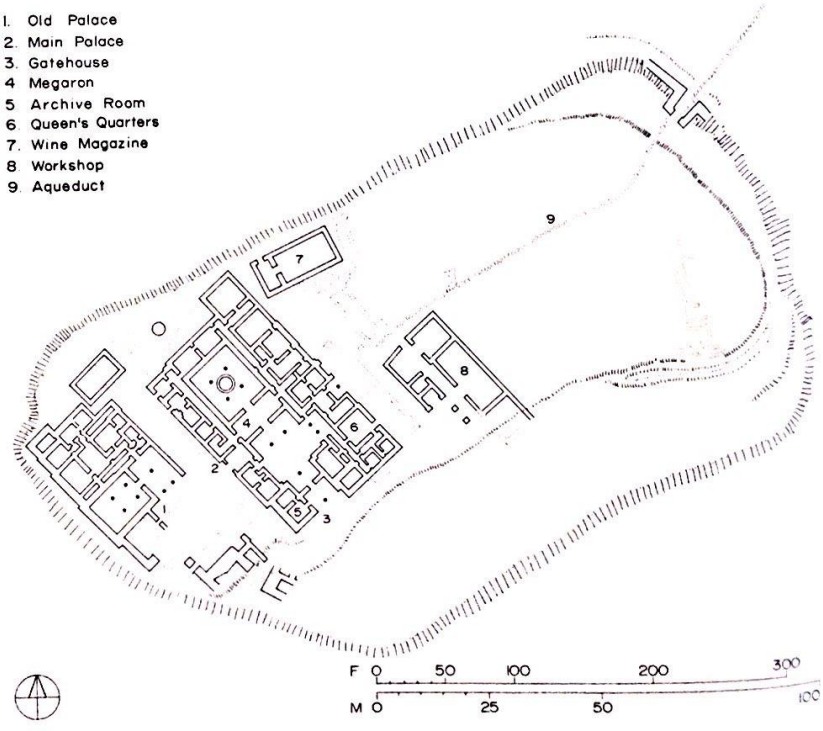


Fig. 5.13 Pylos (Greece), the main hall or megaron of the palace, thirteenth century B.C.; reconstruction drawing.

Fig. 5.14 Pylos, the palace site; general plan.



southwest corner; and the palace enclosure, the approach to which was a formidable obstacle course. (Fig. 5.15)

The only access to this enclosure was along the east flank. There was no axial approach from the south, and the postern gate on the west side, overlooked by a huge bastion, led to the main water supply outside the citadel. Hidden spring chambers further north could be reached in times of siege by two tunnellike passages through the west wall of the close. The south and southeast section of the citadel wall contained casemates—a series of rooms, with no lighting of their own, opening off long passages whose tremendous corbel vaults parallel those of Hattusas. In fact, this technique of cyclopean corbelling, where each course overlaps and counterweighs the one below on the cantilever principle until the highest course on each side leans inward against the other, was probably introduced from Asia Minor.

The main eastern access, a narrow slit in the wall, could be gained only by means of a northern ramp that exposed the unshielded right side of enemy troops to bowmen on the parapets. Once in, the hostile force would find itself in a long defile and under fire from the tops of the immense bastions along both sides. Two gateways in this corridor had then to be traversed before reaching the entrance of the palace situated on the western side of a forecourt, just beyond the second gateway. Another right angle turn at the palace court proper and one would finally reach the inner gates of the complex.

Mycenae

The design of the citadel at Mycenae has much in common with that of Tiryns. (Fig. 5.12) Mycenae occupies a hilltop between Mount Zara to the east and Mount Marta to the west. In the background rises Mount Profitis Elias on whose summit there are remains of a Mycenaean lookout post. The position of the citadel commanded the sea approach from Crete and the south Aegean in general, as well as the land road to

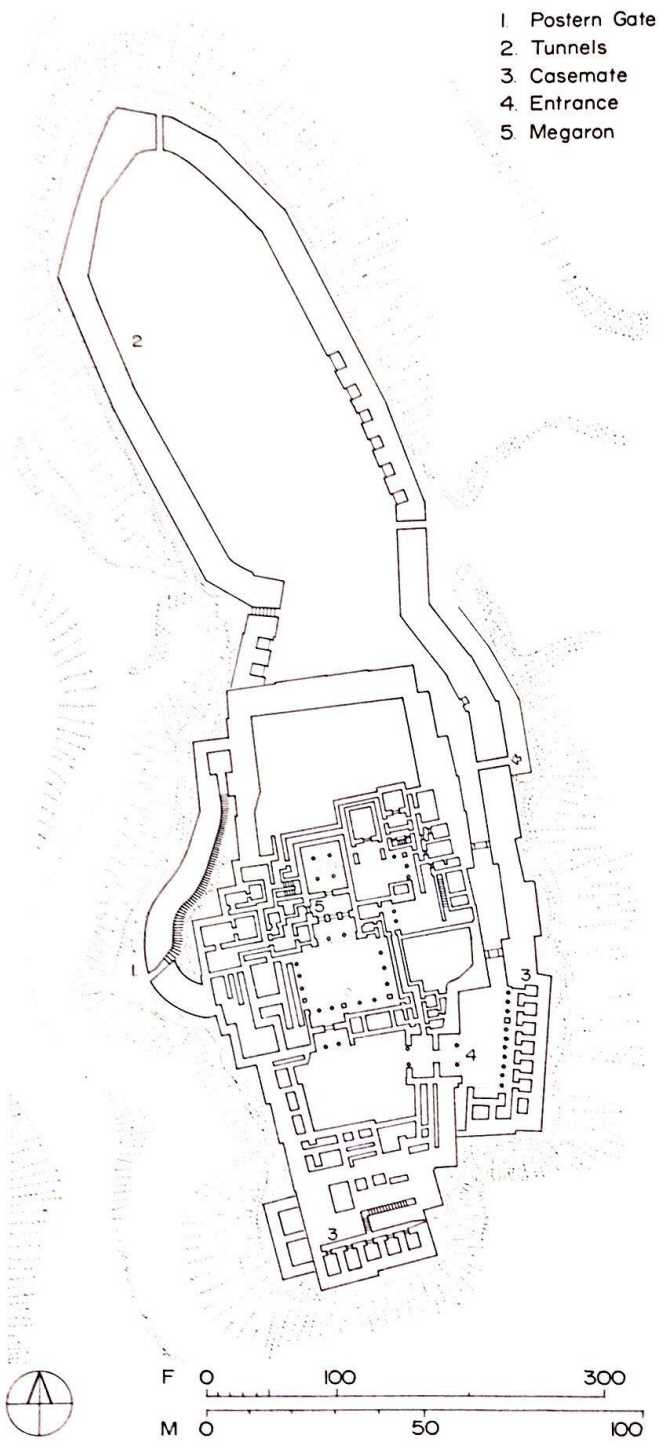


Fig. 5.15 Tiryns (Greece), Mycenaean citadel, ca. 1600–1100 B.C.; general plan.

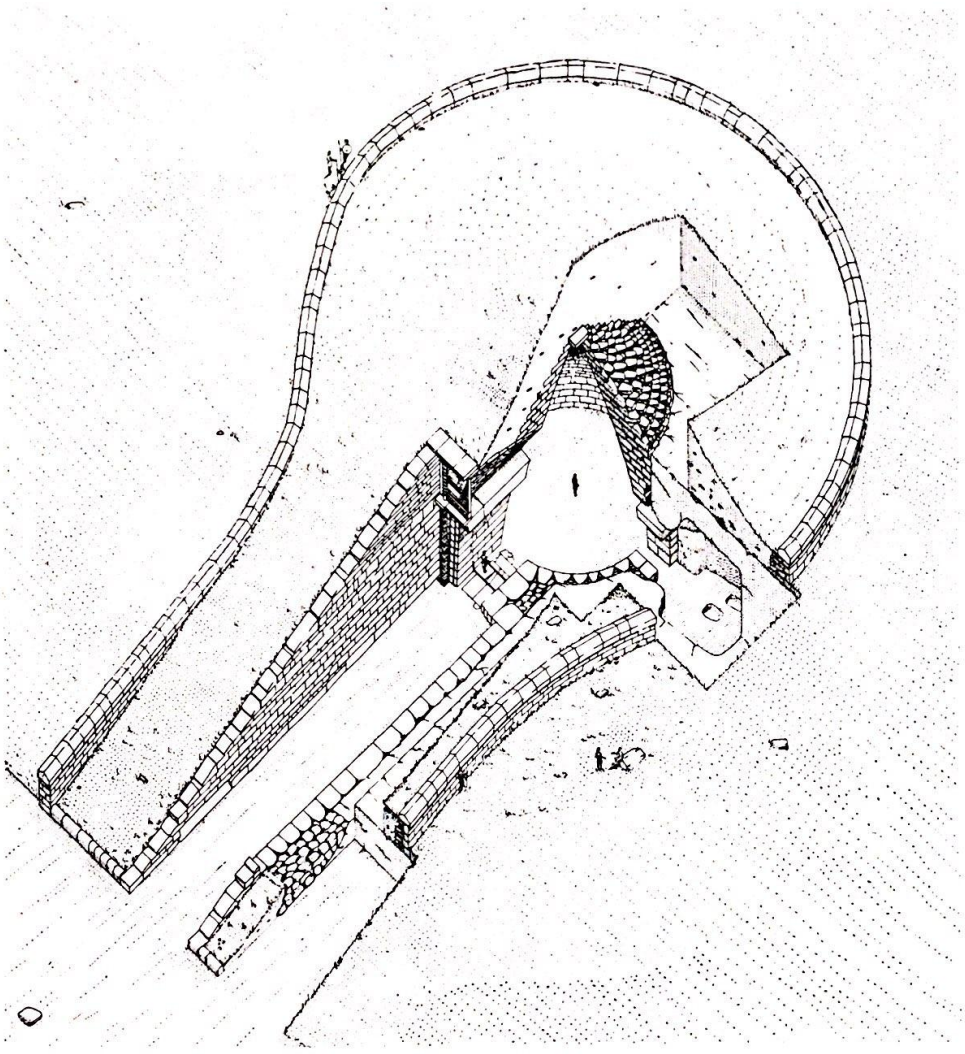
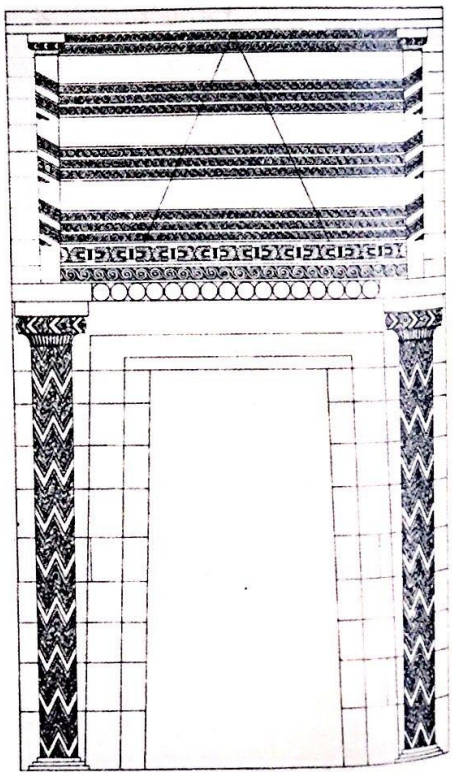


Fig. 5.16 Mycenae, the so-called "Treasury of Atreus," a tholos tomb of the fourteenth century B.C.; isometric view.

Fig. 5.17 Mycenae, "Treasury of Atreus," entrance to the burial chamber; reconstruction drawing.



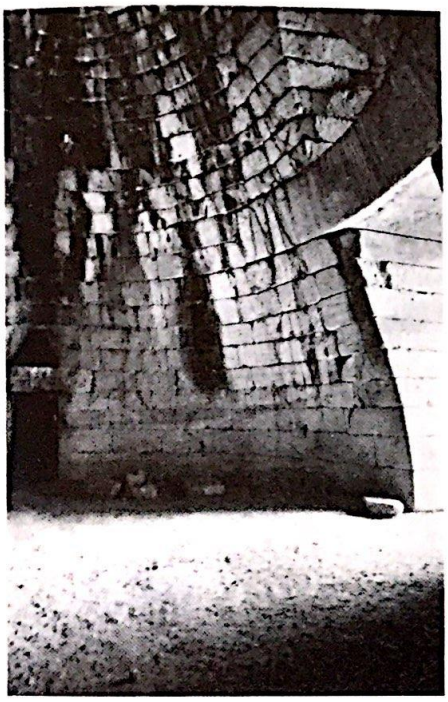


Fig. 5.18 Mycenae, "Treasury of Atreus," burial chamber; interior view.

Corinth and central Greece beyond. This bold prominence of hard limestone was made even more impregnable by the cyclopean walls, which have a thickness of 6 to 7 meters (20 to 25 feet) and employ boulders that weigh as much as 5 tons each. The water supply was copious. As at Tiryns, an underground cistern (at the foot of the southeastern escarpment) was reached by a stepped secret passage that cut through the wall.

The road from the Argive plain ascended a foothill from the southwest which held a large cemetery. The excavator's pick yielded several finds: pre-Mycenaean burials, rock-cut chamber tombs, and an extraordinary class of buildings called *tholoi*, or "beehive" tombs (Fig. 5.16) These tombs were circular structures with corbelled domes of finely cut stone and an approach causeway, or *dromos*. The oldest among them goes back to 1500 B.C. The form has a general resemblance to Neolithic passage graves (see Chapter 2), and circular ossuaries of an earlier date are known in Crete. These ossuaries lacked the dromos, however, and were entered through a simple antechamber; they were built entirely above ground; and when they were vaulted, the stone was finished off in wood. Beehive tombs were subterranean. First, the dromos was cut through a hillslope. Retaining walls were built to secure the two sides of the open passage. Next, a circular area was dug out and the tomb chamber built inside it. The dome, which rose above the ground, was covered up with earth, the mound being supported by a circular buttress wall in line with the haunch of the dome.

The best known and finest beehive tomb is the fancifully named Treasury of Atreus. Its dromos was a full 36.50 meters (120 feet) long and about 6 meters (20 feet) wide. The floor was cemented. The side walls rose in steps toward the two-storey facade of the tomb proper. (Fig. 5.17) The lower story held the doorway which was battered in imitation of an Egyptian pylon. The lintel block extended right across the facade and locked into the dromos walls. The doorway was framed by half-columns of green limestone decorated with bands of zigzag. The downward tapering of these columns and their cushion capitals are clearly of Cretan inspiration. Smaller half-columns stood above them at the second-storey level, the main feature of which was a relieving triangle originally screened with a slab. The purpose of the triangle was to reduce the weight over the lintel. We have already noticed such relieving devices in Old Kingdom pyramids.

The double door of the tomb, as well as the beautifully joined surfaces of the interior, was lined with bronze plaques fixed in place with bronze nails. The curve of the rotunda started at floor level, so that the whole interior described a sweeping arc over the buried prince, made skylike by the bronze rosettes that probably studded it. (Fig. 5.18)

At the Treasury of Atreus, the actual burial took place at a small rectangular chamber to one side of the rotunda, but something of the standard rite can be deduced from evidence on similar tombs. The funeral procession marched down the dromos carrying the bodies of the king and also of his wife and an attendant or two who may have been forced to kill themselves in order to accompany him. The king was lowered into his grave, commonly a pit below the floor, and about him his treasures were arranged—bronze daggers inlaid with gold and electrum, cups of precious materials, ornaments and seals. Logs were stacked up over the opening of the pit, and on this pyre valuable objects and offerings of food and drink in clay pots were burnt. The pyre in the end collapsed into the grave pit. The hole was filled with earth, covering the king and the accompanying bodies laid down by him. Large stone slabs were placed over the grave. The door was closed and secured, and the dromos may have been filled in on the way out.

Beehive tombs were a late form of burial for Mycenaean princes. Earlier on princes were entombed in shaft graves, of which one group, the so-called Circle A group, was incorporated within the citadel during a final enlargement of the walls. The main gate to the citadel, in the northwest corner, is a tremendous structure of monolithic jambs, threshold and lintel; originally it held large wooden doors. (Fig. 5.19) The lintel alone must weigh close to 25 tons. Over its convex top face comes a relieving triangle which here preserves its sculptured screen—a limestone slab showing two lions on either side of a downward tapering column. This is the first piece of large-scale sculpture we have from the Greek world.

We have already encountered beasts as guardians of gates in Assyria and Hattusas. Here at Mycenae the heraldic composition probably stands for the Great Goddess and her beasts. She was portrayed at the rock sanctuary of Yazılıkaya, standing on a panther. (Fig. 5.7) She was also a common image in Crete where small seals depict her on her mountaintop, subduing the wild beasts and insisting on the recognition of her ancient symbol, the horns of consecration. (Fig. 5.20) The rhythmic, small-scale, spruce rendition of the Cretan artist is as eloquent of the fluid vision of that island culture as is the tight, regimented, and powerful relief of the Lion Gate representative of the world of the Mycenaean warlords and their semifeudal society.

Past the Lion Gate, a ramp ascended to-

ward the palace. The unusually oriented megaron is still recognizable, but not much else is, since a Classical Greek temple was built over the palace in later centuries. A path below the ramp led down to Circle A, the site of Schliemann's first spectacular finds. The circular wall around them consisted of two parallel rows of upright slabs, their upper edges cut to receive horizontal roof slabs. The graves were marked by stelai: they have been interpreted as false doors, to let the wandering souls into and out of the tomb. Some of the buried princes wore golden breastplates and face masks with a convincing replication of their features hammered out of the gold sheet.

The concept of shaft graves with false doors, the practice of swathing bodies in bandages and probably mummifying them, and the generous use of gold bespeak direct familiarity with Egypt. Some scholars believe that Mycenaean mercenaries were employed by the pharaohs during the expulsion of the Hyksos from the Delta area in the sixteenth century B.C. If so, Cretan ships may have transported this mainland force.

Knossos

Crete is an island of broad and fertile plains that are defined by tall mountains: Leuka to the west; Dikte to the east; and in the center Mount Ida where according to Greek tradition Zeus was born in a cave and raised secretly, for his father Kronos had taken to swallowing his children as soon as they were born in the hopes that thereby he would thwart the oracle's prophecy that one of his sons would dethrone him. Cretan towns spread out at the foot of these mountains, casual and unfortified. To the Classical world Crete was the Isle of the Blessed: home of the wise King Minos, one of the three judges of the Underworld, home of crafty Daedalus, the architect and inventor, who made wings with which to fly to Sicily, and home of a peaceful, versatile, happy people attuned to the rhythm of the sea and the shaking earth: "There is a land in the midst of the wine dark sea," Homer sings, "a fair and a rich land called Crete, washed by waves on every side, densely peopled and boasting ninety cities."

We have a good image of the builders of this Minoan culture, as it is known from

Fig. 5.19a Mycenae, Lion Gate, thirteenth century B.C.; view.

its legendary king—a race of tall, flexible, narrow-waisted men and women, at home on the high seas in their ships made of the oak and cypress, fir and cedar, trees that then forested the mountain slopes. They lived, so it would seem from their art and built environment, in perfect communion with nature, in a kind of all-embracing pantheism that was never institutionalized into strict religion. In view of most of the ancient civilizations we have studied so far, the extreme rarity of temples (one probable instance is known thus far) and stone statuary is indeed striking. It would seem that there were tree cults, stone pillar cults pregnant of the Neolithic past, and certain rooms in the palace of the king that were set aside for worship. And over it all, over the rising plant and the lapping wave, the Great Goddess ruled from her lofty heights. (Fig. 5.20)

Something of this fluent vision of the world, so different from the preeminent rigidity of Egyptian form, is evident in much of what the Cretans fashioned: in earthen jars, seals, statuettes, murals on the walls of palaces and villas—indeed in the very layout of these buildings and the towns they graced. Marine and plant forms, freshly observed and vividly depicted, figured regularly in the artists' repertory. A large octopus might enliven the surfaces of an oil or wine jar, its writhing tentacles reinforcing the potter's shape. (Fig. 5.21) Flying fish or stalks swaying in the breeze might bring sunny charm into a living room.

Most of these remains date from about 2000 to 1400 B.C. It was at the beginning of this period that a complex urban civilization, based in large measure on overseas commerce, supplanted the existing structure of society. This early society dates back to 6000 B.C. when an initial group of immigrants from Asia Minor set up Neolithic communities like those of the homeland. This village-centered culture was galvanized at the turn of the third millennium B.C. by the arrival of metalworking, the development of a flourishing textile industry, and the invention of clay turntables which prefigure the potter's wheel. To this Bronze Age episode belong the large communal ossuaries we mentioned above in the context of the tholos tombs of Mycenae.

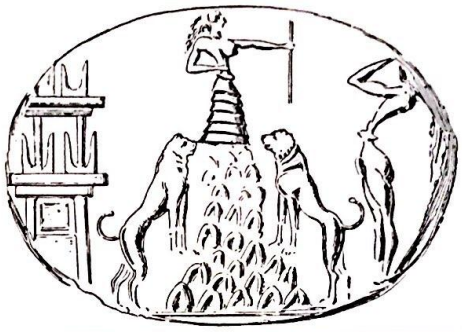
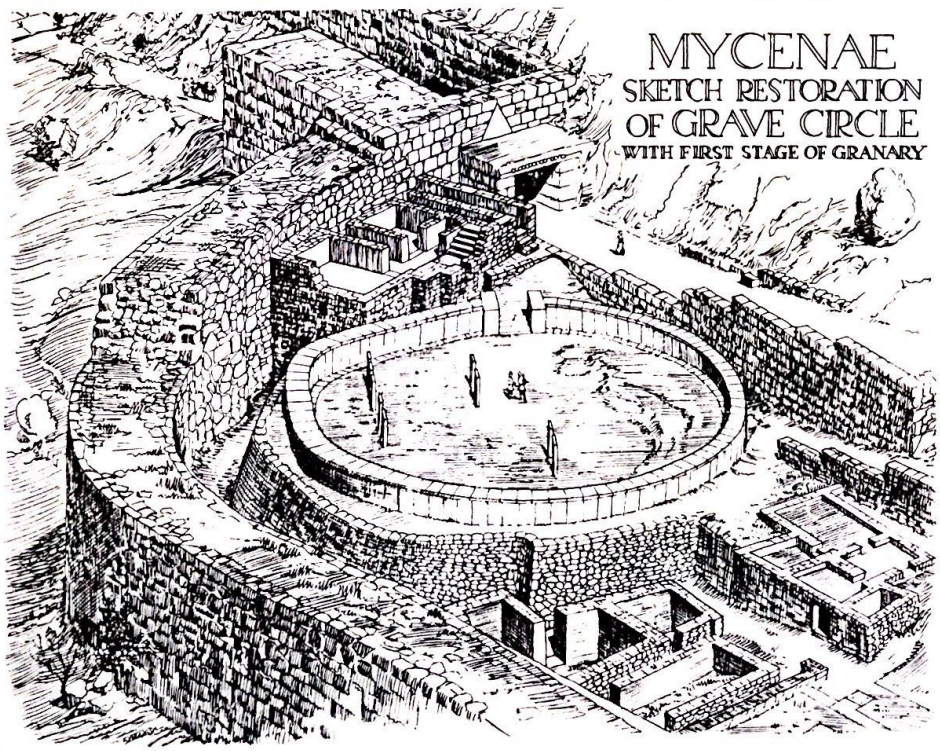


Fig. 5.20 Minoan seal, showing worship of the Great Goddess, sixteenth century B.C.; line tracing. (Archaeological Museum, Heraklion, Crete, Greece)

Fig. 5.19b Mycenae, Grave Circle A, sixteenth century B.C., reorganized and enclosed within the citadel in the thirteenth century B.C.; reconstruction view.



By 2000 B.C., the eastern half of the island had attained a startlingly high level of sophistication. Written records and large royal palaces embraced by prosperous towns were the outward signs of this cultural surge. The palaces were designed around a rectangular court; the court elevations reflected the character of the rooms behind, which were grouped according to function—ceremonial, administrative, religious, or domestic. Most of the familiar particulars of Cretan architecture—porticoes with alternating columns and piers, three-aisled hypostyle halls inspired by Egypt, the practice of using large stone slabs at the base of the walls or for framing openings, lightwells and broad flights of steps—all of these were in full use in these first palaces. They were almost completely destroyed around 1700 by what scholars now tend to agree was a devastating earthquake of the kind the Aegean is prone to. The new palaces were built along the lines of the first. Beginning with the spectacular

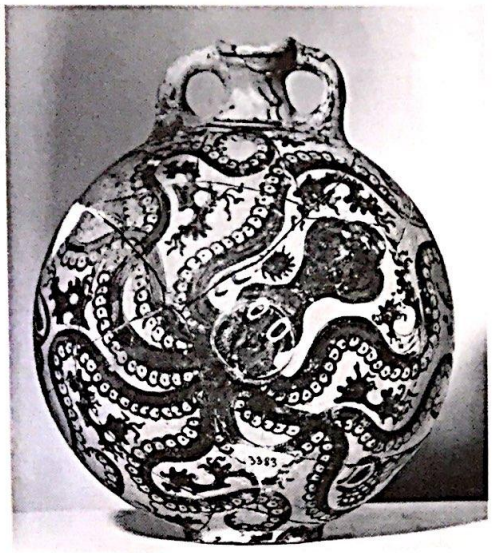


Fig. 5.21 Minoan earthen jar with octopus, from Palaikastro, ca. 1500 B.C. (Archaeological Museum, Heraklion, Crete)

Fig. 5.22 Phaistos (Crete), Minoan palace, ca. 1600 B.C.; view of central court looking north toward Mount Ida.

digging up of Knossos by Sir Arthur Evans, several of them have been sufficiently resurrected to give us a detailed picture of their florid and literate design. (Fig. 5.22)

Despite their small size, the towns themselves, with their public institutions and amenities, were worthy predecessors of the Greek city-state, the *polis*. From the first they made provision for an open place of assembly whose defining wall faces may have supported seats. A network of streets, topographically and functionally determined and retaining the dwelling patterns of the Bronze Age villages on the same site, converged on this town square and the palace. Most were paved. And although in time the palace gained prominence, the sense of a lively community is always unmistakable.

Gournia in the northeast, on the bay of Mirabello, has the best preserved layout. (Fig. 5.23) It had about sixty houses—a very small town indeed in the company of Babylon or Hattusas. But the urban form is cohesive and logical. A tight mesh of streets wrapped itself around the low hill whose saddle held the administrative and ritual focus of the town, the king's palace. Two main streets, one on the hill and one further down on the plain to the east, were linked with secondary streets.

The houses were small and densely packed; almost all had upper floors reached by outside staircases. The ground floor was often used as a storeroom, with no entrance from the street. But further up, the facade opened to the outside light by windows, as we can see clearly on a series of tile plaques uncovered at Knossos that depict a Minoan townscape. (Fig. 5.24) These windows of four or six panes must have required a transparent cover of some kind, oiled parchment most likely—an unusually advanced feature for such an early date. To judge from the Knossos plaques, the houses were capped by a lantern or skylight serving as a light well for the interior; or, perhaps, that element should be interpreted as a pent roof or a summer room. The rule seemed to be single-family dwellings. But there were multiresidences too, such as a house from Vasiliki where dozens of rooms were grouped somewhat arbitrarily into suites on at least two stories along two sides of a paved courtyard. A landed gentry lived in country mansions.

The intricate, seemingly haphazard, plan from Vasiliki is typical of Crete. The Minoan architect did not begin with general frames; he did not think in terms of neat bounding outlines. (Fig. 5.25) Just as the towns themselves were unwalled, so too the larger buildings, the royal palaces especially, were freely circumscribed. True facades, in the main, were ordered toward the court. Indeed, there is reason to believe that the layout was planned from inside out, in units radiating from the central court as their function required. Two sides of the court would be established first by straight lines crossing one another at right angles. The more important units would then be developed in relation to these two baselines and in round numbers of Minoan feet.

In deference to the Goddess who dwelled on mountaintops, and in sharp contrast to the haughty siting of Mycenaean citadels

the palaces occupied slopes or flatland. And the nature of the site was respected, even courted. Hittite and Mycenaean appreciation of natural contours was based on defensive genius. Minoan design celebrated the shape of the landscape even when there was no practical advantage to be derived from it. The meadow's lilt, the skirting hill, the dipping down into valleys, and the climb to ridge-tops—all this was solidified into architecture. The aim, to put it differently, was to open up architectural form toward the prospects that befriended it. This is the same respectful harmony with nature, the same way of accepting things as they are and singing of them, which we noted in the forms of Minoan art and its repertory of animals and plants.

Design is the graph of attitude. Compare a Mycenaean palace like that of Tiryns or Pylos with the royal palaces of Crete, and you will have a truthful image of these two Aegean spheres as functioning societies. (Fig. 5.15) Setting aside the disparate character of their sites, both types of palaces are encompassed within loose outlines. But the heart of the Mycenaean palace is fixed in the megaron, the king's hall at which the gods are given hospitality. It is the largest element of the composition and an axial approach toward it is set up which stiffens the general layout and creates a hierarchy of use that is unequivocal.

Fig. 5.23 Gournia (Crete), Minoan town, seventeenth to twelfth centuries B.C.; general site plan.

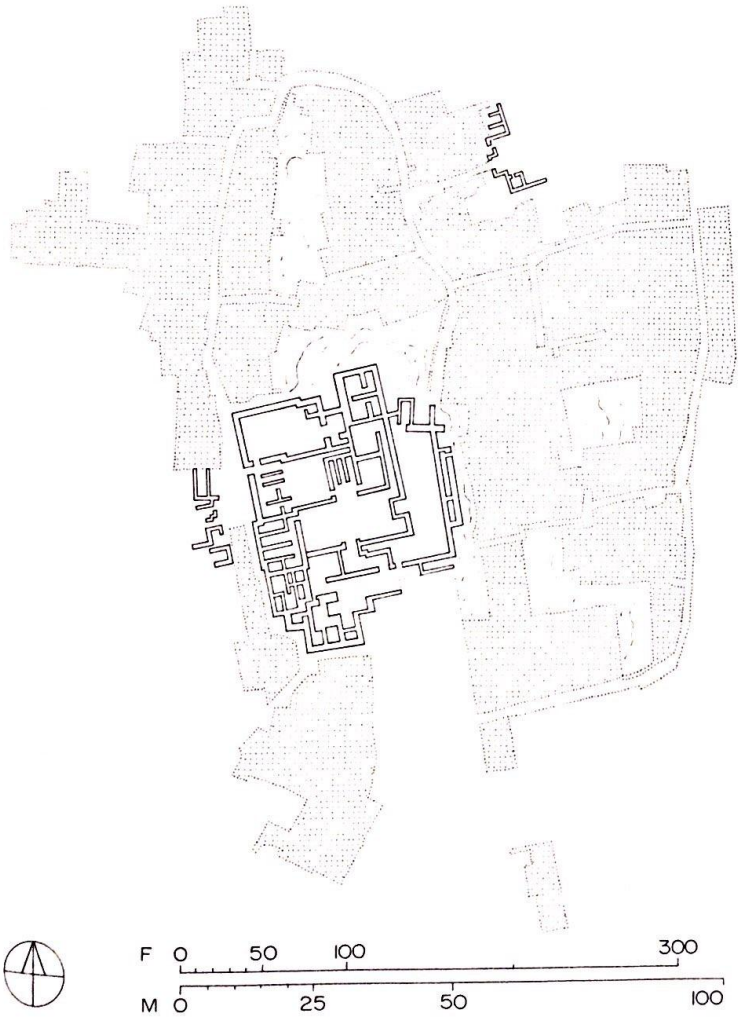
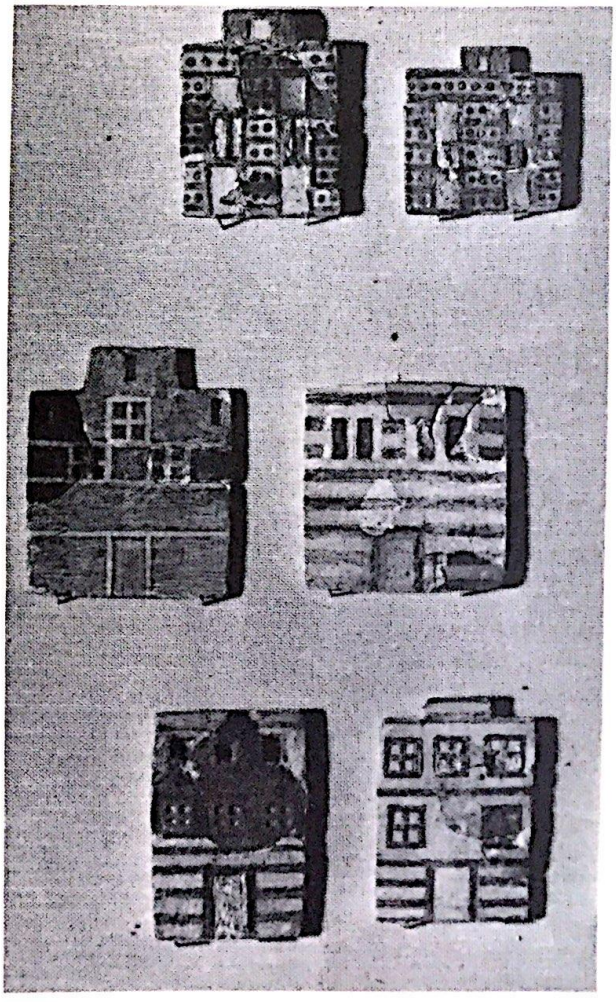


Fig. 5.24 Faience plaques showing Minoan houses, from Knossos, ca. 1500 B.C. (Archaeological Museum, Heraklion, Crete)



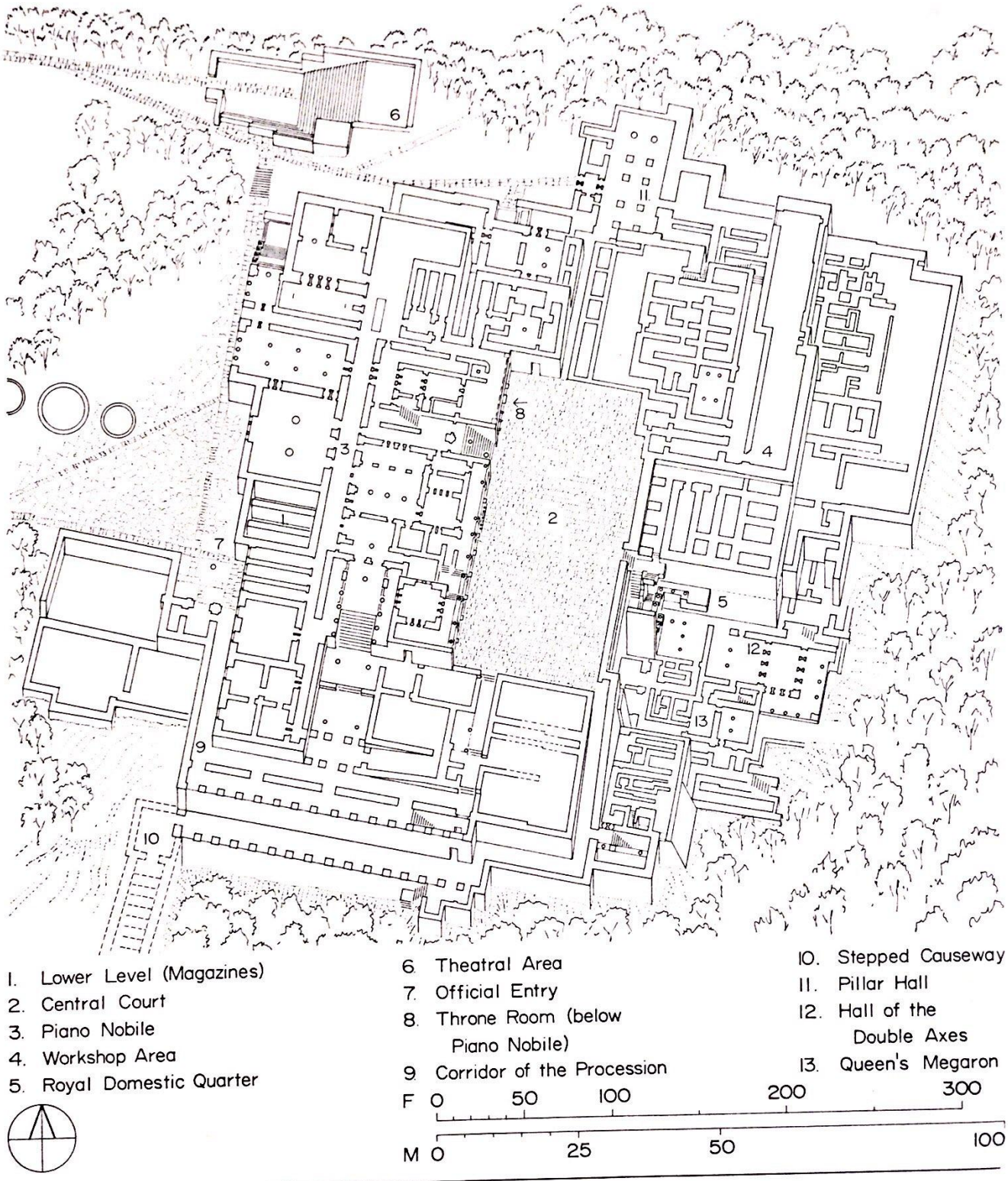


Fig. 5.25 Knossos, the royal palace, ca. 1600 B.C.; axonometric drawing, with plans of major rooms shown at selected levels.

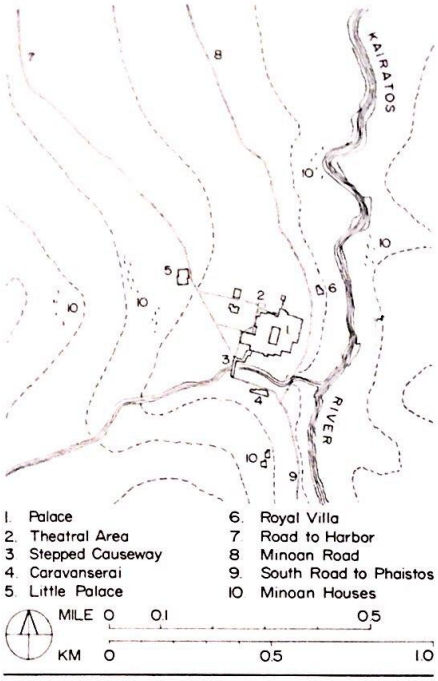


Fig. 5.26 Knossos, general site plan of town.

At Knossos the path is not straight, the goal not predetermined. The heart, if anything, is the all-purpose court. In the surrounding scheme, the functional hierarchy is diffuse, and since this is so, there is no single-minded axis running through the complex. We might picturesquely speak of the design as a labyrinth, and remind ourselves that "labyrinth" is a word of Cretan origin. We see several storeys and half-storeys flexibly stacked up, elevations made up of disparate and accretive elements, rooms arranged in an involved pattern through which pass long corridors of communication with frequent turns and changes of level. Wandering through the remains of Knossos, we recall the story of the Minotaur who resided in the depths of the labyrinth built for him by crafty Daedalus, and of Theseus who went in and killed him but could find his way out only with the help of a guiding thread supplied by the native princess Ariadne. The famous account seems to be Cretan reality made myth.

We should not, of course, exaggerate this mazelike character of the palace. First, a good part of what we see in the plan indicates basement and ground floor rooms; the upper floors where the main state halls were may well have had a more formal organization. Second, there is at Knossos a logic of functional grouping that imposes a conceptual order on the visual irregularities of the composition. The central court and its entrance passages bisect the plan into a western and an eastern half. The western half is in turn bisected by a north-south passage that separates a row of magazines from a higher series of ceremonial rooms, including the famous Throne Room. The eastern half is divided in an east-west sense by a passage, to the north of which lie the workshops of palace craftsmen, and to the south, the domestic quarters of the royal family.

Knossos in its heyday was probably a town of 40,000 inhabitants. (Fig. 5.26) The palace was set on a low rise shielded by gentle hills from any sight of the sea. The knoll slopes sharply on the east and south sides toward the stream of Kairatos. There was a harbor at the mouth of this stream. A main road connected the harbor area with the palace. This road passed by the Little Palace, probably destined for ritual or ceremonial purposes or perhaps for a more intimate summer place; it then ran into the so-called Theatral Area, a public space for some sort of spectacle, with stair-seats along two sides; and finally it reached a gatehouse in the flank of the Pillar Hall, from which a passage of access ran south to the central court.

But there was an equally busy thoroughfare that linked Knossos with the principal town of the south coast, Phaistos, across the Messara plain. Close to the palace this cross-island road went by a resthouse, the so-called Caravanserai. It featured, among other amenities, a footbath for the weary traveler in which water, supplied by a direct pipe, flowed constantly. Beyond that point the road became a stepped causeway or viaduct, crossing the ravine of Kairatos and gaining the south edge of the palace in a series of terraces defined by low side walls supporting a double row of columns and a roof. Along some 90 meters (300 feet) of this covered and stepped causeway, the visitor would have enjoyed both views of the surrounding countryside and the progressively nearer southern prospect of the palace.

The domestic quarters similarly cascaded down the east slope of the knoll and opened up to the outside by airy verandas. Indeed, the purpose of keeping the royal apartments at ground level, while public ceremonial rooms were relegated on the whole to the upper floors, must have been precisely this wish to establish close contact with the land, conceiving of it as an extension of the living spaces.

The official approach was from the west. Here one can truthfully speak of a monumental exterior facade. It overlooked a broad court paved with flagstones. The lower part was blank and composed of upright slabs of alabaster; above this level the facade was punctured by square windows framed in wood. The magazines, with their stone-lined pits for storage and the huge clay jars containing olive oil, the gold of Knossos, lay below this level.

One entered through a single-column porch of the kind we saw emulated at Pylos, past a guardroom, and into the Corridor of the Procession. On the walls of this narrow passage were painted, on two registers, five hundred life-size images of young men and women bearing offerings. The corridor ran south for about 21 meters (70 feet) and then turned left, to arrive at the foot of a broad stair. At the top one discovers a group of small rooms of ritual character. Stairs from here led down to the Throne Room, which could also be entered directly from the central court by means of an anteroom, which housed a shallow prophyry basin for ablutions. (Fig. 5.27) The throne, made of alabaster, survives. It was set against a frieze of griffins and flanked by continuous benches, also of alabaster. Directly opposite the throne was a stone-lined pit for water. For all its formality, this may not have been the most important state room in the palace, which was probably located on the second floor along with the remaining halls of state. The lustral basins and the direct contact with the central court instead indicate that the so-called Throne Room had cult functions associated with the bull dance, the great public celebration of Minoan life.

The domestic wing on the opposite side was built on two stories below the level of the court. Above this, at least two addi-

tional stories must have existed originally. The wing was served by a handsome staircase, with a light court to one side of it. (Fig. 5.28) Here, and throughout the palace, the columns were wood and tapered downward; they had cushion capitals, and both shafts and capitals were painted—one black, the other red. The downward taper and the peculiar shape of the shaft, which was often not round in cross section but oval, have never been satisfactorily accounted for. At the foot of this Grand Staircase one came to the Hall of the Double Axes, a room paved with fine gypsum flagging; here the walls were decorated with frescoes of great "figure-eight" shields of bull hide and carvings of two-bladed axes, the sacred symbol of Minoan Crete called *labrys*. This was probably the Men's Hall. Five piers divided the space into two, and sets of double doors between the piers could be drawn shut or pushed aside depending on whether it was desirable to isolate the two compartments or unite them. Above the doors a series of transoms may have been fitted with waxed parchment to let light into the inner compartment when the doors were kept closed. To the east and south the Hall opened out toward the landscape by means of verandas.

A small room just off this Hall is usually referred to as the Queen's Megaron. It was delicately painted with marine scenes and dancing girls, and the ceiling was decorated with an intricate pattern of spirals. There were light wells on two sides, and a small bathroom was attached, with its clay tub still in situ.

The central court absorbed much of the daily activity of the palace. But it was as the setting for the Minoan bull dance that this space came alive. Initially at least, the bull dance was a sacred ritual connected with the cult of the horned beasts which had preoccupied the communal mind since the late Paleolithic period. Sacral horns were set up at certain points in the palaces, and a distant cleft mountain on axis with the court, Mount Jouktas in the case of Knossos, may have evoked this ancient symbol of the earth's active power. (Fig. 5.22)

The audience sat in the porticoes along one of the long sides and at all the openings of the other court facades. Trained men and women were pitted against the charging bull. With agile courage, the participant would grasp the horns as the bull rushed headlong down the length of the court and would vault over its back, landing on the other side. The grace and lift of this whole maneuver is represented in the painting known as the Toreador Fresco. (Fig. 5.29) The memory of the ritual survives in the later Greek myth of the Minotaur, the creature that was half bull and half man, whose demand of the yearly sacrifice of seven maidens and seven youths from the city of Athens brought Theseus to this spot and made him an immortal hero.

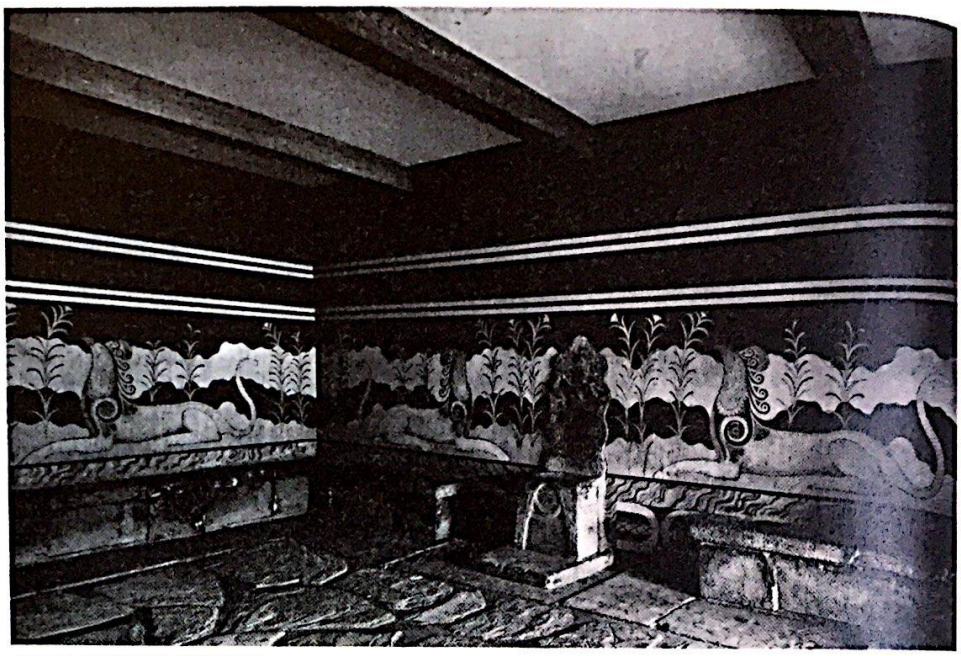
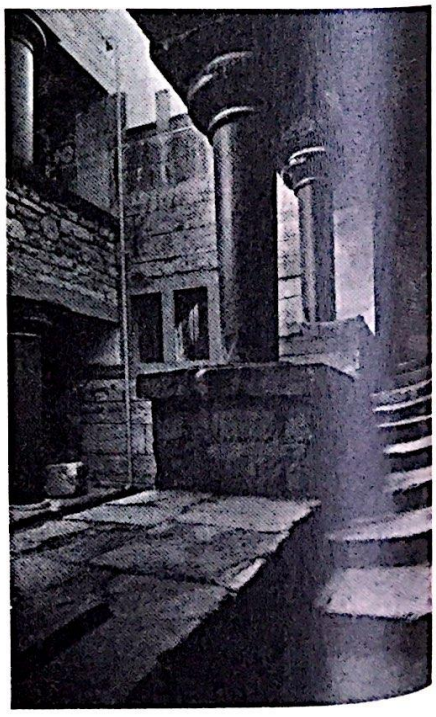


Fig. 5.27 Knossos, royal palace, the "throne room" (no. 8 on Fig. 5.25).

Fig. 5.28 Knossos, royal palace, grand staircase (at no. 5 on Fig. 5.25).



The Closing of the Bronze Age

About 1400 B.C., Knossos and all the other towns of Crete were devastated anew. The palaces collapsed, and the inhabitants moved inland or migrated to Greece. At about this time, perhaps a little earlier, the Mycenaean overlords who had ruled the Greek mainland for two or three centuries extended their sway over the island. But it is doubtful that the Mycenaeans were personally responsible for the ravage. It seems more and more likely that this wholesale

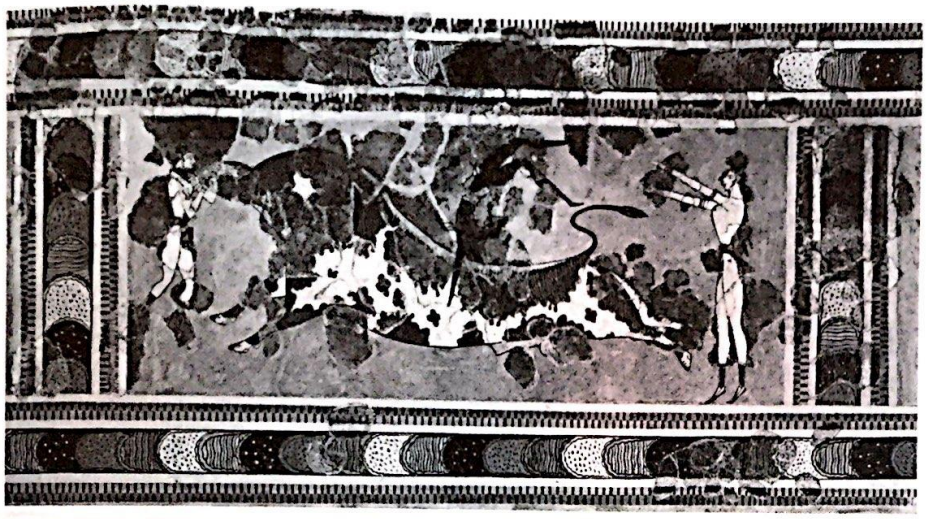


Fig. 5.29 Knossos, royal palace, the "Toreador" fresco, originally in an upper-storey room of the east wing, to the right of no. 4 on Fig. 5.25. (Archaeological Museum, Heraklion, Crete)

destruction of Minoan civilization was the outcome of an upheaval of nature, namely, the violent eruption of a volcano on the island of Thera, which is considerably to the north of Crete, where Santorini now lies. At Thera, a Minoan colony left plentiful remains, including rich wall paintings, which have recently been dug from under the heavy layers of ash that now cover the small cluster of islands in the area. Giant tidal waves and earthquakes occasioned by the eruption wrought havoc as far away as Syria and North Africa. It may be that the apocalyptic texts from Egypt of the Eighteenth Dynasty refer precisely to this disaster. They record a period of prolonged darkness, thunder, floods, a raging plague, and days when "the sun was in the sky like the moon."

> Confusion seized the eyes . . . there was no exit from the palace for the space of nine days. Now these nine days were in violence and tempest. None . . . could see the face of his fellow.

So the Minoans who lived by nature may have been brought down by nature. For the next two hundred years Crete functioned modestly in the orbit of Mycenaean Greece. It taught the mainland princes much about nature cults, representational skills and motives, and the art of living graciously. But its own bloom was gone. It carried on a muted existence until a fresh threat to the entire Greek world materialized on the northern borders of the Mycenaean realm. Linear B tablets from Pylos record emergency preparations. Bronze cult objects were melted down and made into points for spears and arrows. Artisans were assigned to military duties. The coast was hastily fortified. To no avail. Several Greek tribes who had hitherto been left out of the affairs of the mainland, the Dorians among them, now poured in carrying their lackluster iron swords. They systematically sacked every one of the great Mycenaean citadels.

The brilliant Bronze Age was over. The Hittite empire had succumbed to migratory pressures a little while earlier. Groups from mainland Greece spread out onto Aegean islands and the west coast of Asia Minor. On the mainland the newcomers proved no match for the culture they so brutally displaced. They produced no architecture of comparable worth. By 800 B.C. when Homer wrote his poems about the splendid age of the chief prince Agamemnon and his treacherous wife Clytemnestra, of beautiful Helen, of old Nestor, and crafty Odysseus, those giants of epic memory, the contemporary scene about him was dark by comparison.

On the whole he reconstructs the glories and follies of the Mycenaean past knowingly and compassionately. He slips on some details, as when he represents Mycenaean princes cremated rather than inhumed: cremation was introduced into Greece by the Dorians. And when, at one bleak moment of his narrative, he mourns the misery of the human condition, he might be thinking of his own time more justifiably than the golden age of Crete and Mycenae:

> Among all creatures that breathe
> on earth and crawl on it
> There is not anywhere a thing
> more dismal than man is.

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Persepolis (Iran), royal palace, 518–460 B.C.

6

THE GREEK TEMPLE AND "BARBARIAN" ALTERNATIVES

The Passing of the Bronze Age

The second millennium before Christ had been, for the eastern Mediterranean, a period of prosperous and forward states. Endowed with mobility and technical acumen, these societies built supple environments sympathetic with their political and social aims. Contemporary western Europe by contrast must be seen as backward. Despite the megalithic architecture of Stonehenge, Malta, and some spots on the continent, nowhere did the structure of society hint at the complex patterns of civilized life that were displayed in Egypt and Mesopotamia, the Aegean and Asia Minor. When intrepid Mycenaean sailors hugging the northern shores gained Sicily and the Tyrrhenian in search of metal—the obsidian of Lipari, the copper of Sardinia, and ores from the mines of Etruria between the Arno and Po rivers—this area led a simple pastoral life, innocent of urbanism.

In central and southern Italy, the countryside remained seminomadic; megalithic tombs in Apulia, the peninsula's heel, were probably used as rallying places. Villages took several different forms. Neolithic communities with circular earth ramparts can be spotted throughout Apulia, as well as in southern Etruria. Inside them were smaller circular enclosures with their own individual ditches, each containing dwellings for family groups and their cattle. Further north, in the Po Valley and the Alpine region, we find houses on piles. The river villages were protected against floods by moats, earth ramparts, and even timber constructions. Around the mountain lakes, quadrangular log cabins stood on neatly delineated straight streets paved with planks.

The impact of eastern traders on this rustic world was small but noticeable. We can point to rock-hewn chamber tombs and roughly made beehive tombs in Sicily, an occasional stronghold fortified with stone walls of irregular blocks, and even the remains of an ambitious structure in the wilds of Pantalica above Syracuse, with a touch of the Mycenaean palace about it. All of these indicate a raised architectural consciousness attributable to eastern example. The *nuraghi* of Sardinia are more impressive still. They were watchtowers set on hilltops as part of a system of defense; the oldest among them were in the form of truncated cones that held two or three superimposed circular chambers with corbelled vaults. (Fig. 6.1)

Toward the end of the millennium, massive dislocations of peoples in the eastern Mediterranean unmade the balance of strong states and ushered in a dark spell of several centuries when cultural regression, or at best stagnation, was everywhere evident. Invasions from the northern and western fringes of the civilized sphere brought down established orders, infiltrated native stocks, and caused many residents to migrate. The Bronze Age and its brilliant cities folded. The downfall of the Mycenaean and Hittite empires returned their lands to a general level of low subsistence. For once, cultural parity may have been reached between the retarded West and the formerly progressive cultures of the Aegean and Asia Minor. But with a difference. The collective mind in the eastern Mediterranean had at least memories of a glorious past to fall back on and material remnants of it as proof of its existence.

Recovery was slow. The crucial century was probably the eighth. By then, stabilizing forces both East and West could ensure firm government, an improved standard of living, and an urban setting for the nurture and development of a society. In the East there was a revival, at the center of which stood Greece. The radiant Greek spirit, as expressed in architecture and especially the temple form, is the main concern of this chapter.

Fig. 6.1 Palmavera (Sardinia), a Bronze Age watchtower *(nuraghi)*, ca. 1200 B.C.; elevation.

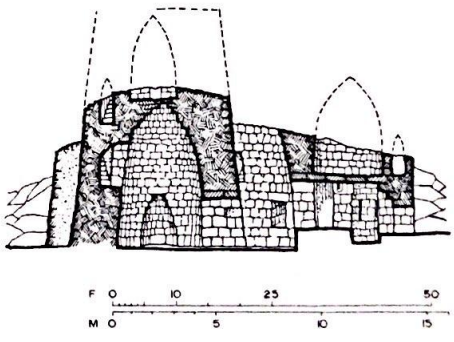


Fig. 6.2 Map: The Greek commonwealth and its neighbors in the seventh century B.C., with detail maps of Greek Sicily (bottom left), and Greece proper including the mainland, the Aegean islands, and coastal Asia Minor (bottom right).

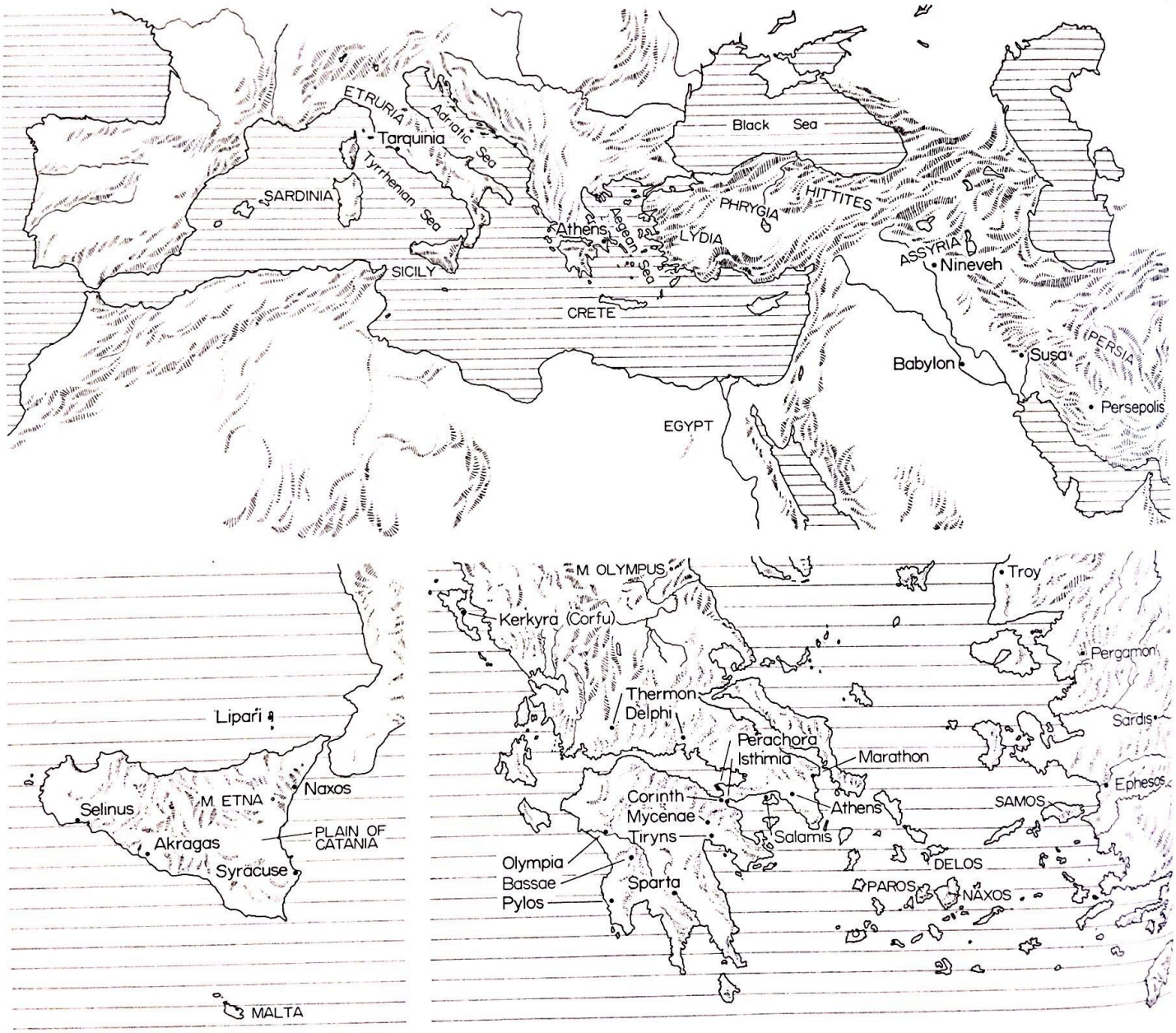


Fig. 6.3 Greek "geometric" vase, with a scene of mourning for the dead, eighth century B.C. (National Museum, Athens, Greece)

But Greece did not blossom miraculously in a cultural desert. In Asia Minor, beyond the coastal strip which it colonized, two small but significant powers, the Phrygians and Lydians, succeeded in upholding the raised hopes of the plateau. Further east the Hittite empire, in reduced but still notable circumstances, roused itself for a sunset career. Assyrians, long locked in a stalemate with their powerful neighbors, resumed an expansionist policy under Tiglath-pileser III (745–727 B.C.) until they were conquered a century later by Medes from the Persian highlands and their capital city of Nineveh was destroyed. Persia itself reacted favorably to the stimulus of an incoming group of Indo-European horsemen, as its fortified towns and wise exploitation of iron show. At the time of the Achaemenid dynasty, it could boast of an opulent, cosmopolitan culture whose most famous extant theater is the palace of Darius and Xerxes at Persepolis. (Fig. 6.23) In the West, immigrants from Asia Minor (according to the most likely theory) organized northern Italy into a confederation of strong cities. This Etruscan state, under the tutelage of neighboring Greeks who had colonized the southern half of the peninsula and much of coastal Sicily, lifted the sleepy countryside north of the Tiber into a period of heady urbanism; its hallmarks were formal layouts, temples, bridges and aqueducts, and lavishly decorated mound tombs.

The Greek commonwealth stood in the midst of this new order, involved at one or another level with all the young states as well as the venerable antiquity of Egypt. (Fig. 6.2) It considered them all inferior to the self-governed polity of its own city-states. They were all "barbarians," a term which meant both alien and not quite up to Greek standards. But in the universal order of the period, the Greek achievement was only one of several manifestations of cultural vigor, none demonstrably inferior to the others.

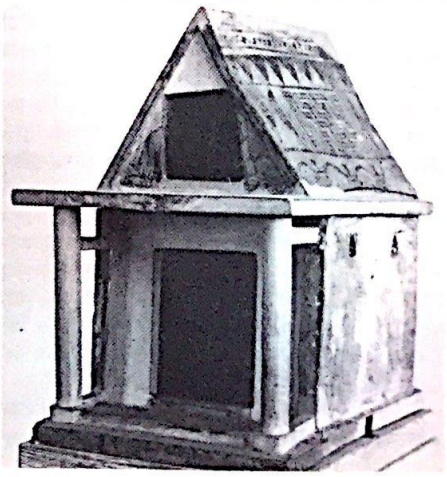
The Emergence of Greece

The details of the post-Mycenaean aftermath are unclear. It would seem that the southbound Dorians, having achieved the violent overthrow of the Bronze Age cities in Greece, settled down to a village-centered rural life based on tribal loyalties and the localized authority of chieftains and deities. Land was owned in common. Cremation replaced inhumation as the standard burial rite. The most striking relics of these dim years is in fact of a funerary nature: large stately vases for liquid offerings, decorated with geometric patterns. (Fig. 6.3)

Iron, and not bronze, was now the chief substance out of which weapons and tools were fashioned. The new metal became the physical symbol of the descent from a sparkling past to a lackluster present. Hesiod, the Boeotian poet and rough contemporary of Homer, recounted gloomily in his *Works and Days* the fall from a golden age to an iron age in which "man will never cease by day or night from weariness and woe." The time of the heroes who had fought at Troy was long gone by—its nostalgic retelling was Homer's subject. Hesiod, on the other hand, looked at post-Mycenaean Greece and the realities of his own time. He put all his faith in the plot of bad land on the slopes of Mount Helikon, which he and his brother Perseus inherited from their father, and cultivated it doggedly.

Community architecture was now simple and of uniform scale. Nothing like the Mycenaean palaces was being attempted. The houses were elliptical at first, then rectangular and apsidal. They were one-room detached structures of mud-brick on a foundation of stones or rubble. Shrines were not much different, except for a small roughly hewn, wooden statuette of the local deity called a *xoanon*. These frequently apsidal chapels might have interior posts—irregularly spaced, or arranged in one or two rows—to facilitate the roofing of the main space. They would also use a triangular truss at the facade end that shaped the tall gable in which a window would be cut, as well as a system of radial poles to support the hip roof over the apse. (Fig. 6.4) The overhanging eaves were sometimes made to rest on posts along the entire length of the struc-

Fig. 6.4 Greek shrine, votive clay model, from Argos (Greece), eighth century B.C.



ture, except at the gabled front, which had its own small porch. The roof, whether pitched or flat, was covered with thatch.

Humble though they were, two aspects of these village chapels foretold of the distinctive character of religious architecture to come in the scheme of the future Greek city-states. First, the chapels were now the only special focus of the built area. The full-grown temple will also figure later as the principal architectural beacon of the cities, and this because no human agency was to seem exalted at the expense of others, as the Minoan-Mycenaean palace had been.

Second, the chapels were intended for the exclusive use of a god or goddess, and not as congregational halls for worshippers or as centers of the community's economic or social structure. This intention, too, will be carried forward into the urban phase of Greek history. There was to be no powerful priestly class in charge of the temple and its rites, along the lines of Egyptian or Mesopotamian practice. The Greeks' relation to divinity was to be an open act around monumental buildings, with laypeople performing priestly duties as part of the responsibility of citizenship. The citizen owed honor to the deities of the land but did not belong to them in the way the citizens of Ur or Warka belonged to their titular deities. The Greeks' allegiance to the city was to be secular, despite the preeminence of religious architecture in the cityscape. The city itself was the faith, and the temple was its banner of fixity, the historic identification of the people with the land vouched for by the immortal beings who preceded human settlement.

The balance of the ancient world is always that tenuous one of the human and the divine. Like two forces that compete but must also complement each other in the structure of life, humans, or their most potent representative the king, and divinities, as they are interpreted by the priesthood, jostle for possession of the land and of communal destiny. Some sort of accommodation is worked out by each culture, depending on that culture's aspirations and outlook. Architecturally, the contest is between the palace and the royal tomb on the one hand, and the temple on the other.

In Mesopotamian city-states, the king was content to serve as the caretaker of the city,

Fig. 6.5 Olympia (Greece), sanctuary of Zeus; general view of site.

which properly belonged to a god. The ziggurat or temple tower loomed in the built environment, and the royal palace rested in its shadow. With the Assyrians, the might of the ruler tended to eclipse the presence of the deity, as we can see from the secondary standing of the ziggurat in the palace district of Khorsabad. (Figs. 3.14, 3.25b)

The progress in Egypt was somewhat the reverse. First came the order of the Old Kingdom when the king *was* god, and the land reflected this one-sided state of affairs by featuring as its most palpable marker the pyramid tomb which announced his central authority. Then came the political change that forced the king, under the New Kingdom, to accept a more modest role among the gods and to allow their ritual setting, the temple, to dominate his land. (Figs. 4.10, 4.22)

In Crete and Mycenae the priesthood was clearly subordinate. There were no major temples. The deities lived in the open, in groves and caves and mountaintops where they originated. Altars and small shrines in these spots focused popular devotion. But, above all, these deities found hospitality at the king's hearth. (Figs. 5.13, 5.20) Homer makes clear that they had acquired the habit of visiting Mycenaean palaces: "Athena . . . crossed the barren seas, and came to Marathon and the broad streets of Athens, where she entered the strong palace of Erechtheus." With the disappearance of these mighty kings, the predictable happened in Greece. Divinities took over. Being conceived in human form, they were now accommodated architecturally in houses—modest ones at first, and then more and more magnificent ones in the course of time.

Evidence of this transfer of the people's destiny can be found in two architectural facts. First, the basis for the form of the mature mainland temple is the Mycenaean megaron. (Fig. 5.14) There are differences of course. The continuous exterior colonnade of the mature temple was a Greek invention; the orientation of the Mycenaean megaron was north to south, while the temple customarily faced east; and instead of the flat roof of megara, all stone temples

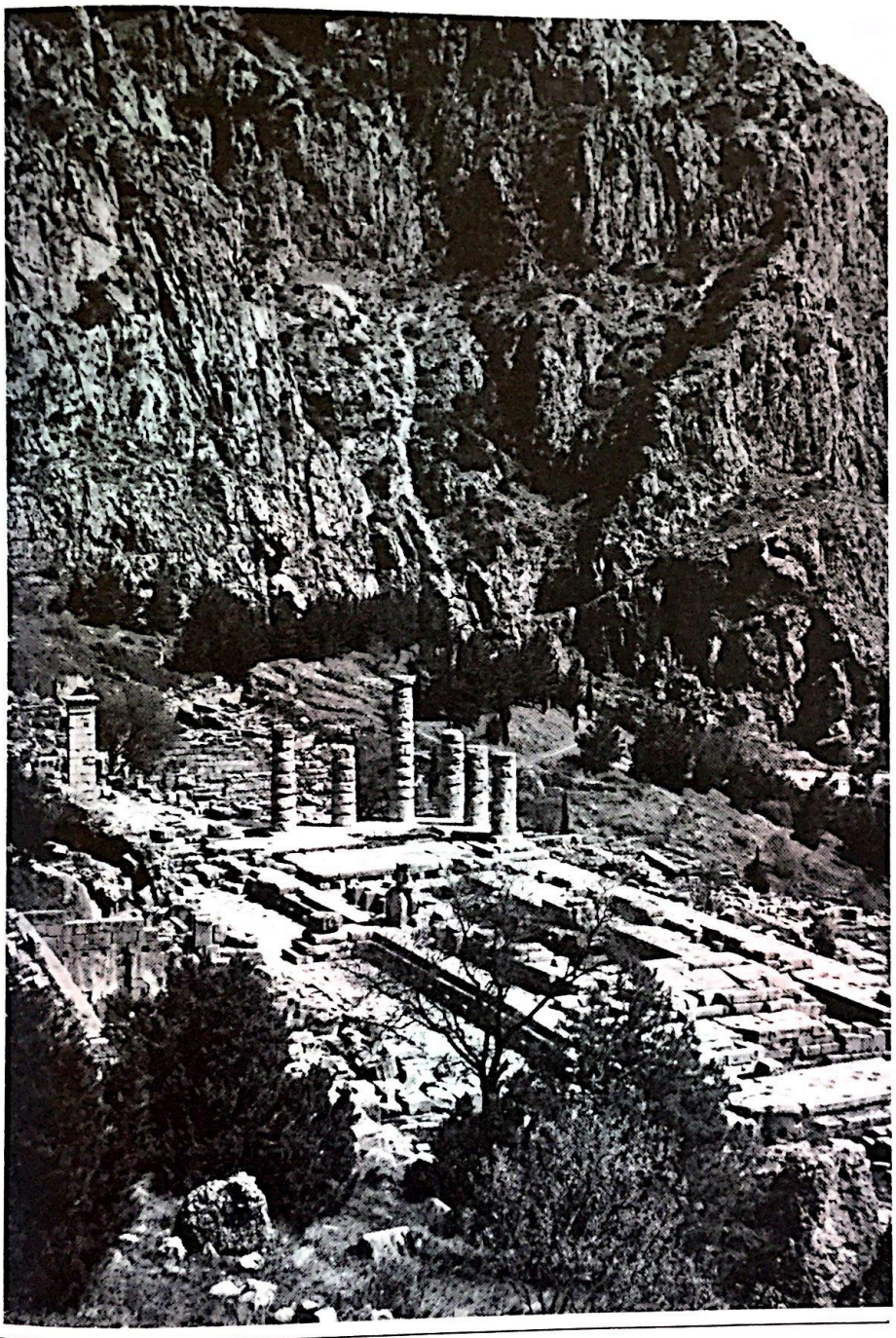


Fig. 6.6 Delphi (Greece), sanctuary of Apollo; general view of site.

had gabled roofs. But the sequence of the columned porch *in antis* and the main rectangular chamber beyond is unmistakable. The shift was in occupancy: the royal hearth was displaced by the statue of the deity.

The second point is topographical. The literary and archaeological evidence shows that at some sites early temples were built on the grounds of a former Mycenaean palace. This was so at the Akropolis of Athens. Sometime during the dark centuries a chapel or shrine dedicated to the goddess Athena was planted in "the strong palace of Erechtheus," overlapping the megaron. Athena who came to visit in the old days was now permanently at home.

Athena and several other major deities of the later Olympian pantheon were known to the Mycenaeans. Whatever deities of their own the Dorians may have brought in, these extant cults were not suppressed. On the contrary, together with a common language they were the chief source of Greek unity. When in the eighth century the Greek commonwealth started in earnest to forge a national identity, this heritage of a holy family helped to transcend the local allegiances of the hundreds of communities that dotted the tough Greek land and its newfangled colonies. Homer's poems sharpened the specific personalities of these gods and goddesses, demystifying them by imparting them with human foibles and weaknesses.

Two cults stood out as particularly important to this Panhellenic effort. At Olympia in southern Greece, Zeus as the father of the holy family was honored by all. (Fig. 6.5) In an ample grove at the foot of a hill sacred to Kronos (the deposed parent of Zeus and his sister-wife Hera), games were instituted beginning in 776 B.C. Every four years, a moratorium would be declared on the bitter rivalries of the Greek communities, and here at the grove athletes would converge to compete on behalf of their fellows and to gain honor from almighty Zeus. A significant complex of buildings grew at Olympia during the next three centuries that included a stadium, a row of treasuries set up by individual Greek cities, and two large temples dedicated to Hera and Zeus.

The other cult was that of Apollo, the overseer of the oracle at Delphi. (Fig. 6.6) Before the setting down of written laws in the

sixth century B.C., this oracle had emerged as the general fount of wisdom, the dispenser of binding advice that softened the harsh ancestral morality of tribal living with a new doctrine of moderation and respect for civilized order. The craggy wild of the site testified to the violent struggle between old underworld forces, like the snake Pytho, and the young god who in overcoming these forces trampled basic fear and made reason triumph. There in the tossed land, over the chasm of the earth, Apollo's temple rose as a trumpet call to measure and self-control. Many of the early temples in mainland Greece and abroad were dedicated to the Lord Apollo. Colonies were usually established on the advice of his Delphic oracle.

The Panhellenic community that such a national church encouraged corresponds with the rise of the *polis* or city-state at the regional level. The Greeks embraced urbanism as a matter of choice. The polis did not respond to a major technological advance or the push of commerce. It was not, initially at least, a manufacturing or marketing center; if anything, it remained an overgrown agricultural village dependent on the traditional labor of the countryside. The importance of urban organization lies in the desire to go beyond the common law of tribe and clan, to live under controllable institutions of self-government.

The Greek city was founded on two concepts that typify the turn away from a patriarchal and custom-bound society and its burden of *aidos,* "that vague sense of respect for gods and men," as one scholar describes it, "and shame of wrong-doing before earth and sky." One of these concepts was the right of private property, which spelled the breakdown of the tribal common land. The other concept was individual freedom, the faith in human parity that is the opposite of the self-reducing collectiveness of tribal destiny. The social grouping was now, theoretically at least, one of equals bound by their own decision-making and administered by elected magistrates. The hearth became the city, and every Greek became above all a citizen, there to fight for the city's interests and guide its affairs. There was to be no organized military system, any more than there was an organized priesthood. Each man carried his own weapons, as each person was ultimately accountable for his or her own good relations with the immortal protectors of the city and its laws.

The Greek Temple

Greek temples served simultaneously as the symbol of a broad union of Greeks—a union predicated upon a common religion, a common tongue, and the belief in a common ancestry—and also as the symbol of each city's special involvement with one of the immortals—Samos with Hera, Ephesos with Artemis, Corinth with Apollo, Athens with Athena. They had, then, both general and particular validity; they distinguished Greek from "barbarian" and one Greek city from the others. The message of the temple to its own audience, from the Tyrrhenian to the Black Sea, was that the same architecture and religious iconography could be used to make very individual statements. The message of the temple to the alien world was that of a free people, subject to neither king nor priest: "The whole folk year by year, in parity of service is our king," as the playwright Euripides was to put it about Athens. In this larger sense, in what it stands for as much as in the way it looks, the temple remains a uniquely Greek achievement.

There were, of course, some borrowings—both in the built form itself and in the art that enhanced it. Already in the eighth century, the geometric style of the funerary vases was being overlaid by a hybrid language of curvilinear designs, plants, and intimidating beasts borrowed from the late phases of Anatolian, Mesopotamian, and Egyptian art. (Fig. 6.7) At the same time, Homer's consolidation of fable into historic memory was finding a visual counterpart in the potter's workshop. It is out of this visual codification of myth, scenes involving Herakles or the wily Odysseus, that the formulae of temple art were to emerge.

In architecture, however, foreign influence went far beyond the importation of specific motifs. The great "barbarian" lesson was monumentality, the power of an architecture of public scale built of cut stone and made pregnant with communicative sculpture: and the great teacher was Egypt,

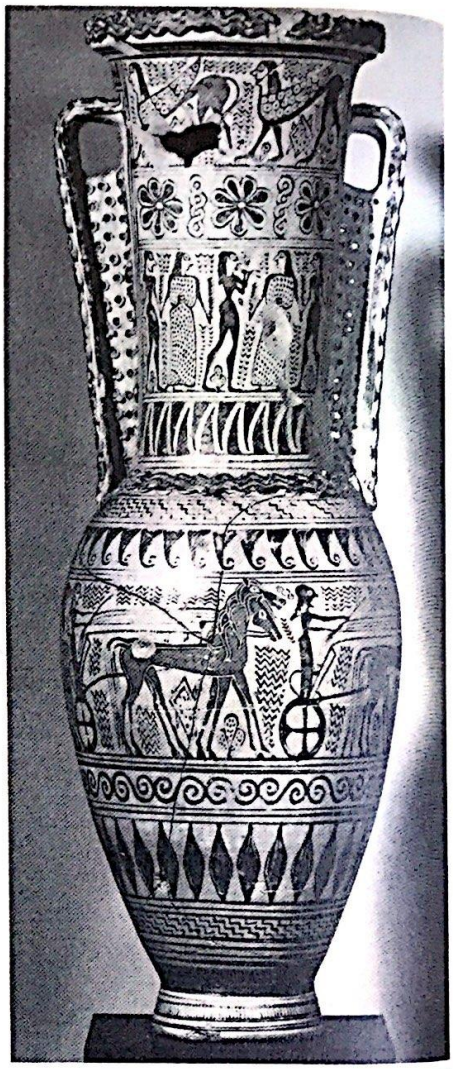


Fig. 6.7 Greek vase in the "orientalizing" style, seventh century B.C. (Louvre, Paris)

a country with which the Greek world had been in close contact at least since the seventh century. This lesson in architectural expression swept aside the early folk experiments and brought forth the strong salient form of the Greek temple that we can still see in hundreds of sites throughout the Aegean, southern Italy, and Sicily. It is this luminous stone specter in the landscape

Fig. 6.8 Corinth (Greece), temple of Apollo, sixth century B.C.; view of remains.

that has been, along with Roman law, the Bible, and the plays of Shakespeare, one of the prime staples of the Western imagination.

We should distinguish three overlapping stages in the evolution of the Greek temple.

1. To the first stage belong the apsidal chapels prevalent in the obscure period following the Dorian occupation of mainland Greece. The domestic character of these structures, their literal function as houses of local deities, is evidenced not only in their basic form but also in the fact that some among them included a hearth within the cult room.

2. This initial experimental stage, when the structure of the Greek pantheon was still vague and the Greek nation still unformed, was superseded by a generation of temples noteworthy for two things: their comparatively larger size and the appearance of the peristyle. The period in question, the eighth and seventh centuries, corresponds with the rise and early success of the *polis*, widespread colonization, and the genesis of a common Greek tradition and faith. The apsidal form was now everywhere abandoned in favor of strict rectangularity. The cult room, or cella, created a tunnel view toward the statue at the far end. This view could be kept clear only by limiting the width of the room. Ampler proportions usually called for a central row of supports, which either blocked the view or forced the statue to one side of the central axis.

The peristyle made these internal arrangements of minor consequence. (Fig. 6.8) This formal portico that surrounded the entire outline of the cella, including the entrance front, may have been employed first in the temple of Hera on the island of Samos, which was built sometime in the early eighth century.

So far, the temples we have studied in the Near East fall into two classes. They either have cult rooms which are hermetically sealed from the outside, as is the practice in Egypt, or else the temple envelope is perforated with windows that bring in ample light, the solution of Temple I at Hattusas. (Figs. 4.18, 5.5) The effect of the peristyle is very different. Rather than opening up the cella walls toward the light, the Greek builder at Samos chose to enshrine this hall within an architectural screen, and in so doing he changed the concept of the temple from a tabernacle of the holy image to an external thing, a form that mattered as a mid-space object and had visual validity from all sides. The ring of uniform wooden posts outside prevented the long narrow hall from being read as a simple container and obscured the distinction between the open entrance end and the solid end with the cult statue. The house of the deity was on its way to becoming the monument and talisman for the city. And, in fact, this conceptual advance is what is so revolutionary about these early temples. The continuous portico was never wide enough to provide usable space. The practical advantage of being able to extend the eaves beyond the walls, and thus protect the mud-brick structure from rain, had already been recognized in the first stage. Besides, when a generation or two prior to 600 B.C. stone columns began to replace the wooden posts, and ashlar masonry the mud-brick of the walls, such practical considerations were clearly irrelevant.

3. The shift to permanent materials was completed with the invention of terra-cotta tiles as a new roofing material. Since these tiles were not fastened to the roof but were kept in place by their own weight, the steepness of the roof was moderated to an easy rise, visually more stable and more in tune with the height of the stone columns at the two short ends than the earlier high-pitched gables had been. (Fig. 6.11) These two ends were made to look identical even beyond the peristyle layer by the addition of a false back porch to the main body of the cella, matching the entrance porch of the east front. (Fig. 6.16) In its plan the cella now resembled the megaron type of Troy II. (Fig. 5.9)

Once again, however, it would be perverse to explain the choice of stone columns in the peristyle as the practical requirement for the heavy tiles. Masonry structure and tiles both were the outcome of a new vision that required a new technology and had to do with intangible gains, such as community pride and faith in the city's stability and strength. This mood of confidence that was articulated in the new architecture also accounts for the simultaneous rebirth of large-scale stone sculpture, absent from the Greek scene since the

days of Mycenae. Public statues of young men and women singled out for athletic prowess or exceptional virtue began to people the periphery of the temples. (Fig. 6.9) These full-size images were not set up as individual portraits but, instead, existed as civic monuments—generalized presences honoring the city through its choice citizens.

That architecture and sculpture were thought to be integral to this public display of a city's prosperity and glory is suggested by the fact that early architects like Theodoros of Samos were equally well known as sculptors. They were in charge of the total decorative program of the temples which at this time began to include figured panels in painted terra-cotta (a device probably learned from Assyria) and stone reliefs. The spare, almost heraldic, depiction of familiar subjects, the deeds of immortals and half-mortals, completed the statement of the temple, the fabled content of the scenes supplying the citizenry with the archetypes of a shared morality.

The very first stone temples seemed to have appeared in the northeastern corner of the Peloponnesus, at places like Corinth and Isthmia, and in outposts within their cultural sphere, like Thermon in the remote region west of Delphi. It is surely not fortuitous that this sudden show of constructive courage should be staged in the area of the Argolid plain where the ruins of the two greatest Mycenaean citadels, Tiryns and Mycenae, proclaimed past accomplishment and invited revival, even though the stone temples showed little formal and technical similarity to this Mycenaean precedent.

The initial source, for the mechanics of stone-cutting as well as the conventions of large-scale sculpture, was Egypt. Even the Doric column, the central element of the decorative order that was invented on the spot and was adhered to in mainland Greece and the Western colonies for at least three centuries, favored the Egyptian look. The capital itself may well have been inspired by the Mycenaean examples on the triangular relief of the Lion Gate and the facade of the so-called Treasury of Atreus. (Fig. 5.17) But Doric columns did not adopt the peculiarly Minoan-Mycenaean inverse taper; instead, they tapered upward in the Egyptian manner. At any rate, the borrowed preliminaries were digested within the span of a generation, and the Doric order emerged as a quintessentially Greek system of design. So did the Ionic order, some fifty years later than the Doric, in the Greek cities of the eastern Mediterranean.

The names of their creators have been preserved in the record: Trophonios and Agamedes, the legendary pair associated with the first stone temple at Apollo's Delphi; Theodoros, who worked on the huge temple of Hera at Samos, which superseded the timber structure we spoke of above; Chersiphron, the designer of the temple of Artemis at Ephesos. The task they faced, to embrace a technology that differed fundamentally from the traditional building methods of wood and mud-brick, was comparable to that of Imhotep at Saqqara 2,000 years earlier.

Quarrying and transporting the stone were their principal worries; construction techniques and structural soundness were rudimentary. Beginner's caution probably accounts for the overbuilt forms—the thickly spaced peristyle columns (at times monolithic), heavy superstructures, massive foundations. Chersiphron, we are told, sought the advice of Theodoros of Samos regarding the Ephesian temple's stability on its marshy site; he was instructed to put a layer of ashes (packed charcoal, according to another source) beneath the foundations to keep the stone blocks from sinking. Chersiphron wrote a book about his experiences with the new technology, in which he explained the mechanical device he had used for transporting column drums from the quarry to the site. These were too large to be carried in ox-drawn wagons, so he set them in cylindrical frames of wood that could be pulled along like enormous rollers. (Fig. 6.10)

The general attitude in the ancient world was to submerge the identity of the architect in the person of his powerful patron, the king or minister who commissioned the building. This is the case with Mesopotamian and Hittite architecture. In Egypt, we know a fair number of state architects by name, and we have plenty of evidence that they were held in high esteem and exercised considerable power as supervisors of vast and costly public projects. But their

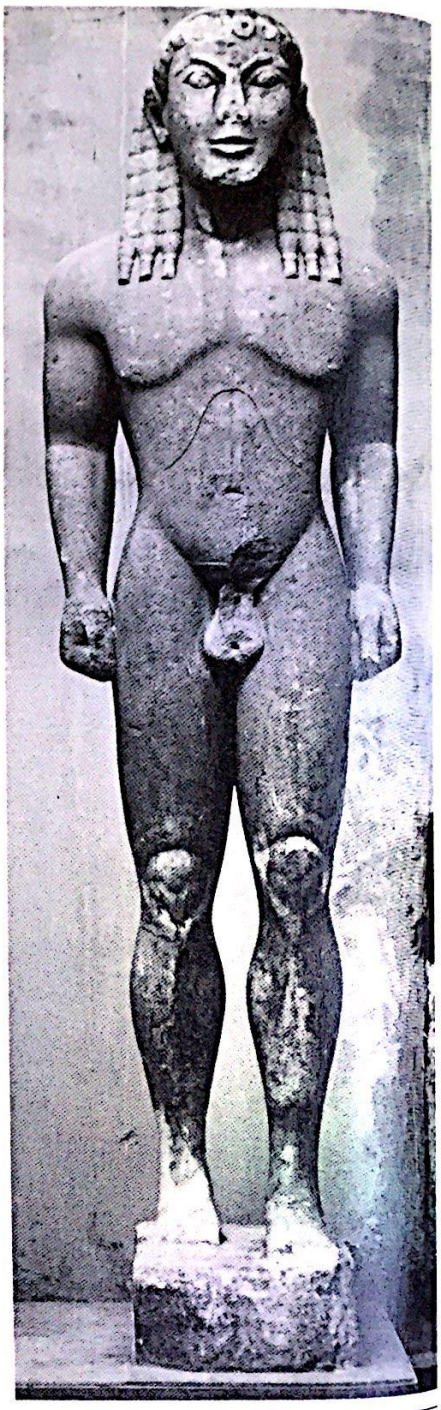


Fig. 6.9 Archaic Greek *kouros*, athlete named Biton, ca. 600 B.C. The statue stands over 2 meters (7 feet) high. (Museum, Delphi)

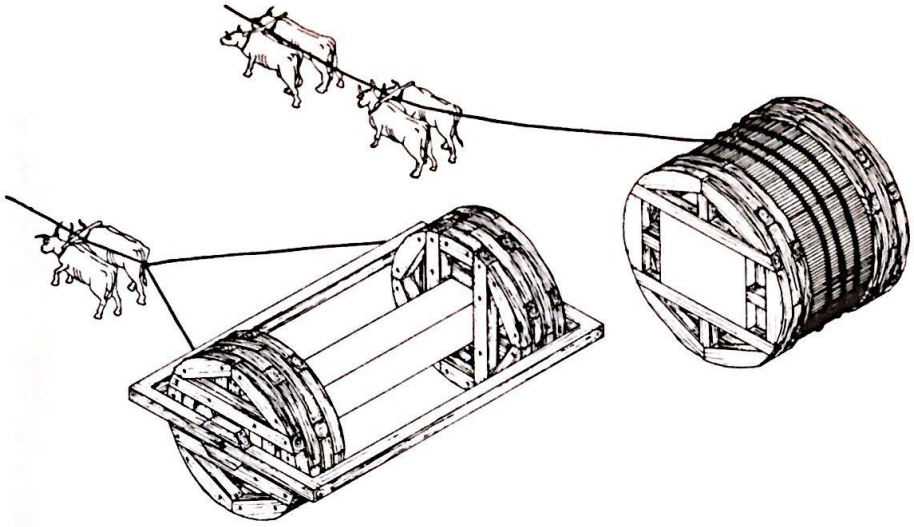


Fig. 6.10 Two ways of transporting stone building blocks in the sixth century B.C., according to ancient Greek sources; reconstruction drawing.

craft was secretive. The architect practiced with the aid of documents, including drawings, that were considered to be divinely inspired and were kept in the archives of temples and other official institutions. He was prominent precisely because of this privileged access to occult sources, since literacy was the exclusive attribute of high courtiers and the priesthood. Senmut, the famous architect and intimate of Queen Hatshepsut, boasted of this distinction on the walls of his tomb: "I had access to all the writings of the prophets; there was nothing which I did not know of that which had happened since the beginning."

The Greek architect was not so exalted, but he was a respected professional whose name was on public record and whose craft was accessible in trade books and treatises. His patron was commonly the city, as represented by its governing bodies. These government agencies set the budget and appointed a building commission to work closely with the architect in procuring the designs and in putting the project out to contract. The contractors were responsible for cutting and shaping the blocks at the quarry and for transporting them safely to the site. There they would be trimmed down to their final surface for proper fitting. The finishing and assembly of the hundreds of premade units were the most exacting responsibilities of the architect.

The Doric Order

Matters of technique and construction, though obviously important, were not the prime testing ground of Greek architects. The mettle of Greek built form lies in seemly appearance.

Greek thinking is at once typal and specific. It takes on an idea (or a form, which is nothing other than a congealed idea), nourishes and perfects it through a series of conscious changes, and in this way informs it with a kind of universal validity that seems irrefutable. The process is in fact *ideal,* that is, based on "the perfection of kind." It presupposes orderly development and the practicability of consummation. Greek architecture is, by this definition, conservative. It invented little, and invention was slow. License was disciplined, and quality filtered through self-imposed restriction. Every building existed within the limits of its norm and was judged against other exponents of this same norm. And because this was so, every building could convey precise meaning against a background of familiarity.

The stone temple of mainland Greece and its full decorative panoply, the Doric order, was an ideal invention. It did not constitute, as a mechanistic view would have it, the gradual translation into masonry of conventional timber forms. It seized upon the possibilities of the new technology to restate the principal theme of religious architecture as typified by the first peripteral temples of the eighth and early seventh centuries. In so doing, it *expressed* some of the effects of wood detailing rather than trying to petrify them exactly. It is therefore not very fruitful to seek precise references in timber construction for individual elements of the Doric order, to see triglyphs as beam ends and columns as tree trunks. It is the contrast and not the transference that needs to be stressed. This is plain when we set side by side the reconstructed elevations of the temple of Artemis at Kérkyra (Corfu), about 600 B.C., where the Doric order appeared in full form, and that of the second temple of Hera at Samos from the mid-seventh century, with its flimsy timber armature and its nervous verticality. (Fig. 6.11)

Once launched, this system of design remained fairly stable, except for corrective changes that smoothed out infelicities of form and heightened the expressive impact. This of course is a statement of general fact. The evolutionary process could have been neither entirely systematic nor predictable. Regions marched at a varying pace and offered different solutions to the same design challenges. On occasion a Doric temple—the temple of Zeus at the Sicilian town of Akragas (Agrigento) is a good instance—would take so many extraordinary liberties that it would seem to defy the essential constant of its norm. Finally, we must allow that the results of the evolutionary process could have been very different from what we know them to be. There is no strict determinism in the history of architecture. Tidy accounts of development can be drawn by historians only because they know how it all came out, and they can therefore rationalize a quirky string of choices so that it seems predestined.

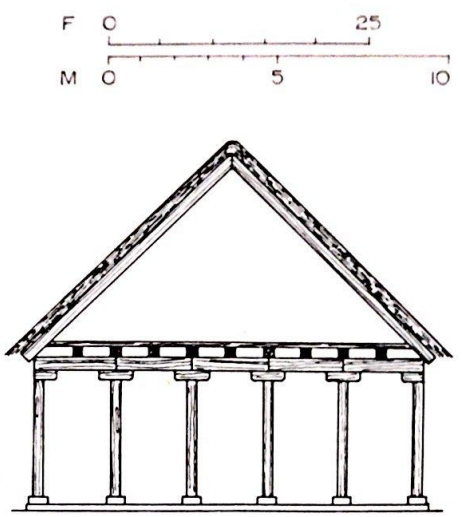


Fig. 6.11a Samos (Greece), the second temple of Hera, mid-seventh century B.C.; conjectural elevation.

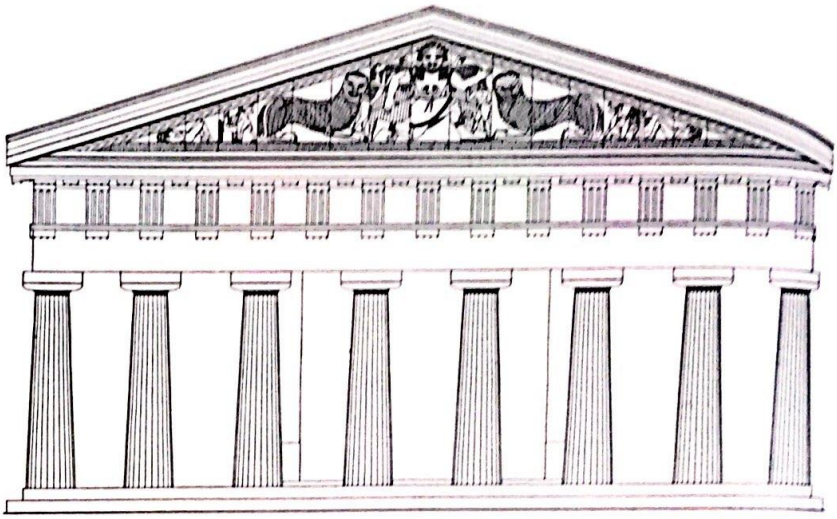


Fig. 6.11b Kérkyra (Corfu, Greece), temple of Artemis, ca. 600 B.C.; restored elevation.

Let us now take a close look at the Doric temple. The first thing we should notice is that the temple was a supremely artificial construct—a luminous presence of right angles and sharp geometries. It stood apart in the land, a monument of a vital abstraction, eschewing the studied fusion with the natural site, which was the aim of Minoan-Mycenaean design or the city defenses of Hattusas. Greece is devoid of great sweeps of nature like the Egyptian desert, devoid too of grandiloquent mountain chains or broad navigable rivers. The contrasts are dramatic but on an intimate scale: defiles and precipitous valleys that might become contested boundaries between city-states; small cultivable plains boxed in by naked mountains, which are themselves small but also visually explosive because of the constricted formation of the land; and craggy, wind-battered, inhospitable shores with few natural harbors or easy beaching facilities. It is against all this that the temple stood, its form the very opposite of the agitated landscape. (Fig. 6.6)

This contrast of the natural and the devised is at the heart of Greek religious architecture. It heralds both the separateness of human achievement from the dark ancient forces of the land and the propitiation of these divinely controlled forces through the act of building. We should neither consider the temple, then, merely as a thing in itself, a beautiful shell independent of its setting, nor should we assume that the setting had primarily picturesque value, as if the land were a neutral element which the builders made use of to add visual interest to their own creation.

For the land was not neutral. Where the temple came to stand was not a matter of arbitrary choice. The choice had been made before any temples were up, by what had once transpired on the land. Here Leto had leaned against a bay tree while giving birth to Apollo; there Athena and Poseidon had fought for the privilege of ruling Attica; here divinity was befriended at the hearth of a Mycenaean king or appeased at some cave or spring source or mountaintop. The hallowed spot was thus predetermined: from the earliest altar set upon it to the latest temple, it would be respected and celebrated. Even where the terrain was extremely unpromising, as at Perachora on the Gulf of Corinth, the temple went up where it did because it had to. (Fig. 6.12)

The first step in the monumental commemoration of the sacred site was the terrace—the element that would horizontally define the space and serve as the pedestal for the structure. The freestanding rectangular shape of this terrace clearly announced that the finished temple would not attempt to blend in with its surroundings. The three continuous steps all around the edge of the terrace would lift the temple above the land and make it equally approachable from all sides. The length and width of the top platform would determine how many columns the temple would have along the flanks and across the two fronts, as well as their spacing.

This spacing depended on two things: the choice of a lower diameter for the columns, which in turn woud dictate their height; and the disposition of the frieze above the peristyle which determined, as we will see, whether the spaces between columns would be of uniform width, or whether there would be variation between the middle range of columns and those at the corners of the rectangle. In other words, the upper parts of the building made precise demands on the lower, and each element was not only proportionally generated but also proportionally keyed to all other elements of the design.

The number of columns for the standard peristyle would be set at 6 by 14, counting the corner columns twice, but early temples sometimes had longer flanks. The columns were stood up along the edge of the

Fig. 6.12 Perachora (Greece), sanctuary of Hera Akraia (Hera of the Cliffs); general view. The archaic temple is in the immediate foreground, with a fourth-century stoa just behind, and further up, beyond the modern structure, the remains of a Hellenistic cistern.

stylobate, the topmost of the three terrace steps, without bases. (Fig. 6.8) The drums were plain and had a hole in the center, so that they could be twisted about a peg as they were piled one on top of the other until they were tightly fitted together. In the sixth century, the height of the shafts measured 4.5 to 5 times the lower diameter; the column was 8 times as high as its capital. The tendency was to make these proportions leaner and more elegant in the course of decades, so that by the fifth century the relation of diameter to shaft was 1:5.5 or even 1:5.75, and the total column stood 11 to 12 times as tall as its capital. At the same time, the upward taper of the columns was also being reduced, so that the flare of the lower member of the capital, or *echinus*, would not be quite as forceful as it had been in the sixth-century temples.

It was this taper as well as the *entasis*, or the slight bulging of the shaft profile, that gave Doric columns a look of vitality and expressed their load-bearing function. The fluting of the shaft also helped to convey this feeling of compression, while at the same time it distinguished the shaft from the smooth background masonry of the cella walls. Fluting was done on the spot, after all the drums of a column were in place. Normally there were twenty flutes per column. This pattern of arrised grooves pulled the individual drums together and created the illusion of flow along the length of the unified cylinder.

The idea of emphasizing the function of lifting by the curved profile and surface treatment of the shaft was an old one. A primitive form of both tapering and entasis had been attempted in the sarsen uprights of Stonehenge. Fluting had been applied to wooden columns in Minoan-Mycenaean architecture, and much earlier in Egypt where entasis was also a common practice. There is in fact a striking resemblance between Doric columns of the sixth and fifth centuries B.C. and some of the attached columns at Zoser's Saqqara complex 2,000 years earlier. (Fig. 4.6)

The Doric capital made the transition from the circular column shaft to the bridging blocks of the architrave above. The capital consists of two parts, a flaring echinus that broadens the circle of the shaft top and brings it in line with the scale of the superstructure, and the square unit of the *abacus* on which the architrave blocks rest. This is a purely geometric cushion of juncture between support and load, with no reference to natural forms like plants or trees. Consequently, we cannot read the column in any literal sense, but must respond to it as an abstraction, or rather as a metaphor.

Perhaps inevitably in the light of their self-awareness, the metaphor of the Greek column has to do with the human body. It is as though we are there bearing the load of the superstructure and would know in our own bodies, empathetically, what is too much or too little for the constitution of the columns. At issue is the *appearance* of a fair balance. The column height and its thickness in relation to the mass of the superstructure are determined with a sense of visual justice, so that both look adequate to their task even if, in the narrow structural context, one or the other, the colonnade or its burden, might actually be overbuilt.

The principle of empathy is central to the understanding of Greek architecture. It comes about intangibly, through the proportional interlocking of the members, which evokes the proportional relationships of a standing human. Proportion, ac-

cording to the Classical theorist Vitruvius, "is a correspondence among the measures of the members of an entire work, and of the whole to a certain part selected as standard . . . as in the case of those of a well-shaped man." This description and the fact that the units of measurement themselves are derived from members of the human body—the palm, the foot—are not unique to Greek architecture. But the phrase "as in the case of those of a well-shaped man" implies a physical affinity between user and building so that, for example, the ratio of column to capital could not be too far removed from the ratio of the human frame to its head. It is this affinity that enables us to comprehend the scheme of the peristyle, and what the column is capable of, in terms of our own capabilities. In the end, this humanly inspired reasonableness of built form is what distinguishes the experience of a Greek temple from the crushing gigantism of Egyptian structures. (Fig. 4.20)

The architrave completes the vertical definition of the peristyle. It is a band of stone that separates the colonnade proper from the crowning elements of the temple—the frieze, the gables, or pediments at the two short ends, and the roof (Fig. 6.13) In reality the architrave is not made, as it appears to be, of a line of single blocks bridging pairs of columns but, instead, of two such blocks, one behind the other, extending from the center of one capital to the center of the next. The plain surface of the architrave effectively distinguishes the structural reality of the peristyle from the applied decorative scheme of the frieze, whose component parts, the alternating triglyphs and metopes, repeat schematically the rhythm of alternating columns and voids in the peristyle.

The play between the actual thing and its apostrophe was originally highlighted by the use of color. The colonnade and its architrave were not painted. If a porous stone had been selected, a coat of stucco would ordinarily be applied to cover up the rough texture; marble columns were sometimes waxed so that they would gleam under the strong Greek light. The frieze up above, having no true structural accountability, was painted gaily—blue for the triglyphs, whose grooves echoed the fluting of the actual columns, and red for the background of the metopes against which sculptured scenes stood in relief. We might today be startled by the notion that good limestone or marble should be concealed by bright paint. Faithfulness to the nature of materials is, however, a relatively modern concern. The Greek architect was interested in clarity; he felt no scruples about tampering with the texture and hue of stone for the sake of proper distinctions.

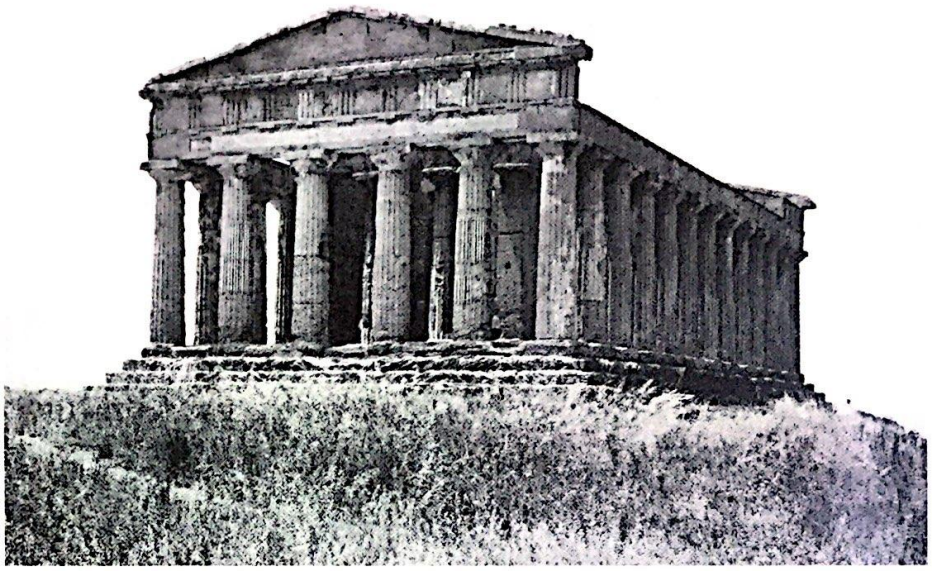


Fig. 6.13 Akragas (Agrigento, Sicily), the so-called Temple of Concord, later fifth century B.C.

The appropriate place for triglyphs was directly above the columns they recalled, centered over each capital. But since the proportion of mass to void in the peristyle could not be approximated in this way, additional triglyphs were placed in the center of each intercolumniation. The architectural symbolism required that triglyphs occupy the corners of the frieze, since columns defined the four corners of the peristyle. To be flush with the corners, the last triglyphs on each side of the temple had to be displaced in relation to the corresponding capitals below. This created a wider space between these corner triglyphs and their immediate neighbors than between any other pair of triglyphs. Two solutions were espoused to deal with the problem (Fig. 6.14). One, favored by the Greeks of Sicily and south Italy, involved the progressive stretching of the frieze elements next to the corner. In mainland Greece, the irregularity was offset at ground level by reducing the span of the columns close to the corner, a procedure known as angle contraction. Sometimes a combination of both systems would be used.

The tiled roof and the two pediments formed the crowning unit that projected beyond the line of the frieze. This unit closed off the peristyle screen to create a stone canopy that sheltered the cella building with its cult statue. It seems evi-

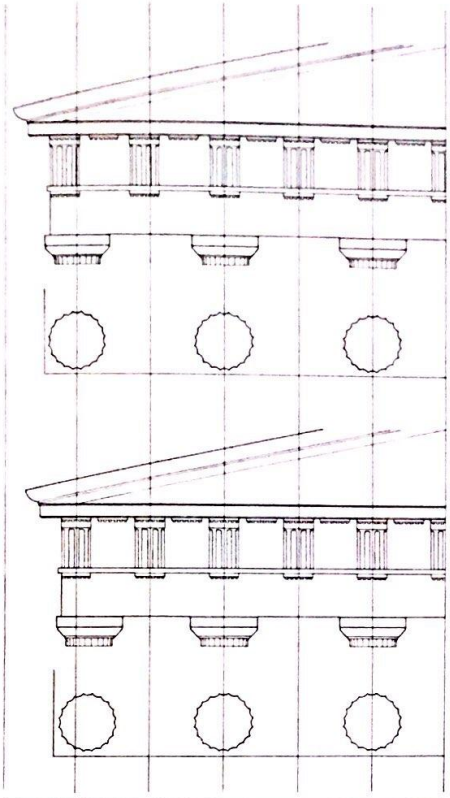


Fig. 6.14 The "corner problem" in the Doric temple. The diagram, with vertical guidelines that are equally spaced, indicates the two alternative adjustments: top, enlarging the width of metopes toward the corner; and bottom, reducing the span between the corner columns, or "angle contraction."

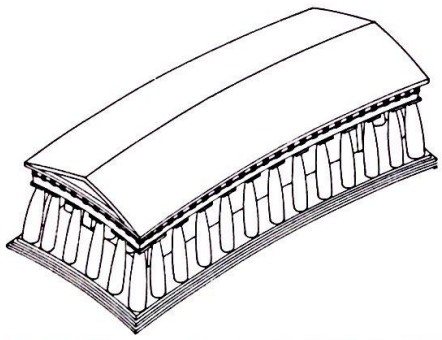


Fig. 6.15 Greek refinements, or visual adjustments in Greek temple design, exaggerated for emphasis; diagrammatic drawing.

dent from temples left unfinished that the cella building was constructed, despite the inconvenience, after the peristyle screen had been set up. It was the screen, then, that mattered most in the expression of the program, both in terms of form and as a religious statement.

The priority of the screen meant that the temple was conceived primarily as an exterior presence. Indeed, it leaned against nothing and had no backdrop except the land shapes around it or the cityscape. It was mid-space architecture par excellence. To stress this point, the screen was made visually continuous. The three steps went all around the terrace; the frieze wrapped itself around the top like a fancy ribbon. There was, in appearance at least, no front and back to the building, no designated entrances. Every approach, ideally, was valid: every intercolumniation could function as a door. To bring home this freedom from a fixed line of access, the path from the precinct gate often cut an oblique line to the temple, so that two sides of the building would be visible at once. (Fig. 6.16)

Meanwhile the architect took pains to have this mid-space object spring forcefully from the ground. To achieve this look of vitality, he incorporated in his design a whole gamut of visual subtleties. (Fig. 6.15) The groundline of the terrace gently curved upward toward the middle of each side. The columns, as we have already observed, tapered and had slightly convex profiles. In addition, the four-corner columns inclined inward and back, and they were also made thicker than the rest. Angle contraction, where it was resorted to for the sake of the corner triglyphs, further strengthened the visual articulation of the temple corners.

These refinements are commonly explained as corrective measures designed, for example, to counter the appearance that the straight lines sag; curving the lines would make them look straight to the naked eye. We had noticed similar adjustments before in the great ziggurat of Ur-Nammu at Ur. Philon of Byzantium in the late third century B.C. wrote that such optical compensation was necessary to prevent things that "were in fact of equal thickness and straight" from appearing not to be so. But actually some of the refinements, for example, the rise of the stylobate and entasis, are easily detected for what they are if we have been made aware of them. (Fig. 6.13) They are intentional and evident distortions that render the otherwise thoroughly rational design of the temple live and spry. If we do not ordinarily notice them, it is precisely because they are so successful that they become part of the natural image of the Greek temple. "The eye," John Ruskin once wrote, "is continually influenced by what it cannot detect. . . . It is most influenced by what it detects least."

In religious terms as well, the peristyle screen was preeminent. The cult statue in the cella would be glimpsed through the doors that were opened during important observances. The daily intercourse with the godhead took place in the open. At the level of the terrace, the temple was surrounded by statues, mostly of humans—the standing life-size images of nude male youths and draped women set up by their cities as memorials of special excellence. They peopled the sacred precinct and underscored that peculiarly human scale of Greek architecture we spoke about earlier. The metopes and pediments received sculpture too, all of it religious. These sculptures were reared aloft by the columns of the peristyle. Nonetheless, they could clearly and unequiviocally be seen by all users of the temple precinct and in the open daylight. The temple, in this sense, was the meeting ground of the human and the divine. At the same time that humans were lifted up by the proud and measured soaring of the columns, deities came down to the level of human visibility. (Fig. 7.21)

This, then, is the Doric temple as it matured in Greece during the sixth and fifth centuries B.C. It registered, close up, through the special arrangement and proportions of its parts; and in the distant view, through its interaction with natural elements like the mountains and the sea. There was also an intermediate frame, the holy precinct, defined by a wall that narrowed the landscape at large and that established a fixed boundary within which the temple was played against smaller buildings such as treasuries, altars (and especially the principal altar to the east of the temple on which the open-air ritual focused), and dozens of votive monuments.

Within the precinct, the interplay of the looming mass of the temple and these smaller foils to its visual statement was a

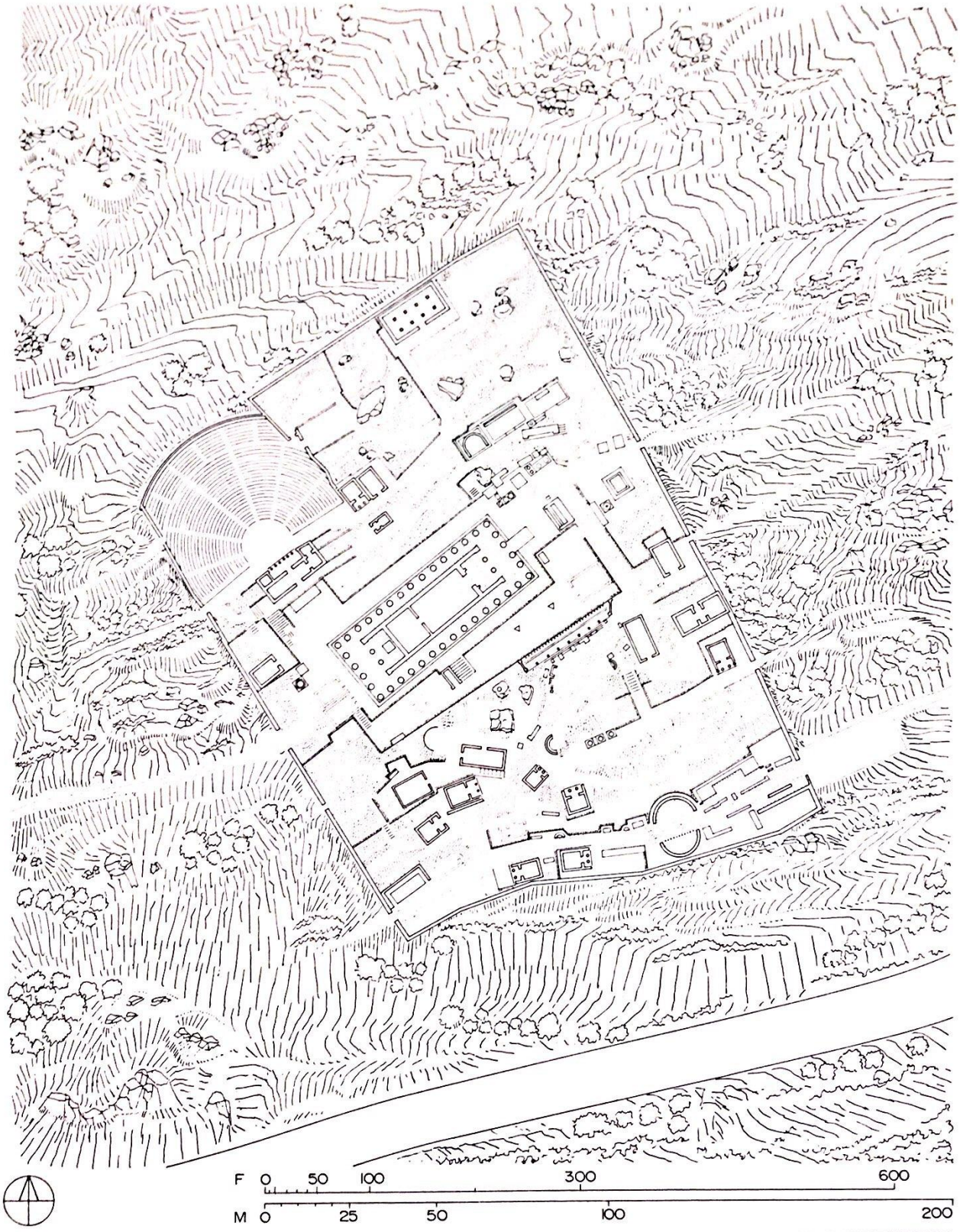


Fig. 6.16 Delphi, the sanctuary of Apollo; general site plan ca. 400 B.C.

vigorous, constantly changing relationship. (Fig. 6.16) First, the buildings and statues were seen according to the way the worshipper moved through the site along time-worn paths. The visual experience of any one building or statue had no fixed value, no single point of view. Treasuries, small replicas of the temple built by individual cities in Panhellenic sanctuaries like Delphi or Olympia, created an unregimented pattern in relation to the sacred way, jostling each other as spectators might during a parade. And second, new structures or monuments were regularly added to the site, and with each addition the relationship of those already present would alter and shift. The site plan, haphazard looking to the modern observer, was keenly reflective of old patterns, the drive of civic competition, and change through time. The temenos was caught in a process of continuous becoming; yet it was also complete at every stage of its growth.

The Temple in the West

A spirited individualism, only partly attributable to local conditions, characterizes the transplanted Doric temple in the Western colonies. At the outset, the strange land in the West posed two unique problems. For one thing, it was not marked, in the way that Greece had been, by a legendary age of pre-Hellenic ancestors. Moreover, the look and feel of the land was alien. The vast, fabulously fertile plain of Catania, the natural harbors and sand beaches, fuming Etna—for these there were no Greek parallels.

To mark this unfamiliar territory with proper, broad-based reverence, and to hold down the extravagant spaces, the religious architecture of Greek Sicily and southern Italy behaved remarkably. The size of the temples was often prodigious. No sixth-century Doric temple in Greece can compete with the heroic bulk of Temple G at Selinus, under construction for more than a century and still unfinished when the Carthaginians destroyed the city in 409 B.C. Such striking monumentality did more than advertise the prosperity of the colonies and their boastful pride: it also overreached in response to the call of the open, un-Greek horizons. The same rationale, coupled with the desire to play host to a fair number of Olympians, must hold for the banding of temples in groups of four or more, as is the case with the group east of the akropolis at Selinus and the other on the akropolis itself, and in the splendid series that dots the southern sea ridge of Akragas. (Fig. 6.17)

Western Greece, although it remained within the Hellenic fold, was in no way subservient to its historic homeland. Its own unique contributions were legitimate regional preferences rather than aberrant provincialisms. We can quickly scan these design peculiarities by looking at one of the most impressive of sixth-century Sicilian temples, the so-called Temple C at Selinus built about 500 B.C. on the highest point of the akropolis and in plain view of the sea.

Temple C was built of local stone. There were no marble deposits in Sicily, and so public architecture relied on local varieties of somewhat friable limestone and sandstone that had to be protected by coats of stucco and terra-cotta revetments. Marble, used for luxury details or heads of sculptured figures, was commonly imported from Greece.

The general plan of Temple C is very elongated. (Fig. 6.17) There are seventeen columns along the flanks in comparison to the standard fourteen. The cella is consequently long and narrow, all the more so

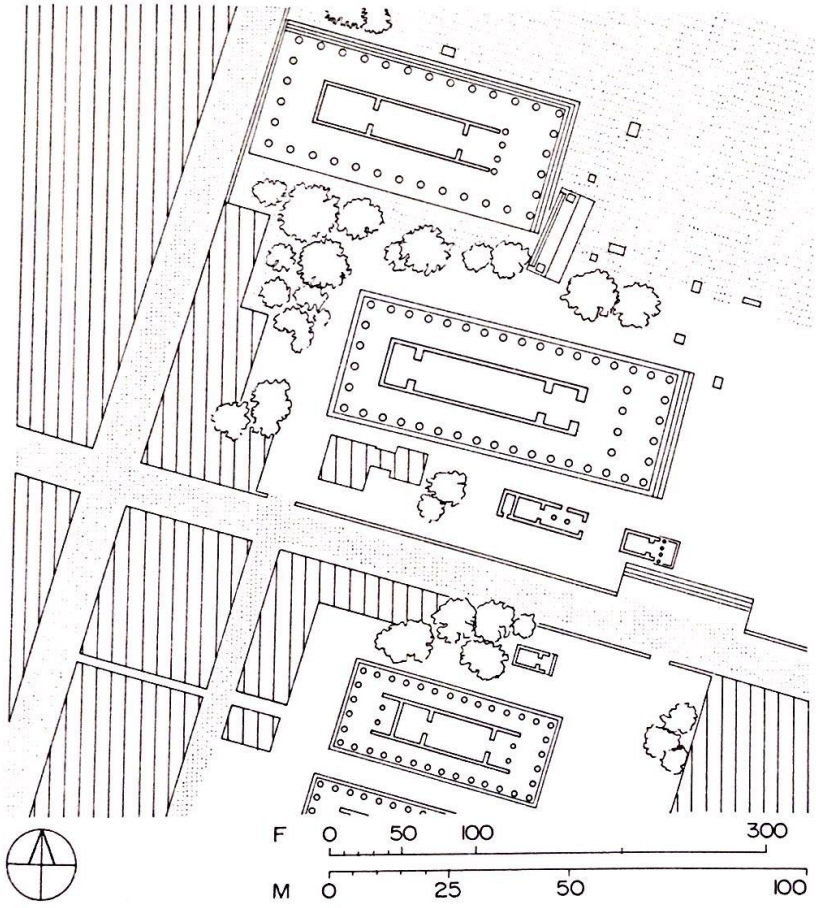


Fig. 6.17 Selinus (Selinunte, Sicily), temples at a major intersection of the upper town; ground plan. Temple C, ca. 500 B.C., is in the middle; Temple D is shown to the north; and Temple A to the south. Hatching indicates houses.

in that the architect has chosen to leave an exceptionally wide space between its walls and the peristyle. The cella walls in Greece align with the penultimate columns of the short ends of the peristyle. (Fig. 6.16) Sicilian temples either have cellas that are independent of the lines of the peristyle, or if the walls do align, it is often with the second and not the first intercolumniation. These narrow cellas can be roofed without the aid of interior supports.

Without rejecting the mid-space character of the Doric temple, certain features of Temple C clearly favor the east facade, and therefore an axial approach in the longitudinal sense. Behind the east colonnade of the peristyle, for example, there was a second row of columns that found no equivalent in the west end. There were sculptured metopes over this inner colonnade, but none on the outside in their normal place on the frieze. The terrace had not three but six steps on the east side. Lastly, the cella ended, to the west, in a closed rear chapel, or *adyton,* but lacked the false porch that would equalize the visual status of the two short ends of the cella when seen from the outside.

This incipient axiality of Temple C and a number of other Western Greek temples may bespeak familiarity with Etruscan practice. And there exist less equivocal borrowings in Etruscan temples, indeed in Etruscan architecture and in city planning generally, from their sophisticated neighbors to the south. But the liturgical needs of the two adjoining civilizations, their total outlook toward the world, differed fundamentally.

The Etruscan temple, for long a building of mud-brick and wood brightly painted and clad in terra-cotta, was raised on a high podium that jutted beyond a rectangular precinct. (Fig. 6.18) The only approach was across this formal area and up a broad flight of steps. A deep porch pulled one into its space through two rows of Tuscan columns which, despite their bases and unfluted shafts, owed allegiance to the Doric order. The porch afforded three passages corresponding to the tripartite sanctuary. The central (and broader) passage led into the cella proper; the side passages, into open wings or, in temples dedicated to a triad of deities, into separate cellas. A single, low-pitched roof projected deeply from the side walls, enveloping the flanks in shadow.

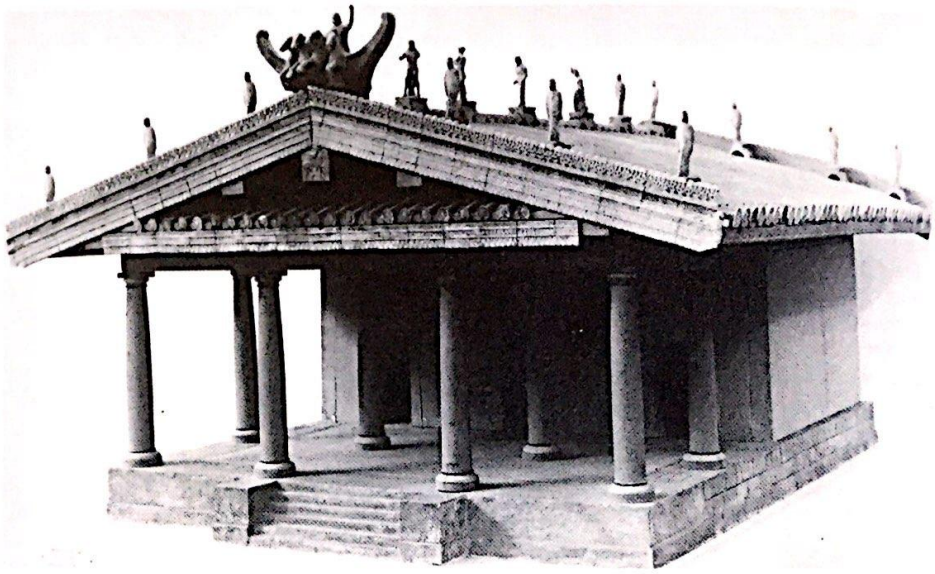
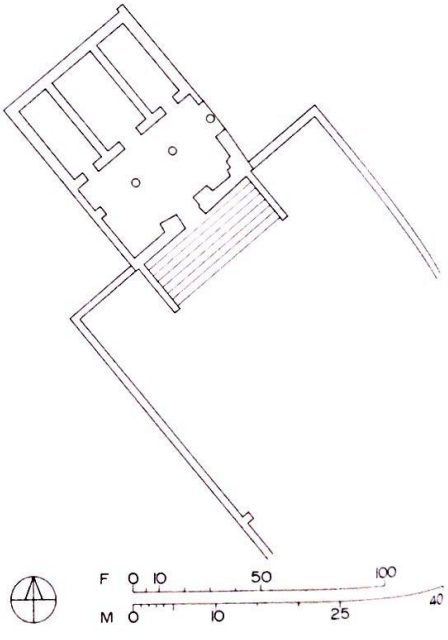


Fig. 6.18a An Etruscan temple, according to the description of Vitruvius; modern reconstruction. (Rome University)

This low, lowering, and strictly axial form, fronting a geometrically oriented public space, is a far cry from the sculptural force of the freestanding Greek temple where enclosed space is of decidedly secondary interest. The basic concept of the Etruscan temple, including its orientation toward the south, seems eastern and not Greek in origin. We should remind ourselves that, in all likelihood, the founding stock of the Etruscan state came to Italy from Asia Minor, and more particularly from Lydia if we are to heed the claim of the Greek historian Herodotus.

Inwardness, along with axial alignment, is a prevailing trait of Etruscan built forms. It is manifested in the Etruscan fondness for the round arch and the circular plan. (Figs. 6.19, 6.20) The origins of the round arch are distant. There are brick, mortared arches in Mesopotamia and Persia, even Egypt, in the second millennium B.C. Even the stone voussoir arch, constructed of precisely cut wedges and dry joints that are locked in place by the keystone, may have had Greek rather than Etruscan parentage.

Fig. 6.18b Orvieto (Italy), the so-called Belvedere Temple, fifth century B.C.; plan. Typical layout of Etruscan temple with enclosed precinct, straight flight of stairs, deep entrance porch, and triple cella.



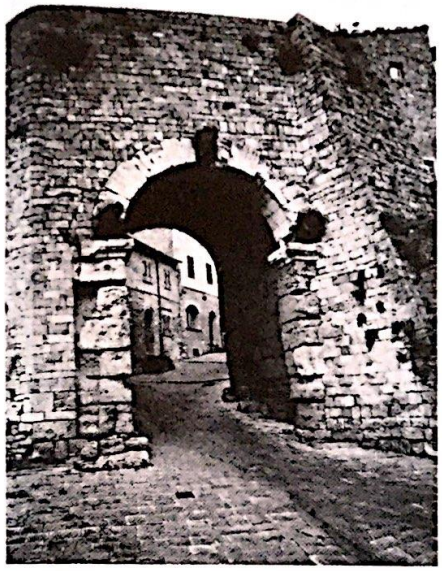
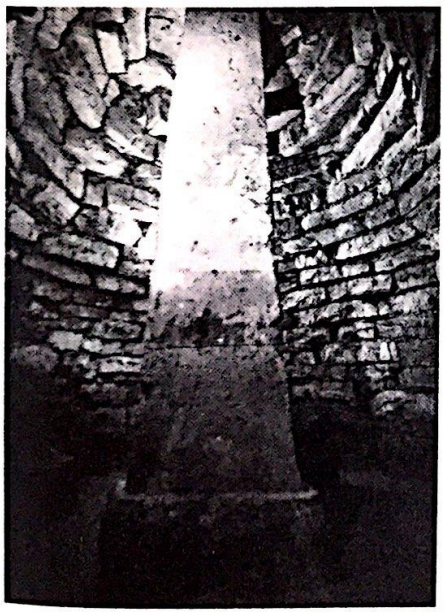


Fig. 6.19 Volterra (Italy), Etruscan city gate, fourth–third century B.C., with later, Roman repairs.

Fig. 6.20 Casal Marittimo (Italy), tholos tomb, ca. 600 B.C.; interior view. (Reconstructed in the Archaeological Museum, Florence, Italy)



Yet even with a handful of Greek examples, it is clear that the arch—and eventually its three-dimensional extension, the true vault—was congenial to the Italic, but not to the Greek, mentality. The Etruscans used corbelled vaulting, and the arch was used singly, in city gates and domestic architecture, rather than in any coherent system of architectural design. It was the Romans who exploited true vaults and arcuated surfaces later. Nevertheless, the Etruscans were nursing the germ of an encapsulating, space-engulfing architecture in these centuries of recovery. And this was a non-Greek phenomenon. Or rather pre-Classical; for the great corbelled tunnel vaults and domes that can still be seen in Etruscan funerary structures are, if anything, a throwback to the era of Bronze Age heroism, to Tiryns and Hattusas.

The same can be said for the most characteristic relics of Etruscan civilization, the mound tombs on handsome circular platforms cut from the living rock in the great cemetery cities of Cerveteri and Tarquinia. Round forms as a whole have an extremely limited appeal in Greek architecture, and interest in the afterlife does not extend to providing for it monumentally. The earthfast round tombs of Etruscan cemeteries, with their elaborate furnishings imitating domestic environments and equipped for all requisites of a life after death, belong in spirit to the tombs of Egypt and, in form, to Mycenaean pendants like the "Treasury of Atreus." (Fig. 5.18)

The Ionic Order

We must now turn briefly to the second of the Greek decorative systems, the Ionic, which crystallized, somewhat later than the Doric, on the Aegean islands and in coastal Asia Minor. The differences between the two orders are plain enough. The Ionic is a more delicate and more ornate convention. (Fig. 6.21) Vitruvius was to consider it the feminine order, in contrast to the Doric which for him was imbued with "manly beauty, naked and unadorned." And, indeed, the sober abstraction of the Doric is countervailed in Ionic forms by a smack of the organic. Ionic ornamental details favor the curvilinear and freely recall leaf and plant forms.

The column itself is taller and thinner by comparison and rests on an elegantly molded base. The flutes do not meet at sharp arrises as a rule; instead, they are joined with fillets and gathered together at the top of the shaft by neck moldings. The volutes of the capital spread the upward energies of the column laterally along the line of the architrave. The architrave itself is divided into three horizontal strips that reduce the visual impact of the load in appreciation of the slender grace of the supports. The frieze above was often a continuous band of relief, enhancing the sense of a layered elevation that reads very differently from the determined verticality of the Doric.

One of the earliest and greatest Ionic temples was the Artemision at Ephesos of about 560–550 B.C. (Fig. 6.22a) We have mentioned it earlier in relation to the start of stone technology in Greek architecture. It provides us with a good case study for the rising Ionic order as an alternative to the Doric of the mainland. It also demonstrates the peculiar involvement of this order with the non-Greek context of contemporary Asia Minor.

Ephesos was a Greek city, but like most Greek cities of coastal Asia Minor, its affairs were tangled in Anatolian politics. At the time of the construction of the Artemision, it was controlled by the Lydian forces of King Croesus, and his interest in the temple affected the final form. Artemis shared aspects of the Near Eastern great goddess whom we have met in various guises on both sides of the Aegean. The fact that her temple at Ephesos faced west may well reflect liturgical bonds with Asia Minor.

The temple was immense by Greek standards of the time and was rarely surpassed even later. The site was the low ground at the head of a broad bay (today silted up), close by the water's edge. Low marshy sites are as common for Ionic temples as is precipitous high ground for Doric. This setting helped to emphasize the grovelike character of the peristyle that consisted of a double row of columns, eight of them across each short end in the preferred manner of Ionic temples, and had additional columns lining the attenuated front porch. The effect of massing so many columns is almost Egyptian. The cella may have been open to the sky in the middle, forming a monumental stage set around an earlier shrine.

The double peristyle and deep entrance porch filled with columns radically alter the experience of the Greek temple. (Fig. 6.22b) What is lost is the crisp interplay between the single row of peristyle columns and the walls of the cella visible just behind. Also lost is the straightforward relationship of the entrance porch to the colonnade of the east front when viewed head on from the outside—the door slightly higher than the stylobate and standing about half as tall as the framing columns of the porch, which would be partly shielded by the corresponding columns of the peristyle. The entrance to the cella, then, is both keyed to the peristyle and properly set back from it in the next plane. (Fig. 8.5)

At Ephesos the entrance would have been at the end of a long defile, dwarfed by the perspective and buried in the sprawling width of the temple like the promise of a clearing in a forest. The effect would have been one of multiplanar depth, as if the aim were processional penetration. Assuming that the cellas were indeed hypaethral, the pool of light behind the entrance would have enforced this feeling of openness beyond and would have acted as an additional inducement to move toward the core of the building. This prospect is wholly at odds with the obscure depths of a Doric temple where the cult statue would dimly show when the cella doors were thrown open. (Fig. 7.26)

Temple against Palace

One element of the Ephesian monument strikes a curious note. The peristyle columns were a gift from King Croesus of Lydia, and the lower sections of the shafts were carved with figured reliefs that collectively portrayed a grand procession, very probably of the court of Croesus beginning with his divine ancestors. The planting of this dynastic program on the temple of a Greek city-state highlights the peculiar standing of Ionia compared to the structured monarchies of the hinterland, Lydia and Persia in particular, a situation that did not exist for Greece in the West. In these countries, the palace was still the hub of political power. To the extent that the temple competed, it did so in the form of monastic complexes with large landholdings. The Lydian capital of Sardis complemented

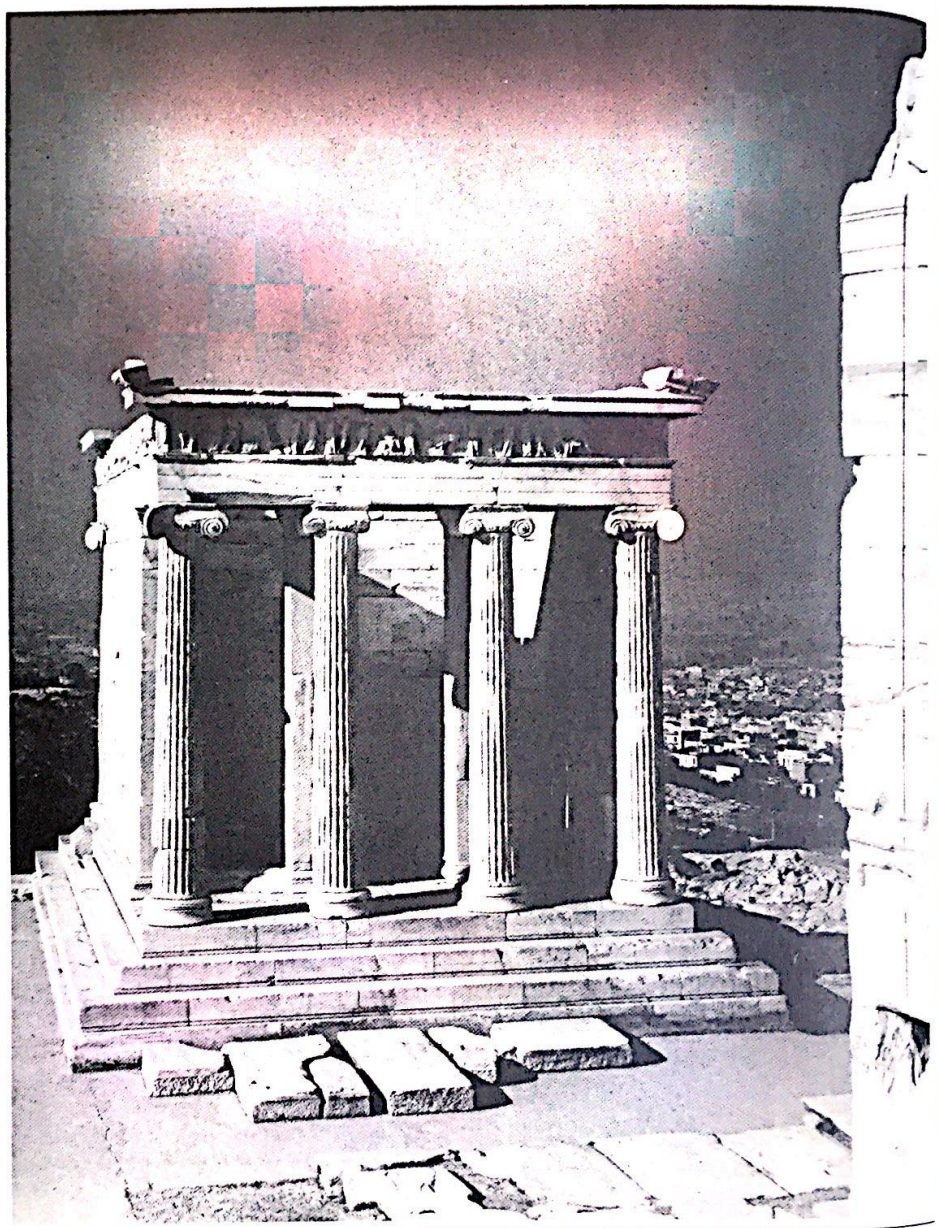


Fig. 6.21 Athens (Greece), Akropolis, temple of Athena Nike (Victory), 427–424 B.C., Kallikrates; view of east front. The general form of this commemorative shrine is untypical for an Ionic temple and will be discussed in Chapter 7.

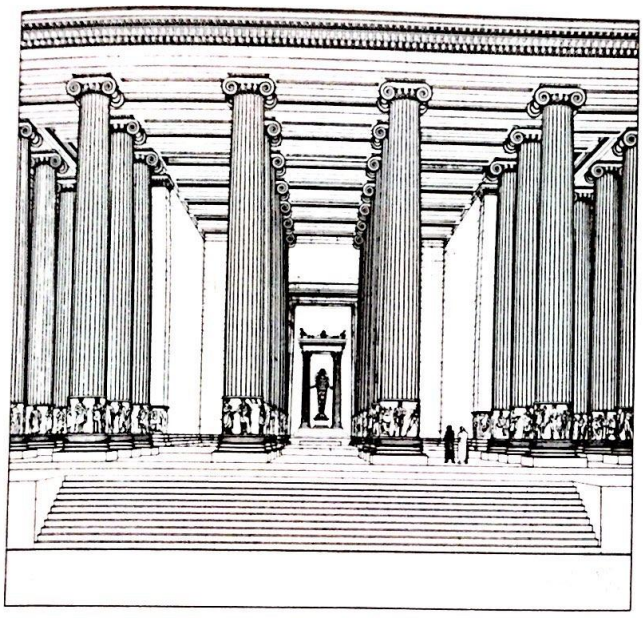


Fig. 6.22a Ephesos (Turkey), temple of Artemis, ca. 560–550 B.C.; reconstruction drawing of west front, close-up view.

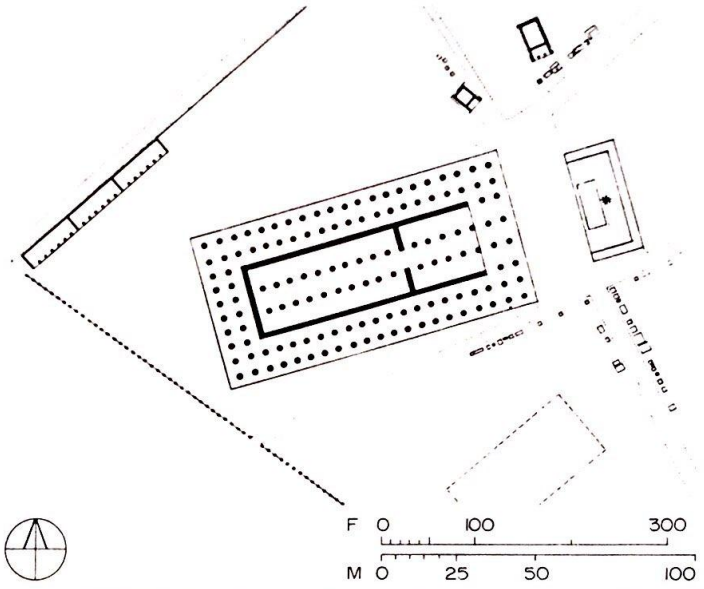


Fig. 6.22b Samos (Greece), third temple of Hera, begun in the late sixth century B.C.; ground plan.

these two traditional components—the palace and temple—with an active agora or public space, but its excuse was principally commercial. It was, in fact, the stage for what may well be the first free market in world history based on a monetary economy, namely, the gold currency made possible by the fabulous mines of the country which made the wealth of Croesus proverbial.

In the Greek cities of Ionia, palaces were rare. The protagonists of urban cohesion were the temple and the agora. The first, as we have seen in this chapter, was as far removed from the temple monasteries in the East as was the Greek view of life from that of pharaonic Egypt or that of the Hittites. The agora, as we will see in the next chapter, existed primarily as an arena for public debate and self-government. In the eyes of the East, it was a theater subversive of the state, an upstart institution to be ridiculed and crushed. "I never feared the kind of men," the Persian king, Cyrus the Great, is said to have remarked disdainfully, "who have a place set apart in the middle of the city where they get together and tell lies to one another under oath."

With the elimination of Lydia as a buffer state, Persia confronted the Greek commonwealth across the Aegean. The Ionian cities, for the most part, had recognized the suzerainty of the King of Kings and had become constituent members of the Persian empire along with Assyria, Lydia, and Egypt. Whatever the Greek view of absolutism as a political system, this empire, which perhaps for the first time in history embraced peoples of vastly varying tongues and faiths, was distinguished by a prevailing mood of tolerance and decent rule. Its principal belief was the unity of nations under the Achaemenid dynasty. And nowhere is this theme expressed better than in the palace at Persepolis, the ceremonial court of Darius and Xerxes, north of modern Shiraz, on its platform 40 feet above the wide plain of Marv-i Dasht. (Fig. 6.23)

Here every spring, on the day of the vernal equinox, the people came from all around to attend the festival of Nawruz. They came bearing tribute, bringing the wealth of the empire to Persepolis. They passed through the main gateway, called All Lands, which was reached by means of a splendid, double-reversing stairway in two flights, and moved on to the *apadana* and the throne room, great square halls filled with remarkably tall wood columns, plastered and painted, and opening out on all sides with airy verandas. The stairs that led up to the apadana were flanked by a procession in painted relief of guards and representatives of the imperial domain shown carrying their gifts to the King of Kings. (Fig. 6.24)

The palace, too, was viewed as an offering; the symbol of this first modern empire, it was built with the labor and materials that Persian rule could command. A surviving building inscription from the palace at Susa describes this collaborative construction in the words of King Darius.

This is the palace which I erected at Susa. Its ornament was brought from afar. . . . And that the

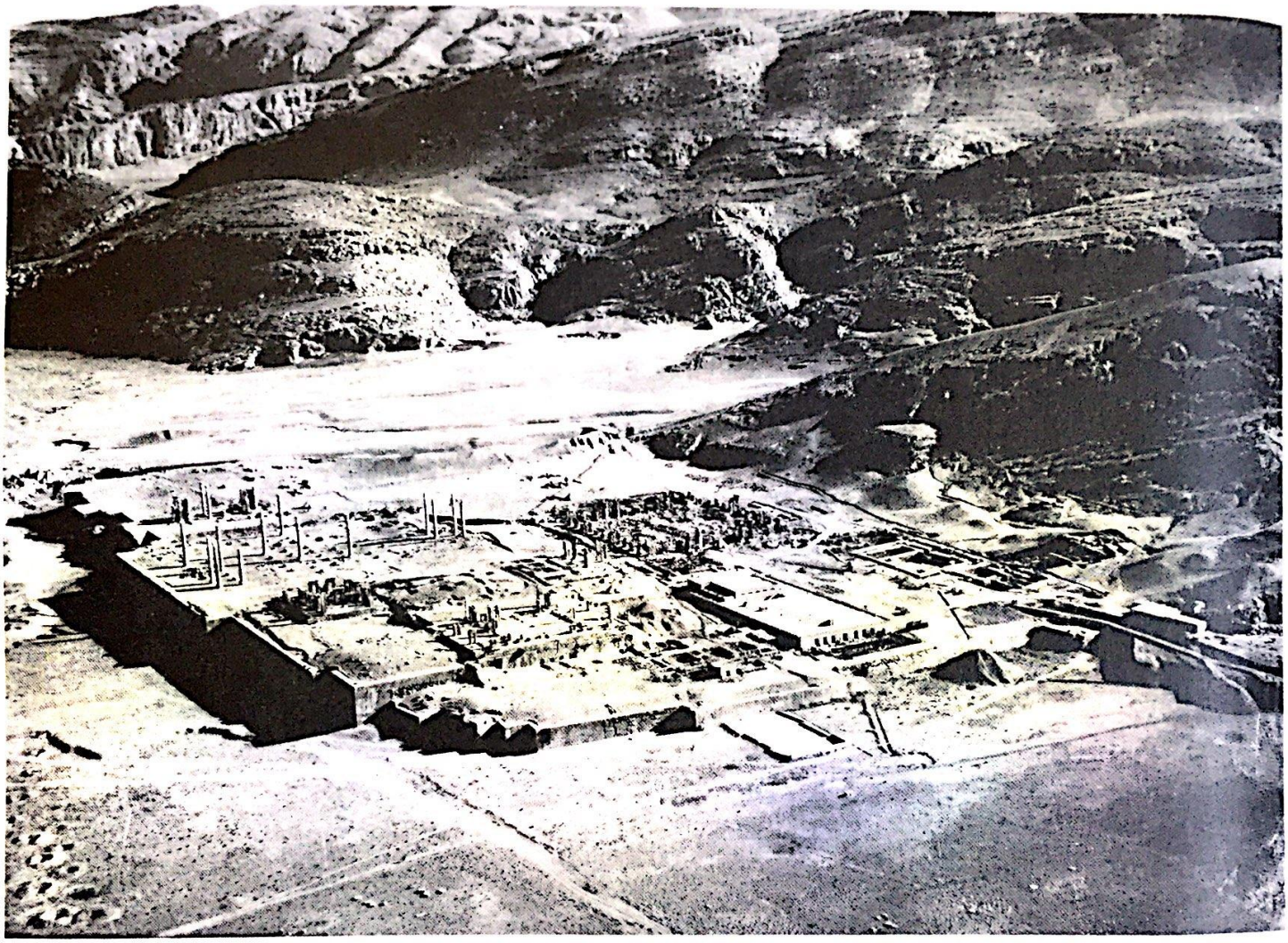


Fig. 6.23 Persepolis (Iran), royal palace, 518–460 B.C.; aerial view.

earth was dug, and rubble was packed, and brick moulded, the Babylonian folk, they did it. The cedar timber was brought from a mountain named Lebanon; the Assyrian folk, they brought it to Babylon; from Babylon the Carians and Ionians brought it to Susa. . . . The gold was brought from Sardis and from Bactria . . . the silver and copper from Egypt . . . the ivory from Ethiopia. . . . The stone cutters who wrought the stone, those were Ionians and Sardians.

Yet the design was also collaborative. Everywhere at the palace of Persepolis the subject nations would have been greeted by motifs of their own invention, absorbed within the general scheme. There were Assyrian monsters and crenellations, Egyptian cavetto cornices, Ionic column bases and volutes. But they were all revised according to the will of the mighty patron and stamped with the native spirit. Ionic volutes are stacked in two pairs of confronted tiers on top of plant capitals and carry, in turn, crowns of double-headed bulls that take the ceiling rafters. (Fig. 6.25) There is nothing very fearful any more about the Assyrian monsters at the gate, precisely because fear is absent generally from this lighthearted royal environment; the em-

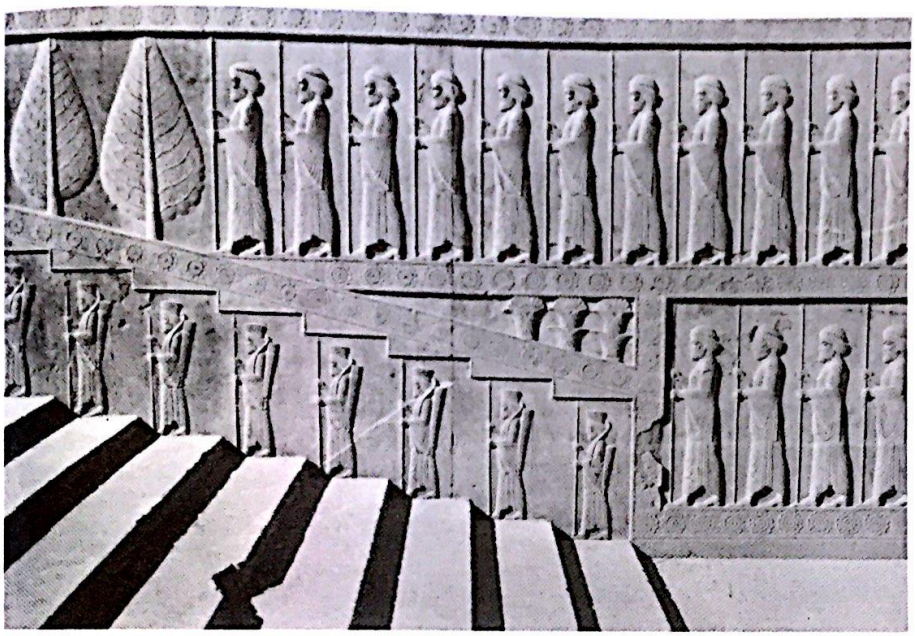


Fig. 6.24 Persepolis, royal palace, staircase with a sculptural frieze representing guards; detail.

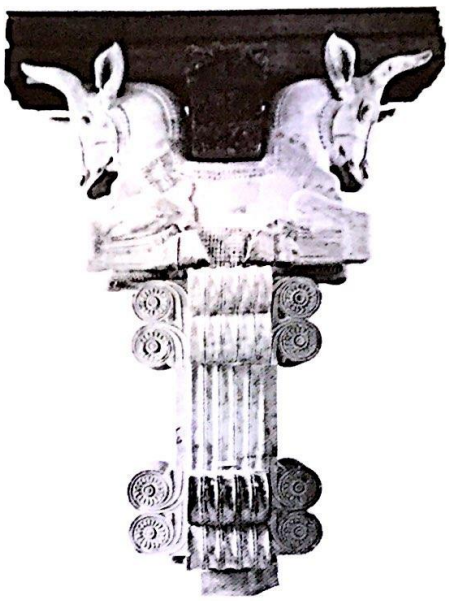


Fig. 6.25 Persepolis, royal palace, double "bull" capital from the *apadana*, or audience hall. (Louvre, Paris)

phasis is placed on festive ceremony and the concert of nations.

To compare the palaces of Persepolis and Khorsabad is to acknowledge that dichotomies such as Greek versus barbarian or democracy versus absolutism must remain crude and simplistic. There is benevolent centrism as well as oppressive monarchies; and the authoritarian and highly restricted populism of Sparta is a sinister application of the Greek boast of self-government. Architecture sometimes mirrors these distinctions, and at other times it does not. Perhaps because of the distance in time and historical identity, the palaces of Persepolis and Khorsabad tell very different stories in their built form. But the temple behaves much the same way in Sparta as at Athens, despite the radical split in their notion of democracy.

A series of seemingly trivial events brought the confrontation of Persia and Greece, the confident centrality of a world power and the disunited but proud congress of city-states, to a boil. The King of Kings and his mighty force crossed over to Europe to silence the tiny but outspoken neighbor—only to be defeated, against all odds, in one of the great turning points of history. For a time at least, the temple held its own against the palace. It was not until a century and a half after the battles at Marathon and Salamis that Greece and Persia, both victims of Alexander the Great's headlong conquest of the world, found themselves in the same political envelope and were forced to bury the old distinction between Greek and barbarian.

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7

POLIS AND AKROPOLIS

Athens and Her Empire

Greece came out of the Persian wars aware and confident, more so than at any other time in her history. The invasion had been sobering for the boastful Greeks. It taught them, for a while at least, the benefits of unity, creating legends of superhuman valor that would sustain generations of Greeks to come. A quickening of spirit and a consciousness of the human frame, what it is capable of physically and bound by morally, were now evident in everything the major cities produced—in art and building, drama and poetry. The public statues of young athletes stood free of the four-square frame that had held them in the sixth century. (Figs. 6.9, 7.1) Leaning now on one leg, the body distributed its weight subtly and unevenly; muscles articulated the vitality of real flesh. The head, instead of staring rigidly ahead, turned to one side and gently inclined forward in a manner that suggested introspection, thought, the mind beneath the stone surface.

> Wonders are many [Sophokles sang in his *Antigone*], and none is more wonderful than man. . . . Speech and wind-swift thought, and all the moods that mold a state hath he taught himself: yea, he hath resource for all. . . . Clever beyond all dreams the inventive craft that he hath which may drive him one time or another to well or ill.

The temple form was civilized. It now had new, svelte proportions and sober sculptural programs in pediments and metopes. Their full impact is felt first in the Panhellenic sanctuary of Olympia, where a splendid temple to Father Zeus rose in the decade of 460 to complement the old Hera temple on the north side of the precinct. It was the first major building effort on the part of the war-ravaged cities.

By mid-century the mood of reconstruction took hold in Athens, the premier Greek city and the acknowledged leader of resistance to Persian hostility. A costly, ambitious building program set about to revive the Akropolis which had been laid waste by the sack of 480. For fifty years, mostly under the general artistic supervision of the sculptor Phidias, marble was quarried at Mount Pentelikon 16 kilometers (10 miles) from the city and transported on carts and timber tracks to the site, columns were fluted and polished, and hundreds of figures carved for pediments and metopes.

This radiant complex of three new temples and a monumental gateway (the Propylaia) on the outcrop of rock that overwatched the bowl of Attica became one of the marvels of the Greek world. (Fig. 7.2) Its theme was uniquely Athenian. It celebrated the divine protectress of the city, the warrior-maiden Athena, and it expressed the rich involvement of worshipper and worshipped, that limit-knowing partnership of humans in the natural order which is one essential aspect of what we mean by the term Classical in reference to fifth-century Greece. And yet, because the Athenian Akropolis was so deeply personal, because it projected its local message so forcefully and finally, it came to be seen as a paragon of Greek achievement—to be coveted, marveled at, emulated.

In the wake of the Persian onslaught, Athens saw herself as the champion of Greece. She presided over the Delian League, a naval alliance of more than three hundred cities bordering the Aegean. Long before the Persians, Athens had subjected the entire district of Attica, dissolving the old boundaries of its four traditional tribes and thereby setting aside local attachments and the power of major landowners. Now under Perikles, the great statesman of the second half of the fifth century, the anti-Persian league was turned into an Athenian empire of tribute-paying cities. Athens kept her own special temples in allied territory and built garrison towns in strategic places as far away as the region of ancient Troy.

To Perikles, Athens was a divine city, the earthly citadel of all Greek gods, and the new Parthenon on the Akropolis was its beacon. It was to surpass all other temples in size and splendor, its shining form of Pentelic marble visible to incoming ships. He had no compunction, therefore, in using moneys from the general treasury of the Delian League for the embellishment of Athens. She was the custodian of Greek might: from her public buildings would emanate a collective pride.

At the time, Athens was not only the most famous Greek city but also the largest. In Piraeus she had the largest and safest natural harbor of mainland Greece. (Fig. 7.3) Her fleet, hastily built after the first Persian invasion, secured a wide sea hegemony. The foodstuffs it carried homeward were transported from Piraeus to Athens within a set

of impregnable walls, the so-called Long Walls, built in the decade of 450 to guard against raids by her arch-rival Sparta. The fame and safety of Athens, and the booming construction industry, caused phenomenal overcrowding. Athens alone, not counting the port city and the countryside of Attica, may have had a population as high as 200,000, inclusive of alien residents (metics) and slaves. This was an extraordinary concentration when we realize that a city of 5,000 male citizens (or a total free population of 20,000) was considered large.

The Shape of the Polis

Indeed, the great majority of Greek cities—and there were about seven hundred in the commonwealth—were very small in size and modest in appearance. The older among them had come about through the *synoecism* of several rural settlements sometime around the eighth century. Aristotle later described the process in these words: "When several villages are united in a single complete community, large enough to be nearly or quite self-sufficing, the polis comes into existence." Some few cities, Athens among them, were successors of Mycenaean citadel-towns. For most, agriculture remained the mainstay of the community.

This modest local economy, even when supplemented by some small sea-borne commerce in the case of coastal cities, left little for fancy building. The architecture of the few great cities was often disappointing, outside of a handful of temples and public buildings. A contemporary source describes Athens as

> dry and ill-supplied with water. The streets are nothing but miserable old lanes, the houses mean, with a few better ones among them. On his first arrival a stranger could hardly believe that this is the Athens of which he has heard so much.

Greek houses, like those of Mesopotamia, turned inward. They were usually built around a court with a cistern or well in it as well as an altar. (Fig. 7.4) In the more substantial houses the court might have simple porticoes on one or more sides. The rooms were not strictly defined by function. A low, raised platform around its walls

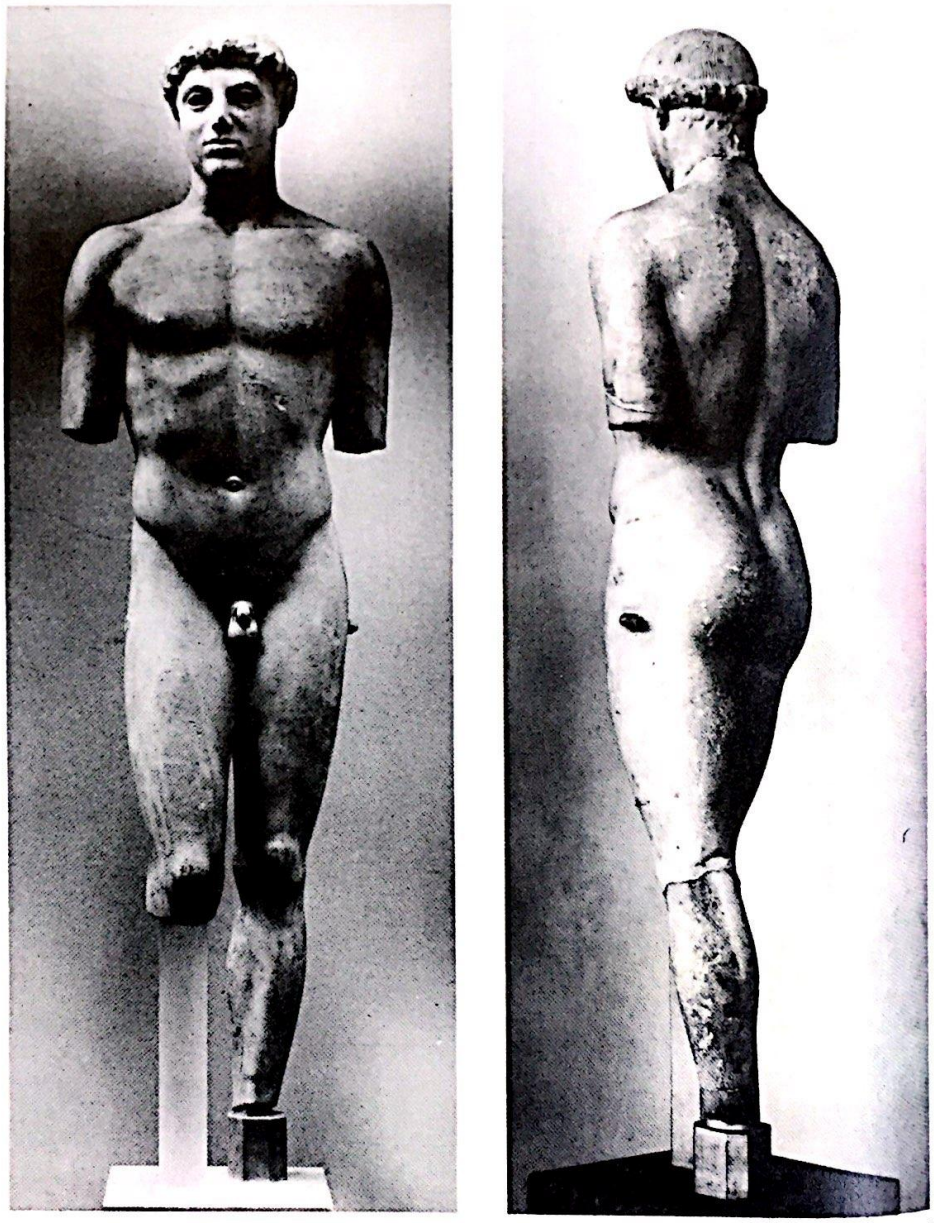


Fig. 7.1 The so-called Kritios boy, Greek sculpture of ca. 490–480 B.C. The height is a little under one meter (2 feet, 9 inches). (Akropolis Museum, Athens, Greece)

Fig. 7.2 Athens, Akropolis; distant view from the southwest.

distinguished the main dining and entertainment room, or *andron*. The platform was for the couches on which the diners reclined during meals. The andron was usually found in a corner of the house, so it could receive direct light from two sides. It might also be enhanced with a cemented or pebble floor. All other floors were of hard-packed earth, and the walls of sun-dried brick would only occasionally be stuccoed and painted. Certain regions featured a well-developed house type whose main pecularity was a long narrow room north of the court, the so-called *pastas*, extending across the entire width of the house or nearly so. The megaron has disappeared from the range of residential forms, along with the princely program it once housed.

Orthogonal Planning

In the old cities, the general outlines of both the houses and individual rooms were irregular. Only when a city was consciously planned would the blocks be uniformly rectangular and the houses within more methodically separated. Planned cities were usually colonies imposed on the land at a single stroke. Colonial cities were, at their inception, artificial. They did not come about through the normal growth of an existing settlement pattern and were therefore not bound by environmental pressures of prior occupancy and use. The settlers took possession of their chosen site directly by imposing on it a rational order. In an unfamiliar terrain, the cityscape had to be diagrammatically intelligible and easy to get used to.

At first this order may have been more hierarchical than strictly geometric. The temples were suitably accounted for. The fire from the state hearth of the mother city, which had been carried along on the journey, would start the colony's own hearth, housed in the *prytaneion*. Then, the agora

would be designated—the public open space that would serve as the multipurpose gathering place of the new citizens and their focus of self-government. The leader of the colonial expedition now supervised the division of the remaining land among the settlers, both within the boundaries of the city and for the farmland beyond.

By the seventh century a normative grid began to determine the layout of new colonies and to regulate the form of those already in existence. The grid provided a straightforward way to divide the land, shape the structure of the city, and control its future growth. Too much can be made of the grid, however, as the planning device of egalitarianism. In the Greek colonies the grid inscribed the social preeminence of a property-owning class, a kind of territorial aristocracy. The first settlers divided the land and thereby ensured themselves the power to govern the affairs of the city. To guard against change, they passed laws that declared property inalienable and

Fig. 7.3 Map: Athens and its region. Left, the walled city of the fifth century B.C.; top right, the relationship of the city to the port of Piraeus; bottom right, the territory of Attica and nearby islands.

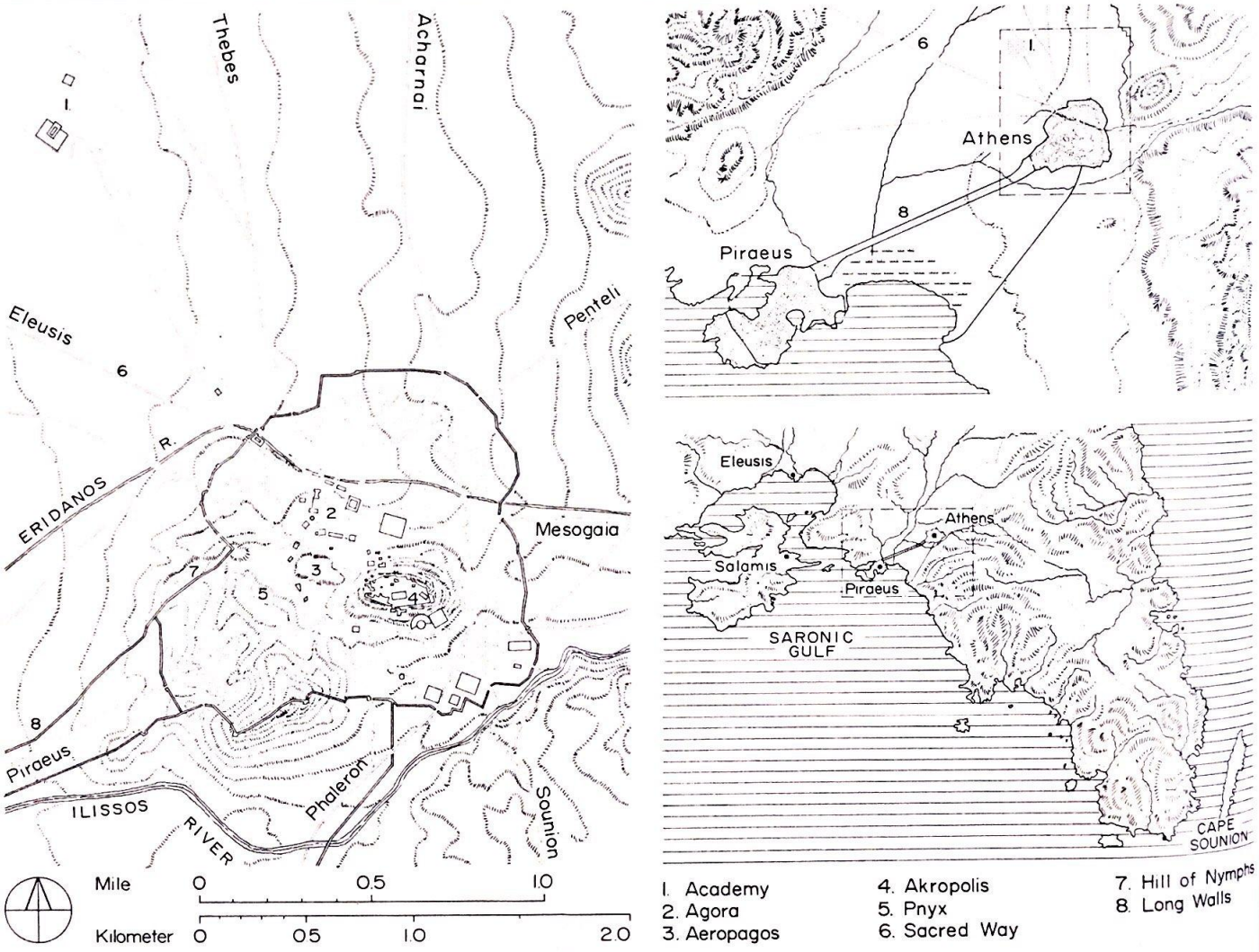
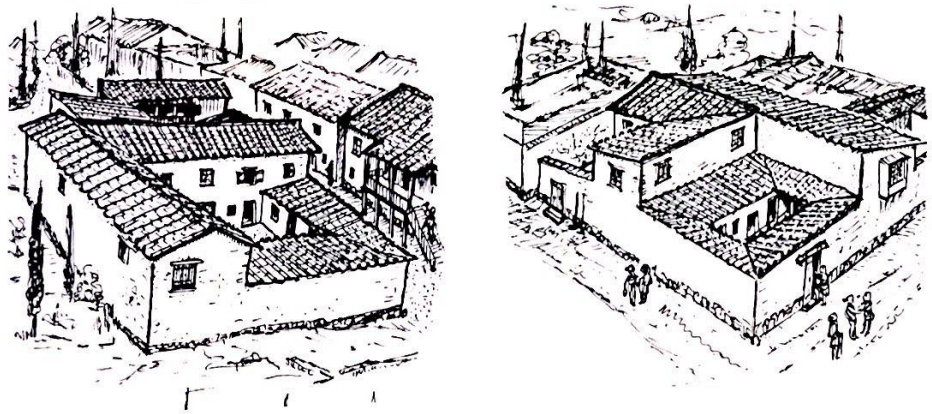


Fig. 7.4a Comparative plans of Greek housing blocks: Olynthos, laid out ca. 432 B.C.; and in the lower right, Athens, houses and workshops west of the Areopagos (no. 3 on Fig. 7.3).

Fig. 7.4b Athens, houses of the fifth–fourth century B.C.; reconstruction views.



discouraged a land market. Later arrivals constituted the city-dwelling middle class of renters—artisans and also merchants who along with the rank and file of the army constituted the base on which populist regimes might rise from time to time. Demographic or economic pressures within the city could turn this class into the driving force that would set up new colonies further out from the city, creating settlements twice removed from the mother city.

Orthogonal planning is of course as old as Egypt. (Fig. 4.2) But none of the pre-Greek grids can be considered fully coordinated systems of public and residential buildings with coherently organized blocks. That is the achievement of Greece. The preferred Greek variety was the so-called *per strigas* ("by bands") scheme. A small number of broad east-west avenues divided the territory into bands dissected by one or more north-south avenues. The superblocks so delineated were then subdivided by narrow lanes into rectangular blocks, the proportions of which vary considerably from city to city. The blocks were then systematically apportioned into building lots. Once established, the grid determined the size and shape of public buildings as well, temples included.

Miletus

The *per strigas* scheme had seen some obscure pre-Greek applications in Asia Minor, but the major credit should go to the Ionian cities along the Aegean coast of Asia Minor, the birthplace of Greek geometry, and especially to the great town of Miletus. The plan of Miletus must rank as one of the most sophisticated uses of the grid in antiquity. The general layout dates from soon after 479, the year when Miletus was liberated from the Persians who had taken and destroyed it in 490. (Fig. 7.5) But the older city almost certainly also had an orthogonal design. Earlier still, in the Bronze Age and its obscure aftermath, the settlement was centered on the hill to the southwest and the slope in front.

The ruins of Miletus now lie 9 kilometers (5.5 miles) in from the sea. The original site was a triangular promontory oriented northeast-southwest at the mouth of the Meander River. It afforded two natural har-

bors along one side, the Lion Harbor and the older Theater Harbor. The land was almost level, except for a low eminence between the two harbor bays. The theater took advantage of one of the seaward slopes of this eminence.

The grid was not directed toward the cardinal points but, instead, took best advantage of the configuration of the land so that certain streets could run the length of the peninsula. There were three clusters of housing, about 400 blocks in all which were 30 by 53 meters (100 by 175 feet) on average, a ratio of 4 to 7. Two streets broader than all the rest crossed each other in the southern grid. There may well have been more of these avenues, so that the blocks at the start may have been intended to be more elongated, in the usual early manner of Greek grids.

This grand master plan of Miletus is associated with the name of a local man, Hippodamos. We know of him mostly from Aristotle who says that he discovered "the divisioning of cities," that he laid out the Athenian port city of Piraeus, and that "he was the first man of those not actually involved in politics to make proposals about the best form of constitution." Aristotle does not say, of course, that Hippodamos invented the grid plan, but implies that he advocated a special instance of it and combined it with a social theory of urbanism.

According to Aristotle, Hippodamos conceived of an ideal city of 10,000, with the citizenry divided into three classes—artisans, farmers, and soldiers—and the land into three categories—sacred, public, and private. It seems that the Hippodamian system relied on a theoretical formula of geometry more so than the purely technical (and empirical) practice of architect-planners, and that it was carefully adjusted to the specific demands of the site. If we can judge from the city-form of Piraeus, the system involved the division of the urban territory into sectors, each with its own rectilinear street pattern; the setting aside of public areas for specific public functions (agora, port, etc.); and provision for the placement of individual public buildings. If we can further accept an ancient tradition that attributes the planning of Rhodes to Hippodamos, his geometric system had a triple order of division. (Fig. 7.6) The largest element was a square of which the sides measured about 200 meters (650 feet). Each of these squares was quartered, and each of these smaller squares in turn divided into six parts to form rectangles measuring 30 by 46 meters (100 by 150 feet).

The triple division of Miletus into sectors and the allocation from the very start of public areas for specific functions recall the Hippodamian system. The master plan was laid out for a very large city, clearly with a total population much higher than the 10,000 he found ideal. The huge area of 100 hectares (250 acres) covered by the grid envisioned a brisk and orderly growth.

The old downtown lay between the hill to the southwest and the Theater Bay. Here was the old Athena temple, which under the new plan assumed a different, north-south orientation. In fact, the focus had shifted to the north, the city center now moving close to the Bay of Lions. The earliest agora of the post-Persian city was built facing the bay and aligned in the east with the sanctuary of Apollo Delphinios. A main road of the grid started at this point and ran the length of the peninsula to join the old sacred way, which headed to the great Apollo sanctuary at Didyma about 22 kilometers (14 miles) south. But another agora had already been

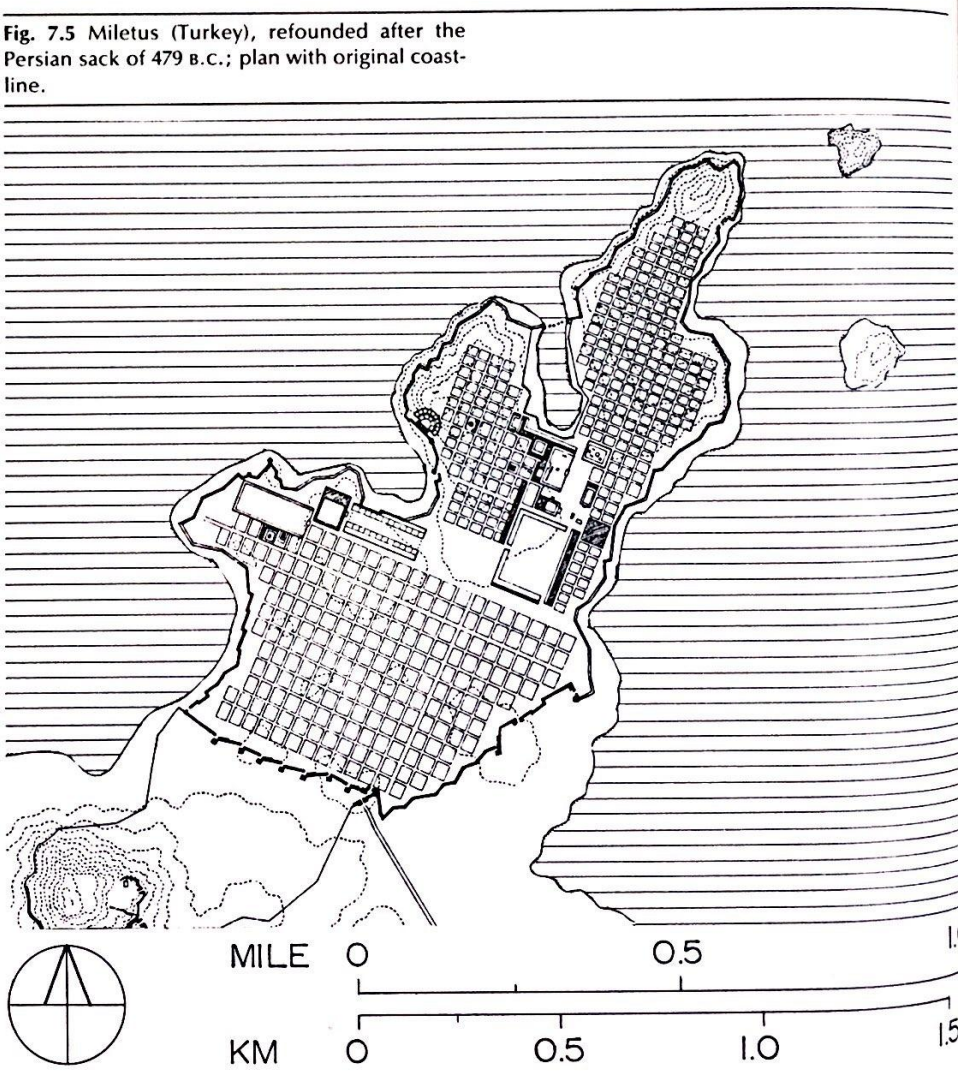


Fig. 7.5 Miletus (Turkey), refounded after the Persian sack of 479 B.C.; plan with original coastline.

anticipated in the western section, just above the old Theater Harbor, and in the low-lying central area among the three clusters of housing, generous space was allotted for yet a third, the Great Agora.

The Stoa

The word "marketplace" inadequately describes the concept of the Greek *agora*. The agora was the public forum of all the inhabitants and on all days, a bustling place that served as the democratic alternative to the two great organizing foci of non-Greek cities, the temple precinct and the palace complex. It was the scene of public speeches, citizens' assemblies, shows, as well as social and commercial activity. About the marketplace, the public buildings of most consequence for municipal administration tended to gather, as did facilities for shopping and display.

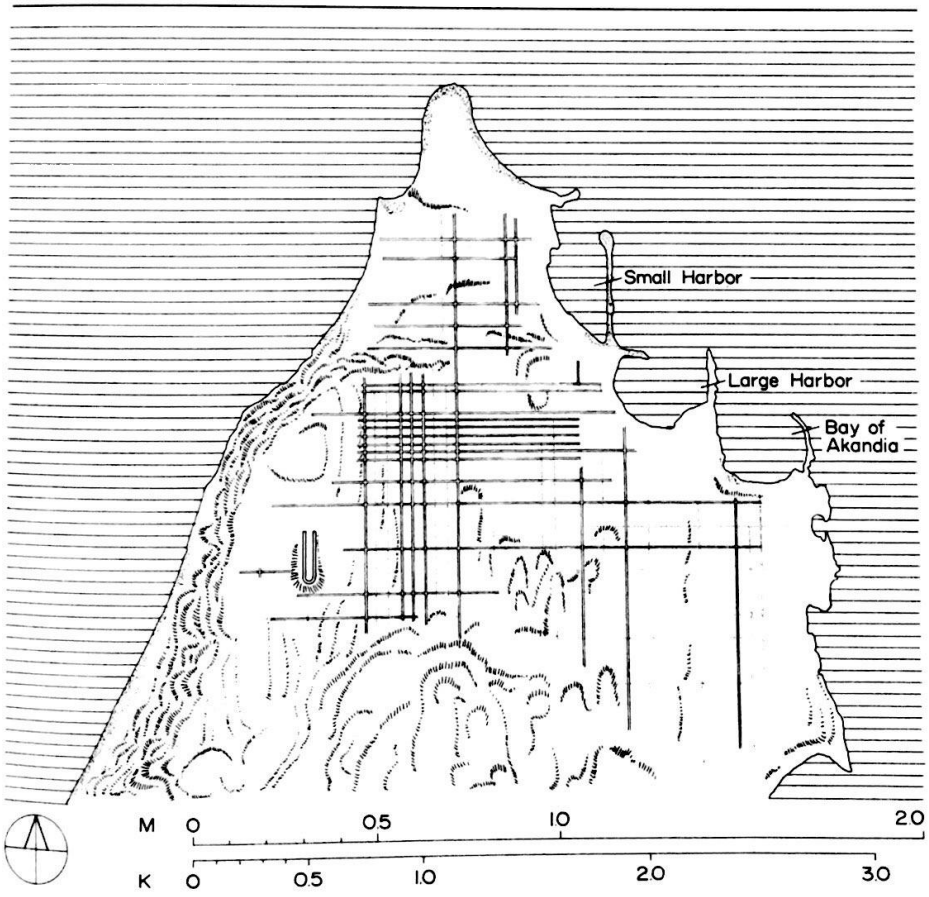
The agoras of Miletus are defined by stoas, at least along two sides. In contrast, the agora of an unplanned city was at first not much more than a level piece of open ground, often with a hillslope on one side which could be used by the attending crowd during spectacles or meetings. (Fig. 7.15) The stoa was one of a number of free-standing buildings that loosely hugged this public space. At Miletus the stoas became elements of a total design, making the open space formal and monumental without enclosing it. (Fig. 7.9)

The stoa is as distinctive a Greek building type as is the temple, and much more flexible in form and function. It came to use about the same time as the full-blown stone temple, in the late seventh century B.C.; and indeed its first role was in the context of sanctuaries. It was a freestanding portico, modest in materials and structure, but able to serve a number of loosely related functions—shelter from the weather, for example, and overnight accommodation for pilgrims and those patients who were brought to the sanctuaries to be healed.

This building type was soon secularized and became a common urban feature. By the fifth century, stoas were substantial stone buildings containing notable programs of public art. New functions came to be identified with them. Public sessions of the courts (and occasionally the city council) might be held there; official banquets given; public notices displayed. The walks around the stoa were frequented by students of human behavior like Zeno whose school of philosophy, Stoicism, owes its name to the architectural setting of his discussions. And quite naturally for a place where people lingered, shopping and browsing became a common aspect of the stoa's varied program.

The external portico, that intermediate space between the indoors and outdoors, was common enough in the Bronze Age Aegean. (Fig. 5.25) But there the feature always functioned as an extension of another building. The continuous colonnade of the peripteral temple is a Greek example of the same practice. But the stoa was a building in its own right, a covered portico of sufficient length and width to be usable by numbers of people. On its own or in conjunction with others of its kind, the stoa gave formal shape to a piece of open space by providing a definite edge that was nevertheless "soft," that is, capable of absorbing some of the public activity of the open space. Stoas constitute some of the finest products of Greek architectural genius. They were a genuinely populist expression of monumental architecture, intended for the common good and were

Fig. 7.6 Rhodes (Greece), founded in 408–407 B.C., school of Hippodamos of Miletus; schematic plan.



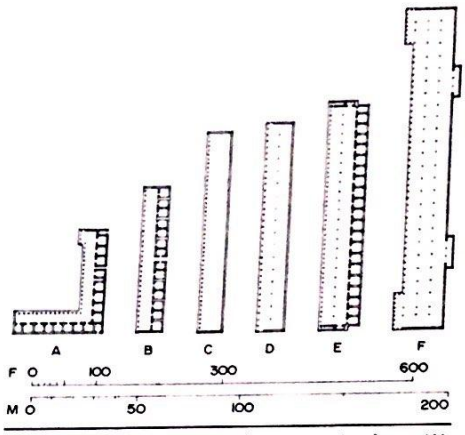


Fig. 7.7 Greek stoa types; diagrammatic plans: **(A)** L-shaped stoa (e.g., Delos, stoa L); **(B)** single-aisled stoa with shops (e.g., Delos, south stoa); **(C)** single-aisled stoa without shops (e.g., Olympia, the first Echo stoa); **(D)** two-aisled stoa (e.g., Samothrace, stoa J); **(E)** two-aisled stoa with shops (e.g., Athens, stoa of Attalos, no. 4 on Fig. 8.20); **(F)** three-aisled stoa with projecting wings (e.g., Megalopolis, stoa of Philip).

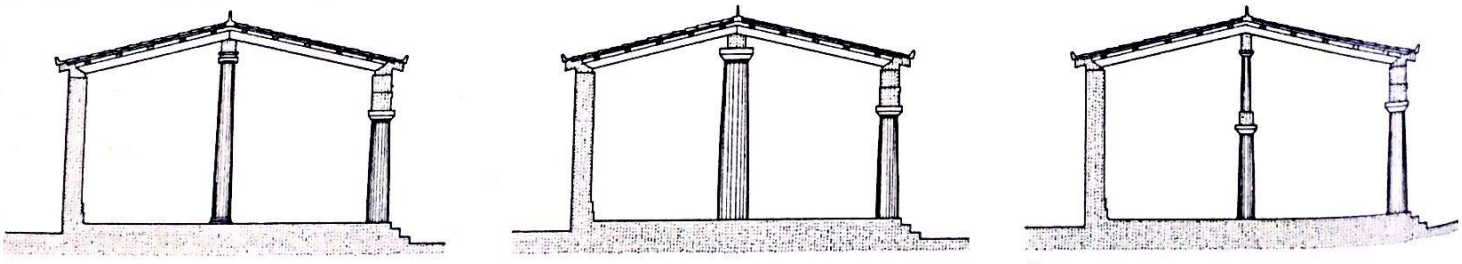
often financed through private contribution.

In its simplest form a stoa consists of a long row of posts, a wide aisle behind, and a back wall. (Fig. 7.7) It is covered with a flat or a ridge roof, less commonly with a shed roof. There is no separate ceiling, the interior view being open to the rafters. This basic form was elaborated in several ways. Often the interior space was divided into two aisles by means of an inner row of supports; a line of single-bay shops opened out from the back wall; wings extended at right angles to the two ends; and, by the fourth century B.C., stoas were being built with two usable storeys instead of one, and with L-shaped plans. The supports were columns of the Doric or Ionic order depending on locale, at least until the middle of the fifth century. From then on, Doric was preferred everywhere for the outer colonnade, even in Ionian states. In the case of two-aisled stoas, again until the fifth century, the inner colonnade repeated the order of the outer. It was at Athens where the orders were first mixed, through the use of the Ionic order both for the inner colonnades of stoas and on the Akropolis, in the interior of the Propylaia and the back porch of the Parthenon.

The introduction of the Ionic order in this premier city of the Doric mainland was undoubtedly in part an aesthetic choice. But it must also have been political: Athens claimed leadership over Ionian states as well as peninsular Greece. In two-aisled stoas, an Ionic inner colonnade also responded to architectural convenience. (Fig. 7.8) This colonnade had to be taller than that of the facade in order to reach up and support the roof. The accepted proportions of the Doric order, with the height of the column shaft about 5.5 times the lower diameter in the fifth century, required that an inner row of Doric columns be substantially larger in diameter so that it could reach higher than the outer row, thus inhibiting the usable space; or else, there had to be two superimposed tiers of columns, a system tolerable in temple cellas where the view runs lengthwise, but quite unsatisfactory in stoas where one would encounter the two-storey screen head on. The slenderer proportions of the Ionic order (the column height being 9 to 10 diameters) was clearly a happier solution to the problem of interior height.

The stoa of the earliest agora in the Hippodamian plan of Miletus, the north agora, was single-aisled and L-shaped. (Fig. 7.9) This one distinct architectural corner sufficed to set the scale of the public space and bind it to the harbor. The colonnade afforded an impressive urban frontispiece to incoming vessels. The row of shops was backed by a smaller stoa, also L-shaped, which faced inward toward the city. The L-shaped plan presented two problems: the juncture of roofs at the corner, and the meeting of the two lines of entablature on the corner column. At Miletus the first problem was solved by choosing to use flat roofs, which are easier to reconcile at right angles than ridge roofs. The other difficulty was chiefly aesthetic—the accommodation of two triglyphs over the same column of the re-entrant angle. (Fig. 7.10) It gave rise here to the invention of the heart-shaped pier, made of two half-columns attached to adjacent faces of a square pillar. (Coincidently, this thick pier strengthened the structure at the point where the pressure from the roof is particularly great.) The re-entrant angle will be a recurrent design problem in columnar architecture; for ex-

Fig. 7.8 The two-aisled Doric stoa; sections showing alternative arrangements for interior supports: **(A)** Ionic inner colonnade; **(B)** Doric inner colonnade; **(C)** two-storied Doric inner colonnade.



A B C

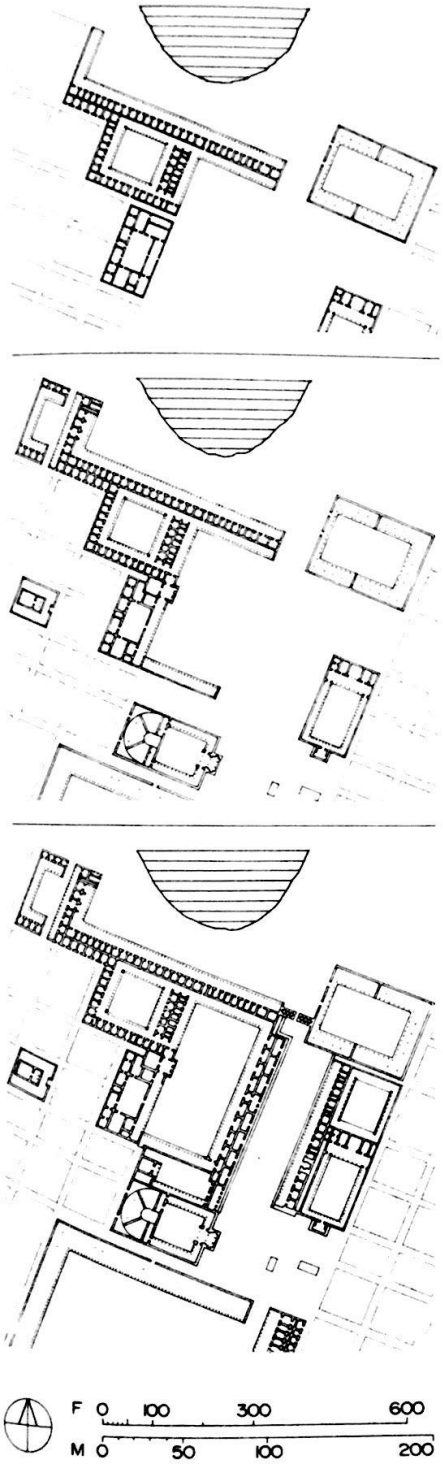


Fig. 7.9 Miletus, the north agora at three stages of its development; ground plans: top, the agora in the fifth–fourth century B.C.; middle, in the third–second century B.C.; bottom, in the first century B.C.

ample, we will meet it again in the inner court of the Renaissance palace in Italy.

Composite forms like the heart-shaped pier are by and large an index of later, Hellenistic practices. The elaboration of the stoa system at Miletus is in fact Hellenistic. (Fig. 7.9) The Hellenistic designs of the Miletian stoa made use of *two* re-entrant angles, either by devising a single stoa with three arms in the shape of the Greek letter P (Π), a type not unknown earlier, or else by facing two L-shaped stoas without actually marrying them. This second arrangement is seen in the Hellenistic duplication of the small L-shaped stoa behind the north agora, which we mentioned above, and in the Great Agora to the south where, in addition to the two matched L-shaped stoas, a straight stoa was run along the fourth side of the space, defining a full rectangle. The plan is in accord with the design sensibilities of this later Greek period which favored the definite circumscription of public spaces by colonnades but eschewed total enclosure.

The final step was taken by the Romans. When they remodeled the Great Agora, they closed off the north-south road that passed between the Π and the eastern stoa of the Hellenistic scheme and turned its stretch within the agora into a colonnade; and again, to the east of the Lion Harbor, they brought the arms of a new, three-sided stoa almost up to the water's edge, using the shoreline as a fourth arm to create the feeling of total enclosure.

Here at Miletus, then, we can follow the three successive stages of Greco-Roman planning. (1) *Classical* Greece understated the architectural definition of civic spaces by merely suggesting enclosure, using the spare presence of colonnaded borders mostly along one or two sides only. (2) In the *Hellenistic* phase, architectural symmetry became important; the space was usually articulated on three or even four sides, but with open access to it from the outside along several points of the architectural envelope. (3) The *Roman* planner, finally, preferred seamless enclosures entered only through formal gates at calculated axes. The public space was thus sealed off from the outside and allowed to stage its own total experience.

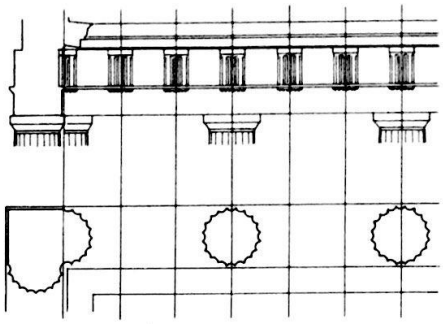


Fig. 7.10 Heart-shaped corner support in the Doric order; elevation and plan.

Organic Planning

But even in its least restrictive, Classical phase, orthogonal planning sacrifices that dynamic and ever-shifting interrelationship between the open and the built, which is present in older Greek sites like Delphi. (Fig. 6.16) In these sites, the temple would be approached along the flexible path of a traditional sacred way and glimpsed first at an angle; this revealed two of its sides simultaneously and transformed it into a mid-space object. The grid regimented the temple, along with every other aspect of the urban experience. It would now be approached in a straight line. At colonial implants like Selinus or Paestum, several temples might be primly lined up along one main thoroughfare of the city grid. (Fig. 6.17)

The planned Greek city makes several assumptions. First, the entire urban territory is a rational form geometrically conceived at one time. Second, this form governs both private and public buildings. And third, the form is a blueprint for the orderly future development of the city. The polis in this context is at once a work of art, that is, a deliberate and artificial configuration that sets its own internal rules of ar-

chitectural behavior, and a controlled experiment, that is, a community with an established growth target and a predetermined, limited setting.

As such, the planned city strains some of the assumptions of the earliest city-states of the Greek world. These were moral and political entities foremost of all, aggregations of free citizens and their dependents. The city was as large as its population of the moment, and this was gauged principally by what the surrounding land would support. When the population came to exceed the tolerance of its countryside, it sent out colonies or tried to advance its area of influence. The small city might aspire to become the center of a group of kindred townships; the center, in turn, might aspire to dominate several, similar clusters, becoming the capital of a state like Macedonia or Thessaly.

The site and its prior sanctities were major conditions of the nongeometric city. Natural paths that led through the terrain and joined villages to each other, or to some ancient citadel-town, continued in use after the official birth of the polis. The choice of the site was itself partly dictated by the convergence of these paths. Some among them had become sacrosanct as the processional ways to shrines. In the case of re-energized Bronze Age towns, the citadel hill, the seat of Mycenaean princes, declined in favor of the agora in the flatland at its feet. The hill was slowly appropriated by the gods and became the *akropolis*, literally the "head of the town." This was not because the gods demanded such lofty premises for the observance of their rites, but because no citizens should presume to set themselves above their fellow citizens.

Aristotle recognized this *symbolic* sense of order when he observed that "An akropolis is suitable for oligarchy and monarchy, level ground for democracy." The premise of democracy is that no citizen is more privileged than any other unless given power for a limited time to do a certain job. To Greek thinking, which is acutely visual, an akropolis invokes a prefixed hierarchy in relation to the plain below, and the only hierarchy that was tolerable in Classical Greece was that between humans who are mortal and the gods who are not.

Athens—"The Eye of Greece"

The city of Athens will serve well as a case study of the old, irregular polis. (Fig. 7.3) Since she had a continuous urban life from Mycenaean times onward, an account of Athens can chronicle the history of settlement from that earliest phase of Greek culture to the Classical period. Enough of her ancient fabric has been revealed through excavation to afford a good chance for us to look at urban arrangements, and at building types other than the temple and the stoa. Finally, a visit to the Periklean Akropolis can summarize the essence of Classical architecture before we move on to later periods, for in that complex of buildings we have perhaps the finest surviving specimen of Greek design and a materialized vision that was considered ageless even in antiquity. "Such is the bloom of perpetual newness, as it were, upon these works of Perikles," Plutarch wrote in his biography of this statesman, "which makes them ever to look untouched by time, as though the unfaltering breath of an ageless spirit had been infused into them."

The Mycenaean City

Athens had not always been famous and great. The Bronze Age citadel on the Akropolis was bypassed by the invading Dorians probably because it was not important or rich enough. The location, however, was superb. The Akropolis rises sheer in the midst of Attica, a bowl-shaped plain that is ringed by mountains all around except toward the south. In that direction it lies open toward the sea, with a spit of land jutting out into the Saronic Gulf that affords excellent harbors. But there is no evidence that Athens was conscious of this advantage, or strong enough to exploit it, until the sixth century B.C. when the spit was first fortified and the port of Piraeus was born.

The Mycenaean city occupied the top of the Akropolis and stretched out and down the south slope, a short way into the plain below. A little further out, on the western cluster of hills—the Pnyx, the Hill of Muses, the Areopagos—small settlements lived in the shadow of the citadel. This agglomeration was hemmed in, to the north and south, by the rivers Eridanos and Ilissos. A ring path (the Peripatos) hugged the base of the citadel, and a number of roads that utilized the passes of the encircling mountains converged on this central focus of the plain.

The citadel had a strong cyclopean wall around it, from the later thirteenth century, bits of which still survive. A lower outer curtain defended the western approach of the rock, the only side that admitted easy access. At the top were the usual features of a Mycenaean citadel: a fortified gateway at the southwestern tip of the rock, the megaron palace on the north side, and the rock-cut stairway that led from here down to the secret spring outside the walls.

The transition from the Mycenaean citadel-town to the celebrated polis of Pallas Athena is obscure. The citadel lost importance with the passage of the Bronze Age, and by the eighth century a small temple to the goddess had already taken over the prince's palace. At about that time small independent towns in the Attic plain were attached to Athens, which thus became the city-state of a large territory. This consolidation was believed to have been the work of Theseus, the same legendary king of Athens who is also credited with slaying the Minotaur. The fifth-century historian Thucydides described it this way:

> [Theseus] abolished the council-chambers and magistracies of the other towns, and merged them all into the present city establishing a single council-chamber and town-hall. Individuals might still enjoy their private property just as before, but they were henceforth compelled to have only one political center, viz. Athens, which thus counted all the inhabitants of Attica among her citizens.

Buildings of Assembly

The word for council chamber in the original Greek of this passage from Thucydides is *bouleuterion*, and for town hall, *prytaneion*. The location of these buildings is uncertain, but it was not far from the agora demarcated by Theseus along the northwest slope of the Akropolis. The city center then, perhaps as a gesture to the incorporated townships, had moved north to face in, toward Attica rather than the sea, while the core residential area continued to be in the south where it had been, between the Akropolis and the Ilissos River.

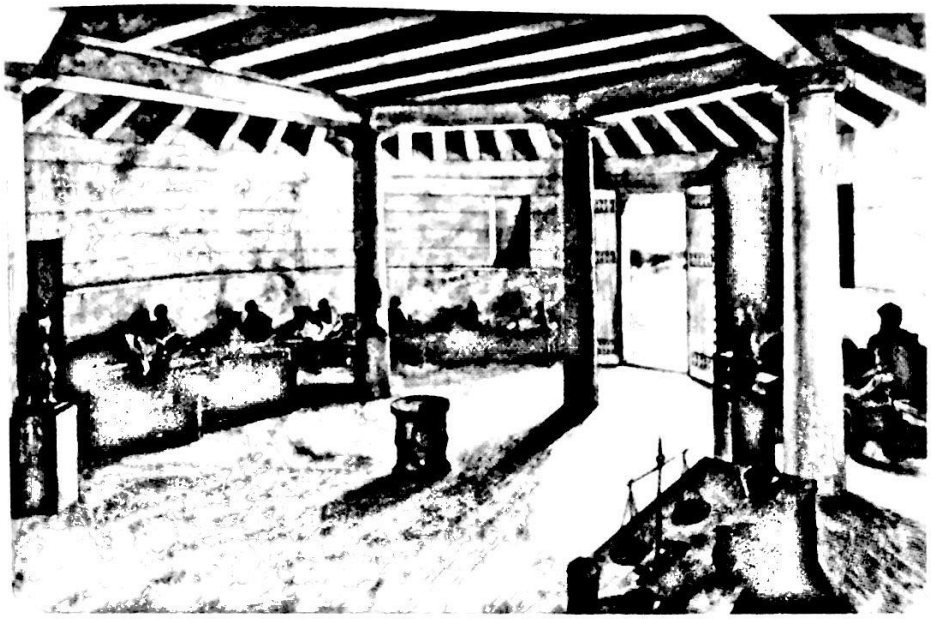


Fig. 7.11 Athens, agora, the round building called Skias (no. 7 on Fig. 7.15), ca. 465 B.C.; reconstruction view of interior.

In the next two centuries, Athens grew in size and passed, like other Greek cities, from kingship through oligarchy to a full system of democracy. The agora now shifted to a flat open space further north, formerly a major cemetery, which was overlooked on the western side by a low rise. Here it was to stay throughout antiquity. The popular assembly of the Athenian people, or Demos, may have convened in this new agora at first. When the population of free citizens grew too large for the space, the assembly repaired to the Pnyx. But even then some important, mass decisions, such as the vote of ostracism which banished an individual citizen for dishonorable conduct, were taken in the agora. The elected representative council, or Boule, held its meetings in a building on the western rise of the agora. (Fig. 7.15) A complementary structure acted as the prytaneion annex; the actual prytaneion of Theseus, too venerable to relocate, remained where it had always been, somewhere along the north edge of the Akropolis.

At the time of the Persian invasion, both of these administrative structures at the agora, the bouleuterion and the prytaneion annex, called the Skias, had been rebuilt. The Skias was a round building, a very unusual form for post-Mycenaean Greek architecture, which had no fondness for curvilinear design. (Fig. 7.11) Several surviving round buildings, called *tholoi* (*tholos* in the singular), are late for the most part and seem to have served very special functions. Fragmentary evidence points to underground cults and burial. There was a famous tholos at Delphi, and another at Epidauros, connected with the cults of Apollo and the healing-god Asklepios, respectively.

The Skias consisted of a solid, circular wall with a door facing the east, opening toward the agora, and probably a second door on the north side, which communicated with an adjoining kitchen and the bouleuterion just beyond. The tile roof rested on six internal columns spaced in groups of three on either side of the north-south axis of the tholos. Couches and tables were set up along the inner circumference and perhaps also in the central space defined by the columns. The principal function of the Skias was in fact that of a dining room. Council presidents (or *prytaneis*) took all their meals here during their monthly tenure, joined by a handful of other state officials.

The remaining functions of a normal Greek prytaneion were still housed in the original Theseian building. They included the maintenance of the eternal flame of the city hearth; the convening of a special court that dealt with cases of murder; the enactment of solemn ceremonies such as the induction of Athenian youths into citizenship; the preservation of historic documents and statues of historical and allegorical figures; the official entertainment of foreign ambassadors; and the recognition of prominent citizens and benefactors who were extended daily dining privileges. In its role as home of the communal hearth and state hospitality, the prytaneion appears to have assumed some of the functions of the Mycenaean megaron, as the temple had borrowed characteristic features of its form.

The bouleuterion was rectangular. A partition along one side closed off a vestibule. The inner room held about 700 people. The speakers stood in front of the middle of the partition while the council members spread out on tiered benches parallel to the other three walls. Some version of this basic form, which may have originated with the great hall of mysteries at the sanctuary of the earth-goddess Demeter at Eleusis, a short distance from Athens, was employed in most early assembly buildings. The main design worry was to ensure that the interior posts needed to carry the roof obstructed the sightlines as little as possible.

At the end of the fifth century a new bouleuterion was raised to the west of the existing one. The main innovation here was to fit a semicircular auditorium into the outer rectangle. (Fig. 7.15) This seating arrangement was suggested by the rising ground, which could be cut into to create the benches; in fact, it represented an attempt to bring indoors a formula that had been locally developed during the past hundred years for outdoor assemblies.

The idea of using natural slopes as auditoria is surely ancient. It was at Athens,

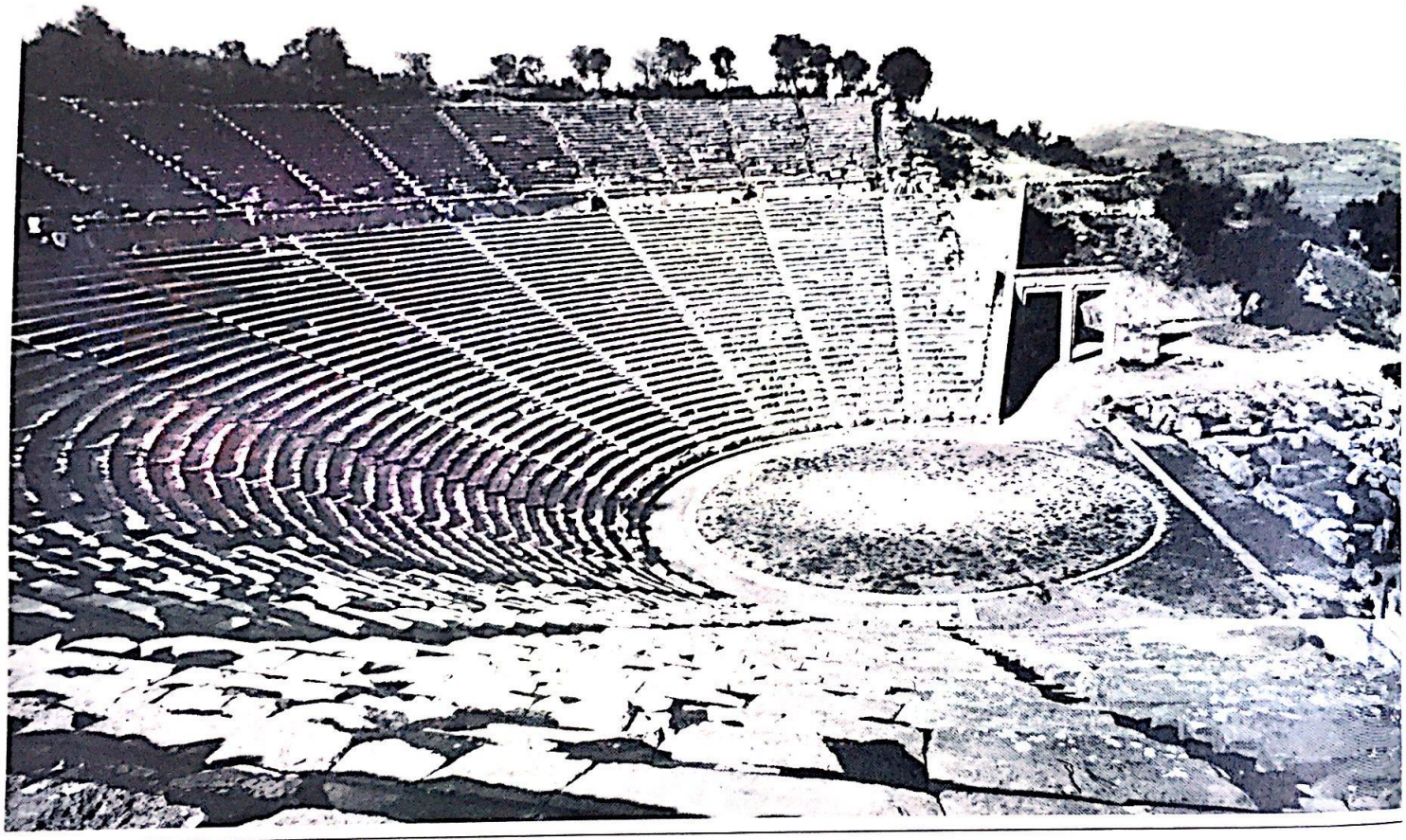


Fig. 7.12 Epidauros (Greece), the theater, ca. 300 B.C.

however, toward the end of the sixth century B.C., that the architectural systematization of this simple idea began when the Demos moved its meetings from the agora to the Pnyx. The northern hillside facing the city, which had a gentle incline, was evened off at this time to accommodate the attending membership, and on the north side of this open-air auditorium a straight retaining wall was built to separate it from the speaker's platform, a level place created with land fill. (Not until 403 B.C. was this scheme revised and the direction of the auditorium reversed.)

Meanwhile, on the south slope of the Akropolis, a similar solution was applied to a different purpose. Here there was the ancient sanctuary of Dionysos, and dances and choral songs were performed as part of the wine-god's festival. It was out of such pious performances that the Greek theater, recalled by the great Athenian names of Aeschylus, Sophokles, and Euripides, eventually emerged. As the literary and technical aspects of the plays became more elaborate, the theater was revised to keep pace. (Figs. 7.17, no. 4; 7.18, nos. 5–6)

There was little at first but the slope itself for the audience and a circular floor of beaten earth at the foot of the hill, called the *orchestra*, to the south of which stood a semicircular retaining wall and the little temple to Dionysos. In the mid-fifth century a building, which acted at times as part of the set, was put up behind the orchestra primarily for storage. Actors made their entrances and exits on ramps to either side of it. By this time spectators were accommodated on continuous stone seats, and fancy thrones for the priests of Dionysos and other dignitaries ringed the northern hemicycle of the orchestra. Next to the theater, Perikles had an *odeion* erected for musical performances. (Fig. 7.18)

Athens' theater, in use until Roman times

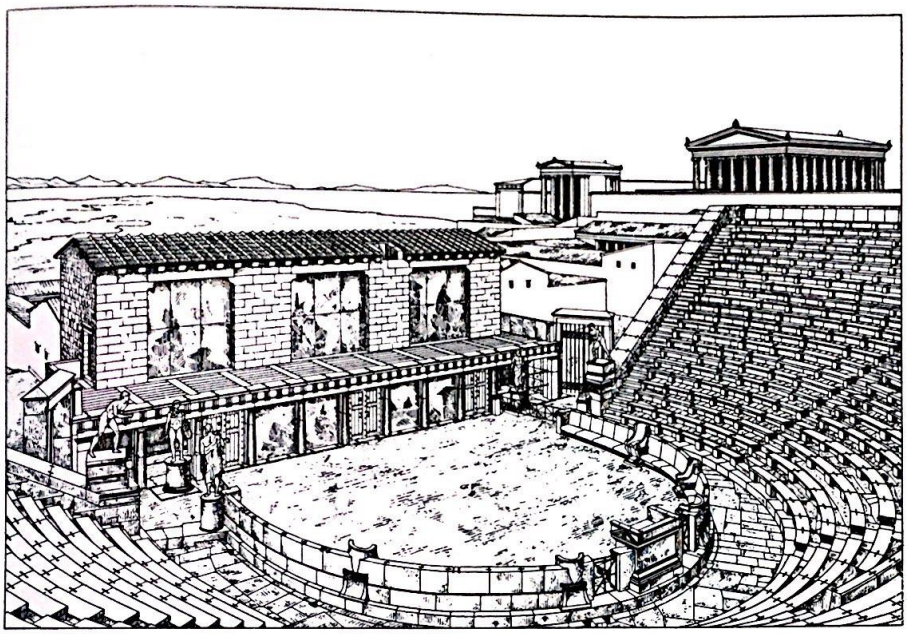


Fig. 7.13 Priene (Turkey), the theater, late second century B.C.; restoration drawing.

underwent constant transformation, but a pure example of the Classical type is the theater at Epidauros, adequate for more than 14,000 spectators, whose remarkable acoustics surprise visitors even now. (Fig. 7.12) Radial staircases divided the stone benches of the auditorium into wedge-shaped segments, and a broad gangway two-thirds of the way up promoted horizontal circulation. This building type remained stable until about 300 B.C. By then the chorus, an integral part of Classical plays, had become detached from the action and assigned independent songs of its own. This separation of actors and chorus was perhaps decisive for the introduction of a new feature into theater design—a high shallow stage where the principal scenes could be elevated above the choral interludes taking place in the orchestra. (Fig. 7.13) The theater of Epidauros itself, built shortly after 300 B.C., had such a stage. It stood just off the circle of the orchestra and had slight projections at the two ends.

The podium of this high stage, called *proscenium,* was usually decorated with attached columns; between them, wooden panels would be inserted with painted scenery suitable for tragedy or the New Comedy of Menander and others. A second storey, the *episcenium,* now formed the backdrop for the acting onstage. With its love for theatrical extravagance, the Hellenistic age will lavish much attention on the design of these two architectural sets, the proscenium and episcenium.

The Classical City

By 400 B.C. the principal lines of the city-form had been fixed. The old town was the Ilissos district, south of the Akropolis, where Mycenaean Athens had its start. Along its north limit, at the edge of the Akropolis slope, stood the theater of Dionysos and the odeion. The densest quarter, the Koile, occupied the Pnyx. Between this hill and the Akropolis, on the Areopagos, open-air jury courts were held. (Fig. 7.3)

The Akropolis itself was entirely dedicated to the gods, and primarily to Athena in her various guises. At the entrance, she was Nike, the securer of Athenian victories. A colossal bronze statue of her just within represented her as Promachos ("the Champion"), in battle gear, the gilded tip of her spear visible all the way from the sea. The two main temples on the hilltop, the Parthenon to the south and the Erechtheion to the north, were dedicated to Athena Parthenos and Athena Polias, two aspects of the goddess as guardian of the city—one an intellectualized presence that personified the hard moral fiber of the polis triumphant, the other a softer, homier, older image of community. The greatest ceremonial moment of this effulgent sacred summit came on the virgin goddess' birthday, the 28th of the month of the Hekatombaion (our own July/August), when the festival of the Panathenaia came to a grand climax as a procession of citizens mounted the Akropolis in pomp to file past her temples.

Public life thrived in the agora. (Fig. 7.14) Near the top of its gentle western rise Athena shared a new temple with lame Hephaistos, the god of fire, the anvil, and the forge. The area southwest of here was largely inhabited by Hephaistos' own craftspeople, the marble cutters and metalworkers who made Athens beautiful and equipped her for war. The temple, which survives almost intact, could be seen unobstructed, and head on from the agora below. On the shelf between the temple and the open space public buildings, both civic and administrative, lined up: the Skias and bouleuterion, and at the northwest corner the Stoa of Zeus, a two-aisled building with short side wings, and the old, very small Royal Stoa, which served as the setting for special trials of impiety and housed the office of the *archon basileus,* a dignitary who had inherited some of the religious functions of the old kings.

There were two other stoas on the north side of the agora of which one, the Stoa Poikile, was famous for its mural paintings of historical and mythological subjects, such as the battle of Marathon and the fall of Troy. (Fig. 7.15) Yet another stoa, along the south side, had a series of dining rooms at the back. This was a very popular rendezvous for Athenian men and underscores once again the special place public dining

held in the daily life of Athens. Also on this side was the state mint and the Theseion where the great king was buried in accordance with an old tradition that sanctioned burial within the city walls for the founder of a polis or some other extraordinary local hero. In the middle of the open space, traversed diagonally by the path of the Panathenaic procession, was the orchestra and the *Tyrant-slayers,* a large commemorative sculpture of Harmodios and Aristogiton who had slain the tyrant Hipparchos on this spot in 514 B.C.

Visitors to Periklean Athens poured in by land and sea. Main inland routes included the Sacred Way to Eleusis, which extended beyond the great sanctuary of Demeter to link the city with the Thriasian plain and the Peloponnesus. A ring of distant temples built in the same decades as the Akropolis complex honored old local cults and announced the prospect of Athens. (Fig. 7.3) At Rhamnous on the north coast of Attica a temple to Nemesis, or Fate, perched on a high cliff that plunged to the sea. On a similar, lofty promontory to the south, at Cape Sounion, the sea-god Poseidon was honored with a temple that was the first dramatic beacon of Athena's city for ships sailing in from the east. The main arrival point for overseas vessels was the port of Piraeus, newly laid out in the Hippodamian manner. While cargo and some passengers then proceeded to the city proper within the secure band of the Long Walls, a highway skirted the exterior of the north curtain to join the city on the west.

Whichever the line of approach, the first view of Athens was of its walls. They had been hastily constructed immediately after the Persian wars to replace an older, smaller circuit. They consisted of a dry moat and, in the usual Greek manner, defensive walls made of a brick curtain on a stone base. As with other cities of the commonwealth, the walls wrapped themselves loosely around the urban area without determining its internal organization. Important suburbs remained outside, among them the fashionable later district of the Akademeia, the idyllic site of a gymnasium around which a number of schools and other institutions, including Plato's famous Academy, were established. Such extramural gymnasiums

Fig. 7.14 Athens, agora, temple of Hephaistos (no. 4 on Fig. 7.15), 449–444 B.C., with final details added some twenty years later; general view of site.

set in groves combined in their architecture facilities for athletic contests and classrooms and libraries for the instruction of the mind.

Fifteen gates pierced the walls. The main city gate, called the Dipylon or "double gate," was in the northwest, the area called Kerameikos which the new walls divided into two. Outside lay a large and sumptuous cemetery, including an official burial place for Athenian statesmen and those fallen in war. Here also was a reservoir into which the main sewer of Athens drained; from here, the sewage was conducted through a series of canals to fields near the city. The Inner Kerameikos was the potters' quarter.

It was at the Dipylon that the Panathenaic procession formed on Athena's birthday after several days of contests for athletic skills, chariot racing, music, and the like. Between the gate and the agora, along the line of the Panathenaic Way known as Dromos, were situated cult buildings, including a temple to Aphrodite and the Pompeion, the storage structure for the equipment of the Panathenaia.

These cult buildings coexisted informally with the potters and with the meat, fish, vegetable, and oil markets nearby. The arrangement illustrated that, in the city, religious and secular functions, administrative and commercial, were not neatly segregated. It was only in the later fourth century that Aristotle advocated two separate agoras, far from one another and properly distinguished—one exclusively for public affairs and one for commerce. It was about this same time that in Rome, too, the commercial functions of the original public space, the Forum Romanum, were discontinued and moved to adjacent sites.

The Akropolis

On the appointed day the citizens gathered in the Outer Kerameikos among the tombs of their prominent dead, as if the year's Panathenaic procession was to be the

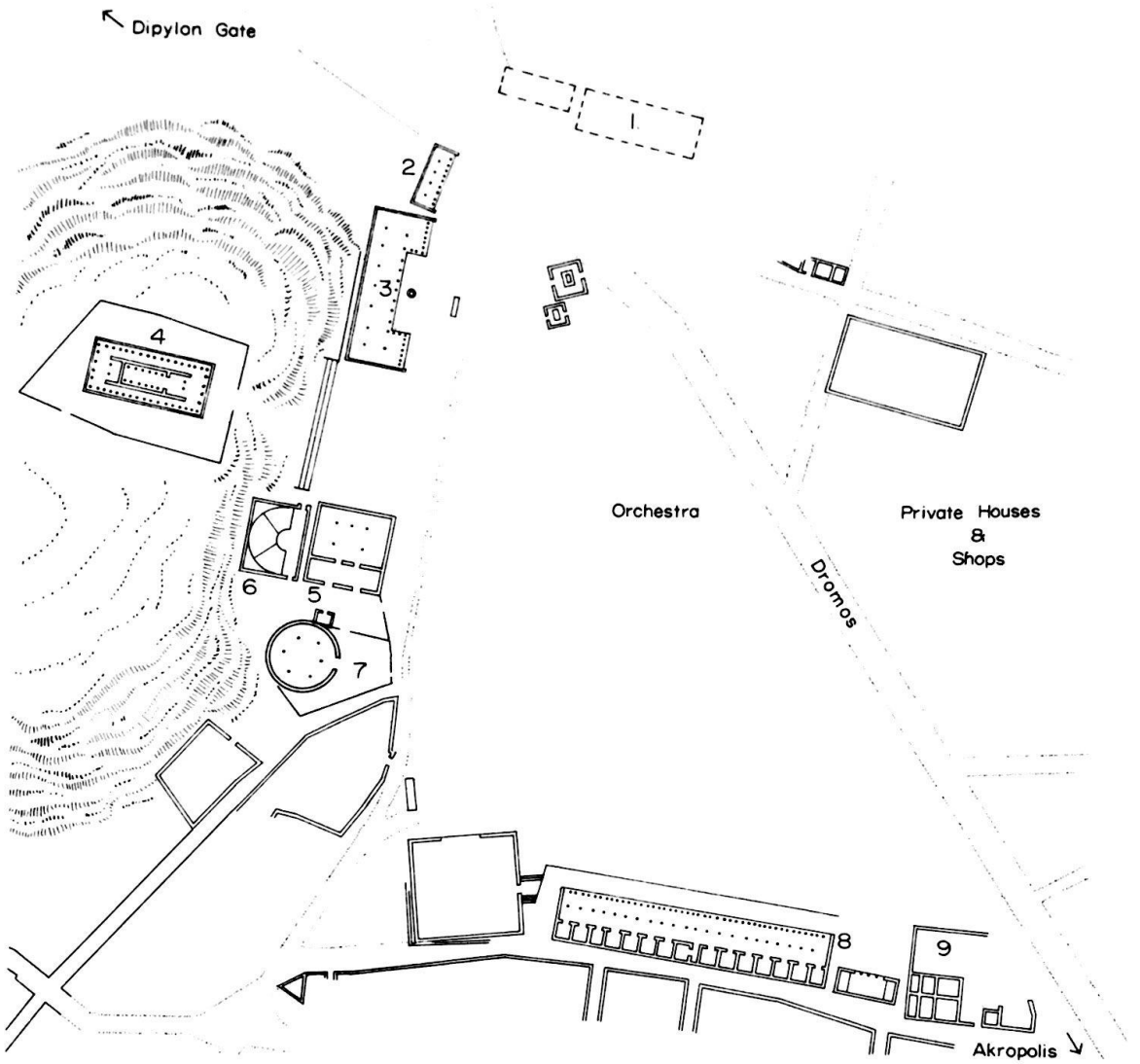


Fig. 7.15 Athens, the agora as of 400 B.C.; plan.

vanguard of generations of Athenians, past and recent. A little after sunrise they passed through the Dipylon and onto the wide Dromos that ran directly to the agora. At the head came the *peplos*, Athena's ritual tunic knitted during the year by a select group of the city's maidens and decorated with scenes from the battle of the gods and the giants; it traveled on a cart made to resemble a ship, pinned to the mast like a sail. The Dromos cut diagonally through the agora and then commenced its sharp ascent toard the Akropolis. The procession made a leftward loop to go by the old Theseian agora and the prytaneion, then skirted the Akropolis along the west. Here the ship dropped anchor. The peplos was unhitched and taken over by the maidens who would carry it up the steep slope. They were followed by the cavalry and the charioteers, who would soon dismount; the elders bore olive branches, Athena's own tree; then came musicians, young men with jugs of oil and wine, and the sacrificial animals which included sheep and heifers.

The distance traversed from the Dipylon to this point was about 1,000 meters. All along the processional path, the marble temples displayed their upper mass above the rock, like markers fixing the goal of the ritual advance. As the foot of the escarpment was attained, the temples slowly sank out of sight, to be regained at the top. The maidens now started up the straight ramp, perhaps even a staircase, that had replaced the winding pre-Periklean path: the worshippers had reached their destination. (Fig. 7.16)

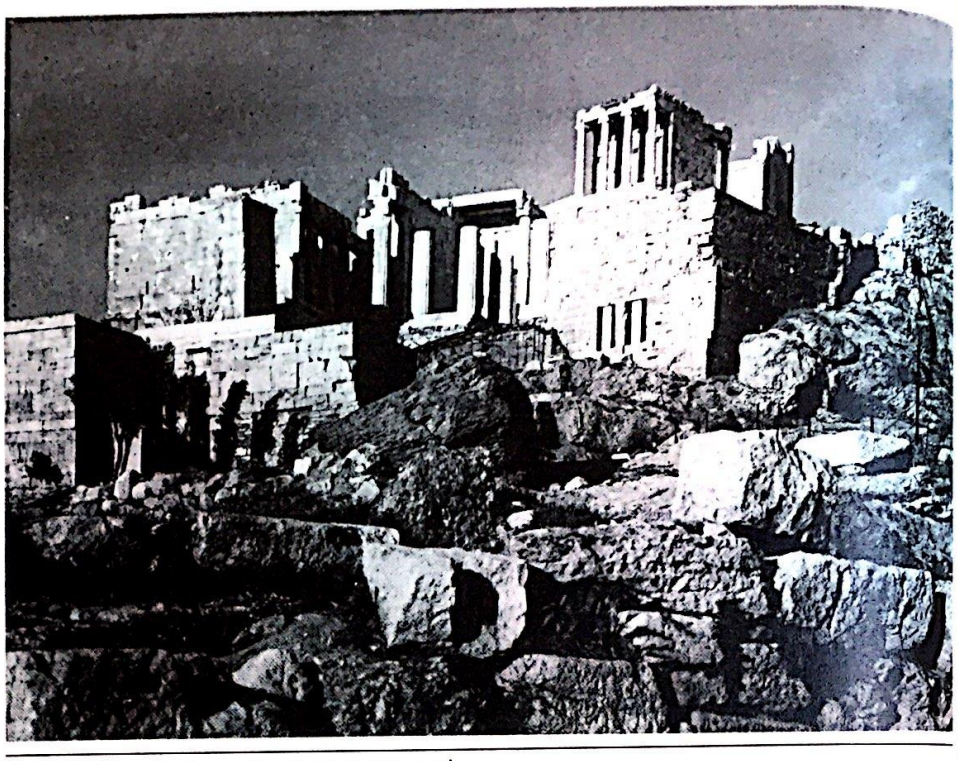


Fig. 7.16 Athens, Akropolis; western approach, with the Propylaia seen from below.

To one side, as one gained the gateway or Propylaia, the gleaming silhouette of the temple to Athena Nike could be seen. With four columns only on each of the two fronts and none along the flanks, this tiny elegant Ionic structure acted at once as an abstraction of Victory, the lady who was often represented in the arts alighting in a tentative flurry from above, and as a firm space definer, a wall, for the channeled path that led to the entrance of the Propylaia.

The first altar to Athena as the patron goddess of the Panathenaia was dedicated on this spot in 566 B.C., the year the festival was instituted. A temple was built here shortly after the battle of Marathon in 490, in commemoration of that new and more spectacular communal victory. In the Persian sack of 480 this small shrine suffered along with the limestone precursors of the Parthenon and the Erechtheion. The new Periklean shrine, by the architect Kallikrates, who also had a hand in an early phase of the Parthenon, was of Pentelic marble. The exaggeratedly pointed corner volutes of the oversized capitals, it has been suggested, were meant to lead the eye toward the sea, toward Salamis, the site of the heroic sea battle against the mighty fleet of Xerxes in 480 that liberated Athens and all of mainland Greece. (Fig. 6.21)

The Propylaia was a very unusual building; it was a clever redoing by the architect Mnesikles of the older gatehouse that had stood at an oblique northeast-southwest angle. (Figs. 7.17, 7.18) One passed, at the top of the broad axial approach ramp, through a forecourt flanked by two unequal wings. The north wing, a refreshment station for pilgrims with the usual dining couches, was lavishly decorated with paintings; the south wing was a small chamber that gave access to the Nike temple. Symmetry was probably never intended beyond the Doric facades of the two wings that looked toward the forecourt. The main unit of the Propylaia had a six-column portico, also Doric but of more imposing proportions, with the central opening considerably wider than the rest. This opening led to the middle passageway, while the two doors on either side of it gave way to broad aisles.

Beyond the opening, the scale again changed. The procession filed into a cool dim interior space that shot upward at the same time that its volume constricted suspensefully. (Fig. 7.19) There was light ahead of the passageway and light at the back. Tall

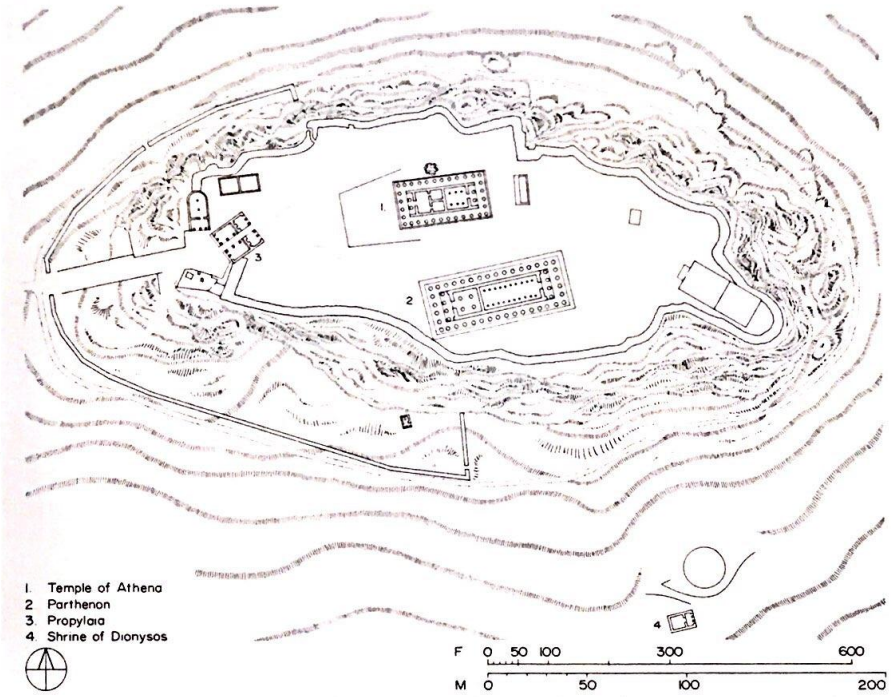


Fig. 7.17 The Athenian Akropolis during the sixth century B.C.; general site plan.

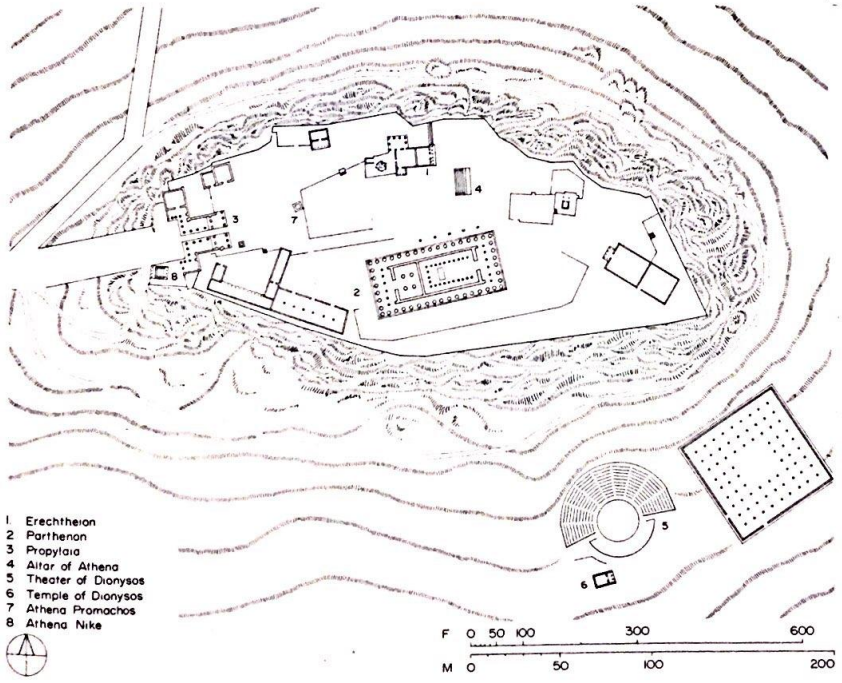


Fig. 7.18 The Akropolis at the end of the fifth century B.C.; general site plan.

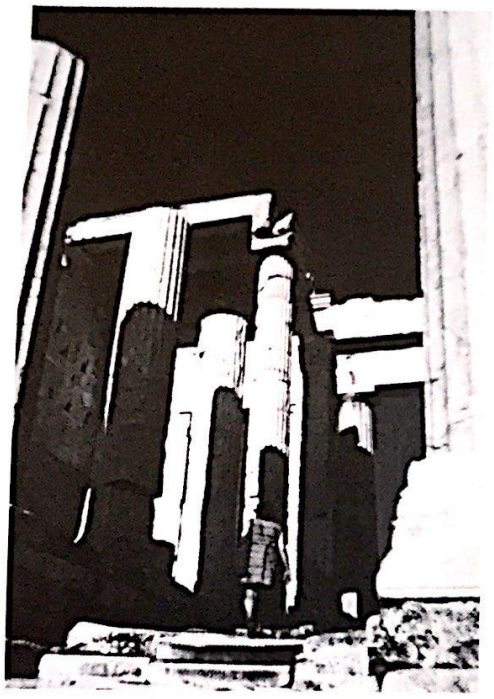


Fig. 7.19 The Akropolis, Propylaia (no. 3 on Fig. 7.18), 437–432 B.C., Mnesikles; view of the central passageway, looking east.

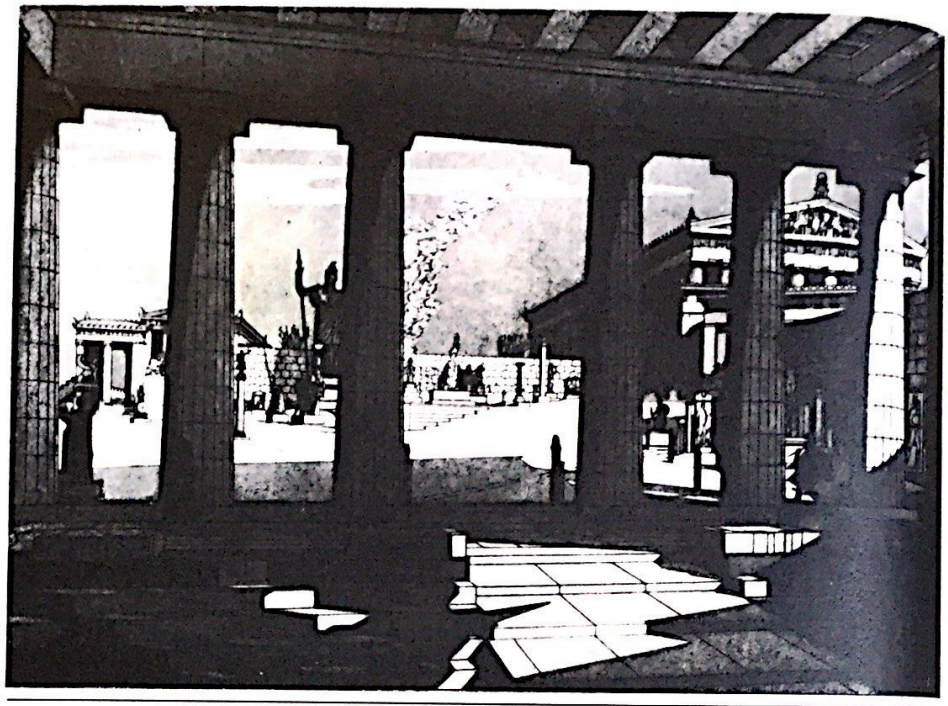


Fig. 7.20 The Akropolis, looking from the east portico of the Propylaia toward the Erechtheion (left) and the Parthenon (right); reconstruction view. The tall statue in the middle ground represents Athena Promachos (the Champion), the colossal bronze image by Phidias, ca. 460 B.C.

slender Ionic columns on either side carried a ceiling of marble beams. At the end of the passage was a porch with a columnar facade matching that of the entrance. The moment of constriction was passed and, once again, with resounding dramatic impact, the procession stood in the blazing sunlight of an Attic August, with the two main temples of the site vying for its attention (Fig. 7.20)

The passage through the Propylaia had purged and altered the worshipping citizens. They were now in a special, open space, different from the one that was left behind at the entrance to the monumental gateway. Directly in front, a little to one side, stood Athena Promachos. Halfway down the void, between the two temples, was the altar of Athena where the animals would be sacrificed; a little to the right and back of this, was the precinct of Zeus where the axe that killed the beasts would itself be condemned to death.

In the pre-Periklean scheme, the precursors of the Parthenon and the Erechtheion were standard look-alike temples, placed almost parallel to each other, each with a six-column front. (Fig. 7.17) The north temple was the smaller of the two and had a complex cella division, to account for the fact that Athena shared the site with Poseidon, Hephaistos, the legendary King Erechtheus whose palace had once stood in this very place, and the hero Boutes. Otherwise, the two west facades of the temples lined up rather redundantly on either side of the narrow central void.

The Periklean rebuilding changed all this. (Fig. 7.18) The two temples were now quite dissimilar. The Parthenon, which was started before Perikles with typical, six-column facades, developed under the architect Iktinos into a huge looming mass with no fewer than eight columns across the fronts and seventeen along the flanks. The Erechtheion was a delicate structure of a uniquely irregular shape sitting a little to the north of its predecessor and so augmenting the central void. The new Propylaia faced the void rather than favoring either temple. The two natures of Athena were now visually set apart, but one approached both temples nonaxially, adjusting to their varied sequence of view and scale.

The Parthenon was probably the first to be visited by the procession. The rock floor of the Akropolis sloped upward from the Propylaia to the platform on which the mighty temple stood, the result of a vast filling and leveling operation. (Fig. 7.21) Monumental stairs rose to the west front where, on the pediment, Athena and Poseidon fought in the presence of the other

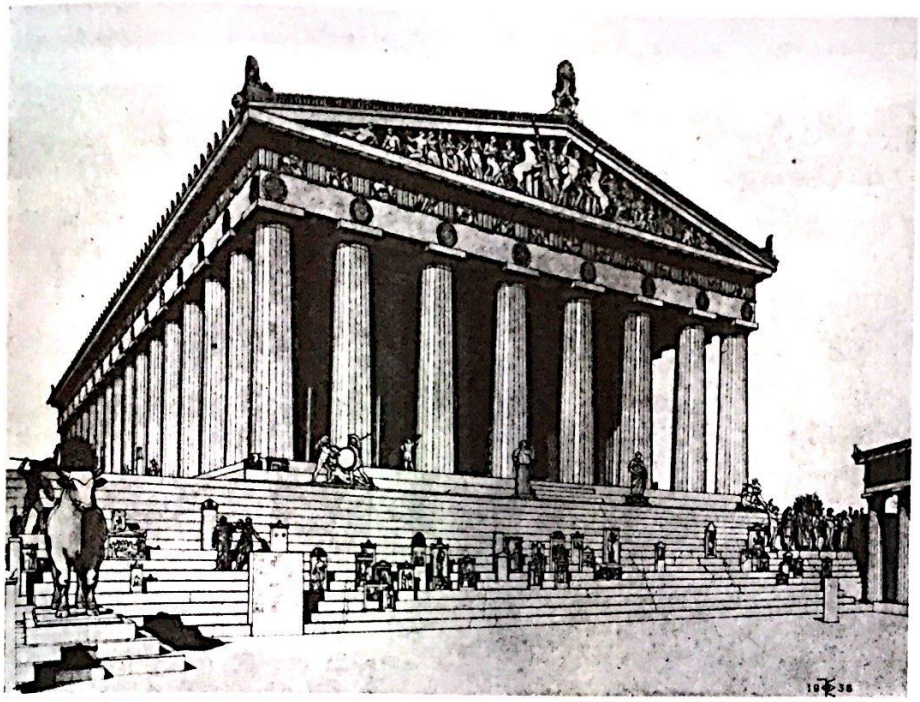


Fig. 7.21 The Akropolis, Parthenon (no. 1 on Fig. 7.18), 447–432 B.C., Iktinos and Kallikrates; near view from the northwest, reconstruction drawing.

gods to determine who would rule supreme over Attica. In the metopes below, eternal adversaries grappled in inextricable pairs: Lapiths and Centaurs, Greeks and Amazons, Greeks and Trojans along the north side in the direction of Troy, Giants and gods on the south. (Fig. 7.22) In many of the metopes the struggle was shown in mid-course: there was no victor, no vanquished. Warring opposites complemented each other in intricate, almost heraldic, groupings—and this is perhaps another essential aspect of the term Classical. It conjures aloofness, a sense of timeless idealism; but involvement, too, and violent involvement at that, is part of the Classical spirit. Yet the artist chooses not to take sides openly, recognizing that the greatness of the victor is directly proportionate to the skill and obduracy of the foe, that the hero needs the villain to gain his identity, that balance lies in mid-battle.

The procession now moved a little closer, up the west steps of the Parthenon, and a new revelation awaited it. A continuous frieze, running the length of the building along the top of the inner core behind the peristyle, showed, for the first time in Greek history, the citizens themselves on the temple. (Fig. 7.23) The great frieze, probably executed in place, depicted the very procession that had brought them to the Akropolis. The frieze, 160 meters (525 feet) long and 1 meter (3.5 feet) high, started at the southeast corner and progressed in two streams, along the west and north sides and along the south side, ending with a grand gathering of the gods on the east front of the temple's inner core, over the six columns of the pronaos. The top part of the frieze was carved in higher relief than the rest, to compensate for the angle of vision and the dimmer light at that height. The background would have been painted blue, and color and metal accessories would have picked out the main accents of the procession.

What was attempted in this long and beautiful frieze was not the representation of any one moment of the procession. Instead, we follow the various stages of the day's activities, arranged in sequence: the preparations, the setting out and gradual acceleration of the pace, the horsemen in the lower city, and those marching on foot. Here they all were: the riders of Athens who, in the words of Sophokles, were

> . . . conquered never.
> They honor her whose glory all men know,
> And honor the god of the sea, who loves forever
> The feminine earth that bore him long ago.

Then followed the slow pace of the elders; and behind them the jug-bearing youths and the sacrificial beasts, one raising its head as it were in anticipation of the inevitable blow—"that heifer lowing to the skies," as Keats described it in his "Ode on a Grecian Urn." (Fig. 7.24) And then the maidens with the saffron peplos, marching in pairs, calm and stately in their long tunics like fluted columns. (Fig. 7.25) Then the scene changes, from Athena as a focal point, to Mount Olympus where the gods and goddesses of the Greek world are gathered to hail one of their number.

The worshippers below provided the unity of this episodic composition as they marched along the frieze. They are the human content of the polis, what the polis is made of; Athena is its sacred embodiment. Courageously they chose to portray themselves on the temple of the goddess in the act of doing homage to her because, in a sense, they were the goddess—"Our own dear daughter who is amongst us," as Plato says of her.

To venerate the immortals and to be a member of a polis—these were the covenants of Greek humanity. Nothing that humans achieved or aspired to could be thought of outside this dual covenant. In the gods resided ancient obligations to the forces of nature and the appeasement that was their due. And in the frame of the polis,

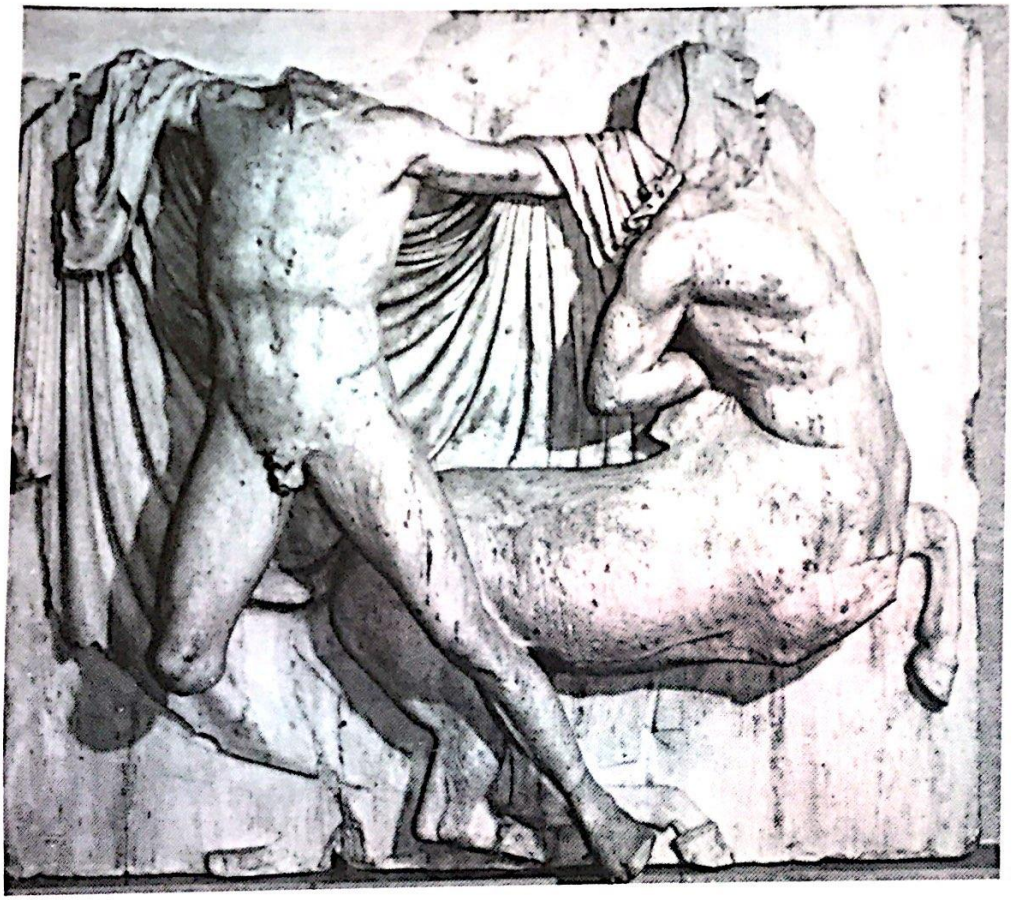


Fig. 7.22 Parthenon, metope showing a Lapith youth battling a Centaur. (British Museum, London)

Fig. 7.23 Parthenon, Panathenaic frieze, riders. (British Museum, London)

Fig. 7.24 Parthenon, Panathenaic frieze, a sacrificial heifer being led by youths. (British Museum, London)

the citizen found the fulfillment of human life—the realization of moral worth and philosophic, political, and artistic identity. To be cityless was to be lost or to have dwelled with dishonor. Something of all this was being sung in the program of the Parthenon and the eloquent interlocking it attempted of Athena, Athens, and the Athenians.

On the east pediment the birth of Athena was depicted: the maiden goddess who never knew the labor of birth and was not born of the womb, but who sprang fully grown from the brow of her father Zeus. The great east doors of the cella would have been thrown open on this holy day, and the procession would now complete its veneration of one nature of its city's godhead by catching a glimpse, at the end of a tunnel of space lined by two rows of Doric columns, of the tall gold and ivory statue of this warrior maiden, helmeted and with shield and spear in hand. (Fig. 7.26)

The peplos was not meant for this masterpiece of Phidias but for the old wooden cult statue in the Erechtheion. The procession now wended its way toward this other temple, so different from the overwhelming Parthenon that had wrested attention to itself upon entrance to the site, invited approach, and directed the crowd down its flanks. (Fig. 7.27) At the Erechtheion, Athena was another shade of womanhood—warm, refined, domestic. An exquisite Ionic order reflected this character externally and flirted with the masculine severity of the Parthenon across the way.

The layout of the Erechtheion was extraordinary. It was built, like the Propylaia, on several levels. The east front, at the level of the Parthenon, had six columns across. The north side sank along a smooth marble wall and ended in a projecting columnar porch that sheltered the trident mark of Poseidon which was left when he struck saltwater from the rock during his contest with Athena. She retaliated by striking the rock with her spear and producing the olive tree, and an olive tree was always present—and is today—on the irregular west side of the temple. This west elevation climbed in two stages from the north porch level up to the level of the Parthenon, along a wall that carried four engaged Ionic columns. A small porch on the south side balanced the tall north porch, but instead of columns it used six sculptured maidens that carried the burden of the entablature on their heads—caryatids as we call them. (Fig. 7.28) They stand there with one leg forward and so begin a cross-axis that runs through the void between the two temples and comes to rest on the north flank of the Parthenon, one-third of the way from the west corner.

There was also a figure of the earth goddess Gaia in this void on the cross-axis, rising from her own soil not far from the altar of Athena. But essentially this empty space belonged to the Athenian. Here he stood,

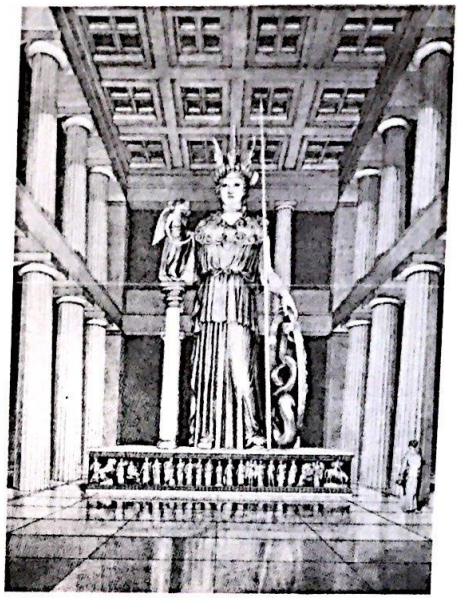


Fig. 7.26 Parthenon, interior of cella with the gold and ivory statue of Athena Parthenos (the Virgin) by Phidias; reconstruction view.

Fig. 7.25 Parthenon, Panathenaic frieze, young women walking in pairs. (British Museum, London)

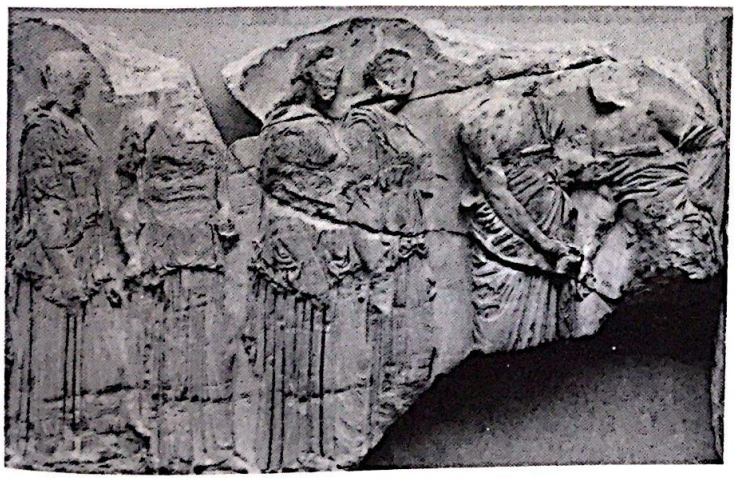


Fig. 7.27 The Akropolis, Erechtheion (no. 2 on Fig. 7.18), 421–405 B.C., Kallikrates and others; view from the southeast.

the measure of all things, between monuments that immortalized the two natures of Pallas Athena and through her the polis itself. The polis was hearth and it was intellect, tradition and brash invention, security and challenge. The citizen was the bond that locked it all in place. As he filled the center of this devised order on the Akropolis with his own humanity, the Athenian saw to the east and south the spreading city, and beyond the walls the hard-tilled land that sustained it. To the west, he would look toward the Propylaia from where he had entered this proud rock sanctuary, and beyond, the path he took through the agora to reach it. Further out still, the sea and recent memories of triumphs won there against great odds.

This was the physical and temporal frame of the polis, and the built shapes in the immediate periphery—the Propylaia, the Erechtheion, and the Parthenon—held its truth in stone. They stand today much as they did then, a miracle of nothing more than Pentelic marble, the blazing light of Attica upon it, and the concept of the column, reasonable and obvious, a shaft of stone sitting simply upon its stone pavement. This is the secret of Classical art if it can be thought to have a secret: that what is visible is the chief reality; that what is real can be expressed in the simplest and most honest way; that opposites coexist and are interdependent; and that out of such a view of the world comes blooming pride in the achievement of humans, and the corollary of pride is joy. In the words of Aeschylus:

> Joy to you, joy of your justly appointed riches.
> Joy to all the people, blest
> With the Virgin's love, who sits
> Next beside her father's throne.
> Wisdom ye have learned at last;
> Folded under Pallas' wing,
> Yours at last the grace of Zeus.

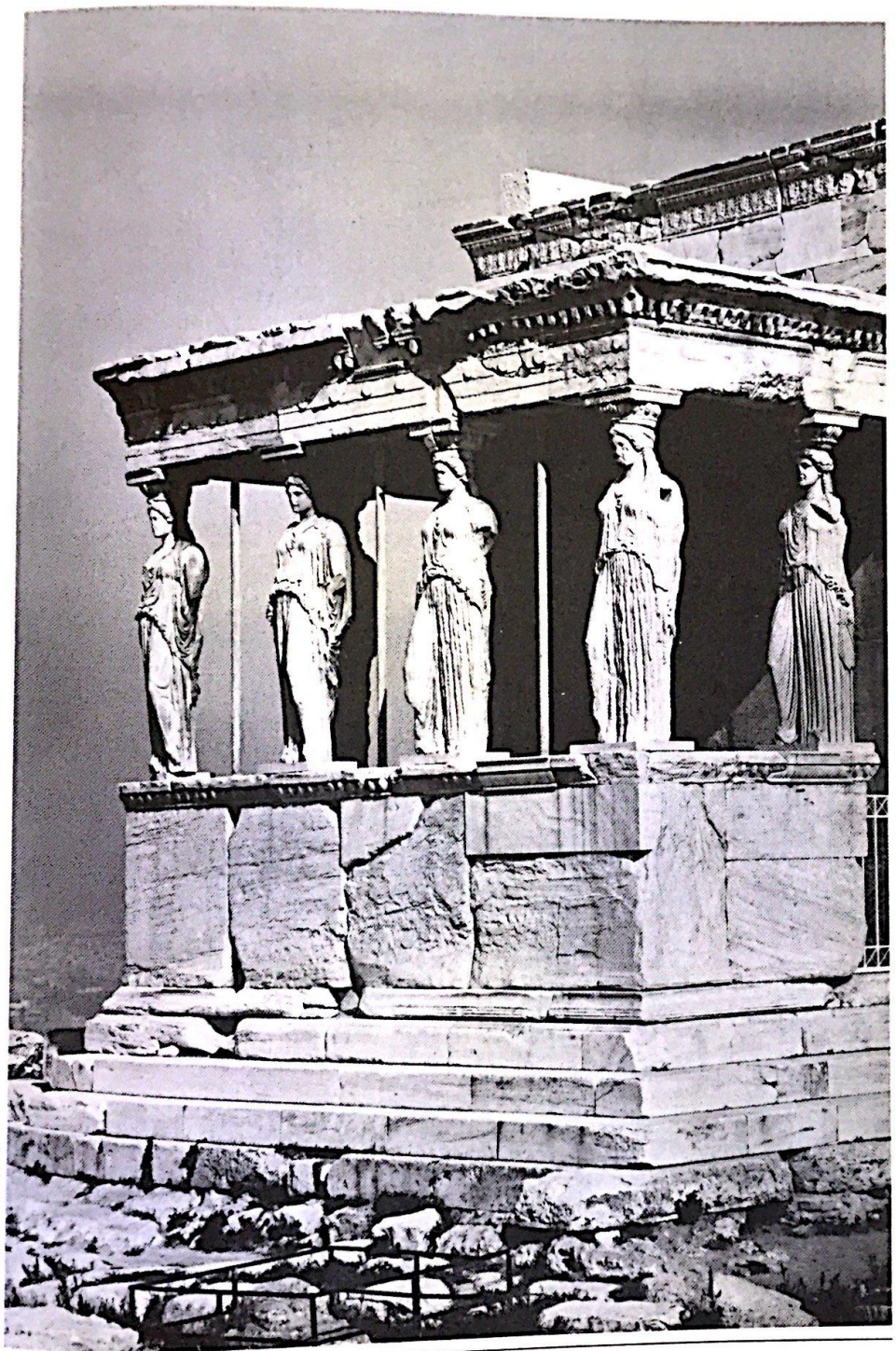


Fig. 7.28 Erechtheion, the Caryatid Porch.

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Lindos (Rhodes), sanctuary of Athena, 300–200 B.C.

8

THE HELLENISTIC REALM

The New Order

The crowning age of the polis—the administrative and social unit of the Greek commonwealth—was the fifth century B.C. By then this vigorous institution had begun to leave its mark beyond the Greek sphere. To some degree, the example of Greek Sicily and southern Italy had touched the city-making of the Etruscans even before. Rome itself had come about, in the eighth century B.C., by a process akin to the "synoecism" that Aristotle diagnosed as the agent of early Greek urbanization. In fact, quasi-urban settlements in Spain and in central and northwestern Europe at the time of the polis indicate that Greek practice was now being heeded beyond the coastline of the Mediterranean, in areas where the usual pattern had been one of hill forts.

But at the time when the example of the polis was quickening the rural habits of Europe, its fate in the Greek homeland headed for a decline. Soon after the bitter Peloponnesian War between Athens and Sparta at the end of the fifth century, a sharp rise in the birth rate produced more mouths than the polis could feed. This, coupled with a weak economy, brought on severe unemployment. Colonization as a remedy was by now outmoded. The young man who could not find work now turned professional soldier and was willing to serve anyone. The concept of the mercenary was inimical to the Classical polis which represented, more than anything, a moral entity based on the full commitment of a person to an individual place. And this was only the beginning.

In the fourth century, there was a call to unite the Greek cities into a strong confederation that could push out toward new frontiers. The obvious choice was Asia Minor, the territory held by Persia which also controlled the Greek towns of the Ionian coast. To return past aggression would be a powerful incentive for unity, a holy cause. Rather unexpectedly, the military muscle that could propel this Panhellenic exercise now materialized on the fringes of the Greek world, in the region of Macedonia. This backward kindgom in the northern uplands of Greece rose to prominence toward mid-century under King Philip II. Philip's campaign to unite the Greeks, through force where necessary, was completed by his brilliant son Alexander the Great. (Fig. 8.1) This Macedonian subjection, however noble its ultimate aim, muted the autonomy of the cities, their proudest asset.

Once Greece had been bullied into the semblance of a nation, Alexander set out to liberate Asia Minor. His army swept into the heartland of Anatolia and with uncontainable impetus overwhelmed the traditional states of the Eastern world in the span of a decade, stopping short only at the doorstep of India.

This headlong conquest marked the end of the Classical polis. In the new order the hundreds of coexisting city-states, large and small, that had formed the volatile Greek community found themselves engulfed in a vast political construct that contained old empires like Persia and Egypt. Greek rule was no longer coextensive with the Greek race. Now many Greeks lived among alien peoples, rendering meaningless the age-old duality of Greek and barbarian. So, too, that other grave distinction that fixed the Greek's place in the scheme of things, the relationship between humans and the immortal population of Olympus, lost its power when Alexander, a mere mortal, was deified even before his death. The practice soon became commonplace among the dynasts who carved up this unwieldy empire in the years to come.

A famous image of one of these men, the bronze statue entitled *The Hellenistic Ruler,* is a telling sign of the new order. (Fig. 8.2) In the Classical period such public statues of male nudes were of young triumphant athletes, never of rulers; and the formula of these *kouroi* was to show contained energy at rest or equilibrium—the body aware of its potential without the need to advertise itself. The Hellenistic image is one of sheer brute power, boastful and overpowering. And yet the generalized confidence of the body seems negated by the particular concern of the face, which is often shown worried and frowning. This split between the head and body, and the dependence on the face to characterize the specific humanity of a person, contrasts with the indivisible presence of the kouros, body and head together, representing an individual as the embodiment of something larger than himself, the state that made him.

Classical values were based on the respect of the single individual within the

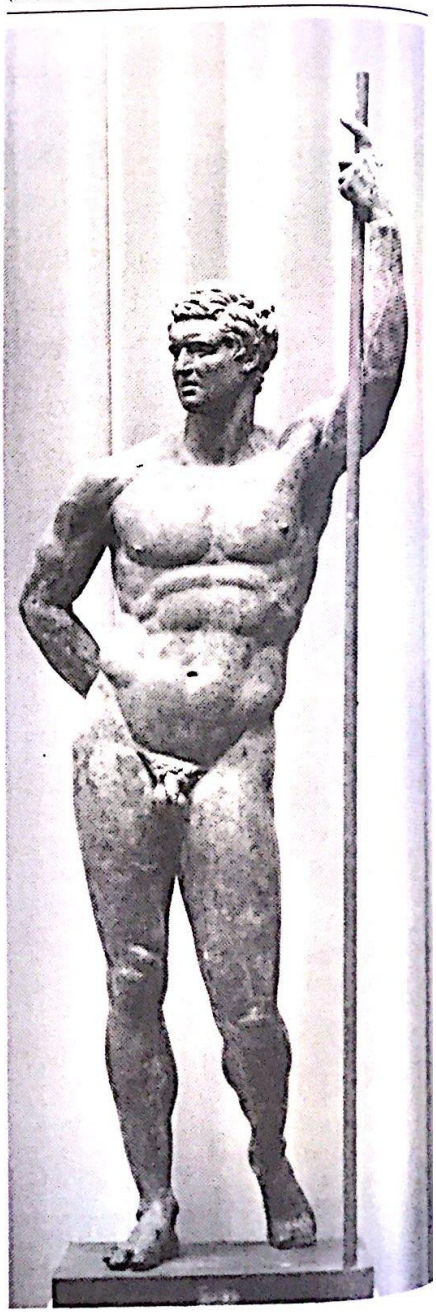
Fig. 8.1 Alexander the Great (336–323 B.C.), a mosaic representation of the Battle at the Issos in 333 B.C., from the House of the Vetii in Pompeii, ca. 100 B.C.; detail. This is a Roman copy of a Hellenistic painting of ca. 330 B.C. (National Museum, Naples, Italy)

framework of the city-state. It was his bigness within the narrow confines of the city that Classical culture celebrated. And it was precisely this that Alexander's fabulous accomplishment destroyed. The state was stretched out formidably to include empires. Even with the more restricted kingdoms that sprang up after his death, the scope of government was enlarged inordinately, and the standing of the individual was correspondingly reduced. (Fig. 8.3) The citizen-soldier unquestioningly defending his own polis when it came under attack yielded to the professional fighting man for whom soldiering was a career. Contending armies seemed now almost interchangeable, and victory became an abstraction. And so inevitably there grew a preoccupation with defeat, and pity toward the vanquished. The professionalization of athletic games similarly annulled the luster of the triumphant kouros. We are now shown tough, leathery pros whose crown of victory is less a godly reward than a hard-won, tangible profit.

The change we are sketching here in broad strokes is more easily evident in sculpture: the rise of portraiture; the depiction of little children and their cute antics, nude women as vehicles of erotic love, and clinically accurate representations of old people; subjects of pain and defeat. (Fig. 8.4) Sculpture itself took on a looser form and became prone to theatricality and vigorous entanglement. The value structure became less rigid. Classical Greece, like youth which it idolized, was high-minded, unyielding, exclusive. Culture seemed to grow old with the enlarged empire and now tended to be permissive, yielding, broadly compassionate.

The Classical hero is above all ethical, and

Fig. 8.2 The so-called *Hellenistic Ruler*, a heroic portrait, bronze statue, later second century B.C. (Museo delle Terme, Rome)



ethos according to Aristotle is "that fiber in man which reveals choice, what sort of a thing a man chooses or avoids in circumstances where the choice is not obvious." The hero in Classical art is often shown caught in a moment of decision, his dilemma unresolved. It is in the thinking out of it that his humanity is revealed. We feel *empathy* for him because we identify with his stance between opposite ends, because his morality and ours is existential. (Fig. 7.22)

The Hellenistic hero, on the other hand, is not the instrument of choice but its victim. His morality is melodramatic. He is not posed between alternatives, but abandoned to face one. The artists represent him as either gloatingly victorious or else piteously vanquished. The observer is not allowed therefore to remain engaged in the struggle. The image is after effect and is intent on eliciting a predictable response. The message is not implied; it is shouted. We are thus forced into *sympathy*, which means feeling for, not with. (Fig. 8.4)

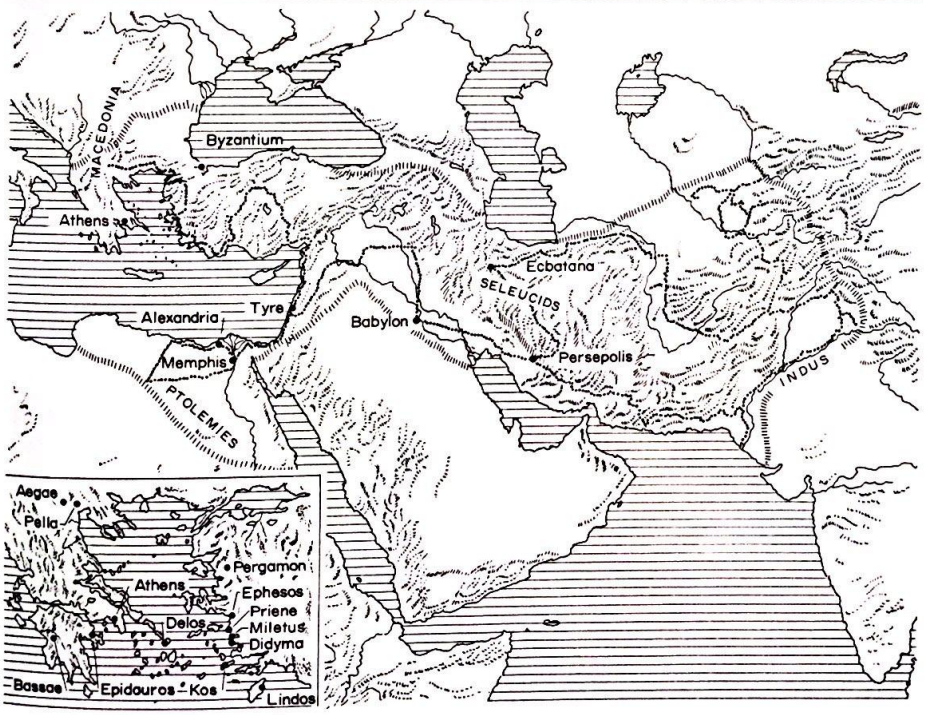
Precocious Trends

These observations also apply, but rather more abstractly, to architecture. First, though, we must remember that we are charting broad trends over a long period of time. The hinge between the Classical and Hellenistic period is the electrifying reign of Alexander, but political or military events do not always initiate a change of form; they may sometimes merely precipitate it. Remember, too, that a style crystallizes out of conditions and components that reach back beyond the point when it gains general validity. And even after its decisive appearance, a style coexists with older modes that carry on untouched, or touched only in part, by the new vision. What we call Hellenistic architecture in fact had its beginnings before Alexander. The term itself covers three hundred years, from Alexander to the fall of the last of the Alexandrine kingdoms, Cleopatra's Egypt, to the Romans in 31 B.C. Architecture during this extended period was neither static nor uniform across the immense territory involved.

Looking back, we see the seeds of Hellenistic architecture as far back as the fifth century and probably nowhere better than in the Athens of Perikles, the quintessential locus of Classicism. The axial monumentality of the approach ramp of the Akropolis and of the western prospect of the Parthenon presages one of the central themes of Hellenistic architecture, its preference for banked effects and the dramatic use of staircases. (Fig. 7.16) On the west elevation of the Erechtheion the column and the wall, the two hitherto distinct and separate elements of Greek design, are married. The engaged column, which we will return to, is the hallmark of Hellenistic architecture and, along with the pilaster or engaged pier, is the principal component of an exciting range of surface articulation whose distant consequences would be felt all the way to the modern period.

The Parthenon itself looks forward in at least one other important respect—the attention it devotes to the interior layers of its temple form. The public reality of the Doric temple lay in the exterior colonnade and its superstructure; the cella was an interior space of very limited use, a rather straightforward container for the cult image. Two rows of columns in a single or double tier were used to divide the space into three fairly equal aisles, the central one of which tunneled toward the statue. However, in the Parthenon, the placement of the Panathenaic frieze *within* the peristyle, along the exterior walls of the cella, already encourages the user to penetrate the column screen. (Fig. 7.23) Inside, the rows of columns are pushed out toward the lateral walls of the cella, reducing the outer spaces into narrow aisles and aggrandizing the effect of the central nave. Furthermore, the colonnade is brought around and

Fig. 8.3 Map: The Hellenistic realm, ca. 330–30 B.C.



behind the statue of Athena Parthenos, framing it fully on three sides. (Fig. 7.26)

It is not clear whether this burgeoning interest in the interior of the temple corresponded to any major change in ritual practice. Whatever the case, the subtler design and fancier embellishment of the cella drew people to enter the temple for reasons other than formal religious proceedings. The temple, which had already at times doubled as a treasury or bank, now started its career as a civic museum. Moreover, architects more and more relied on internal effects to bring out the uniqueness of each deity, most especially in those cults with a potential for drama. Ionic temples (for example, the archaic temple of Artemis at Ephesos) had always been susceptible to architectural elaboration of this kind. Now this concern was becoming general, and temple architecture leaned more and more toward the expressive and theatrical.

The Case of Bassae

The temple to Apollo at Bassae in the wilds of Arcadia is of crucial importance to our discussion. (Fig. 8.5) It was begun roughly at the same time as the Parthenon and is attributed by one ancient source to the same architect, Iktinos, but it probably was not complete before the very end of the fifth century, perhaps even the early fourth. Today it sits in splendid isolation within a tossed, lonely mountainscape not far from the Panhellenic sanctuary of Olympia. Made of the drab grey limestone of its setting, it would compare poorly with the luminous marble form of the Parthenon were it not for the fact that in this remote thunderous site the archaic look and the awkward, rather heavy-handed execution of the temple sculpture seem eloquently appropriate and may well have been intentional. Looking at the design in close detail, we would be justified in suspecting the calculated manipulation of standard conventions of temple architecture for the sake of expressive effects.

To begin with, there is the unusual north-south orientation. (Fig. 8.6) Was Iktinos' idea to have the temple face north toward Delphi, Apollo's chief sanctuary and his favorite dwelling-place on earth? Or was this in-

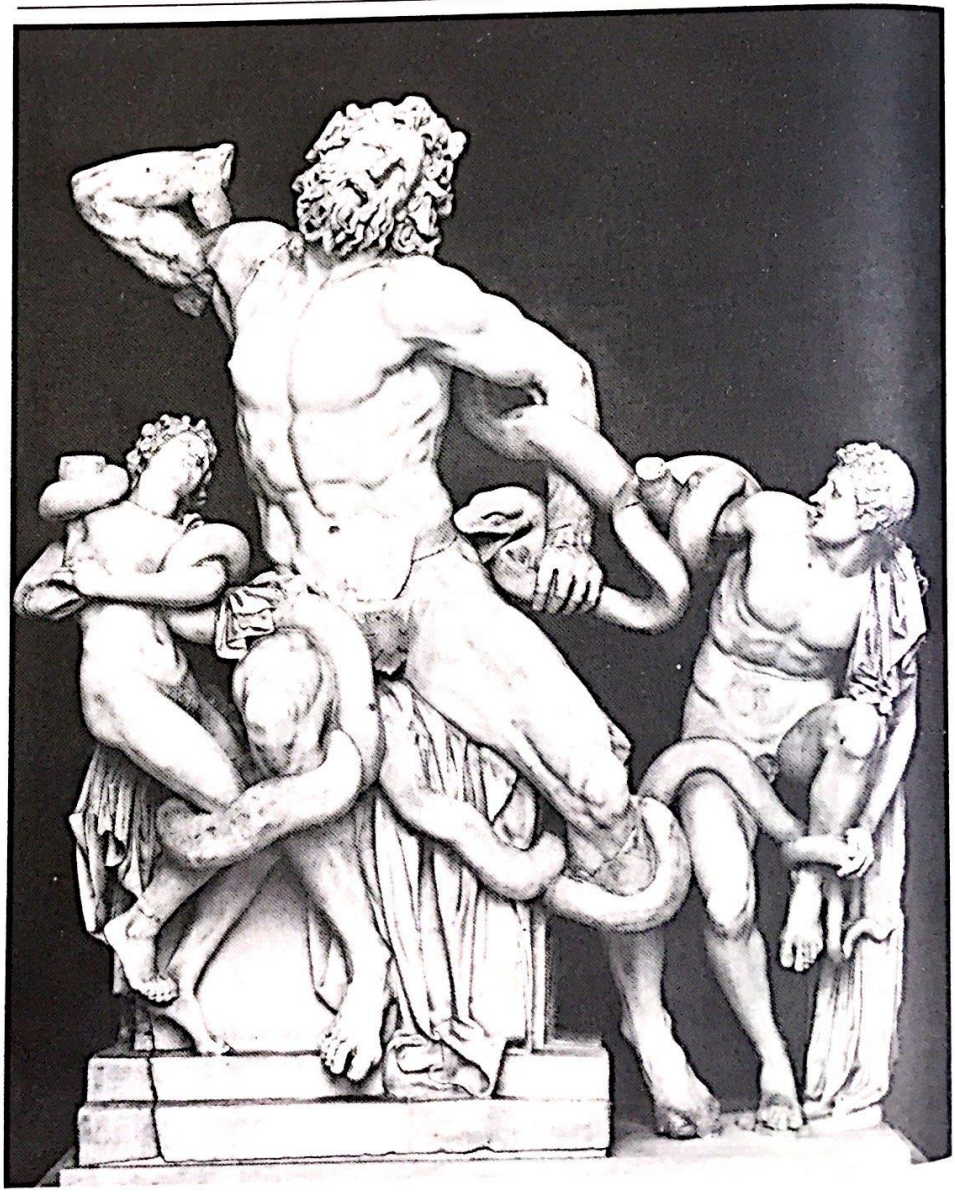


Fig. 8.4 *Laokoön and His Sons*, a statue in the Hellenistic style, probably a Roman copy, from the first century B.C. or first century A.D., of a mid-second century B.C. original by Hagesandros, Polydoros, and Athanadoros of Rhodes. (Vatican Museums, Rome)

Fig. 8.5 Bassae (Greece), temple of Apollo, late fifth century B.C.; general view of the site.

tended perhaps as a visual device, to get an oblique, three-dimensional view of the building along the original precipitous approach from the town of Phigaleia in the gorge of the Nedda River? Almost certainly, a further advantage was sought in this unorthodox siting for the interior arrangement of the cella. A door along its east wall could bring direct morning sunlight to a small backspace just off the cella where the cult statue may have stood—an appropriate tribute to the God of Light who had triumphed long ago over the dark forces of the earth.

Between this room and the cella proper stood a single, extraordinary column. (Fig. 8.7) It is the first surviving instance of a new architectural order, the Corinthian. In later antiquity the Corinthian capital was said to have been invented by a sculptor and metalworker named Kallimachos, a pupil of Phidias. In contrast to the abstraction of the Doric and the curvilinear grace of the Ionic, this new capital is composed of natural foliage, acanthus, a motif often used on fifth-century funerary stelai. In fact, story has it that it was an offering basket on a tomb enveloped by the leaves of an acanthus plant that had inspired Kallimachos to fashion this architectural novelty. (Fig. 8.8)

The Corinthian order never developed its own distinctive entablature and used the Doric or Ionic themes interchangeably. Its

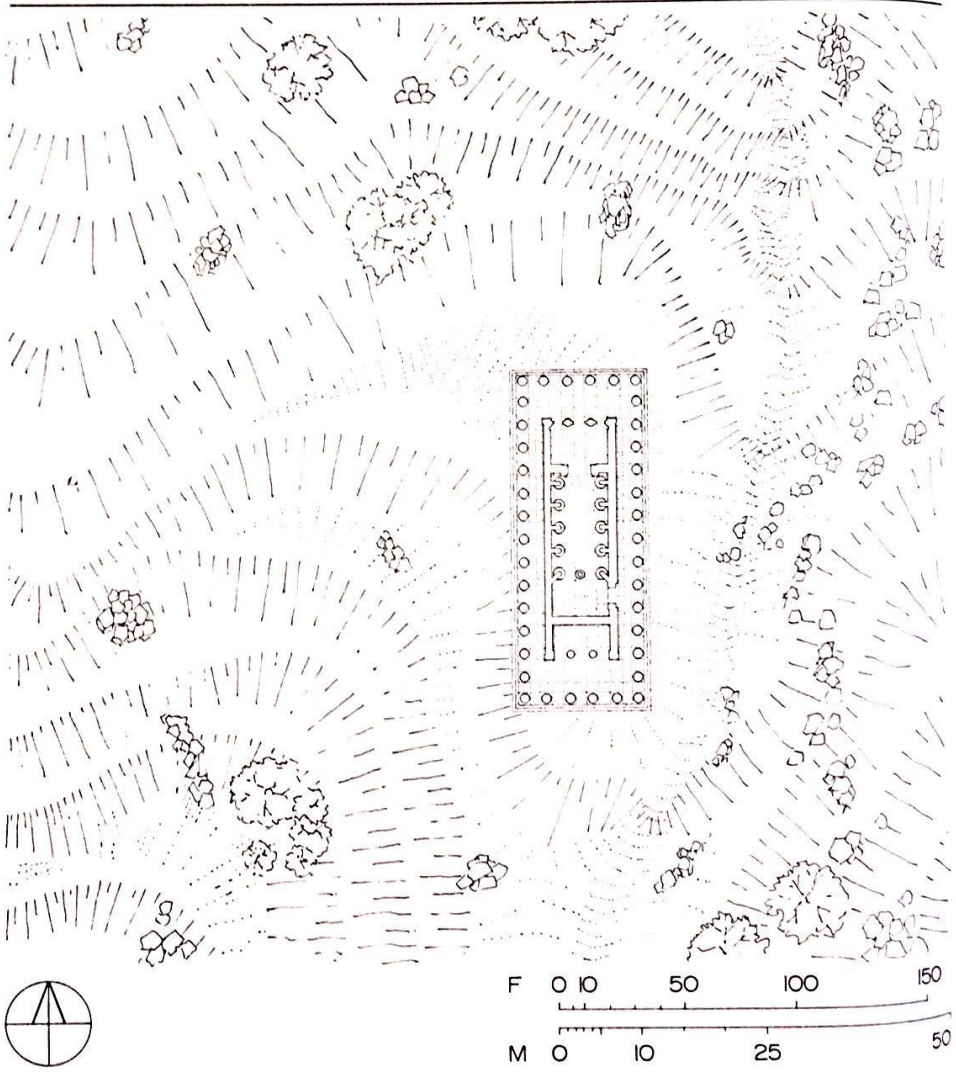
sense was clearly not architectonic. A luxurious plant capital is antithetical to the idea of the column as a load-bearing entity. The deep, shadow-catching, essentially pictorial effects of the carving diffuse the structural logic of the relationship between shaft and architrave. If the Corinthian order indeed started its career here at Bassae, it would seem that the motive was literary rather than functional. It has been suggested that the single, treelike column before the image of the god may have been intended to evoke a central moment in Apollonian myth. When Leto was made pregnant by Zeus, his perpetually jealous and vengeful wife Hera forbade anyone, divine or human, to give the young woman haven for her labor. It was not until Zeus readied the island of Delos that Leto, after her long and desperate wandering, leaned against a laurel tree there and gave birth to Apollo. In commemoration of this event, bronze trees stood outside the temples of Apollo at Delphi and on Delos itself. At Bassae, it seems, the tree was brought within, incorporated in the architecture of the cella, and made the focal point of its deep axis.

This is not the only peculiarity of the temple interior. The sculptural frieze, for the first time in Greek architecture, is brought within the cella proper. The continuous form of the frieze along three sides also tends to centralize the cella and reduce the impact of its axial perspective toward the cult statue. What is more, the manner of the storytelling foreshadows the birth of that tendency toward theatricality, the strongly rendered drama and the controlled appeal to the viewer, which we have already singled out as one visible aspect of the dissolution of the Classical ethos.

The subject is familiar—themes of engagement between Greeks and Amazons, Lapiths and Centaurs. (Fig. 8.9) But the engagement is not concentrated on that mid-battle moment, that steady balance of opposing forces, that we have found so potently expressed in the Parthenon metopes. There is a furious abandon here, with the combatants lunging, falling, or fleeing in great agitation. Garments billow as in a strong wind, heads tilt forcefully to convey a variety of emotions, deep-cut eyes set in pools of shadow hurl glances across intervals of space. Flying drapery, quick action and farflung gestures, the play of deep shadows against highlights, the blurring of planes, bold foreshortening—all the telltale features of a new manner in art are employed in this powerful interior space of Apollo's temple.

The cella seems to have been the target of the architect's attention and ingenuity, as if its importance were preeminent. The short sides are set unusually far back behind the exterior colonnades as in the archaic temples of Sicily, drawing the worshipper deep inside the temple. The space within expands as one enters, seemingly opening up to engulf a pressing crowd. This feeling of expansion is the result of two

Fig. 8.6 Bassae, temple of Apollo; ground plan.



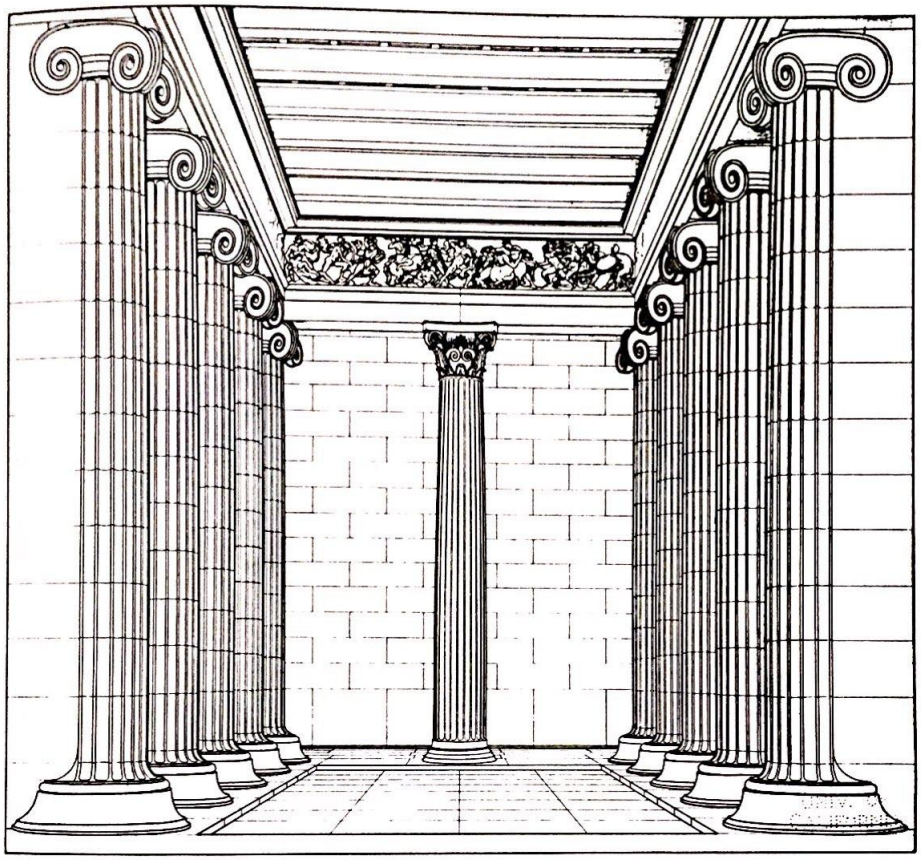


Fig. 8.7 Bassae, temple of Apollo; interior, looking south, reconstruction drawing.

Fig. 8.8 Epidauros (Greece), tholos, ca. 360–320 B.C., Polykleitos the Younger; detail of the inner, Corinthian colonnade (as reconstructed in the Epidauros museum).

things. There is a single row of tall Ionic columns on either side of the cella (the end columns toward the north may have had Corinthian capitals) instead of the usual arrangement of two superimposed storeys of columns smaller in scale than the exterior order. And these tall cella columns are not freestanding, but are engaged instead to the walls by short spurs of masonry.

The move to unencumber the space of the cella by pushing the columns closer to the walls—and so be able, incidentally to increase the size of the cult statue—was already apparent in the Parthenon. Here at Bassae the side aisles disappear altogether, and the cella becomes one large, unified space with deep niches along the sides. The bases of the engaged columns flare extravagantly, forming more than three-quarters of a circle before they hug their masonry spur. Thus the walls are molded into a rich, plastic tapestry of light and shadow.

The capitals themselves are extraordinary. They are three-sided, with volutes on all three sides joined by full convex lines. We saw the beginnings of these "diagonal" Ionic capitals at the temple of Athena Nike on the Akropolis. There, to define the corners more precisely and, as suggested, to point away from the body of the temple, the angle capitals were given adjacent volutes. At Bassae, however, the principle goes beyond corner definition. A normal Ionic capital has two legitimate faces with volutes, the lesser lateral faces showing only the cushion connecting the spirals. To the viewer looking along its length, the standard Ionic colonnade would present a receding row of these unsatisfactory side faces. The three-sided arrangement at Bassae obviates this unhappy visual effect. But in the process it also destroys the structural logic of the capital in relation to its architrave, which can no longer be seen resting in the trough between the two high, voluted faces. The capitals now take on a decorative air, looking pretty rather than looking right.

The traditional purpose of cella colonnades was to help support the roof. As these were pushed out toward the cella walls, the central span became too broad to be bridged in stone efficiently. The architect

resorted to metal enforcement, and the burden of the roof was shifted more and more to the cella walls. At Bassae the colonnades abandon their load-bearing duties altogether and become mere symbolic attachments at the ends of masonry spurs, which are necessary to buttress the overburdened cella walls. The column, then, surrenders its structural reality for the sake of new visual effects. The Classical unity of structure and appearance begins to come apart. Liberated from its structural role, the column could enjoy a new existence as applied ornament. The one-time tectonic logic was thus overlaid by the pictorial element; the architect was freed to try variations on the columnar tradition for their own sake.

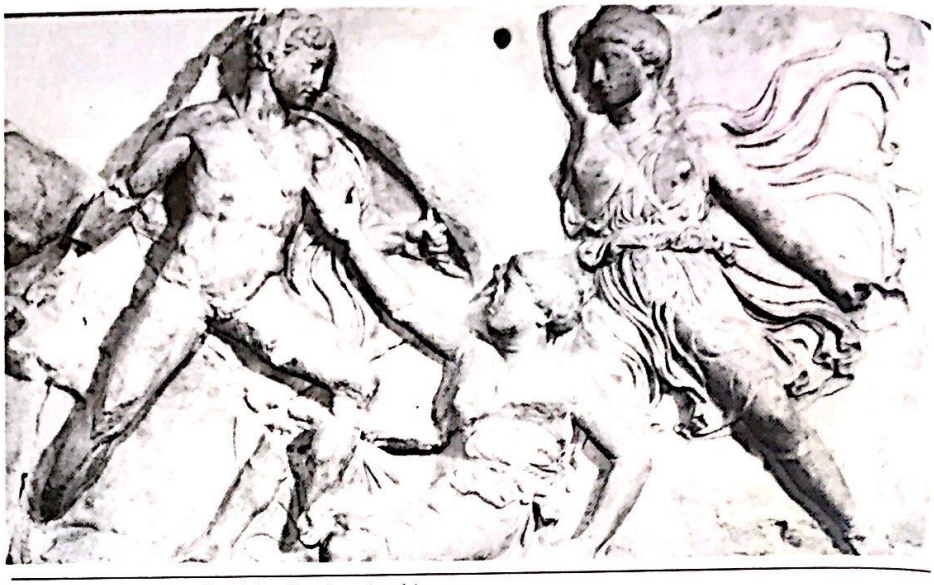


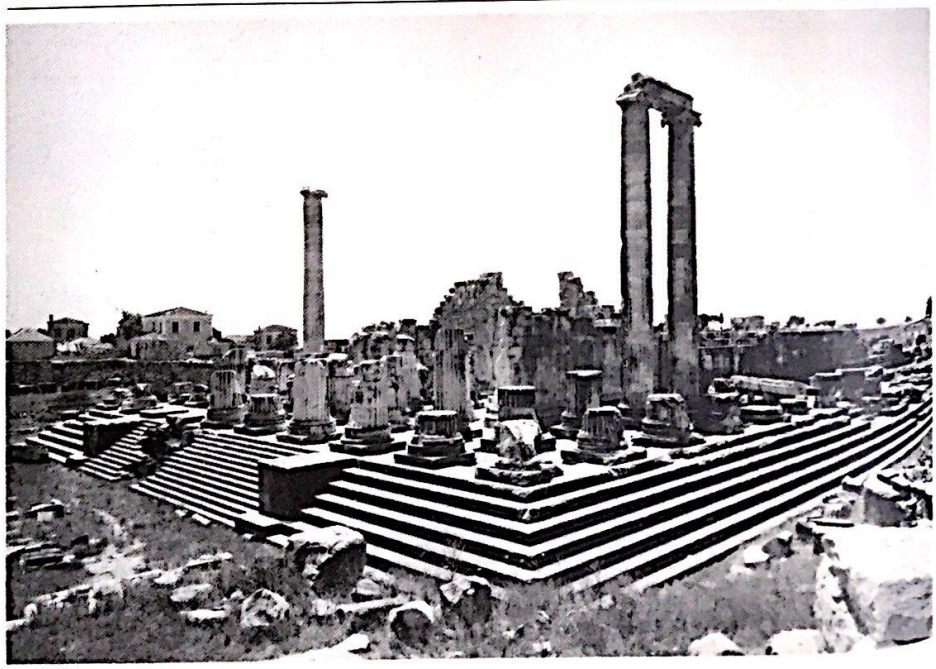
Fig. 8.9 Bassae, temple of Apollo, interior frieze; detail of the battle between Greeks and Amazons. (British Museum, London)

The Hellenistic Temple

About one hundred years after Bassae, a new temple to Apollo began to rise over the ruins of the earlier, Archaic structure at Didyma, the famous pilgrimage site outside of Miletus. (Fig. 8.10) The architects were the Milesian Daphnis and Paeonius of Ephesos. It was a colossal undertaking and construction dragged on into the second century B.C. and beyond without ever being totally completed.

The temple at Didyma illustrates the continuing transformation of this building type in line with the innovations of Bassae. That we encounter this prodigy in the East is no accident. The great eras of architecture in coastal Asia Minor were the seventh and sixth centuries B.C., before Persian suzerainty inhibited the prosperity of Greek cities, and, again, in the Hellenistic period when mainland Greece was eclipsed by the star of Alexander and the initiative passed on to the old Aegean cities set free of their alien yoke, and to the many new towns, like Alexandria and Antioch, founded or Hellenized by Alexander and his successors in the lands of his conquests. Apollo at Didyma spans these two eras of greatness. With its double peristyle and deep entrance porch filled with columns, it retains the formal aspects of the Archaic temples of Ionia, like its predecessor destroyed by the Persians in the early fifth century B.C.,

Fig. 8.10 Didyma (Turkey), temple of Apollo, erected over a sixth-century B.C. structure that was begun in the late fourth century B.C. and was never finished; view from the north.



or the Artemision at Ephesos. But at Didyma the change is revolutionary.

The Ionic order had gone through major adjustments in the fourth and third centuries. A reform of proportions, associated with the architects Pythios of Priene and Hermogenes of Alabanda, made the column taller and slenderer and the spans wider. At Didyma the exterior columns, the height of which is almost ten times their lower diameter or a full 20 meters (65 feet), are the tallest and slimmest of any Greek temple. But it was the decorative possibilities of the Ionic that satisfied Hellenistic taste and made of it the dominant order everywhere. The sterner Doric was less accommodating and was held back by the ever-present "corner problem." After an attempt at modernization that saw it attenuate its proportions, the Doric lost its popularity, "not because it is unlovely in appearance or origin or dignity of form," according to Hermogenes, "but because the arrangement of the triglyphs and metopes is an embarrassment and inconvenience." For the most part, it was now relegated to utilitarian buildings.

There is ample evidence of the decorative enrichment at Didyma. The columns of the east end sat on elaborately carved bases which stood on square plinths whose sides measured 9 Ionic feet each—a module used throughout the building. (Fig. 8.11) The base molding was replaced at times by a set of carved panels that formed an octagon and featured sea animals, dragons, and palmettes. The angle capitals had a bull's head in the center and busts or winged monsters projecting from the corner volutes. Other capitals held heads of Zeus, Apollo, or Leto. This is the start of what are called "historiated capitals," which will enjoy considerable popularity in Roman times and again later in Romanesque churches.

Fig. 8.11 Didyma, temple of Apollo; bases of peristyle columns.

The only approach to the temple was by means of a special flight of stairs cut into the eastern stereobate and through five rows of columns, the three innermost filling the space between the extended walls of the cella. (As in most Hellenistic temples, there was no equivalent back porch.) The central axis terminated in an opening, but passage through it was blocked by a low wall. (Fig. 8.12) To enter one had to use either of two side doors. They gave way to vaulted ramps, dark and narrow, that led down and then emerged, with blinding impact, into a large hall open to the sky.

On three sides, the hall was defined by a very tall podium on which stood pilasters built of ashlar blocks like the wall; so the podium was totally wedded to the wall. (Fig. 8.13) At the top, this interlocking of uprights and wall was expressed by a rich continuous frieze made up of the pilaster capitals, which showed a central acanthus motif flanked by griffins, and linking bands of griffins and lyres. At the end of the hall, where the cult statue would be in a normal cella, sat a miniature prostyle temple, like a play within a play, with other elements of Apollo's oracle sites, such as the spring and the laurel bush, nearby. Only when one had walked toward this chapel, which seems to crystallize the backspace of the Bassae cella, and turned back would the presence of a

magnificent stairway become apparent at the other end of the hall, between the vaulted ramps of access. The stairway led to a platform with two columns that framed the opening one had noticed at the top. This stage was probably used for epiphanies related to the oracular cult, and the opening itself no doubt served a similar purpose for those outside by setting the stage for sacred appearances.

Whatever its relationship in layout to its Archaic predecessor, the Hellenistic temple at Didyma is thus exposed as a theatrical composition that relies on surprise, change of scale and of levels, and an ambivalence in the standing of its various component features. Is the large roofless hall the cella, or an inner courtyard that frames the chapel at the end? Why has it to be approached in such a devious way? What are we doing so deeply drawn into the body of the temple?

The Classical temple was self-contained and active. (Fig. 6.8) It stood in mid-space, a sculptural force complete only in relation to its surroundings, both natural and built, which gave it scale and set it in a dynamic relationship to the approaching worshipper. This vital experience was all—getting to the temple along an often irregular path, moving around it, reading it against distant landscape forms and proximate features of the precinct. The Hellenistic temple tries to be complete in itself. It stages a certain sequence of effects within its own body, to be revealed to the user one by one. It works in only one way: it has secrets to unfold and it is much more than what it seems. The user is not allowed to interact freely with it. The temple becomes, instead, a pattern of staged impressions. The experience is controlled by the architect. We do not make of the temple what we ourselves want, but what the architect wants us to make of it.

Religious Settings

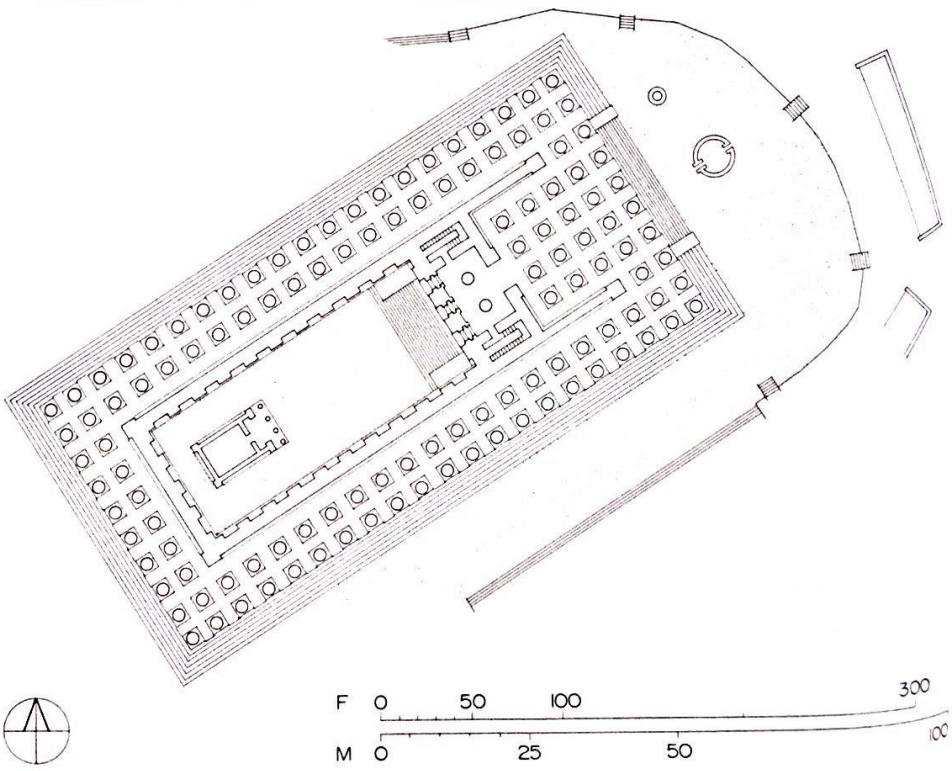
This studied design of the Hellenistic temple extended to its setting as well. This often meant landscaping and terracing, porticoed enclosures and monumental stairways, all arranged along sweeping axes. Nature, once an active participant in the conception and ritual experience of the temple in its precinct, was now exploited primarily for its pictorial appeal, functioning like a painted backdrop. Remember that it was during the Hellenistic age that artists introduced the Greek world to landscape painting, and that nostalgia for country life and rural scenes became a major theme of literature. All this speaks of the gradual separation of natural from built forms. The size and staged formality of the planned environment so thoroughly predominated now that the precarious balance of Classical times, between what always had been and what humans imposed, was bound to be undone. Nature was neutralized, edited, and made the servant of architectural guile.

The new religious settings affected not only original Hellenistic precincts, but the remodeling of old sites as well. Because of a respect for surviving patterns, but also in order to escape rigidity, the axial layouts were rarely dogmatic and symmetry became less than perfect. The twin principles of these grand compositions were panoramic succession and architectural unity—that is, the presentation of a series of tableaux, as the user moved upward along the predetermined axis, that afforded progressively more spectacular views and that were capable, because of the uniform design that overshadowed component parts, of being taken in at once. The enclosure for the temple proper, at the end of the sequence, might be an open horseshoe in form, or a Greek letter pi (Π), or some variety of quadrangle. Sometimes the temple stood in the middle of this enclosure, or else it was withdrawn and moved toward, or even engaged in, the surrounding colonnade.

Asklepios at Kos

Two examples should indicate the range of possibilities. The first we look at is a Hel-

Fig. 8.12 Didyma, temple of Apollo; site plan.



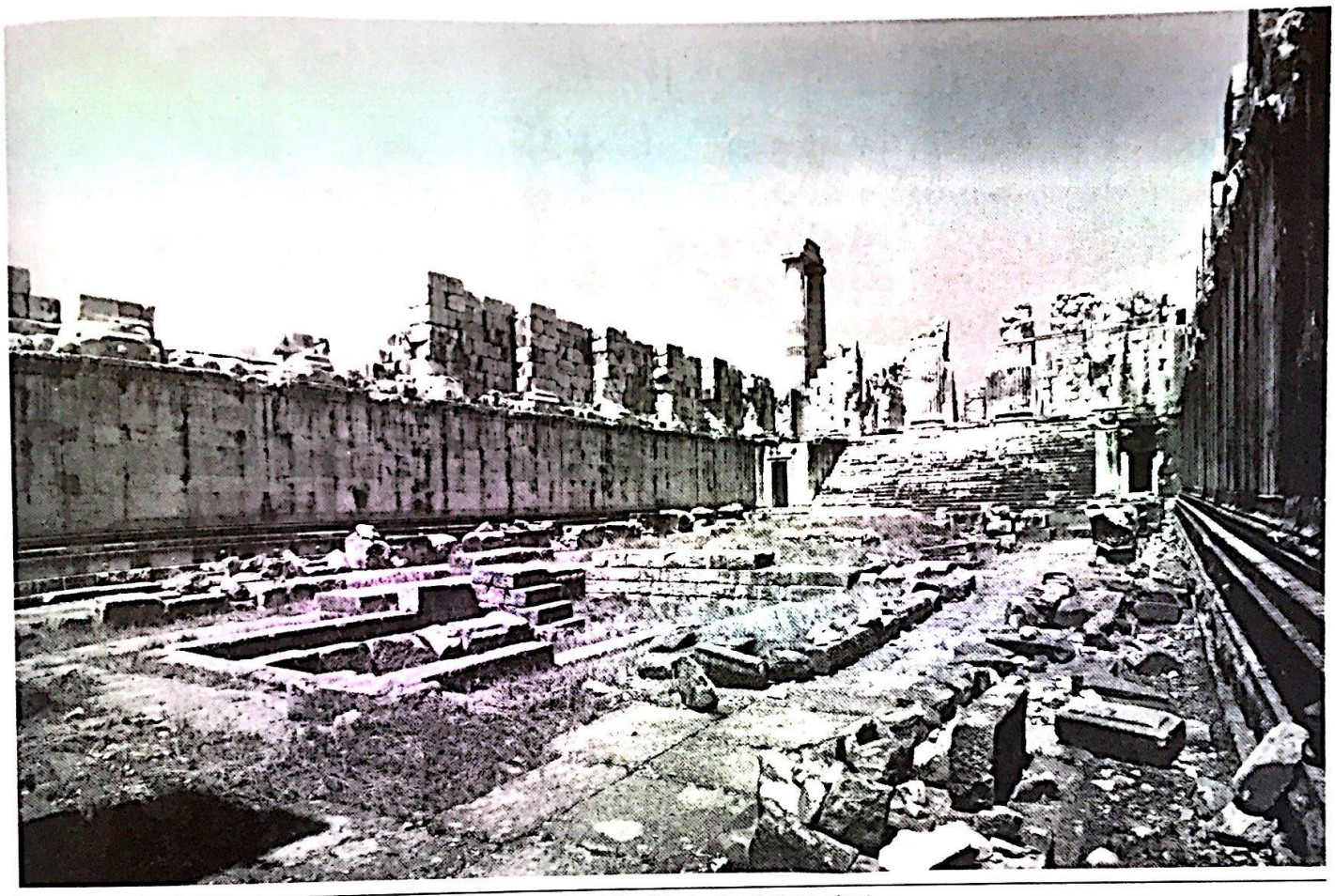


Fig. 8.13 Didyma, temple of Apollo; interior view looking northeast, with the small temple in the foreground and the stairs to the platform of epiphanies at the rear.

lenistic sanctuary on the Aegean island of Kos, which is sacred to Asklepios, the god of healing. (Fig. 8.14) It stood in the open land, a short distance from the main town, against the gentle slope of foothills rising out of the coastal plain. The second example is the sanctuary of Athena Lindaia, the ancient cult of the akropolis of Lindos, the town along the eastern shore of the island of Rhodes. It was remodeled in several campaigns between the later fourth century and the end of the third. (Fig. 8.17)

The scheme at Kos is calm and contained. Three terraces of easy rise are linked by flights of stairs along an axis that leads to the principal temple at the top. Both the first and last terrace are defined by Π-shaped enclosures facing inward, effectively bracketing the entire complex. The lower enclosure, entered through a formal gateway, contained rooms for the sick who came to wait for the intercession of Asklepios. Along the fourth side were fountains set against the retaining wall of the second terrace and incorporating the two springs that were central to the primitive cult. A small temple with an underground treasury and the main altar of the complex faced each other on either side of the axis at this intermediate level. Then the staircase followed, taking us to the final terrace and bringing us directly in front of the temple of Asklepios.

In fact, going through the complex, at least until the uppermost terrace which is the most formal (and predictably the latest), has something about it of the sacred ways of older Greece, like that of Delphi. (Fig. 6.16) It is as if this kind of naturally organized ascent were stiffened by the novel demands of centralized planning and architectural enframement, and it is precisely

the tension between formal control and measured deviation that makes the Kos site so vital.

What is most different is the relationship of the temple to its precinct. It is the climax of the whole composition, but it presides more because of an artificial hierarchy than by its own authority. (Fig. 8.15) Inflexibly frontal, the impact of its peristyle is deflated by the columned frame into which it is visually locked; the temple seems uncommitted, out of the fray, a static image that looks out beyond its place, across the sea, toward the shore of Asia Minor and the cone of Halikarnassos. At Didyma the Greek temple was tamed by absorbing the spirited incidents of a sacred way inside its body. Here at Kos the temple is trapped and put on exhibit by its setting.

Athene Lindaia

At Lindos the temple is even less assertive. It is one of the smallest units of the grandiloquent layout and is caught between the majestic sweep of stairs and column screens through which one must pass to reach it and the sheer drop of its cliff perch which faces the vast open sea.

A temple first marked the craggy spot probably in the sixth century B.C. (Fig. 8.16) The path wound up along the northeast face of the akropolis starting at the harbor below. Pilgrims would have been able to pick out the upper portion of the structure as they climbed the path, confronting the temple directly as it stood clear against water and sky. The design took advantage of the high and unencumbered stance of the temple form against the open horizon—the borrowed bigness of cliff-hung structures.

The new design conjures a different magnitude by starting with an extravagantly scaled terrace, only to narrow down successive elements, until at the scale of the topmost platform the small temple can dominate without effort. (Fig. 8.17) We start out in a huge formal space with a winged stoa ahead of us facing outward. This we reach by a steep and monumental staircase. The central portion of the stoa has been reduced to a single screen of columns, and through this we now see another flight of stairs. We are channeled into a gatehouse not unlike the Propylaia on the

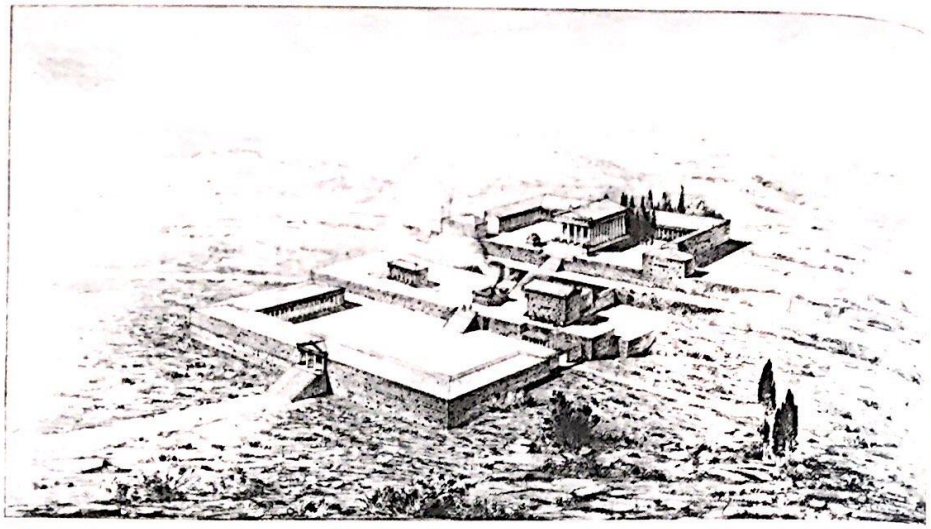
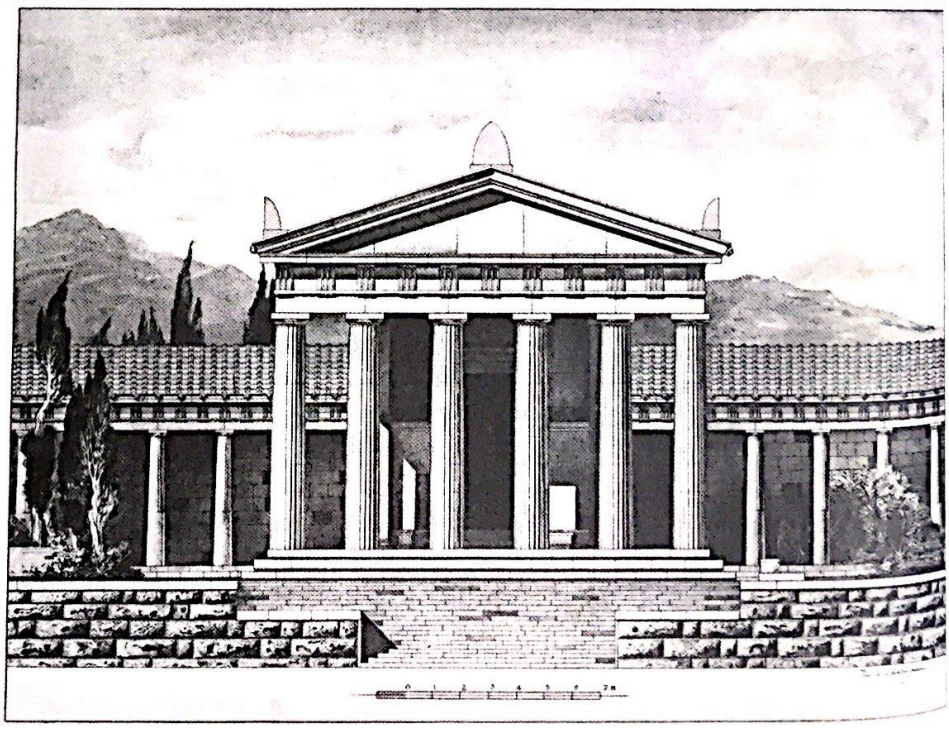


Fig. 8.14 Kos (Greece), the sanctuary of Asklepios, ca. 300–150 B.C.; reconstruction drawing.

Fig. 8.15 Kos, the sanctuary of Asklepios, top terrace with main temple, mid-second century B.C.; frontal view looking southwest, reconstruction drawing.



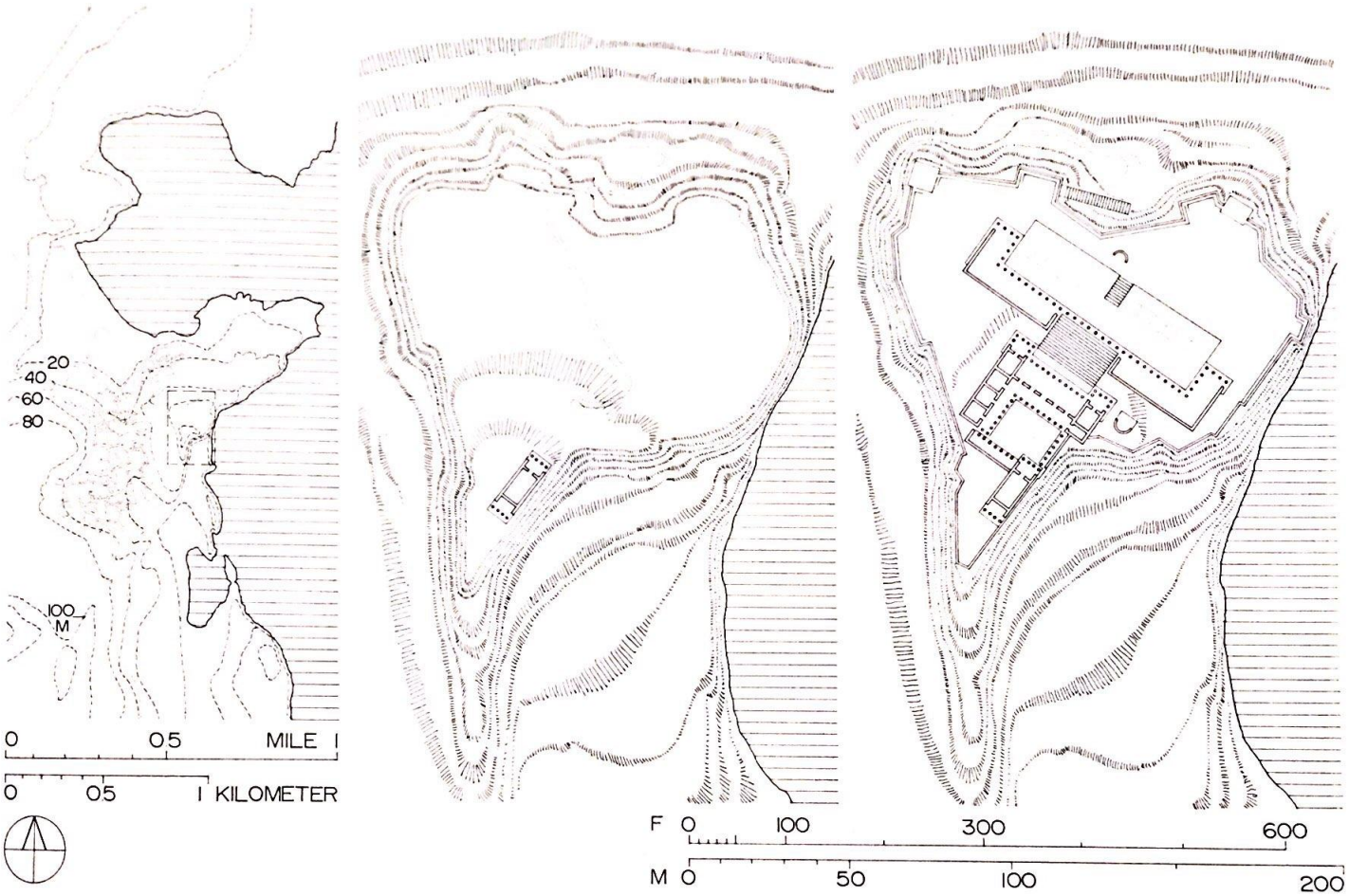


Fig. 8.16 Lindos (Rhodes, Greece), the sanctuary of Athena on the akropolis; plans. Left, the site shown in relation to the modern town and the coastline; center, the site in the sixth century B.C. showing the location of the archaic temple; right, the temple as redone in the fourth century and the additions of the third century.

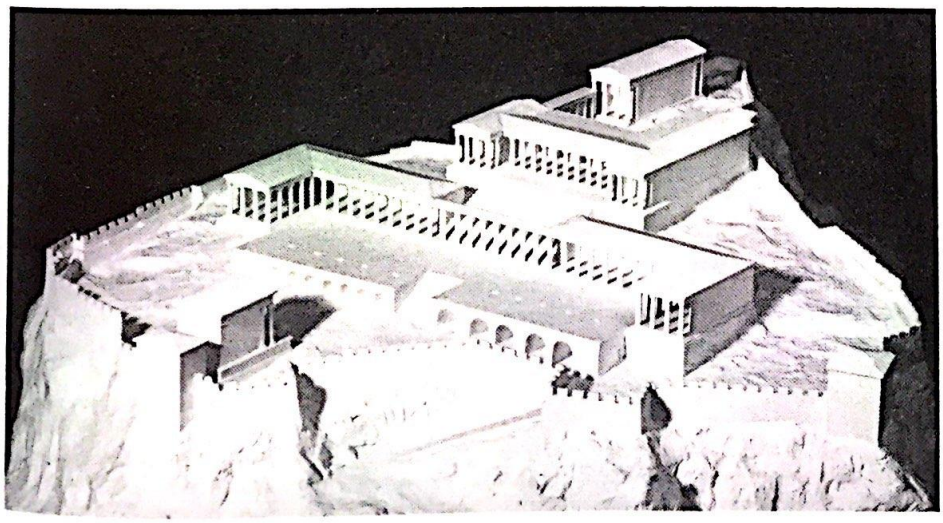


Fig. 8.17 Lindos, sanctuary of Athena seen from the north; model. The temple is at the upper right; the structures in the lower left are Roman additions and were therefore excluded from the plan in Fig. 8.16.

Athenian Akropolis. The inner side of the gatehouse, at the level of the third and final terrace, locks into another system of stoas which defines a small rectangular space. The altar is in the middle and the temple is to the side and back, hugging the cliff-edge to the east.

The contrast between the small, encased temple and this multilevel stage intimates physically the transformed character of the Greek city in the world of Hellenistic kingdoms. The temple and the agora, twin foci of an independent and self-sufficient city-state, were both affected by the princely, centralizing tradition spawned by Alexander's conquests and refined by his successors. Democracy, still thought the ideal form of Greek government, no longer represented real conditions. Royal prerogative touched even the nominally free cities of the Greek homeland. Such august patronage often equated size and ostentation with political prestige. The cities, whether free or subject, began to shape their image in this princely mold. In some ways the Lindos complex is the architectural counterpart of *The Hellenistic Ruler.*

The Noble Metropolis

The fundaments of Hellenistic urbanism were, first, a vastly increased wealth, both corporate and personal, which grew through general trade freshly enhanced by standardized currency and a common language, and second, the willingness of the rich, who monopolized local government, to spend generously for the material betterment of their city. Public funds were set aside for temples, walls, and the planning of municipal services like roads and sewers. But it was mostly civic patriotism that accounted for the evident splendor of most of these cities. Statues of local benefactors were everywhere. The culture that for centuries had declined to commemorate living persons except for victors of the great games now filled sanctuaries, government buildings, and public spaces with rows of wealthy patrons, in bronze or stone or even silver and gold, and even set up special halls of honor for this statuary.

It was now broadly held that respectable cities were invested with noble frames. Self-rule, temples, and a rural territory were no longer enough to make the city. Pausanias in his *Description of Greece* speaks of Panopeus, "a city of the Phocians, if one can give this name to those who possess no government offices, no gymnasium, no theater, no market, no water descending to a fountain . . . ," even though "they have boundaries with their neighbors and even send delegates to the Phocian assembly." The reference to a piped water supply is important. Classical cities with distinguished public monuments, like Athens, could still present a shabby side to visitors because of their lack of public amenities and the rustic look of their residential fabric. The Hellenistic city aspired to be a total work of art.

Determinants of City-Form

The grid continued to be the favorite layout. At the same time a new school of planning introduced a more dynamic organization for hilly sites based on the vertical, three-dimensional alliance of major building groups. The method may have had its origin on the eve of the Hellenistic age in Halikarnassos, the city of King Mausolos, which was disposed like an open-air theater around its bay and was capped by the king's monumental tomb, the famous Mausoleum. (Fig. 1.7) The Attalid capital of Pergamon is the most remarkable product of this school of planning, and we will be looking at it shortly. (Fig. 8.30)

Already a generation or two before Alexander, city walls came to be considered an element of deliberate aesthetic concern, beyond their mere utility. Aristotle in his *Politics* held that "care must be taken that they may be a proper ornament to the city, as well as a defense in time of war." Hellenistic walls have finely turned masonry, often of the "pseudoisotomic" variety that uses alternate courses of differing height; and the introduction of rounded towers should be credited only in part to military advantage. Improved siegecraft and new machines designed on the catapult principle and capable of shooting projectiles at high velocity over considerable distances required larger and more salient towers, as well as an obstructive system of moats and outworks. The citadel of Epipolai at Syracuse proves how superb, technically and visually, the results could be. (Fig. 8.18) Its most vulnerable western approach was defended by three successive rock-cut ditches, a pointed bastion, and, further back, a massive wall with five huge towers to carry the heavy batteries that came into practice in the late third century B.C. In the ingenious network of tunnels and galleries through which these outworks communicated among themselves and with the inner keep, both rock-cut and masonry vaulting were expertly employed.

Classical Greece by and large showed little affection for the arch and the vault. Interest in this form of spanning increased in the Hellenistic period to the extent that architectural programs now involved special problems that could not easily be resolved with trabeation. These had to do with covered units that sloped; underground buildings, like the tombs in the cemeteries of Macedonia or Alexandria, which had to withstand strong external pressure; and terracing, where hollow vaulted chambers were more efficient in leveling and enlarging usable space than embanked fill. Thus arcuate forms remained essentially utilitarian, although there was some timid flirtation with the arch as a decorative element, especially in the design of monumental gateways. A recoverable example is the eastern gate of the agora in the town of Priene that framed a perspective of stoa colonnades. (Fig. 8.19)

It is probably from the use of the stoa along streets that the idea came for avenues with colonnades down their entire length to shelter pedestrians and turn a public thoroughfare into a stretch of urban pomp. (Fig. 12.22b) In addition, behind these covered walks, city authorities would lease shops. The ceremonial street thus doubled as a kind of linear market.

Colonnaded avenues are a late phenomenon in the Hellenistic realm, but the street had long since come of age as a program of architecture. The best of Hellenistic streets were wide and uniformly paved. Their care and embellishment were entrusted to a body of controllers. A law defining the duties of the office survives; it prescribed a 9-meter (30-foot) width for

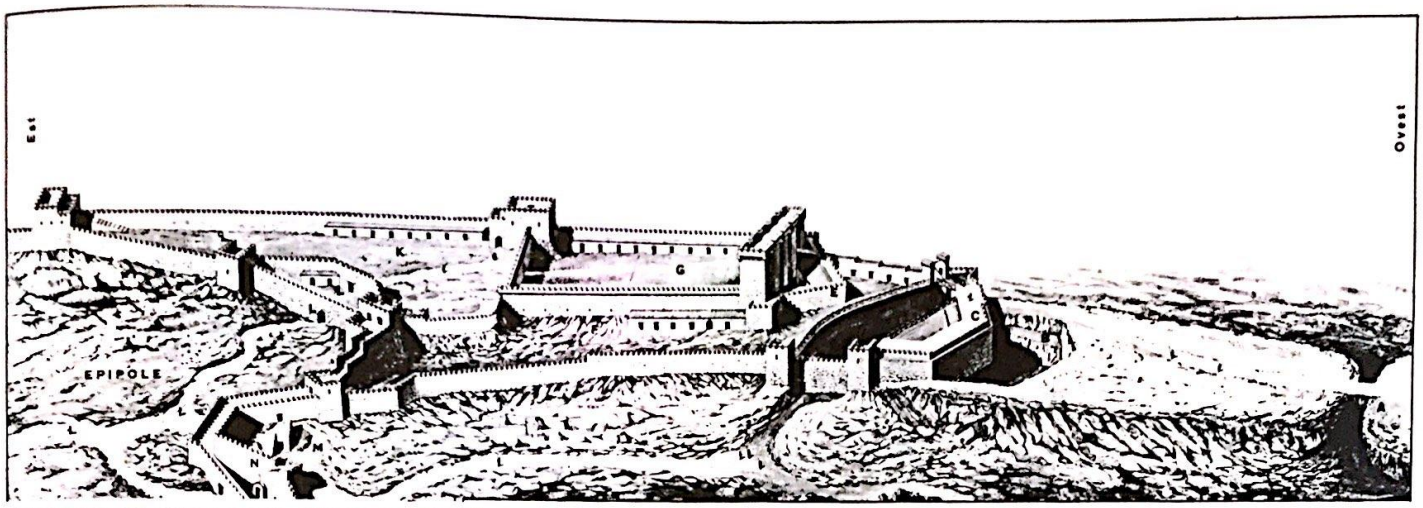


Fig. 8.18 Syracuse (Sicily), the Euryalos fort, which culminated the fortification system of the plateau of Epipolai west of the city proper, fourth–third century B.C.; reconstruction drawing.

main highways and 3.5 meters (12 feet) for secondary roads. Officially, paving was the responsibility of householders. In practice, it is likely that they paid their share of the cost to the city which maintained gangs of public slaves for such purposes.

Handsome fortifications, imposing city gates with a court between their two faces, and colonnaded avenues to link the principal ones among them brought the city-form into a larger context than itself. It was to be admired from the outside as well as from within. The city was an incident along a highway, to be approached in a calculated manner, traversed grandly, and bridged decorously to the next incident.

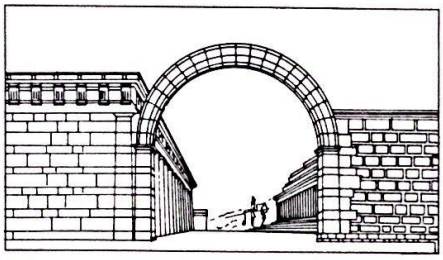
The Persians had already anticipated regional planning in their concept of overland roads, especially the Royal Road from Susa to Sardis which served as the communication axis of their empire, but also in their system of horse-ridden relays with post stops along the way, the choice and placement of the district capitals, and the provision for game preserves and parks in the proximity of springs, lakes, and river waters. The Hellenistic realm was too fragmented for such comprehensive schemes. Nevertheless, landscaping and regional design should figure in any environmental account of the age.

There is the story about the architect Dinokrates, for example, and the project he submitted to Alexander that proposed to shape Mount Athos into the figure of a man holding a fortified city in one hand and, in the other, a huge vase that would collect the mountain streams and pour them into the sea. We also know that the main extraurban sanctuaries were formally connected by large roads with their cities—Didyma with Miletus, for example, and the Asklepios complex we have analyzed above with the town of Kos. Moreover, the law concerning the office of town controller saw fit to regulate the width of country roads. There are also famous instances of planning ingenuity, like the causeway of the Heptastadion, which brought together Alexandria and Pharos Island, or the lighthouse from which the island derived its name, one of the seven wonders of the Greco-Roman world, which put Alexandria in the arc of the Mediterranean.

Closer at hand the tenets of Hellenistic design dictated how buildings might contribute visually to the principal avenues they fronted on. There were two parallel concerns in this respect. Older buildings were suitably reclothed, and sometimes units of disparate scale and form were pulled together by a common colonnaded front. At the same time entrances to the new public buildings were made into events, with stately gates and forecourts leading in from the street.

A comparison of two plans of the Athenian agora, as it existed in about 400

Fig. 8.19 Priene (Turunçlar, Turkey), eastern gate of the agora, second century B.C.; reconstruction drawing.

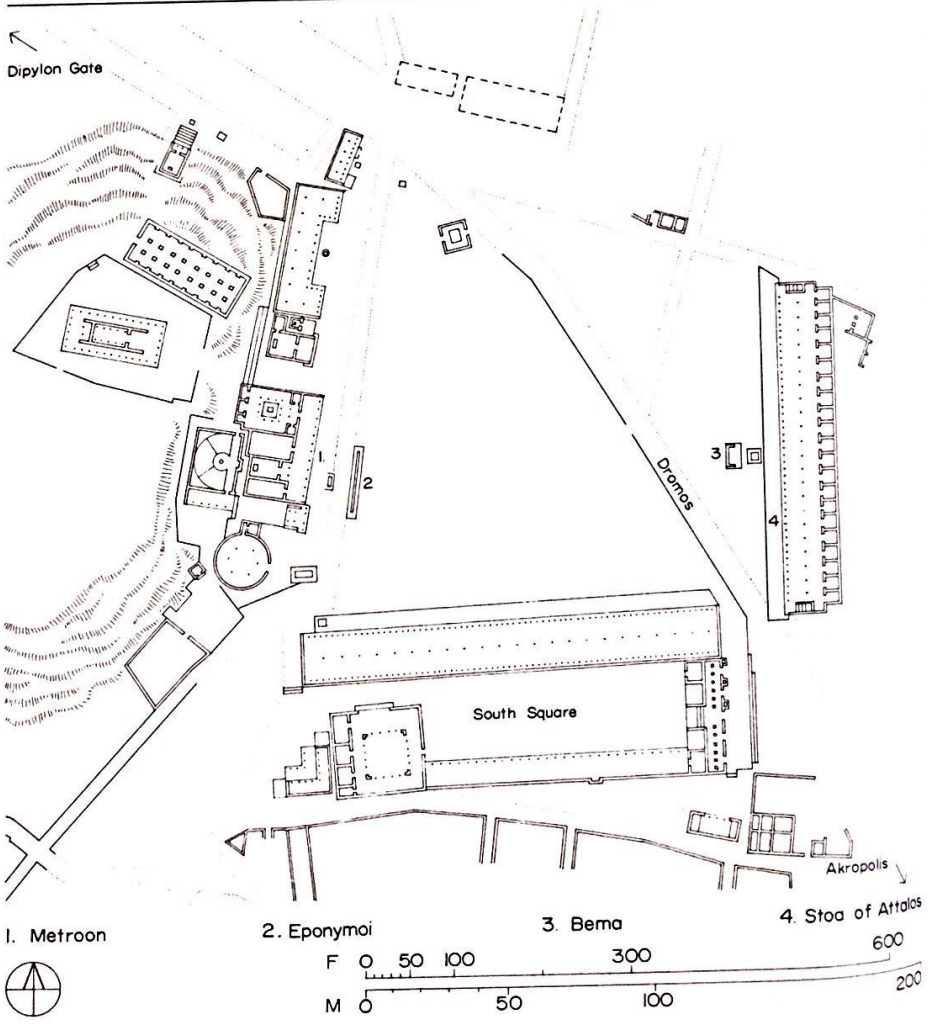


B.C. and again at the end of the first century B.C., demonstrates what Hellenistic design did to inherited patterns. (Fig. 7.15, 8.20) The bent stoa on the south side, yielding to the path of the Panathenaia as it headed toward the Akropolis, has now been straightened, and another stoa further north has pushed back the odd-shaped public space. This constriction was made up for by the removal of private houses and shops east of the *dromos* and the containment of this east side of the agora by a splendid two-aisled stoa, a gift of the Pergamene King Attalos II who had studied at the Athenian Academy in his youth. Before it, a speaking platform or *bema* was set up. On the west side a *metroon* or archive building was built next to the bouleuterion group, and a continuous colonnade masked irregularities of elevation and roofline. In front, across the street from this complex, stood the two-sided base for the statues of the *eponymoi*, the heroes after whom the ten Attic tribes were named. Finally, the two southern stoas were connected by an eastern building and enclosed a formal square which most probably served as a commercial agora, thus segregating this kind of activity from the agora proper, as Aristotle recommended.

The council hall of Miletus was the donation of King Antiochus IV and was built to the north of the Great Stoa between 175 and 164 B.C. (Fig. 8.21) It was of the theater type introduced at Athens in the late fifth century B.C.; but whereas the arrangement of the seats there had been facilitated by the rising ground of the hill to the west of the agora, at Miletus the theater form had to be built up on level ground. Externally, the building was organized in two registers. The lower was treated as a tall plain base. Above this the wall was divided into bays by an engaged order, Doric interspersed with some Ionic details; decorative shields filled the top of alternate bays except on the facade, looking east, where shield bays and bays perforated by windows were grouped in an intricate rhythm. This long rectangular hall on its masonry podium, with its two pediments and the surrounding engaged colonnade, resembled a temple, and in fact temples with the peristyle columns attached to the external cella walls, "pseudoperipteral" as they were called, had made their appearance in the third century B.C. and would become a favored variant of Roman religious architecture.

But what is perhaps more important about the bouleuterion for the present discussion is that it was designed to occupy one side of a court lined with colonnades and entered on axis through a very ornate gate that held a porch of four Corinthian columns. In the middle of the court was a low and lavishly decorated tomb-shrine (or possibly an altar). The gate, the forecourt, and the attention paid to the design of the exterior surfaces of the council chamber are all Hellenistic gestures toward the decorous and monumental treatment of public spaces and the buildings chosen to grace them.

Fig. 8.20 Athens (Greece), the agora at the end of the first century B.C.; plan.



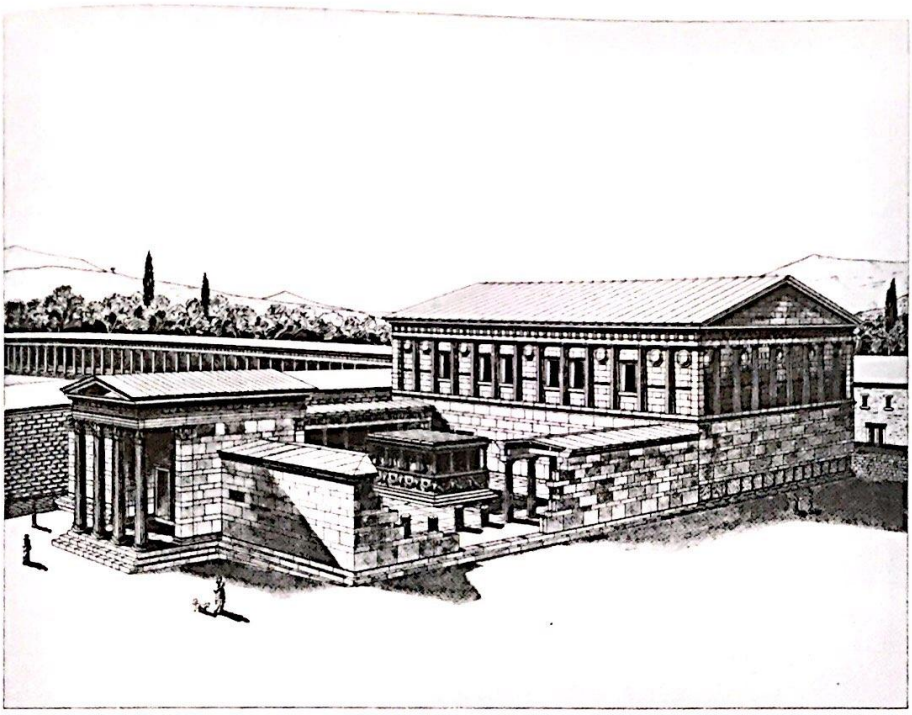


Fig. 8.21 Miletus (Turkey), bouleuterion or council hall north of the Great Agora, ca. 170 B.C.; reconstruction drawing.

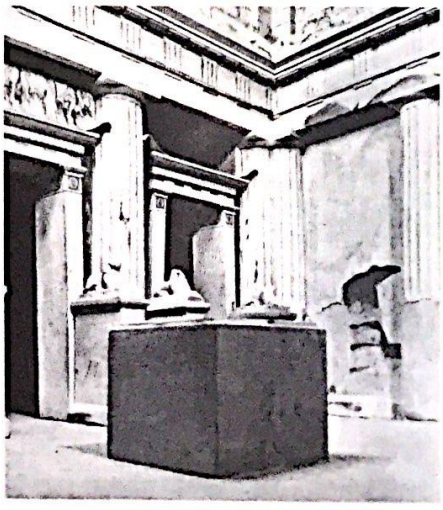
Building Types

Like the council hall, the temple, and the stoa, the standard list of buildings in Hellenistic cities was inherited from older Greece; the difference in the Hellenistic era was in the elaboration of each type. Fountains and well-houses were turned into urban showpieces and often worked into the general design of streets and public spaces. Baths, already familiar by the fifth century B.C., acquired the distinctive sequence of cold, tepid, and hot rooms which will characterize Roman baths. Plutocracy and monarchy gave fresh impetus to tombs of a size and lavishness not encountered in Classical times. The underground tombs of Macedonia were often domed structures with impressive funerary programs that included mural paintings and a wealth of precious objects. The tombs of Alexandria contained opulent rooms that imitated, albeit a little fancifully, contemporary domestic interiors. (Fig. 8.22) At Palmyra there were tower tombs of several storeys, with the vaulted lower storey opening to the exterior. And dynastic monuments of burial, like the Mausoleum, could be very grandiloquent indeed.

Perhaps no other Greek building received as much imaginative attention as did the theater. Hellenistic society loved spectacle. The chief preoccupation of its architects was with creating a world of grand display—in the streets, in the agoras, and in the temple precincts. Much of this effort was illusionist, that is, more concerned with surface appearance than structural integrity. In its reliance on highlighting, color, perspective vista, and an abundance of luxuriant ornament, Hellenistic architecture approached the freedom of the pictorial arts. And nowhere was this freedom more cavalierly indulged than in theater design where painted scenes of buildings, built scenery, and the functional architecture of seating, stage, storage spaces, and the like coexisted within the same frame.

Although all of the Hellenistic scenery has of course disappeared, we get a fair idea of its virtuosity from wall paintings in wealthy houses where theatrical motifs were very popular. (Fig. 8.23) If the painters could slip into fantasy more easily than the limits of executed architecture would allow, it was obviously on the actual built world that this fantasy was based. Broken, hollow, segmental, and volute pediments; spirally wreathed columns; the mixing, miniaturizing, and attenuating of orders; arched architraves; arcades on columns; the inexhaustible variations of the engaged style; the reliance on landscape features and small pavilions; artificial bowers and grottoes; round *tholoi* in rectangular colonnaded

Fig. 8.22 Alexandria (Egypt), rock-cut Hellenistic tomb, late third century B.C.; interior view of model. (National Museum of the Gold Coast)



courts—all these were devices that the painter of architectural scenery and the designer of architectural reality shared between them. (Fig. 8.24)

But beyond the elaboration of standard building types, there were demands for new buildings as well. Setting aside statued settings for choral performances and the like (and also special buildings like the lighthouse in Alexandria or the octagonal Tower of the Winds at Athens), the primary impetus for invention was athletic-educational or commercial.

The principal new building type in the first category included the *gymnasium* and other more specialized institutions like the wrestling school or *palaestra*. The gymnasium housed educational facilities, both of the body and mind. Every Greek or Hellenized city had one or more of these structures, which came to represent civic maturity. The type consisted essentially of a large open space lined with stoas, of which one might serve as the *xystos,* or covered running track. Cloakrooms, anointing rooms, classrooms including lecture halls, and baths usually occupied the units behind the colonnades or were loosely attached to this main core. (Fig. 8.25, nos. 5–9)

Flourishing trade sought its own architecture. For this and similar functions large covered halls were developed which dispensed with exterior colonnades and concentrated on usable interior space. Several examples are found on the island of Delos, an important trading post that became the center of the Aegean grain market when the Romans declared it a free port in 136 B.C.

The so-called Pythion seems to have been built in the third century B.C. to contain a warship commemorating some naval victory. (Fig. 8.26) It was a long narrow hall with a pitched roof, most of it devoted to the ship. A back porch was separated from this main space by two columns engaged to the walls and two others in the middle engaged to piers, which held on their inward sides sculptured capitals of kneeling bulls. They remind us of the bull capitals of Persepolis, but such interchanges between Hellenistic architecture and that of older native traditions were rare. Lindos may have learned from the precedent of Deir el-Bahri, and the main facade of Didyma with presentation window and two flanking doors

Fig. 8.23 Boscoreale (Italy), villa, room with wall paintings of the late first century B.C. (Metropolitan Museum of Art, New York)

may have been influenced by New Kingdom palace facades. But it seems that, despite Alexander's platform of cultural assimilation, the Greek conquerors chose to remain racially aloof, with their architecture pure.

Another Delian example, the so-called Hypostyle Hall, was a mercantile exchange (Fig. 8.27) It was a rectangular building entered from one of the long sides, where much of the wall had been opened up by a Doric colonnade. Internally, there were 44 columns arranged in two concentric rectangles that repeated the shape of the hall, each with a continuous wooden architrave, as well as a row of columns along the middle line except for dead center. The eight columns that defined the central square carried a second storey of supports that formed an open lantern above the main roof. This is one of the few demonstrable cases of the Greek use of clerestory lighting. The building proves the limitations of the post-and-lintel system in the creation of large unobstructed interior spaces. This is an architectural task at which Roman technology will excel.

Delos is a prime site for the study of Hellenistic houses. (Fig. 8.28) With the exception of a house type that occurs at Priene

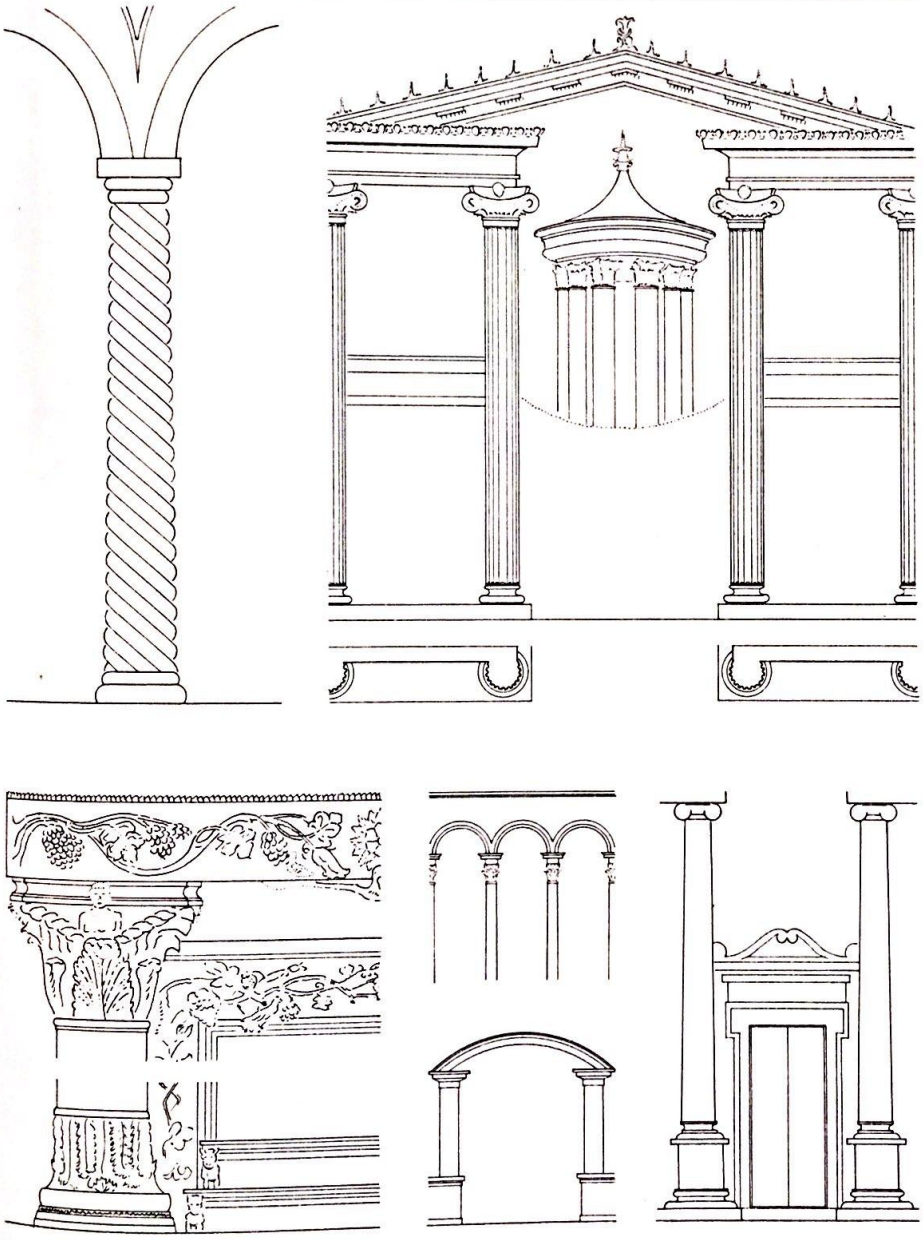


Fig. 8.24 Architectural motifs of the Hellenistic period, including: top left, the twisted column; top right, the engaged column and the broken pediment; bottom center, the arcade on columns and the segmental pediment.

where the megaron form reappears as the major room, the affluent Delian house is fairly typical for the age. Its chief element is a peristyle court with marble columns of equal height on all four sides. Sometimes there were two storeys, and in a variation called "Rhodian" the columns of one side of the peristyle would be taller than the rest. Often a cistern beneath this court collected water from the roof. Running water is absent; the latrine emptied into the public drains below street level.

Where these Hellenistic houses differ radically from their Classical forebears is in the richness of their appearance. In the interval, the distinction between public art and private austerity had fallen by the wayside. Fine mosaic floors of colored stones cut to shape replace the earlier, and rather rare, pavement of natural pebbles. Here the walls are stuccoed and painted to imitate marble incrustation, and on occasion there are architectural motifs and other devices drawn from the repertory of theater decoration. The so-called House of Masks displays mosaics with dramatic subjects. One shows a flute player on a rock and a dancing figure; another, Dionysos riding a panther. (Fig. 8.29) The plan incorporates an additional small peristyle that might have been the center of the women's part of the house. The precise function of the rooms is hard to identify, but Vitruvius, in his detailed description of the Hellenistic house, mentions the *oecus magnus* where the family weaving was done, the *andron* or dining room, a lecture room on the east, a picture gallery, a library, a garden with its own dining room, and guest rooms arranged to ensure privacy when it was desired.

Pergamon and Rome

We cannot talk of the Hellenistic world without referring to the Romans, whose attention turned to the kingdoms of Alexander as soon as the main rival in the west, Punic Carthage, had been contained. Rome was not an upstart state; nor was it unfamiliar with things Greek. A republic that had practiced self-rule for three centuries, it had long stood in the shadow of the Hellenized Etruscans and the Greek cities of Sicily and southern Italy. But the tables had been turned: Rome had come to control what it

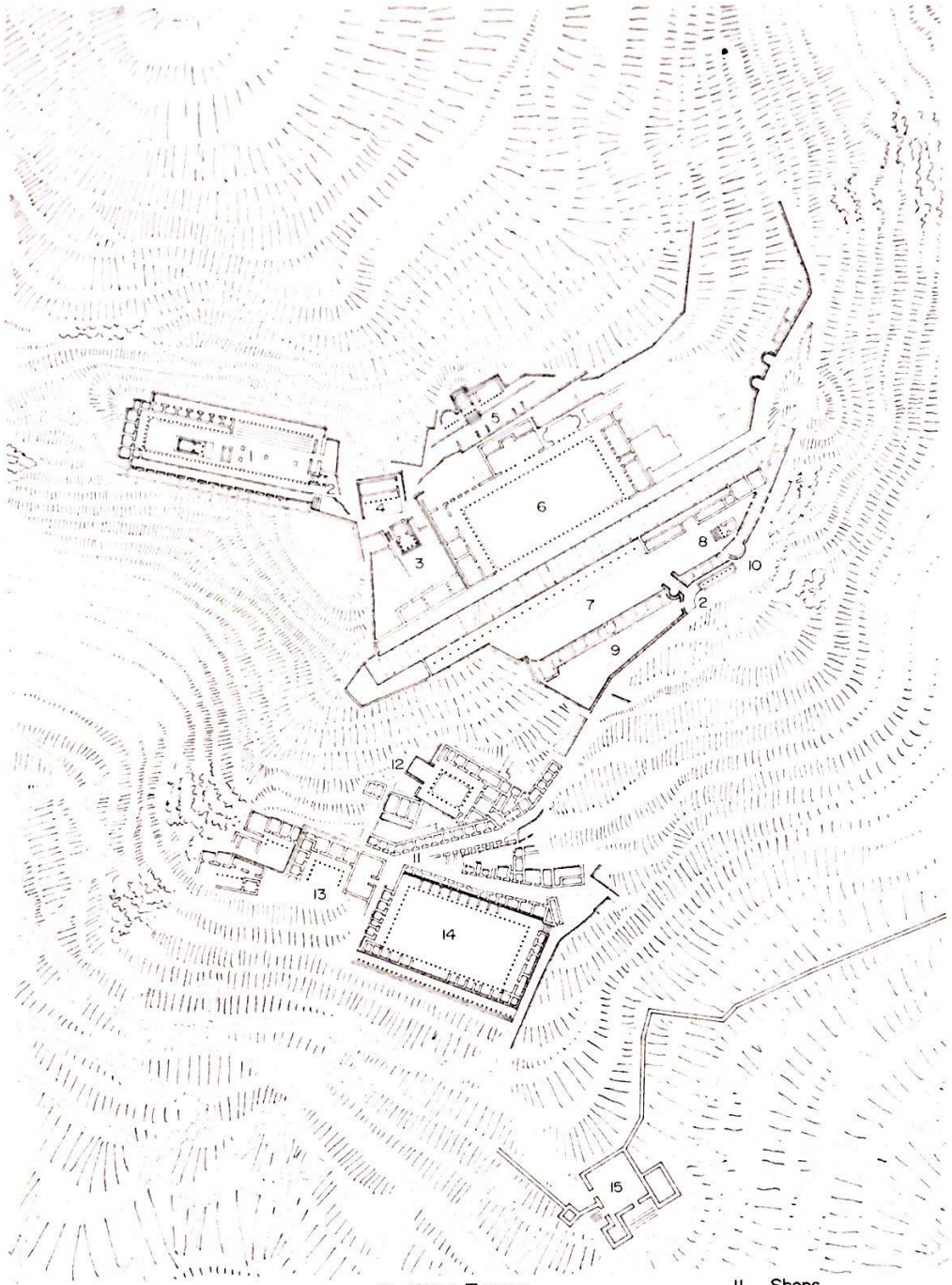


Fig. 8.25 Pergamon (Turkey), capital of the Attalid dynasty, 282–133 B.C., the lower town; plan. Nos. 5–9 are parts of the gymnasium complex.

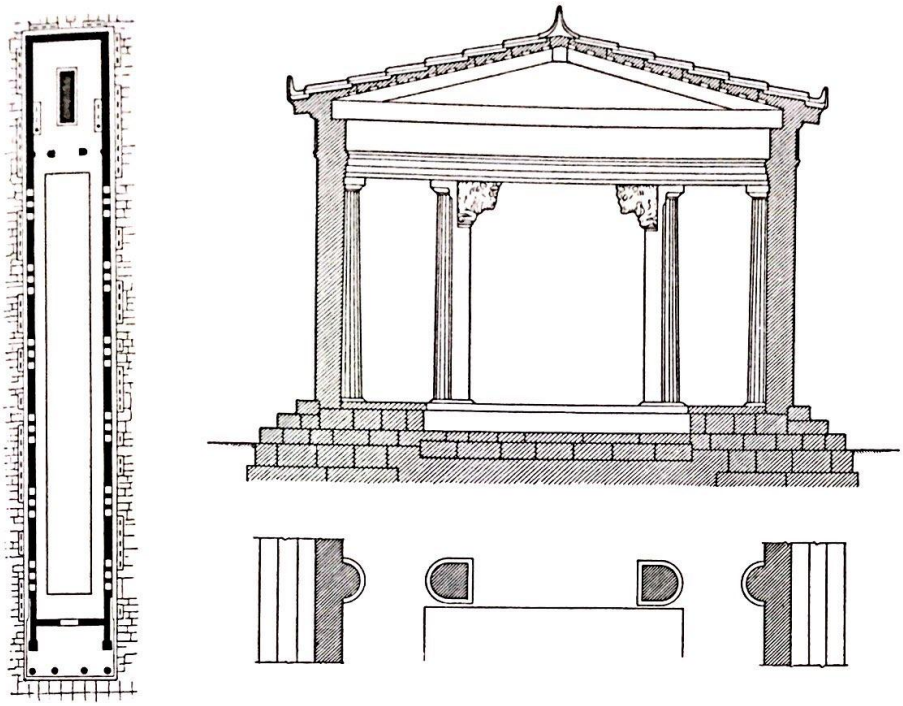
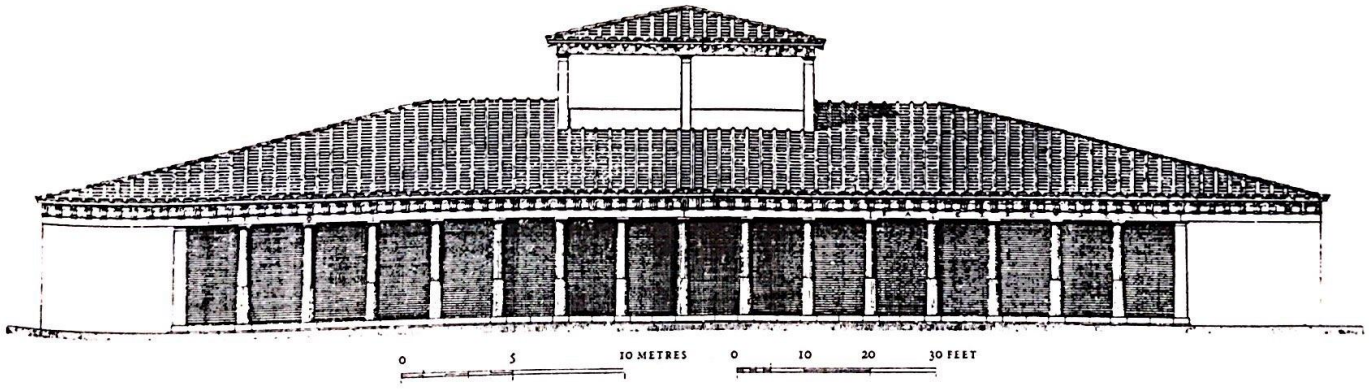


Fig. 8.26 Delos (Greece), Pythion or Sanctuary of the Bulls, exhibition hall for a war galley, probably 306–301 B.C.; ground plan and section.

Fig. 8.27 Delos, hypostyle hall, probably a merchants' exchange, ca. 210 B.C.; restored elevation of exterior.



had been swayed by. And then, when it was sole master of its side of the Mediterranean, the powerful, austere Roman republic ventured East. In these ancient lands, it immediately clashed head on with two seductive and sinister forces: autocracy and luxury. The lands—Greece, Asia Minor, Syria, and Egypt—were subdued and annexed in less than two hundred years. But "the conquered Greeks," the Roman poet, Horace, confessed, "in turn made captives of the conquerors." Rome succumbed first to the opulence of Hellenistic cities, and in time it imported the other Trojan horse as well, the model of absolute rule for which grand architecture is the common advertisement.

It was an epic confrontation, might against culture. The Romans recognized the difference but refused, for the record at least, to feel inferior. Their goal as a nation lay elsewhere. In the words of Virgil,

Others, no doubt, will better mold the bronze
To the semblance of soft breathing, draw
from marble.
The living countenance. . . . Remember,
Roman,
To rule the people under law, to establish
The way of peace, to battle down the haughty,
To spare the meek. Our fine arts these, forever.

But proper Rome, bent on extolling piety and manliness, could not remain immune from the wiles of fashion. Gleaming marble-sheathed buildings, colonnaded avenues, the princely scale of terraces and porticoes, the glitter and sophistication of Hellenistic art—all this worked on their righteous will. First within the private world of the house and then publicly, *virtus*, the republican concept that combined stoic resolve and a sense of virtue, made room for *venustas*, the touch of beauty. And when the repudiation of that old Spartan age was an accomplished fact, it was felt as a poetic loss, an innocence to be vaguely yearned for.

Those were the days [wrote Juvenal] when the
soldier,
Rough and tough, neither knew nor cared for the
art of the Greeks
And Jupiter made out of clay,
Undefiled by gold, proved that he cherished his
people.

The first and most loyal ally of Rome in the East was the Attalid kingdom of Pergamon. One of the petty principalities that surfaced in the wake of Alexander's death, Pergamon prospered under an energetic, ambitious dynasty. While extending its authority over most of the Aegean coast, the Attalids turned Pergamon into a showcase of Hellenistic urbanism. With wealth derived from tribute, home industries like animal husbandry and textile manufacture, the pitch deposits of Mount Ida, and state-owned factories manned by slaves and serfs, the rough mountain stronghold was made, in but a hundred years, into a spectacularly terraced and appointed metropolis that exploited its difficult terrain with a flare unparalleled in the Greek world except perhaps in Periklean Athens. (Fig. 8.30)

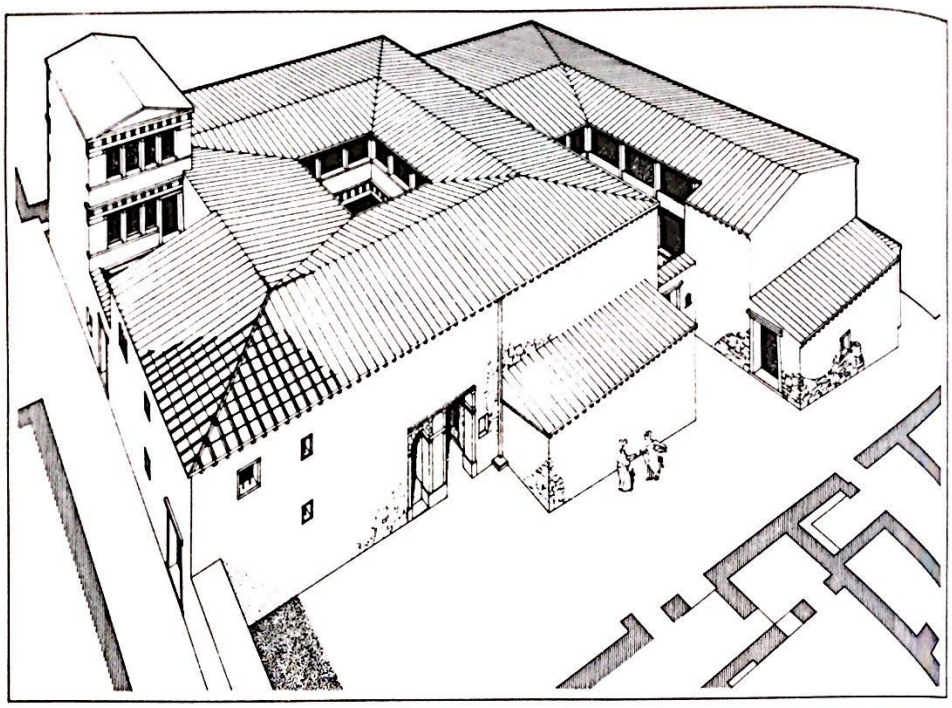


Fig. 8.28 Delos, House of the Comedians, ca. 125 B.C.; reconstruction view.

And it was Athens that Pergamon had set out to emulate. Its home goddess was Athena; its prevalent order, the by now outmoded Doric. Athenian sculptors came to work on the Great Altar of Zeus, and a replica of Phidias' great statue of Athena for the Parthenon stood in the famous library with its 200,000 volumes mostly of parchment mass-produced locally. In fact, in Pergamon an associative revival of the past was cast in a brash, raw brilliance of architectural and sculptural innovation.

To juxtapose the city-form of Rome and that of Pergamon should bring into focus the two cultural poles of the Mediterranean in the late second century B.C.

Rome was a matter-of-fact city of sensible buildings and sensible mores. Its religion was eclectic. The temples were Etruscan in form, made of mud-brick and timber, and decorated with sculptures of rather garishly painted terra-cotta. The city walls were built of local tufa, porous and dark but ruggedly appropriate for this pragmatic community of several hundred thousand people. (Fig. 8.31)

There had never been a master plan for Rome. The city came about through the merger of several hilltop settlements of

Fig. 8.29 Delos, House of Masks, second century B.C.; mosaic floor panel showing the god Dionysos astride a panther.

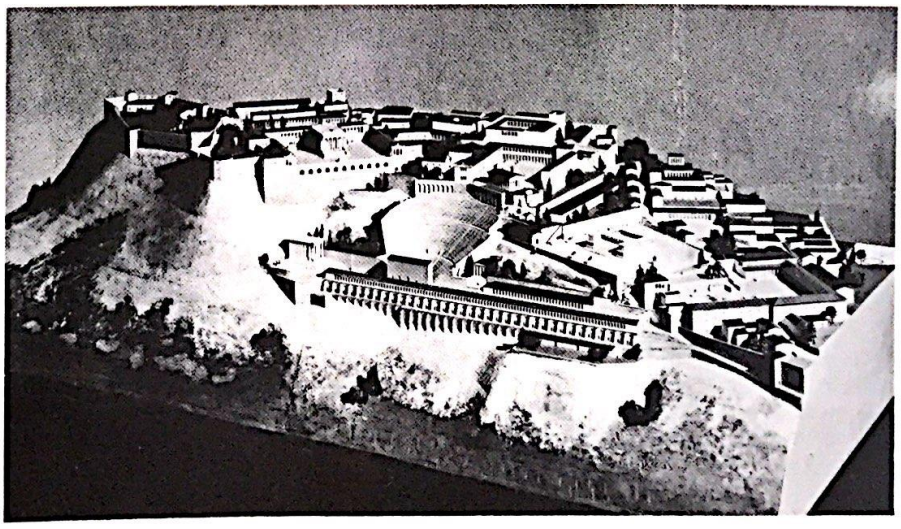


Fig. 8.30 Pergamon, view of the city from the west; model. (Staatliche Museen, Berlin)

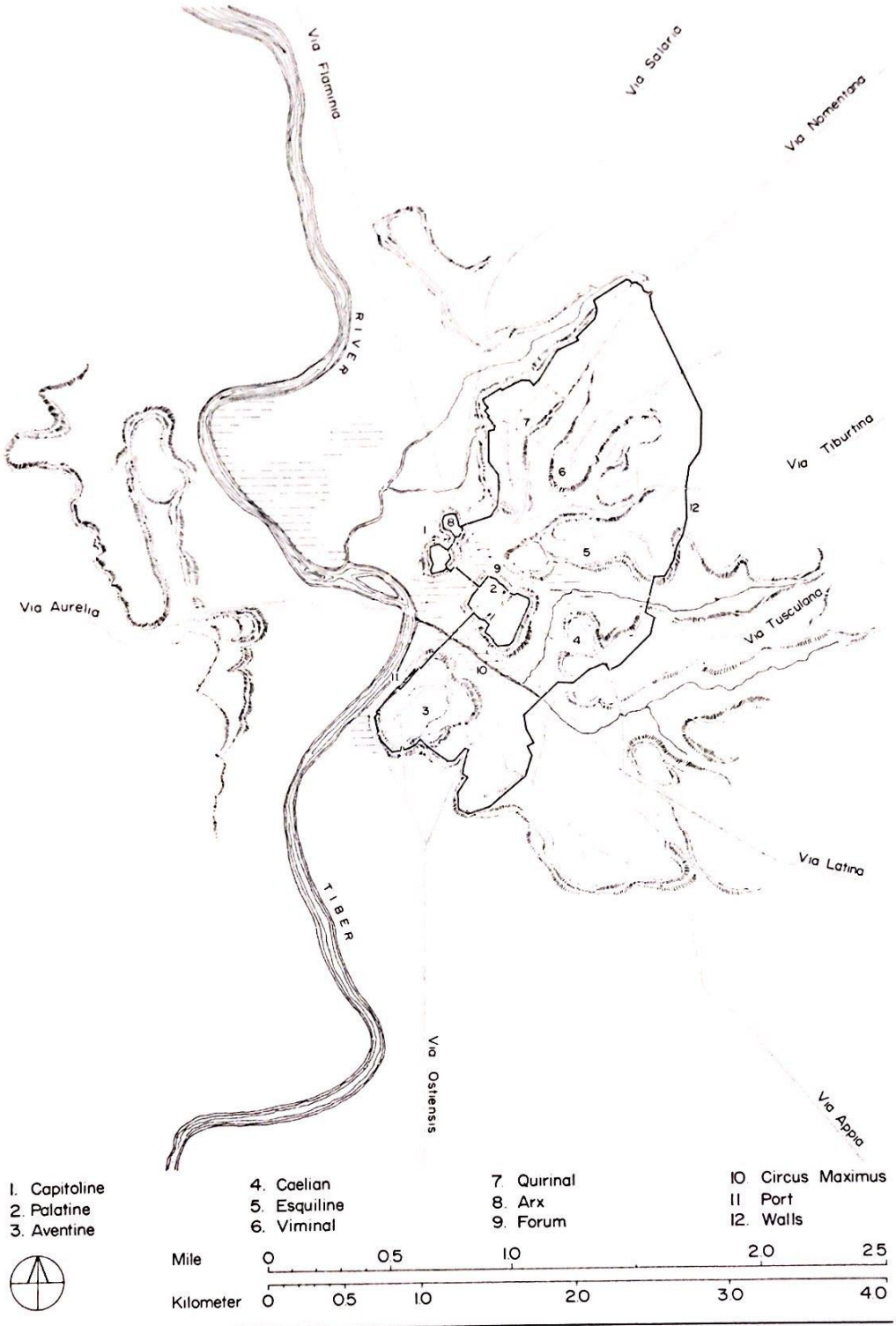


Fig. 8.31 Map: Rome, topography and general layout of the city in the Republican period. The walls shown are of the fourth century B.C.

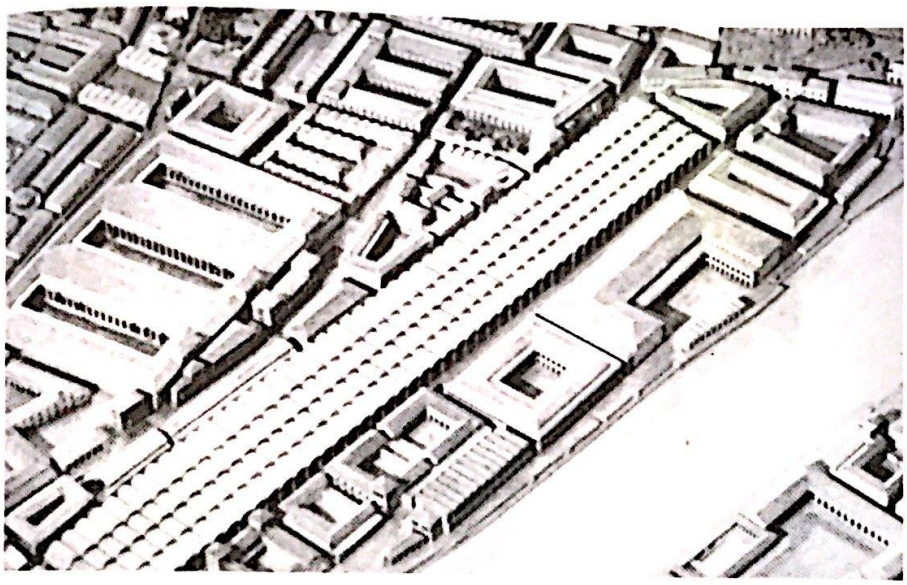


Fig. 8.32 Rome, the Porticus Aemilia, second century B.C.; detail of a model of ancient Rome showing the port area at the foot of the Aventine Hill (no. 3 on Fig. 8.31). (Museo della civiltà romana, Rome)

shepherds and farmers, with the valley in between them serving as the common center of government, the Forum. There stood a number of temples; two basilicas or multipurpose assembly halls where law could be administered; and a small, unpretentious brick building for the Senate, the principal arm of republican government. On a rock that towered on the west was the *arx*, or akropolis, with the temple to the Roman trinity: Jupiter Optimus, his wife Juno, and Minerva who was the double of Athena as the others were of Zeus and Hera. On the south side, the Palatine hill was dotted with the houses of the wealthy, each looking inward upon its atrium. In the valley between the Palatine and another hill, the Aventine, lay the Circus Maximus, a course for chariot races.

The port facilities gathered in the strip of alluvial bank between the Aventine and the Tiber. (Fig. 8.32) The grain, oil, and wine from the Roman possessions arrived at the harbor town of Ostia and were then transported on river boats to warehouses at the port. For such utilitarian buildings the Romans employed a new artificial material called concrete, a viscous mixture of sand, lime, and water toughened by an aggregate of rubble. It was poured on wooden formwork and allowed to cure. The shapes so produced were nearly monolithic and fireproof, if inelegant. In the meantime, in the popular quarters of the congested city, people lived in tall tenements of half-timber construction, five to six storeys high and prone to raging fires.

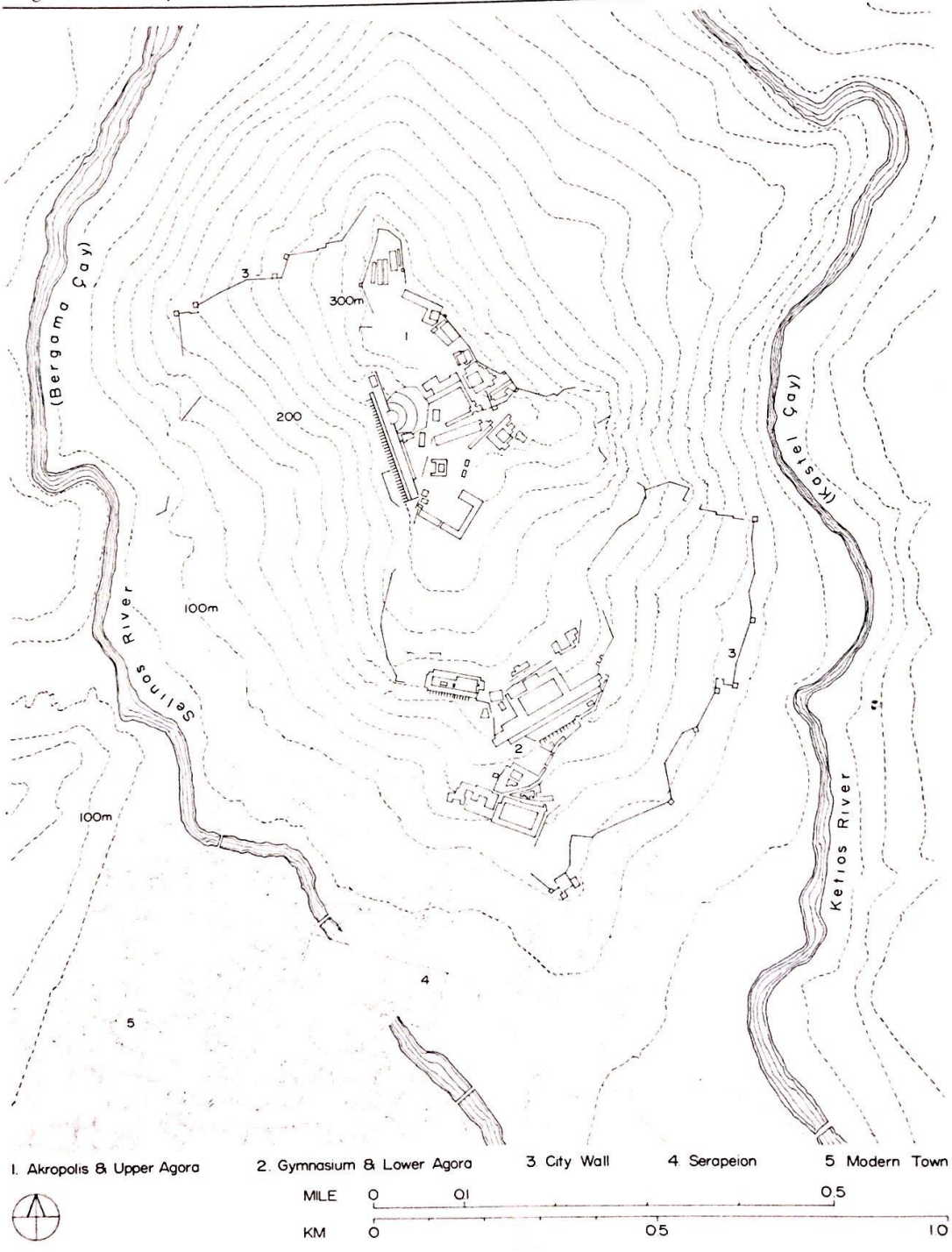
Pergamon was a young creation. It was a calculated work of urban design and its aim was to dazzle. All public buildings were framed by porticoes and set on platforms that locked into one another. The building materials were marble and the handsome volcanic andesite quarried locally. The theater in the upper part of town was the only urban element to accept the precipitous land just as it was. The rest was all contrived.

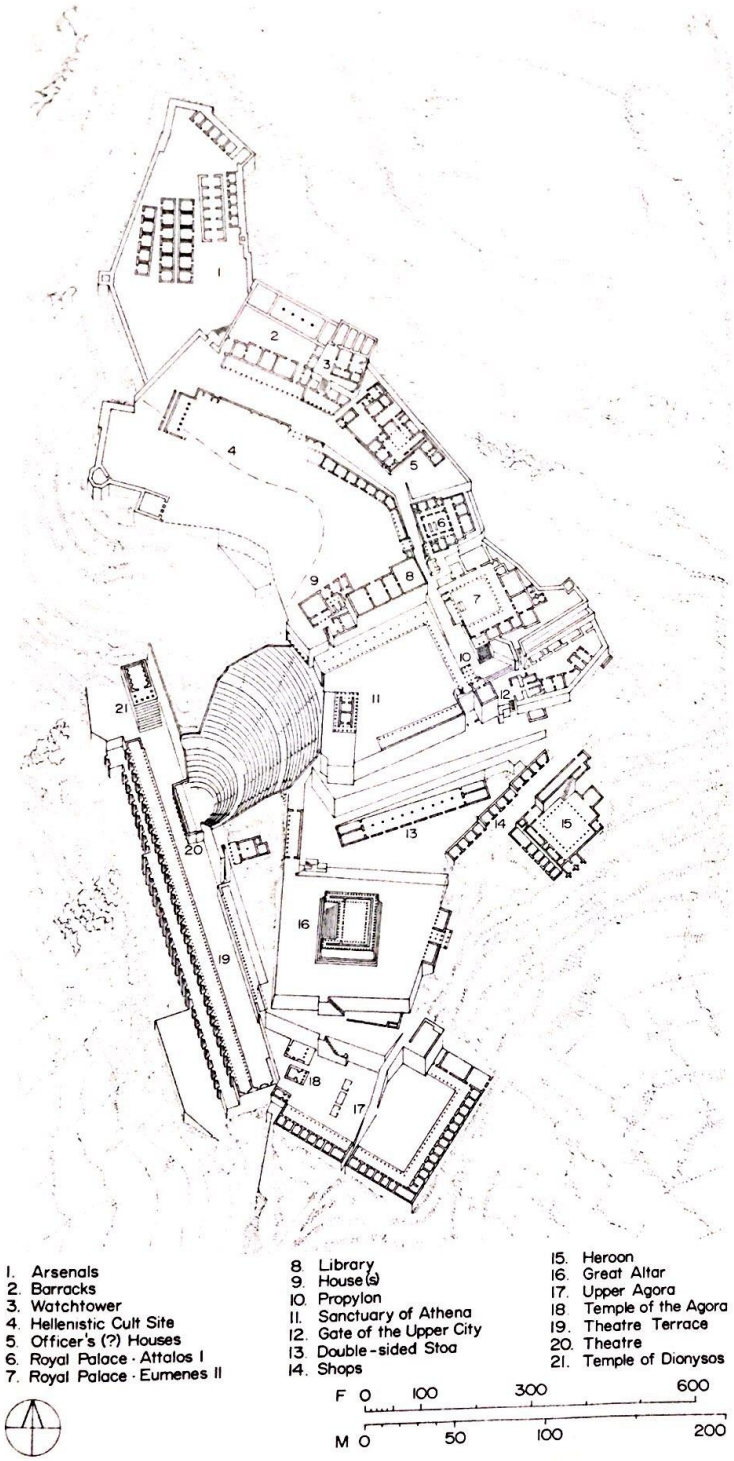
The site of Pergamon is a narrow mountain ridge encircled by river tributaries and backed to the north by the long range of the Madras chain. (Fig. 8.33) The main prospect is toward the south where at the foot of the ridge we see the flatland of the later town, the cemeteries, and, across the valley of the Selinos, a sanctuary of the healer god Asklepios at ease with the calm of the earth as at Kos. The Hellenistic city started at the summit and the easy south slope, some three hundred meters (1,000 feet) above sea level, and spread out through the years to the lower reaches of the west slope and the plain of the Kaikos. By then the city was Roman.

The development of Pergamon should be seen as a downward cascade from the summit where the original stronghold had been in the late fourth century and where the Attalid palaces were later to be built. (Fig. 8.34) On a shelf to the north, just below the summit and totally inaccessible from without, arsenals and storehouses found their proper place. On the next natural level south of the summit, on an emphatic outcrop of rock, the temple to Athena perched early on. The theater was cradled in the steep cavity of the western precipice. This is where the town ended in the first half of the third century, except for a sanctuary of Demeter on a natural terrace that briefly stopped the fall of land southward, a short distance above the riverbeds.

It was this extramural level that occupied Attalos I (241–197 B.C.) and his wife Apollonia. A 90-meter (300-foot) long stoa along the south side of the Demeter precinct at once retained and monumentalized the land shelf and supplied a prototype for all the later interventions that gave Pergamon its matchless appearance. The principles were few and apposite. The architecture was not to violate natural contours but to fortify their inherent design. Terracing was not to be achieved by brutish embankments that offered blank surfaces to the approaching visitor. While the inner face of the stoa at the top of the retaining work opened up its colonnade in the direction of the principal building, the outer face would be similarly cadenced toward the stunning prospects of the south; and below this level an underground gallery lit by windows would exploit the fall of the ground, resting on a

Fig. 8.33 Pergamon; site plan showing the relation of the Attalid city to the modern town of Bergama. The Serapeion (no. 4) is a Roman rebuilding of the sanctuary in the second century A.D.





basement level of more mundane utility. The vertical buttresses that reinforced the embankment were to be shaped and spaced purposely in order to articulate the upward rise of the terrain and form panels that might contain monumental sculpture, fountains, and the like. Finally, the roof of this multistoried structure would be kept low enough so that it would not block the view from the stoa on the far side of the same terrace.

This preliminary solution for the Demeter sanctuary sparked the program of Eumenes II (197–159 B.C.) during whose long reign and that of his successor Attalos II (159–138 B.C.), patron of the eastern stoa of the Athenian agora, the city was spectacularly transformed. A gymnasium complex to the east of the Demeter precinct and a lower agora close by indicate the spread of the city at this date. In the upper city, the original agora was encased by stoas, as was the temple of Athena. Between this agora and the temple to Athena, the Great Altar of Zeus and All the Gods sat on its own vast terrace, while at the level above the sanctuary of Athena and its library annex an additional terrace held a cult of now unknown identity, which was buried under the later temple to the Roman Emperor Trajan. This great fan of terraces and buildings was riveted by the theater, and a paved esplanade, which wended its way uphill in sharp bends to follow the natural configuration, linked the lower town with the akropolis.

The esplanade started at the main city gate in the latest ring of walls which hugged the southeastern skirt of the ridge. It was the point toward which the thoroughfares of the Kaikos Valley led. Just within was the lower agora. Then the road passed through rows of shops and skirted the triple terrace of the gymnasium. Access to the intermediate terrace could be gained by means of vaulted stairs to the west of a beautiful fountain at

Fig. 8.34 Pergamon, upper town in the second century B.C.; plan. The Romans raised a large temple in honor of Emperor Trajan over the Hellenistic cult site indicated as no. 4.

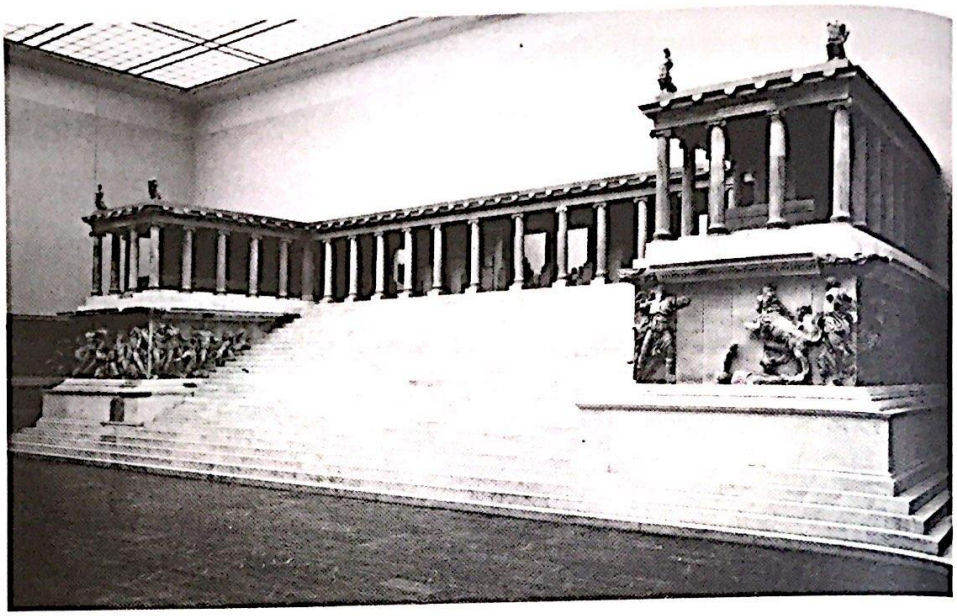


Fig. 8.35 Pergamon, the Great Altar of Zeus and All the Gods (no. 16 on Fig. 8.34), first half of the second century B.C.; as reconstructed in the Staatliche Museen, Berlin.

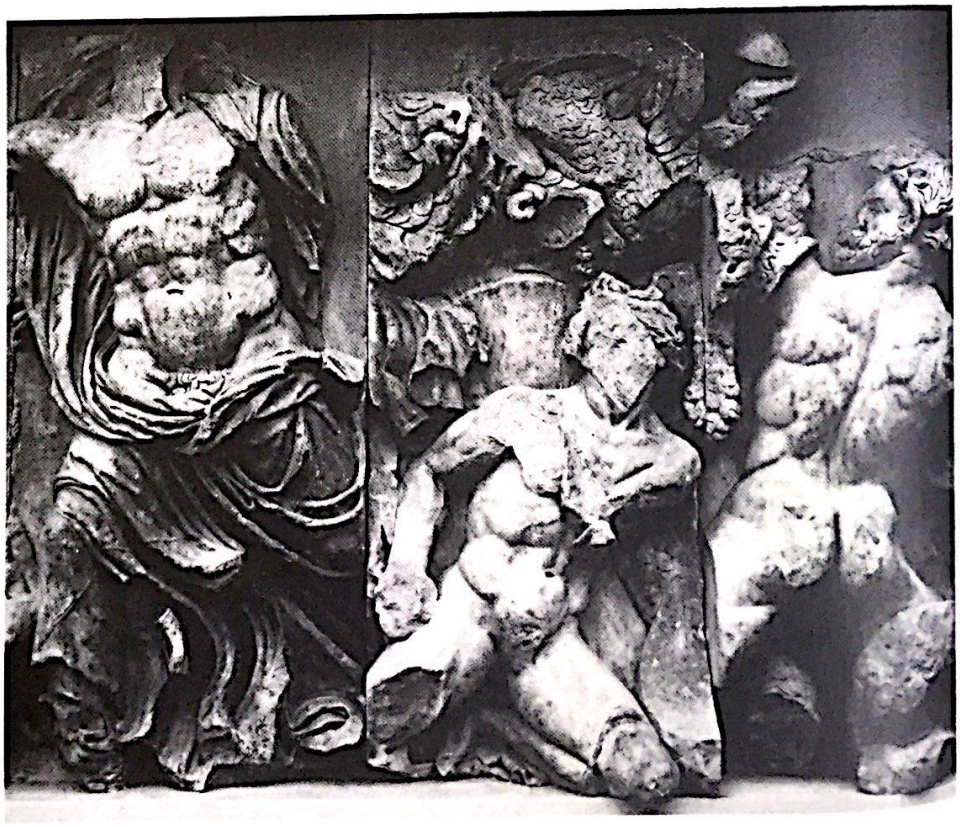


Fig. 8.36 Pergamon, Great Altar; detail of the major frieze showing the battle between the Greek gods and the race of giants who challenged them. The towering figure to the left is Zeus. (Staatliche Museen, Berlin)

the tip of the complex, from which the road swung out in a broad loop that headed toward the upper town. The three levels of the gymnasium widened as they rose, and the substructures of each were diversely treated. There were niches destined for statues between the lower and intermediate terraces, and a covered racetrack lodged in the embankment between this terrace and the topmost. As for the high rock-spur that loomed over the complex, it was carved into rooms associated with the program of the gymnasium. At the northwestern point of this richly planned institution, with its baths, palaestrae, and odeion, one found the passage to the long axis of the Demeter sanctuary.

The road, after running past the north edge of the gymnasium and the Demeter sanctuary, entered a residential area that has not as yet been excavated. It crossed the upper agora and then cut obliquely along the east side of the terrace of the Great Altar, and so made its way to the akropolis.

The Great Altar was the showpiece of the royal city and the nub of its triumphal message. (Fig. 8.35) It introduced the sanctuaries that fanned out around the top of the theater, and in a sense served as the altar of them all. The practice of large altars overscaled in relation to their temples and smothered by sculpture was a Hellenistic novelty. At Pergamon the altar was placed in an inner court surrounded by columns and approached from the west by a flight of stairs. The exterior surfaces carried a mighty frieze that represented the god's battle against the giants. (Fig. 8.36) It was an allusion to the victory of Attalos I over the Gauls, Celtic nomads of the interior, and renewed the old duality of Greek and barbarian that had been the main theme of the Classical polis. Within the court a frieze in a different mood, quieter and more delicate, celebrated the legitimacy of the Attalid dynasty through the retelling of the story of Telephos, son of Herakles, from whom the Pergamene kings claimed descent.

The last stretch of the esplanade runs inside the akropolis, between the temples of the gods to the left and the palaces of the kings to the right. (Fig. 8.33) It should be a strong statement, but the meaning of this magnificent urban design is equivocal, just as the culture itself is confused. Pergamon is synthetic, temporary, wistfully revivalist. It speaks with a new language but falls back on old truths. The king's palace is nothing more than a rich version of the peristyle house, yet it sits on the mountain summit like the residence of a Mycenaean prince. The agora is there, but it is the king's personal triumphs that the public art commemorates, his power that the arsenals and barracks shield. This is a royal and Greek city caught in the tail-end nostalgia of a long, legendary era. It is the swan song of Hellenism—that force which toppled empires and was swallowed in the crash. There is something theatrical in the bequest of Pergamon to Rome by the last of the Attalids in 133 B.C., a concluding gesture. Not much is built in the Hellenistic realm in the remaining century of its token existence as Greek culture, and what is built is mostly the result of foreign needs. Delos gets a new agora for its Italian colony, a guild hall for Syrian merchants and shipowners who call themselves the Poseidoniasts of Berytus, and a Jewish synagogue. When the Christian era dawns, the great Greek cities of the East relax in the lulling embrace of the *pax romana*.

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Rome, basilica of Maxentius, A.D. 307–312, and the Colosseum, A.D. 72–80.

9

ROME: *Caput Mundi*

Early Roman Architecture

To hear her later advocates tell it, Rome had known from the start that she was destined for great things. The site, a healthy spot amid infested land, was chosen by the founder, Romulus, far enough away from sea to escape invasion, and yet close enough to reap the benefits of trade: that was Cicero's opinion. To Vitruvius, Italy was ideally situated between north and south, just as Jupiter lay between Mars, which is very hot, and Saturn, which is very cold. Rome, halfway down the Italian peninsula, was set there by divine intelligence "in order that she might acquire the right to rule the world." And Livy recalled how, during the building on the Capitoline of the first Roman temple, a human head was unearthed in the fountain ditch, "with all the features in perfect condition. There could be no doubt that the discovery meant that this place would be at the head of the empire and the world."

These rationalizations long after the fact have tended to obscure the truth about the unspectacular rise of Romulus' city and the considerable element of political luck involved in her subjection of the Italian peoples around her after a period of being subject herself to one among them, the Etruscans. In fact, it was not until the terrible surprise of being sacked by western Gauls in 390 B.C., during her modest post-Etruscan existence, that Rome woke to the call of expansionism and the promise of her favored position at the confluence of the natural avenues of the peninsula, alongside the easy crossing of the only island in the Tiber. (Fig. 9.1)

Unlike Mediterranean rivers in general, the Tiber—the longest Italian river after the Po—has a stable delta that could be developed as a port. This fact, and the clear passage upriver until the island for transport boats of respectable tonnage, secured Rome's overseas reach. Local traffic was not itself impracticable in the more turbulent upper stretch of the Tiber, and the valleys opened up convenient land routes through the Apennines. With the proper motivation and able military leadership, Rome started to build these assets into a powerful state. A military colony, Ostia, was planted at the river mouth in the late fourth century, the valleys were turned into paved highways beginning with the Via Appia which ran from Capua to Brindisi like a great peninsular spine, and the methodical conquest and colonization of Italy began.

The Sources

At the time, alongside a number of small cultural groups like the Samnites, Ligurians, and the Oscans, the two dominant powers on the Italian horizon were the Etruscans to the north and the Greek cities of southern Italy and Sicily. To account for early Rome, however, in terms of a composite of Etruscan and Greek influence is to oversimplify matters. Etruria, by the time it came to affect the destiny of a fledgling Rome, had already been Hellenized to an appreciable degree. And there were in Roman environmental thinking native Italic elements (for example, the atrium house) rooted in areas other than Etruria. Pompeii, to many of us the quintessential Roman town, was in fact an Oscan foundation with a long interval of Samnite domination.

Rome's Italic character showed in her irregular city-form that was born, like that of many other towns of early Italy, out of topographical dictates and ancient rituals of town planning. This was the Italy of the eighth century, before the sophisticated urbanism of the Greek colonists in the south had become known in the rest of the peninsula. The Etruscans were the first to avail themselves of the land-surveying techniques of the Greek immigrants in their own efforts to colonize. Rome in her turn adopted orthogonal planning in the new military outposts that secured her conquests and in the expansion of older towns that came under her jurisdiction. Roman centuriation—the division of the territory around a town into great squares measuring 728 meters (2,400 feet) per side, which were known as centuries *(centuriae)* because they were meant to contain 100 small landholdings—was itself inspired by Greek practice. (Fig. 9.2)

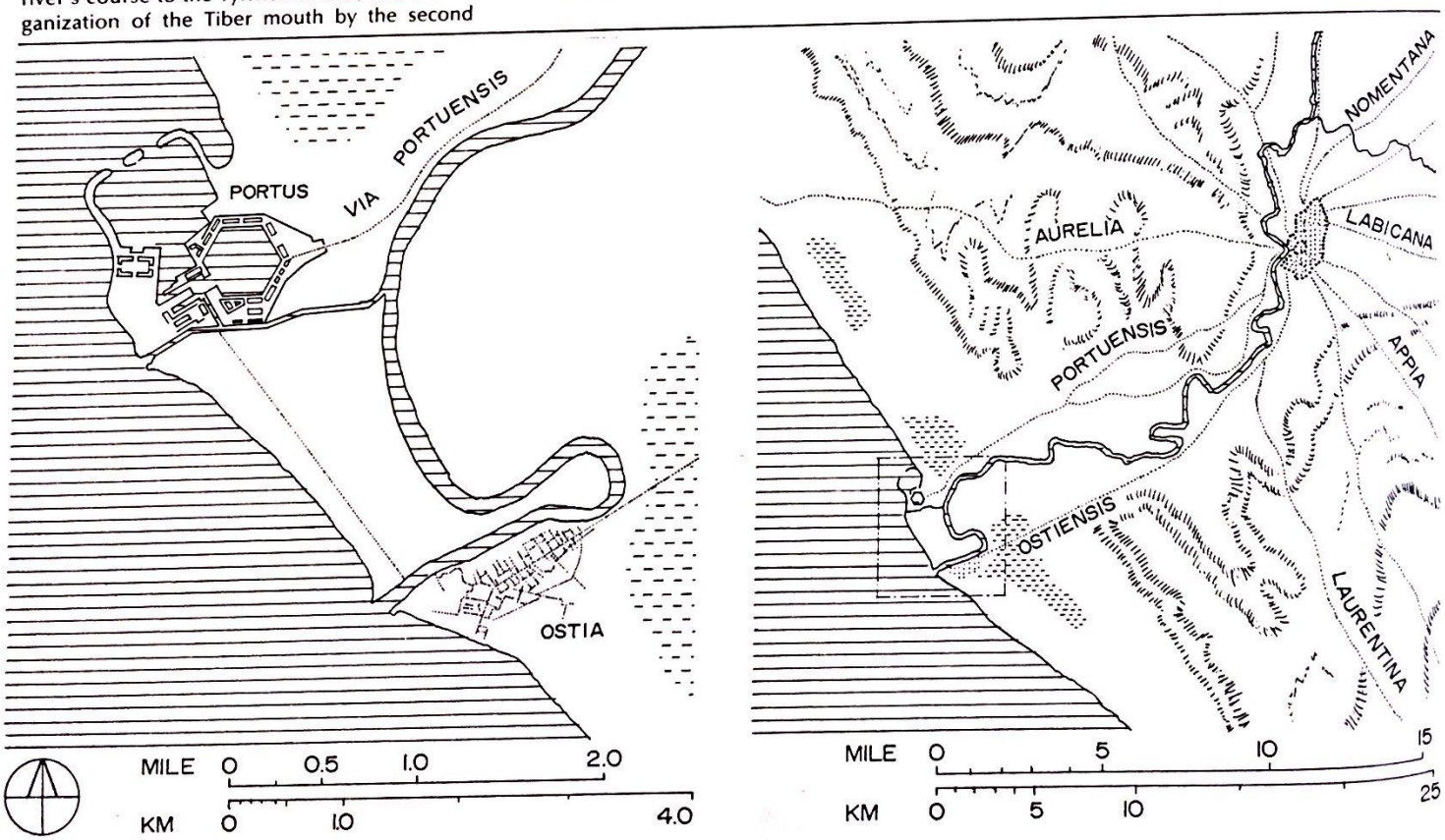
The Romans appropriated the geometrical schemes of Greek and Etruscan colonies in various ways. One way was the Roman practice of locating new towns at the meeting point of the main north-south and

east-west cross-axes (known as the *cardo* and *decumanus*, respectively), with which centuriation began. The practice of emphasizing this crossing by placing public buildings such as the forum-basilica complex there, was another. Also, the Romans preferred square city blocks over the elongated ones in Greek towns, and Roman town planning was influenced by the pattern of their army encampments, or *castra*, and contributed to them—which is not surprising considering the military nature of early Roman colonies.

But perhaps more important than a geometric layout is the repertory of institutional architecture that distinguishes Roman culture, from its first expansionist phase after the Gallic sack, to the creation of the vast Mediterranean empire under Augustus about the time of Christ, and the subsequent three centuries of its dominion. Architecture was a civilizing mission and a sure means of establishing Roman visibility. In established lands with their own architectural traditions, it was crucial to stamp the Roman seal on the cityscapes through recognizable building types. Occupation armies were actively engaged in the construction of civil buildings. Military architect-engineers became increasingly important under the empire, and the precise assembling of huge and complicated structures like amphitheaters out of thousands of standard units extended the strict discipline of the Roman legions to the construction site. The state became involved in every aspect of construction. It had a monopoly on natural materials like marble, tufa, travertine, and their quarrying, and it manufactured its own bricks in state kilns. Transportation, storage, and manpower were all centrally coordinated. Special issues of coins carried representations of major new buildings, commemorating them as significant public events.

Pure invention is rare in architecture, and originality more commonly manifests itself in the purposeful adjustment of traditional forms. Romans were selective in their borrowings and adapted everything to new specifications. In its own homeland Roman architecture developed techniques of construction and composition that were unmistakably its own. At their apogee, the

Fig. 9.1 Map: Rome and its ports. Right, the relationship of the early city to the Tiber and the river's course to the Tyrrhenian Sea; left, the organization of the Tiber mouth by the second century A.D., with the harbor city of Ostia and the major port facilities to the north along an artificial channel.



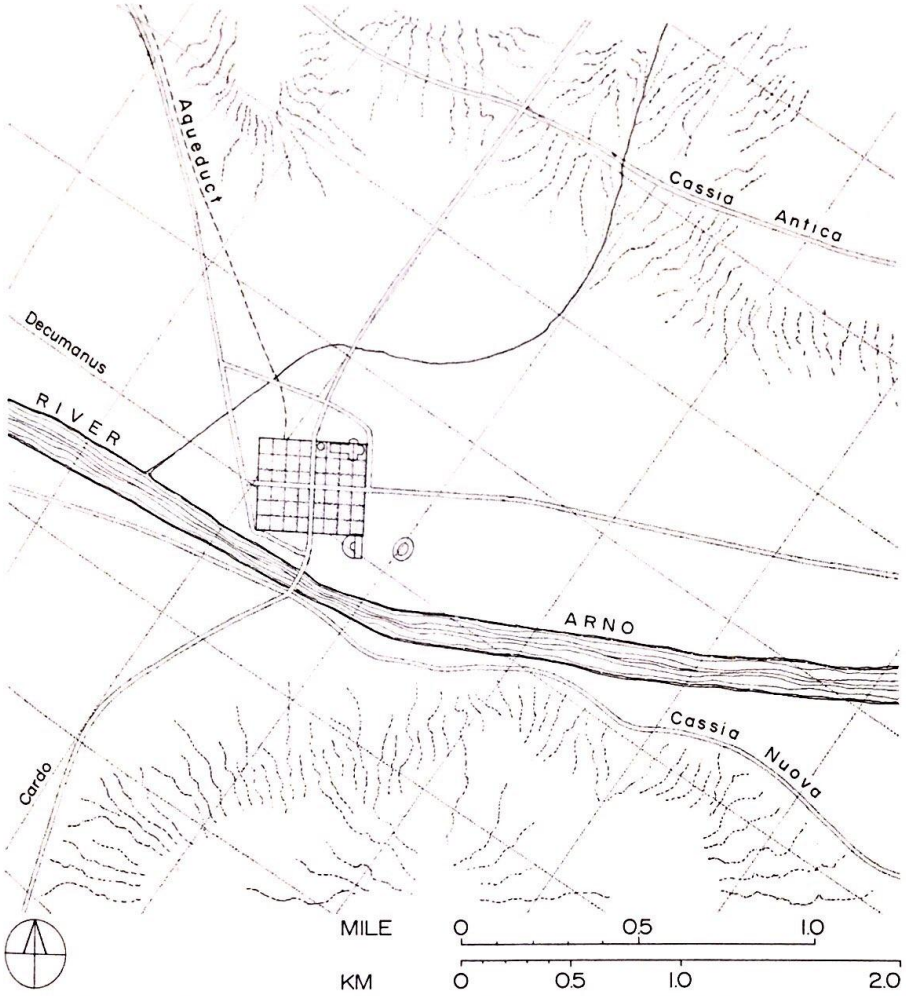


Fig. 9.2 Map: The Roman colony of Florentia (later Florence, Italy) founded in 59 B.C., shown in relation to the ancient highways and the centuriation grid of the territory. The town is oriented toward the four cardinal points; the centuriation is generated by the river course and the land contours. The amphitheater indicated to the southeast of the town dates from about A.D. 130. The cathedral and baptistery at the northeast corner are included to make comparison with the medieval city (Fig. 16.2) easier.

empire and its architecture commanded a uniform vision everywhere, including the traditional Greek territories in the East, even though each province interpreted this imperial program in accordance with local practices.

The Primacy of the Curve

Whatever their Italian origin might have been, the standard buildings of early Roman towns—the forum, the temple, the basilica, and the single-family dwelling—were all aggrandized and enriched by the influence of the Hellenistic East. Still, each one of these conventional trabeated structures bears the Roman stamp; and more to the point is the fact that the true unit of Roman architecture is not the post-and-lintel bay, the colonnade and its stone trabeation, but the arch.

The Romans were preoccupied with the curve—in plan, in elevation, and in the spatial containment of rooms. The premise of the arch is that it enslaves space. Its course is circular and therefore inevitable. In a colonnade the eye, caught anywhere along the length of a column, has the option of going up or down, and at the juncture with the architrave, to continue toward the left or the right. (Fig. 8.27) Each unit of an arcade, however, folds back upon itself; the eye, caught along its path, is inexorably grounded. A series of these units proceeds across space in leaps as if inhaling and exhaling, conquering distances in a way that is alien to the slower and more methodical march of columns. The arch swoops across a river to bridge it, or rises in tiers across a valley to level a tossed landscape at the service of a crossing road or the channel of an aqueduct. (Fig. 9.3) Piled up along the edges of a natural slope, the arch will supply the preparatory formwork for a level platform that extends the usable space at the top.

But the ultimate expression of the arcuated system is in three dimensions, in the encapsulation of interior space. (Fig. 9.4) Extended outward in a straight line, the arch produces a barrel (or tunnel) vault, that is, a curved ceiling that is built on two parallel walls and bridges the rectilinear lower space they define. The intersection of two barrel vaults yields a groin or cross-vault, with four half-cylinders meeting at right angles along ridges called groins. Spun the full 360 degrees, the arch will define a dome.

The word vault comes from the Latin *volvere*, which means to turn about, to roll. Vaulted spaces of any shape are fundamentally different from rectilinear spaces. Flat-roofed rooms are spatially inert. (Fig. 7.26, 8.14) Within their boxlike frame the users have an unchanging relationship to the height of the space wherever they might stand on the pavement. The right angle describes diagrammatically the uncomplicated relationship of load and support. In

vaulted spaces an ambiguity is introduced into this relationship because of the tangency of the curved ceiling to the vertical dimension of the walls. (Fig. 9.30b) Since the center of the ceiling stands higher than the periphery, it is as if we are drawn to this invisible central line (or central point in the case of the dome). The space is thus active, reaching upward against the force of gravity. If the image of trabeated architecture in human terms is the caryatid, the standing figure carrying the load of the superstructure on her head, human reach seems to be the proper analogy for vaulted architecture. (Figs. 7.28, 9.5)

Several times in the past we have encountered preliminary experiments with the arch and the vault. The effect of curved ceilings had been achieved in Neolithic tombs and in Bronze Age architecture by means of corbelling. (Figs. 2.17, 5.4) The true arch—that is, one with a semicircular profile—was known in Mesopotamia but, made of brick, it was commonly wedded to a thicker wall that supported it. The voussoir arch, used both by Greeks and Etruscans, supports itself, and so does the true masonry vault, by being built of suitably curved, ashlar units that start the springing from both sides (or all around, in the case of the dome) and span toward the middle where they are locked into place by central keystones. Utilitarian in intention for the most part, the voussoir arch was sometimes exploited for its aesthetic possibilities, as in the agora entrance to Priene or Etruscan city gates. (Figs. 6.19, 8.19) The canopy of the dome probably always carried symbolic connotations in burial architecture, be it in the passage graves of Neolithic Europe, Mycenaean tholos tombs, or the vaulted chambers of Hellenistic cemeteries. (Figs. 2.17, 5.18)

Roman practice stands out in several ways. Vaulting and the arch form are generally pervasive by the first century B.C., instead of being the rare exception. We see them early in a number of building types—shops, warehouses, baths—as well as in the substructures of terraced buildings. The technique of stone- or brick-faced concrete makes vaults single-shelled, comparatively light, and more efficient to build. Moreover, the serial or contiguous arrangement of vaulted rooms can provide an interesting variety of spaces, as well as mutual buttressing. The warehouse of the Porticus Aemilia in the urban port facilities of Rome, at the foot of the Aventine, has rooms organized in parallel, barrel-vaulted defiles that rise in three levels to introduce clerestory lighting. (Fig. 8.32) In the forum baths of Pompeii, barrel-vaulted shops line the street on the west and south sides of the block, while the bathing establishment proper includes a domed cold room as well as a barrel-vaulted hot room that has a curved end roofed by a semidome. (Fig. 9.17)

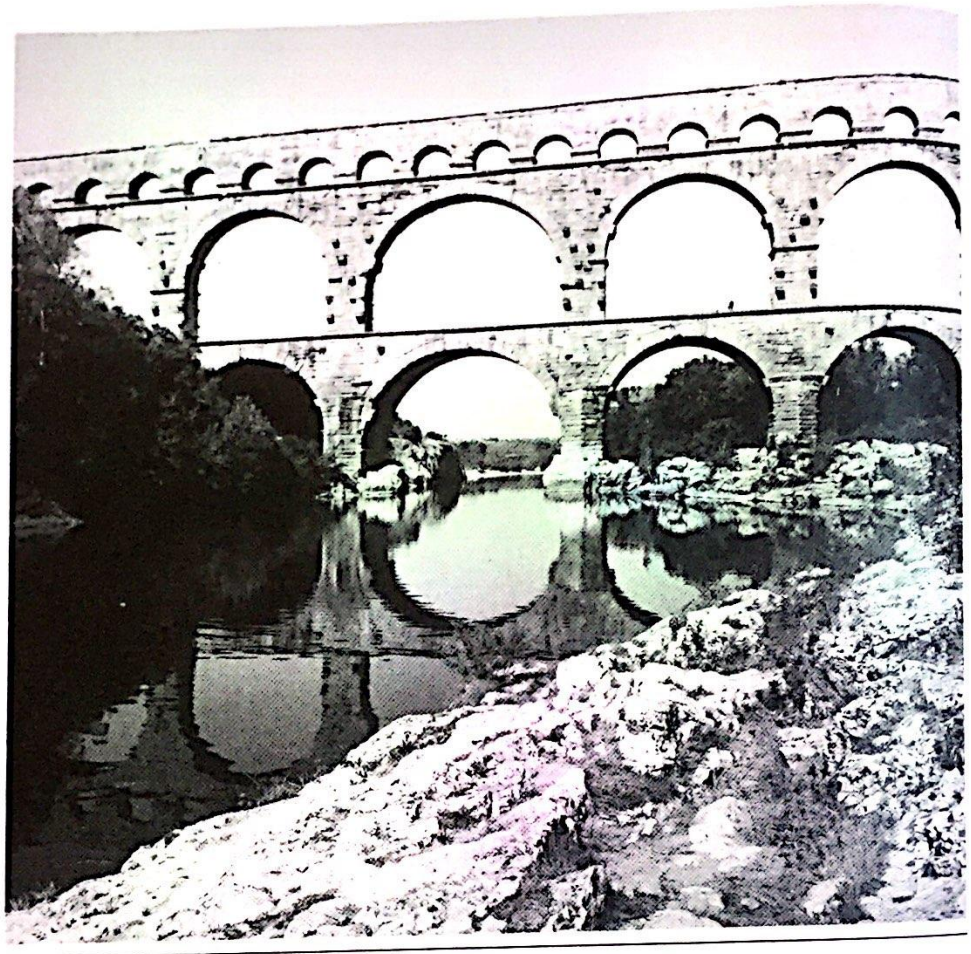
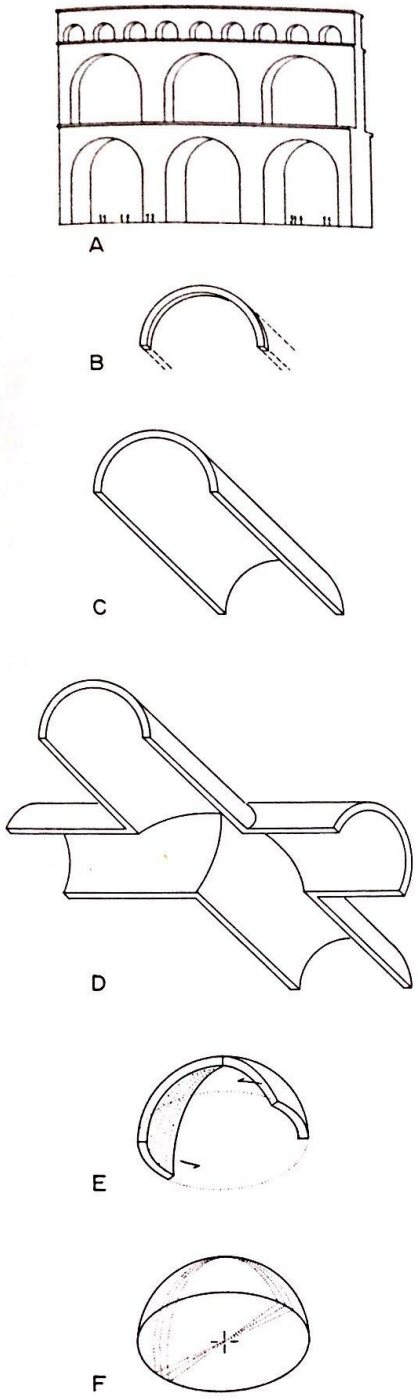


Fig. 9.3 Nîmes (France), Pont du Gard; Roman aqueduct over the Gardon River, late first century B.C.

Components of a Roman Town: Pompeii

Two famous cities, Pompeii and Rome, looked at in some detail should give us a basic understanding of the early phase of Roman architecture and urbanism and the



heights they attained in the century or so after the founding of the empire.

Pompeii was a small, comparatively insignificant town with never more than 20,000 inhabitants. Its burial in A.D. 79 under the effusions of Vesuvius preserved its structure intact at a moment in its life before the great changes the empire wrought in cities throughout the Mediterranean had a chance to take hold. As a Romanized town with a distinctive early history of its own, Pompeii also allows us to review the specific qualities that Rome imparted to older communities with some urban sophistication. It is at Pompeii that we meet with the earliest surviving examples of standard Roman building types such as the basilica and the amphitheater, and it is here that excavations have uncovered the most extensive picture of residential patterns in Roman Italy during this time.

This early phase is followed in Rome itself by the magnificent programs of the first emperors who undertook to make of their capital, once a republican city, the paradigmatic setting of a strong and dazzling majesty in the Eastern mold. Here we can return, for the conclusion of this chapter, to look at the theaters in this time of majesty: the imperial residence on the Palatine, the interlocked series of forums created by succeeding emperors in the thick of town, and the places of popular diversion like the imperial baths and the Colosseum.

Fig. 9.4 The arch and its three-dimensional extension into vault forms; structural diagrams. The arch, within a single plane, can be stacked up into several storeys (**A**). Stretched out in one dimension, as shown in (**B**), the arch yields a barrel vault (**C**), which can intersect with another barrel vault to produce a groin vault (**D**). Rotated 360 degrees, as shown in (**E**), the arch produces a spherical dome (**F**).

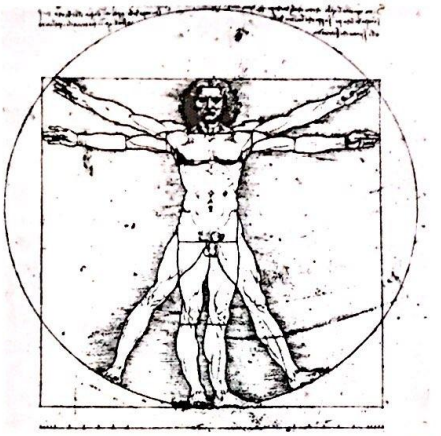


Fig. 9.5 Leonardo da Vinci, *The Vitruvian Man,* ca. 1490. (Accademia, Venice, Italy) This is Leonardo's interpretation of a famous passage in Vitruvius (Book III, chapter 1) which describes how a well-built man, with extended arms and legs, will fit exactly into those most perfect of geometrical figures—the circle and the square.

A General Look

Pompeii sits on an isolated volcanic plateau overlooking the mouth of the river Sarno, a short distance south of Naples—the original Greek colony of Neapolis. (Fig. 9.6) It was always a port town. It served local commerce between the communities upriver and the sea traffic of the Bay of Naples; Greeks and Etruscans both used it as their trans-shipment center. Its other base was agriculture, especially vineyards and the cultivation of olives. But Pompeii's beautiful, verdant location made of it, under the Romans, also something of a summering place for the rich.

The walls enclosed about 9 hectares (23 acres) between volcano and sea, in the fertile plain of Campania which stretches back to the Apennine range. The periphery was farmland—small plantations of resident farmers and *villae rusticae* or summer estates of well-to-do citizens with a farm attached. Closer in, just outside the gates, elegant *villae urbanae,* intended primarily for a life of leisure, shared the edges of the highways with cemeteries. At the northern, Vesuvius gate a reservoir collected the waters brought in by an aqueduct from the inland hills. It stood on high ground to ensure adequate pressure and distributed the water by means of lead pipes to the public

fountains, the two public baths, and, when the water level was high enough, to some private houses. Just within two of the city gates, visitors could check into quality hotels with ample accommodations, including dining rooms, stables, and parking sheds for wagons.

The main north-south avenue ran between the Vesuvius gate and that called Stabian. It was obliquely intersected by the main east-west avenue (now named Via dell'Abbondanza) which passed through the forum area and headed southwest beyond the walls, toward the Bay. These and all other streets were paved with the easily procurable, dark lava stone. (Fig. 9.7) They had raised sidewalks and stepping stones for pedestrians who wished to cross the streets without soiling their feet in the ever-present refuse piles and overflowed water from the fountains intended to flush the streets. Wheeled traffic, which has left deep ruts in the pavement, was mostly wagons and carts high enough to clear these stones.

The public buildings were grouped in three areas. (Fig. 9.8) The forum and its dependencies in the southwest corner of the city formed the civic and religious center. The baths were close by, one just across the street from the north end of the forum, the other at the crossing of the two main avenues. South of this crossing, just within the city wall, was an entertainment nucleus that consisted of a theater, an odeum, a small palaestra, and sanctuaries to exotic gods. A triangular colonnaded space adjacent to this group contained the oldest temple in the city, which can be dated to the mid-sixth century B.C. Finally, the southeast corner of the city was taken up by the amphitheater and a large palaestra to the west of it. The rest was mostly housing, with inns, fast-food places, fulleries (cloth finishing was an important industry), and brothels sprinkled here and there in the residential fabric.

A quarter of tight, small blocks in the southwest had an irregular configuration. This was the oldest Oscan settlement that seems to have consisted of some 2,000 inhabitants clustered around the forum, then an informal open space. The akropolis was to the east where the Doric temple took advantage of the rise to stand out against the sky, and much later a theater was lodged in the southern slope in the common Greek

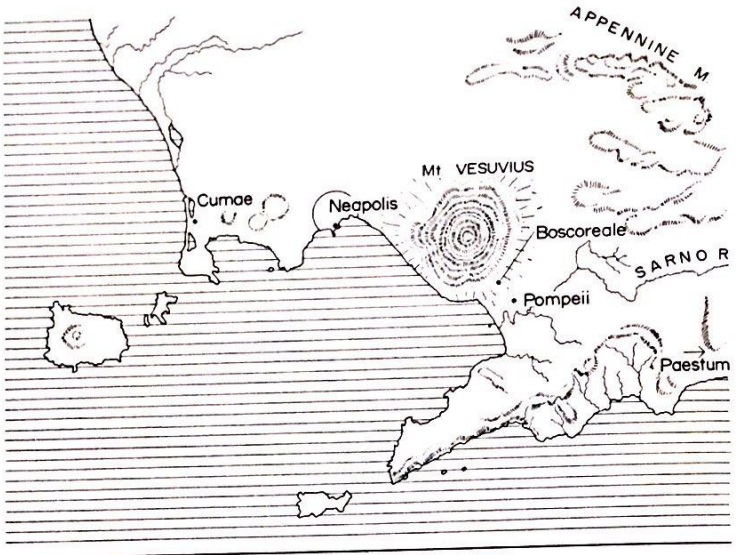


Fig. 9.6 Map: Campania, the district around Naples (ancient Neapolis), with Greek and Roman sites.

Fig. 9.7 Pompeii (Italy); a main intersection (Nola and Stabia streets), with stepping stones.

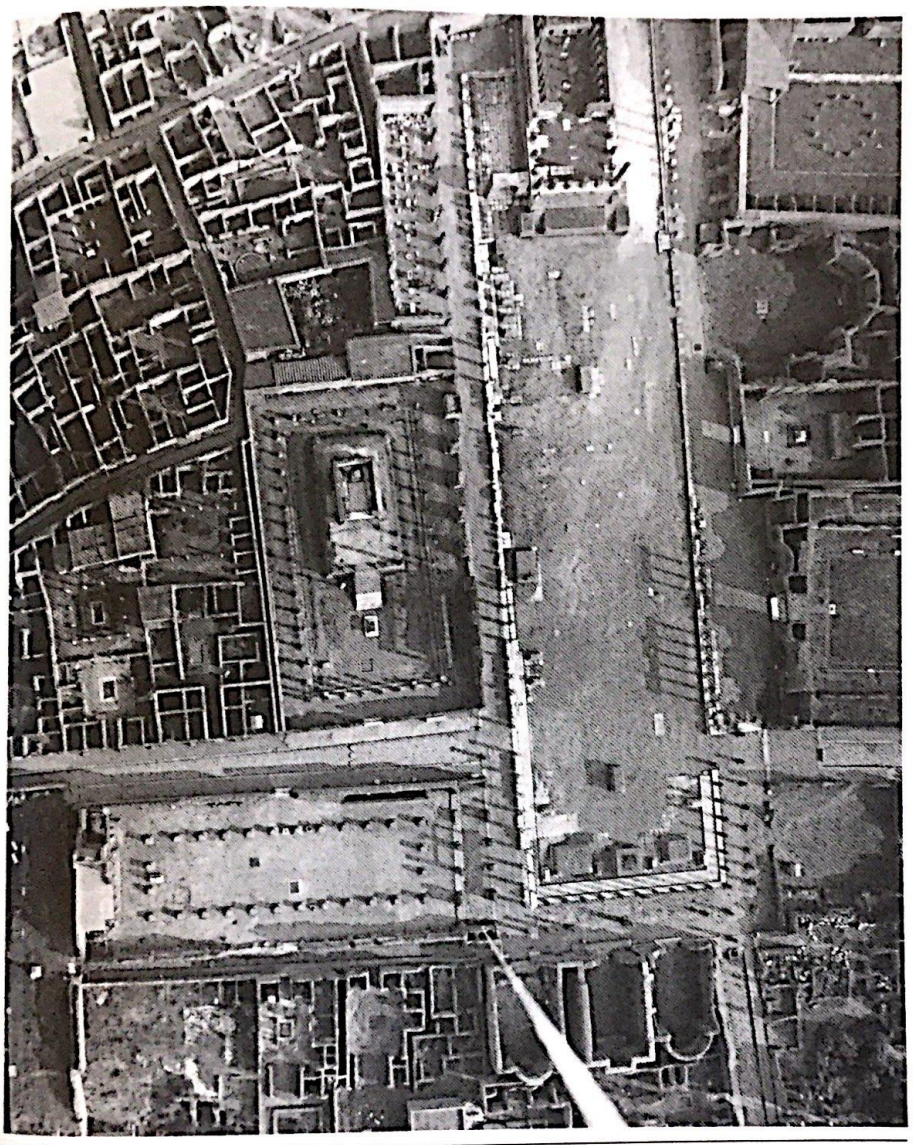


Fig. 9.8 Pompeii, forum; aerial view. The forum, along with the rest of the city, was destroyed by an eruption of Vesuvius in A.D. 79. The remains of the basilica (see Fig. 9.14) can be seen in the lower left; those of the temple of Apollo are just above the basilica, to the left of the Forum. At the north end of the Forum is the temple of Jupiter, and to the right of it, at the extreme upper right-hand corner, the *macellum*.

manner. Beginning in the late fifth century, the inhabited zone was enlarged in several stages, now availing itself of the orderly rectilinear urbanism of Greek neighbors like Neapolis. Each successive addition, however, had its own orientation and block size, so that the overall effect is far from a uniform grid.

The final expansion phase came under the Romans, first in the latter part of the second century B.C. and then after 80 B.C. when Sulla made of Pompeii a colony for veterans of his Eastern campaigns. To this episode belong the final shape of the forum, the remodeling of the baths and of the theater complex, and the building of the amphitheater.

The Doric temple and the original theater were really pure Greek, and the lining of the forum with two-storey colonnades sometime in the second century B.C. represents familiarity with contemporary Hellenistic urban design. The temple of Jupiter on the forum is Italic in its overall disposition, or more particularly Etruscan, but later remodelings gave it a columnar order and decorative veneer inspired by the example of the Hellenistic East. In fact Pompeii, for the greater part of its history, was an architectural crossroads between the Italic north and the Greek south, constantly updating its image with direct infusions from one sphere or the other and with conventions brought in as already hybrid forms.

The Houses

House patterns are a good instance. The earliest, Italic scheme is the single-storey family *domus*—an inward-looking, cool, and quiet house tightly organized around a core space called the *atrium*. (Fig. 9.9) Usually sky-lit, with a corresponding catch basin sunk in the pavement and hooked up to a cistern below, this central room held the shrine of the house gods *(lararium)* and portrait busts of the owner and his ancestors. An entrance vestibule, the atrium, and a main room called the *tablinum* which was open to a back garden were all arranged in a straight line. This axis of alternately light and dark spaces was flanked by symmetrically arranged rooms. The contrast with the looser organization of the Greek house is obvious. (Fig. 7.4) Here we have our first

Fig. 9.9 Pompeii, residential neighborhood northwest of the Forum; plan. Two houses are highlighted: upper left, the House of Sallust, with a section through it shown at (**A**); and, lower left, the House of Pansa, with its section at (**B**). The House of Sallust dates from the pre-Roman phase of the city, in the third century B.C. The House of Pansa, occupying an entire city block, added a peristyle to the original pre-Roman nucleus sometime in the second century B.C.; the market garden at the back, with grapevines, is unusually large for an urban house.

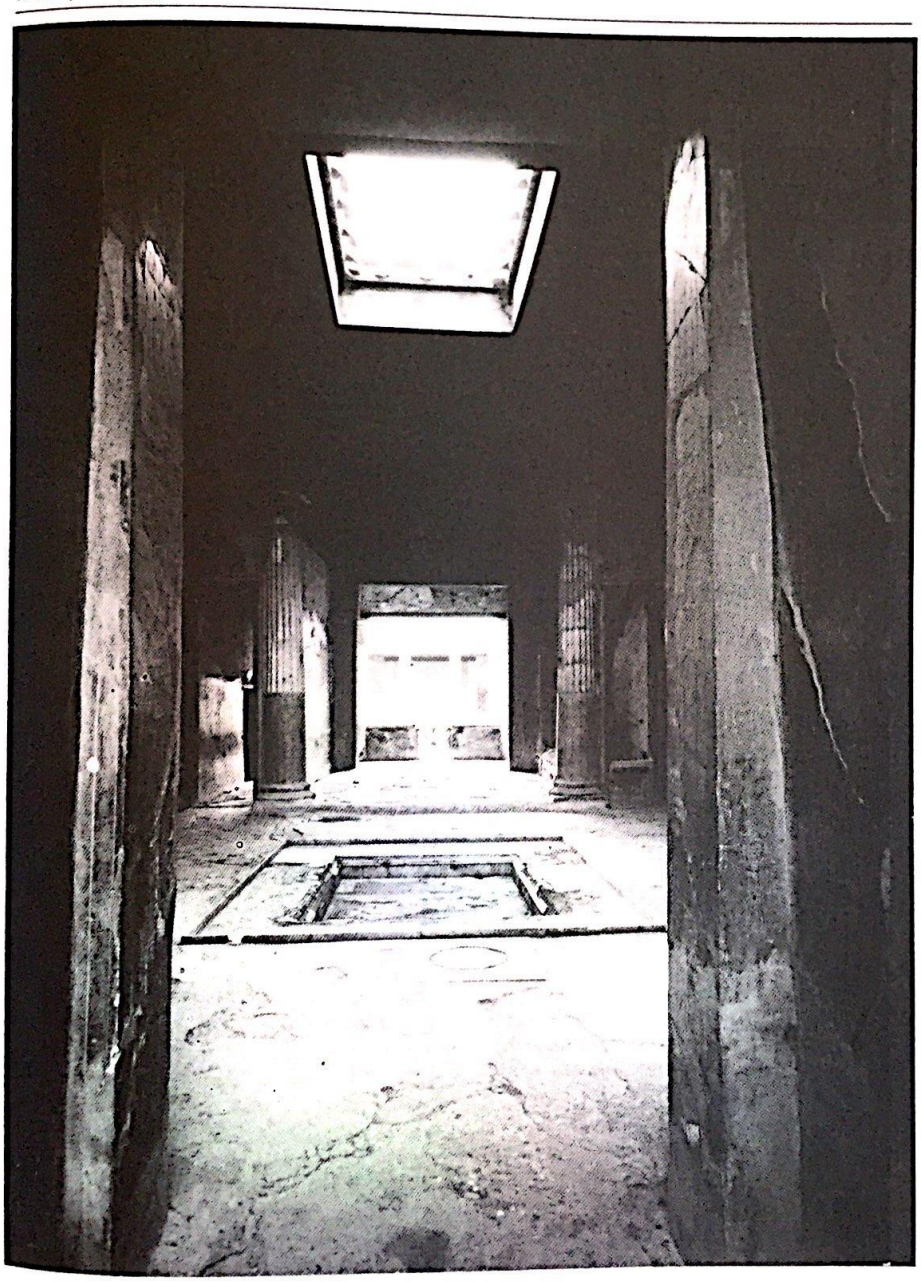


Fig. 9.10a Pompeii, House of Menander, late first century B.C.; interior, looking through the atrium to the peristyle garden at the back.

Fig. 9.10b Pompeii, wall paintings from the House of Ara Maxima, ca. A.D. 70; detail.

indication of two insistent Roman proclivities: a feeling for inwardness and that highly regimented composition that distinguishes Roman layouts from Greek or Hellenistic ones even at their most formal.

When the idea of the peristyle, learned from the wealthy houses of Hellenistic cities, was assimilated in the Pompeiian domus, it was simply added onto the central axis beyond the tablinum. (Fig. 9.10) The catch basin of the atrium was now often marked by four corner columns, and the peristyle also sported columns of Hellenistic inspiration, usually Doric or Ionic. But rather than being paved in the Greek manner, the peristyle absorbed the function of the back kitchen garden, planned formally and with a fountain in the middle. This colorful oasis in the depth of the house would have been evident right from the moment of entering. Again, a peculiarly un-Greek twist is this bringing of nature indoors. For Greeks, nature was there and built things placed themselves in its folds with reverence or, later, dramatic verve.

The practice of stuccoing and painting the walls in imitation of marble incrustation or architectural frames with small figurative scenes was probably derived from Hellen-

istic mansions. But at Pompeii these painted interiors were splendidly elaborate. The blank walls were covered with architectural fantasies that recall Hellenistic theater sets. Within this simulated depth were placed large mythological subjects, derived from the East but duly Italianized, small daily vignettes, friezes of miniature figures, sacred landscapes, and plain open sky, so that the tight dim ambience of the rooms dissolves into magic panoramas of inhabited nature. Ceiling beams were also painted, gilded, or even inlaid with ivory. The floors were paved in stone or fine mosaic with or without figured representations. Small windows up high, tucked under the eaves, were sometimes fitted with panes of a very thick glass or a translucent material known as *lapis specularis*, but by and large wooden shutters, commonly kept shut against sun or cold air, discouraged communication with the bustling streets.

The exterior of these brick and half-timber houses was stuccoed and painted. Shops flanking the entrance door are a late phenomenon; they coincide with the rising population during the Roman influx. Initially the market was confined to the forum area. Then rental shops—single units with an open front and a living space above, called *tabernae*—began to extend commercial activity into neighboring streets and principally along the Via dell'Abbondanza. Congestion and increased ground rents changed the domus proper into a multiple-family dwelling. Second-storey apartments became frequent. In the busier sections these developments opened up the house exteriors to the street with rows of tabernae, whose goods often spilled onto the sidewalk, with large and often showy house entrances, and with balconies above ground level. Tabernae also lined the edges of public buildings, like the forum baths.

The pressures that were being felt in a country town like Pompeii in the early first century A.D. had long before transformed Rome itself into a city of multilevel tenements. Since there was no adequate mode of transportation, the huge population, perhaps one million by the end of the century, crammed into a narrow space. The domus could be afforded only by the very rich, and the capital turned into a city of renters. The model for the high-rise apartment block or *insula* may have existed in the more populous of Hellenistic cities. But in Rome tenements probably developed from the simple shop-with-garret scheme, with several storeys of apartments piling up as needed on ground-level tabernae. Often shoddily built of mud-brick or half-timber construction, with wooden floors, stairs, and ceilings, the tenement blocks had no cooking facilities and were, for the most part, appallingly overcrowded. The state attempted to regulate heights and construction methods, especially after the disastrous Great Fire of A.D. 64 which burned down large sections of the downtown, but its success was very limited. Modern insulae, built of brick-faced concrete and facing out onto wide straight streets, can only be seen in Ostia, and they were the result of a determined reconstruction in the second century A.D. and later. (Fig. 9.11)

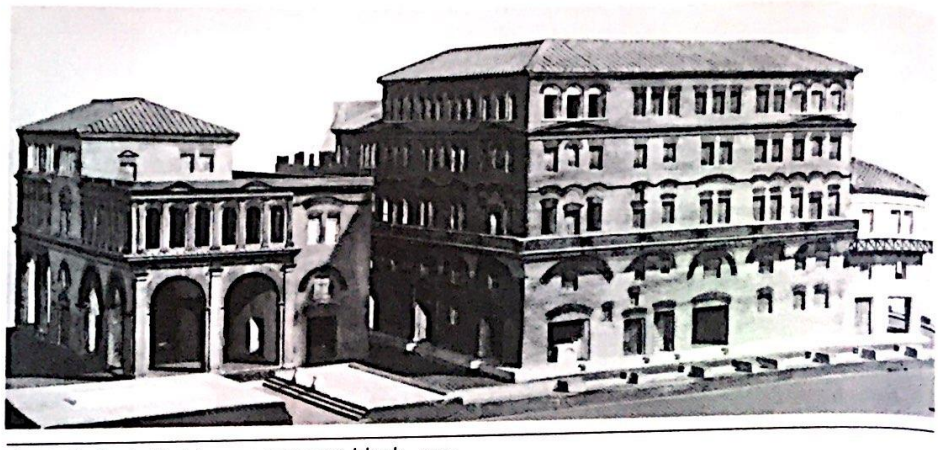


Fig. 9.11 Ostia (Italy), an apartment block, second century A.D.; reconstruction model. (Museo della civiltà romana, Rome)

Most Roman towns of medium density must have stood somewhere between the chaotic crush of the capital and the exemplary order of its renovated port. Pompeii in this respect is atypical. The spread of tabernae and the break-up of family houses were as far as Pompeii's modernization had gone when Vesuvius put an end to its existence in A.D. 79. Even for that period, however, the prevalence of broad peristyles and their gardens along downtown streets is exceptional.

Outside the walls, the picture of luxurious domesticity is even more apparent. Terraced houses on the slopes of Vesuvius, along the south flank of the city, had lower floors of cool vaulted rooms. With their larger peristyles and additional produce gardens, these residences were half town house, half country villa. True villas had inward-looking atrium cores, but they were set on artificial platforms and opened up by galleries to face parklands of laurels, pines, exotic shrubs, and clipped hedges of myrtle and flowers. In addition, the order of atrium and peristyle was reversed; the peristyle was seen first as you entered the villa.

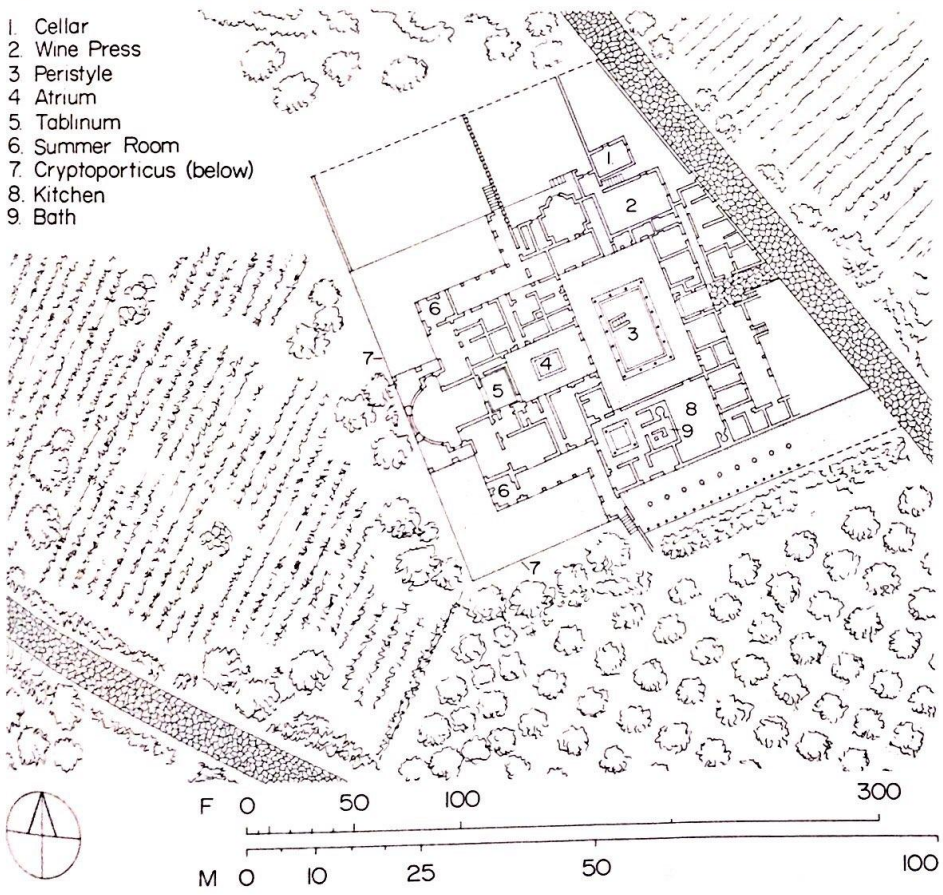
The Villa of Mysteries, so-called because of the paintings in one of its rooms dealing with initiation rites for women in a cult of Dionysos, is one of the oldest and best-known examples of this favorite building type of Campania. (Fig. 9.12) It is the product of periodic remodelings over two centuries. A western terrace secured the villa on the hillslope. Inside it ran a vaulted passageway lit by small windows. This *crypto-porticus* is reminiscent of the terracing devices we saw at Pergamon. The top was planted as a formal garden communicating

through porticoes with the outer rooms of this west half of the villa, which contained the oldest core. The long axis, starting at the entrance and running through peristyle, atrium, and tablinum, culminated in a spacious niche with a lovely view of the coast and sea. The practice of ending a headlong movement of space in a single room (like the apsed hall in the north wing) or in a linear sequence, with a terminal curve, is typically Roman. Greek designers almost invariably ended axes in a flat wall.

The wine press and cellar at the northeast corner of the peristyle belong to the final remodeling, when this wing was being transformed into a rustic farming unit. A second floor above the entrance vestibule was added at the same time to accommodate the resident overseer. At this stage of its development, just before the holocaust of A.D. 79, this splendid mansion slipped from being a *villa urbana* into being a *villa rustica*.

The villa rustica in its purer form is best represented by a late republican establishment near Boscoreale, a short way north of Pompeii. (Fig. 9.13) A main court with porticoes on three sides is a refinement of the central farmyard around which the villa rustica was habitually organized. One entered directly into the court, passing under an overseer's apartment above the portico. To the left was a large kitchen, an important element in these country farms, stables, a rather fancy bathing complex with the latest fixtures, and some rooms probably for the owner's use during inspection visits or summer stays. To the right was a large court lined with rows of vats for fermenting wine, and across a corridor were the wine press, a hand mill, rooms for producing olive oil, a barn, and sleeping cubicles for attendants. Along the southeast edge of the villa lay the threshing floor. The villa rustica nearby owned by Augustus' grandson Agrippa Postumus had a slave barracks for his agricultural workers. It also contained eighteen cells and a prison with stocks.

Fig. 9.12 Pompeii, Villa of Mysteries, third century B.C., with later additions; ground plan. The peristyle dates from the late second century B.C., and the semicircular veranda on the west, from the mid-first century A.D.



Public Buildings

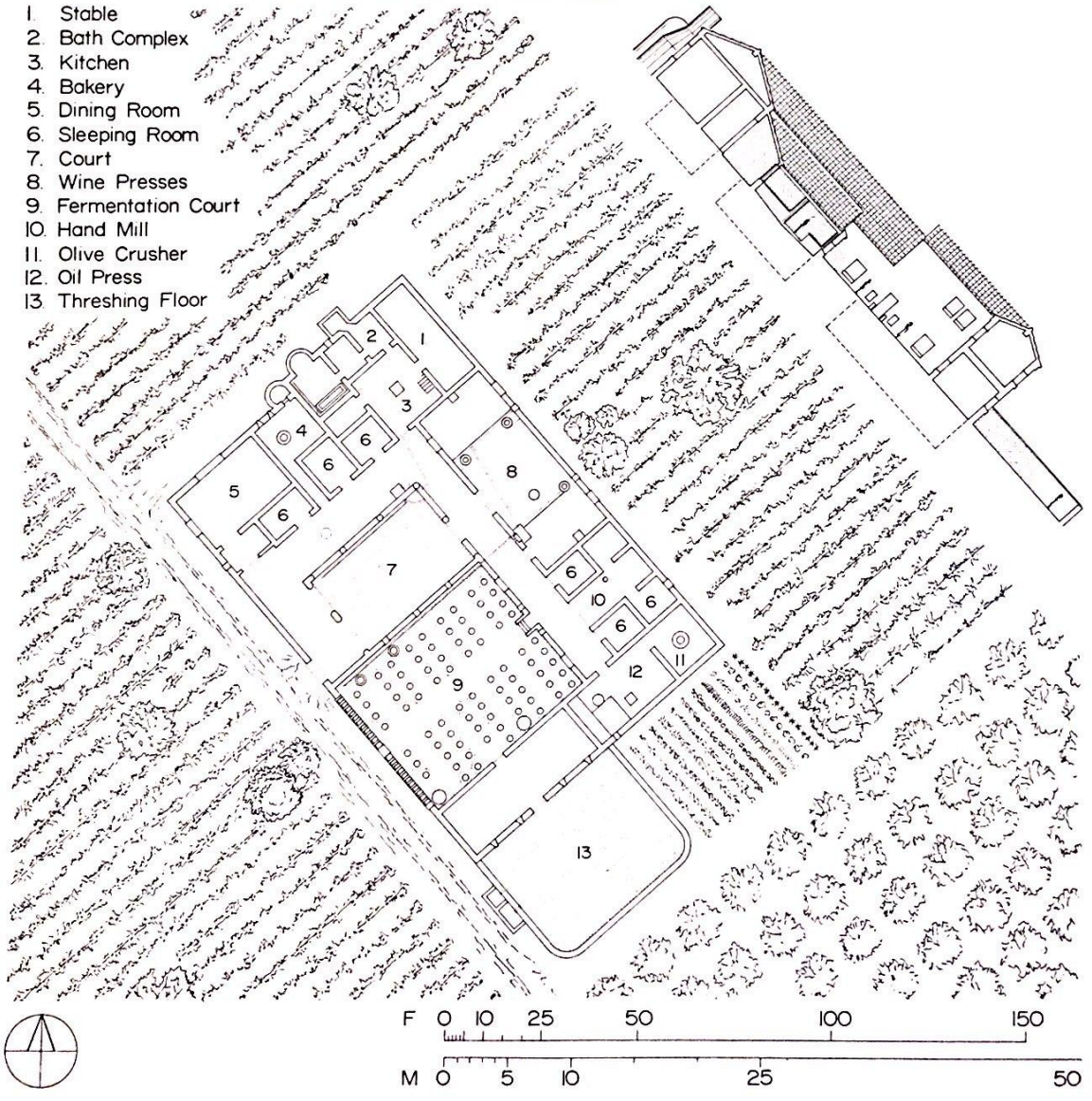
We can now turn to the principal settings of public life at Pompeii, starting at the forum complex. (Fig. 9.8)

In its last phase, the forum was an elongated open space about 150 by 30 meters (492 by 98 feet). It was lined with two-storey colonnades, Doric in the lower order and Ionic above. Fifty statues of prominent personages, some equestrian, stood in front of these colonnades, and behind them, on all sides but the north, a series of large and small buildings opened mostly at right angles to this surrounding portico. The forum was closed to wheeled traffic and, in this late period, it was free of commercial bustle except on market day. Of the surrounding buildings only the *macellum* or food market had a frankly commercial character. The large structure, sponsored by the influential Lady Eumachia, south of the macellum served as headquarters for the clothesmakers' corporation. It is now thought that the basilica, at the southwest corner, absorbed the function of a stock exchange along with its more traditional role as general assembly room and law court. The imposing temple of Jupiter loomed at one end of the prospect. At the opposite end were three small administrative structures. The west side was dominated by the temple of Apollo, placed lengthwise. Between the macellum and Eumachia's building on the east side there nestled an apsed hall, probably the sanctuary of the city

spirits *(lares publici)*, and a late addition, the chapel of the imperial cult.

The obvious model for this forum is the Hellenistic agora. The Roman contribution has two aspects to it: the strong sense of axial organization we had noted earlier in the arrangement of the common family house; and the insistence on total enclosure—that is, the preference for interiorized and controlled public spaces whose design, seen from within, would shield undesirable bits of urban fabric or, as is the case at Pompeii, bring uniform order to the irregular massing and elevation of surrounding buildings. Adjustments were made in these buildings so that they and the ground-level portico of the forum would appear to belong to a single master plan. Notice, for example, the way the depth was varied in the row of shops along the west front of the macellum, or the way in which

Fig. 9.13 Boscoreale (Italy), a "villa rustica" or country farmhouse, first century B.C.; ground plan and section. The context is conjectural.



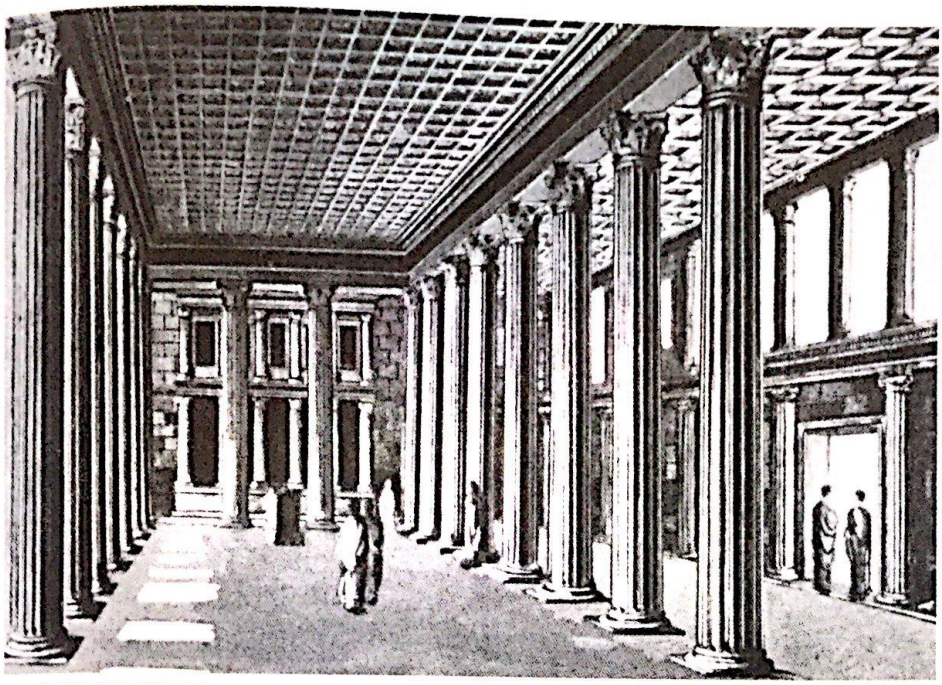


Fig. 9.14 Pompeii, basilica, ca. 120 B.C.; interior reconstruction.

the piers on the east side of the Apollo temple were reduced in thickness moving from north to south. The object was to bring buildings of different date and orientation together into a total design, something Roman architects and planners were particularly good at.

Forum, temple, and basilica—these were the basic components of the Roman civic center. They were frequently laid out as an articulated complex, ideally with the temple framing the long and narrow space of the forum at one end and the basilica, transversely laid out, closing it off at the other end. This grouping seems to have originated in the towns of northern Italy and then to have moved out to the northern provinces. It was broad planning guidelines of this kind, together with the presence of distinctive building types on a grand scale, like theaters, amphitheaters, and public baths, that gave the Roman stamp to a vast array of towns within the empire without wholly suppressing local traditions of construction and design. These buildings impressed the townscape by their sheer bulk, by their unique forms that often exploited the sweeping curve, and by their tiered arrangement that created a dramatic sense of architectural height.

The origin of the *basilica* is obscure. Its history started with the Roman Forum, perhaps as a spontaneous invention expanding on the Greek stoa, or with some closer prototype in the Greek towns nearby of which the basilica, and Hellenistic buildings like the Hypostyle Hall of Delos, were the successors. The size of such trabeated halls, whether Roman or Hellenistic, was made possible by the development of the timber truss, a device for roofing broad spans that arranged straight timbers in tension or compression into rigid load-bearing frames. We should not, in our admiration for Roman vaulting systems, forget that timberwork and carpentry improved greatly too. Even concrete shells demanded master carpenters capable of making the necessary formwork.

The basilica of Pompeii had columns on all four sides and a longitudinal axis running from the entrance on the forum to a tribunal at the other end. Most other basilicas were arranged transversely, with entrances on the long sides. They all had roofs supported on timber trusses and some sort of top lighting. (Fig. 9.14) Two-storey galleries surrounded the central unencumbered space, with outside windows at the upper storey. In formal terms we might view the basilica either as an interiorized stoa or an externalized Greek temple without the peristyle. Functionally, the modern equivalent of this sensible urban meeting place is the spacious arcade of nineteenth-century towns, called *passage* by the French and *galleria* by the Italians.

The *macellum,* a courtyard lined with shops, may well have been inspired by the kind of commercial space enclosed by stoas in the Hellenistic remodeling of the Athenian agora. The difference is that the Romans externalized some of the shops (at Pompeii only those along the south side look out onto the court) and emphasized a formal facade on one outer side. The Roman macellum also featured a round columnar pavilion in the middle of the court (at Pompeii it was probably built entirely of wood) where fish were cleaned before being set out on stalls. The food shops all around sold delicacies and products of quality. This particular scheme seems to have originated in Campania and then spread to the south and east. There is a beautiful specimen with two stone pavilions in the North African city of Leptis Magna, roughly contemporary with the macellum in Pompeii. (Fig. 9.15) But there was another type, current about this time in central Italy, in which the entire arrangement was circular, with the stalls opening off a central circular court.

The macellum was of course only one kind of commercial program. There were always open-air markets in forums and sanctuary sites that hosted fairs. Each city had specialty markets for bread, beef, spices, and so forth. Warehouses, called *porticus* or *horrea,* had special magazines for the deposit of foodstuffs. The Porticus

Aemilia in Rome is rather distinctive. (Fig. 8.32) Most others were simple quadrilateral enclosures with identical storage units all around. The state kept a great number of these in the service of its vast welfare program. The name horrea usually implies private use. Rooms on two sides of a central corridor open to the sky were rented out by the owner who left it up to the tenants to arrange for security. Some horrea floated their floors on small brick or stone piers that allowed the circulation of air underneath and kept the grain and other foodstuffs dry.

This particular system started with Hellenistic *baths*. Called *hypocaust*, or subterranean heating, in Greek, it involved circulation beneath the raised floors of hot air conducted from a furnace. (Fig. 9.16) The advantage over the older system of heating by charcoal braziers that smoked and smelled is obvious. A Roman contribution was to run hollow tubes through the walls, thus carrying the hot steam above floor level. The Romans called private baths in houses and villas *balnea; thermae* referred to public baths, which by the first century B.C. had combined the prescribed series of rooms with a Greek palaestra for outdoor exercise.

The bathing procedure changed hardly at all. At the Stabian baths one walked into the palaestra from Via dell'Abbondanza. Its west side was taken up by a large swimming pool flanked by rooms where one could oil oneself before exercise and scrape off the sweat and dirt afterward. The entrance to the bath proper was at the southeast corner, through a vestibule that gave way to a lavishly decorated dressing room, with wall niches for storing clothes. The *tepidarium* came first. In this room the body began to warm up for the much higher temperature of the *caldarium* and the steam bath it provided. (Fig. 9.17) From there the visitor went out again, by the way of the tepidarium and the vestibule, in order to enter the *frigidarium*, a round room having four semicircu-

Fig. 9.15 Leptis (Lepcis) Magna (Libya), market, 8 B.C.; one of a pair of pavilions enclosed within a rectangular space. An encircling portico, of which some columns can be seen, was added ca. A.D. 35.

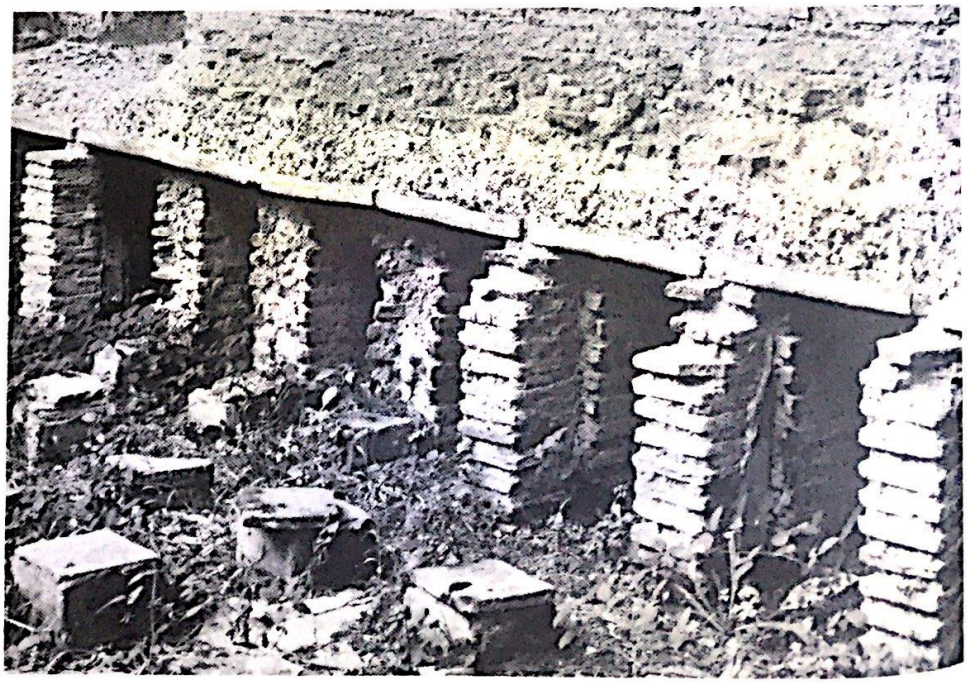


Fig. 9.16 Pompeii, hypocaust system of the Stabian baths located east of the Forum area. The baths date from the second century B.C.; the heating system from a renovation of the early first century B.C.

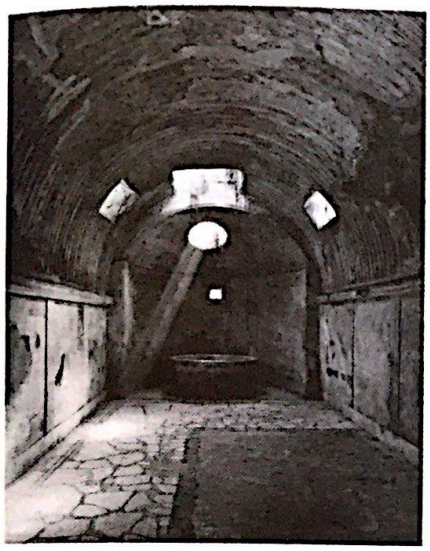


Fig. 9.17 Pompeii, Forum baths, ca. 80 B.C.; the hot room or caldarium in the men's section.

lar niches that opened out from the main space, small round windows, and an oculus in its dome for light. Steps led down to a cold bath where freshwater gushed continually from a high spout. The women's section, much simpler in form, was on the other side of the caldarium. It had its own separate entrances and abbreviated the sequence by substituting for the frigidarium a cold-water tub in a corner of the dressing room.

Religious Architecture

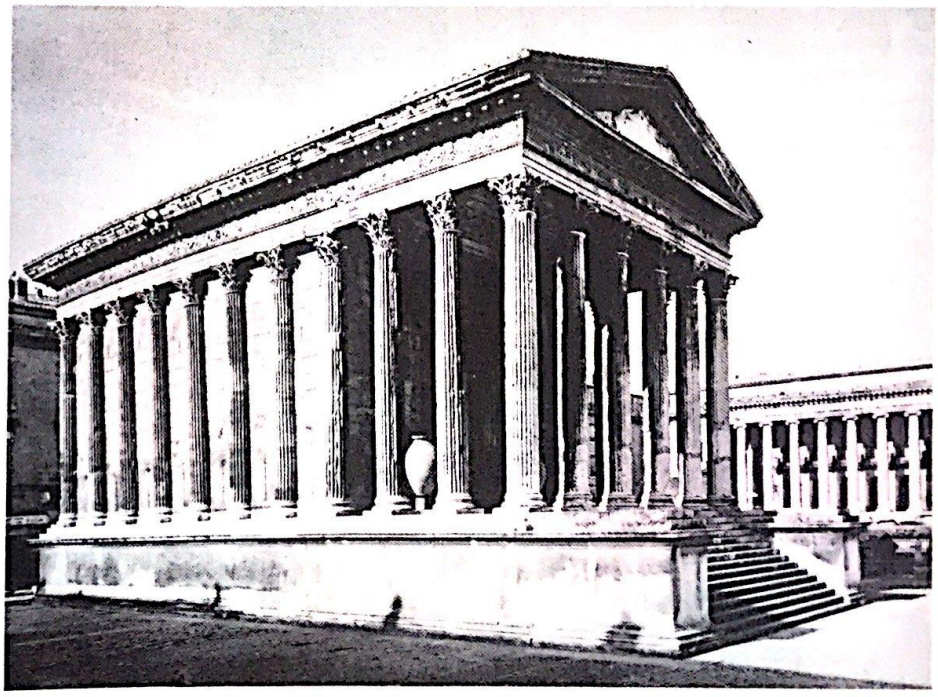
Different stages in the life of the Greco-Roman temple form coexist at Pompeii. The Doric temple by the theater represents the Greek phase, as we mentioned. The temple of Apollo on the west side of the forum combines an Ionic peristyle with a frontally approached peripteral temple on a very high podium—a hybrid creation that looks Greek but acts Italian. The Corinthian temple to Jupiter typifies the official Roman temple. It is raised on a podium that contains rooms meant to serve as the public treasury and as storage space for liturgical objects and sacrificial offerings, functions usually served by the *adyton* or back room of the standard Greek temple. Entered on the short south side by means of a steep flight of stairs and a deep porch, the temple had its back to the rear wall of the forum. A perfect specimen, the so-called Maison Carrée, survives at Nîmes in southeastern France; here the porch columns are continued atop the flanks of the podium and are engaged to the cella walls. (Fig. 9.18)

But also present in Pompeii are a number of religious buildings of diverse shape. The temple to the Egyptian goddess Isis north of the theater had a free arrangement seemingly geared to dramatic effects, including an underground tank in which Nile water was kept. On the forum we have already noted the trilobate sanctuary of the public *lares* and the temple to the genius of the emperor (probably Nero). Indeed, Vitruvius is explicit about the fact that temples must not be built "according to the same rules for all the gods alike, since the performance of the sacred rites varies with the various gods."

The placement and grouping of temples within the city also displayed great variety. Several temples—some round, some rectangular—were at times set up in a single precinct. In one particular solution for hilly sites, the temple figured at the top of a theaterlike, semicircular staircase with an orchestra below. These were the settings of religious festivals that featured outdoor performances.

A handful of theater-temples of the late republic rivaled, and even surpassed, in size and richness of conception, the famous Hellenistic sanctuaries like those at Kos and Lindos. Fortuna Primigenia at Praeneste, a small hill town near Rome, still retains its spectacular terracing beneath the modern overgrowth. (Fig. 9.19) It rose above the

Fig. 9.18 Nîmes, the Maison Carrée; a Roman temple begun ca. 19 B.C. The order used is Corinthian. The temple type is called pseudo-peripteral because the exterior colonnade is not entirely freestanding, but is engaged to the cella walls along the flanks and the back.



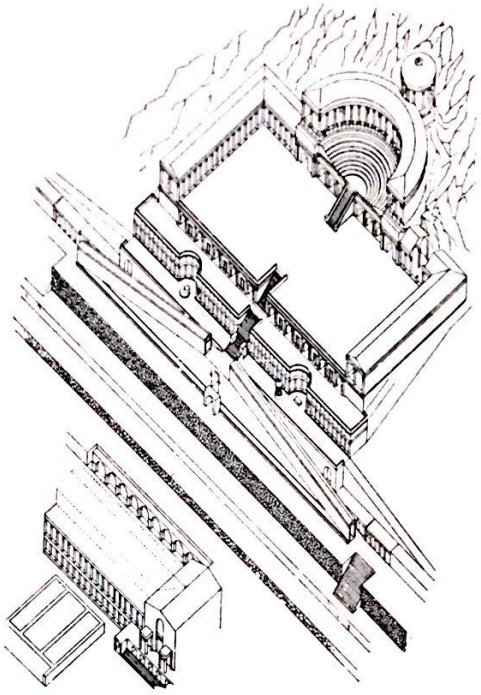


Fig. 9.19 Palestrina (the Roman Praeneste, Italy), the sanctuary of Fortuna Primigenia, ca. 80 B.C.; axonometric plan. The sanctuary, famous in antiquity as a place of divination by lots, occupies the hillslope above the forum. The basilica, shown at the bottom left, and the curia or council hall, along its short east side, belong to the forum complex. The sanctuary is separate from this complex and is arranged along seven terraces. The lower terraces contain rows of shops, while the large piazza at the top, surrounded by Corinthian porticoes, was the setting for ritual dances. The semicircular stairs above this piazza are related to these performances. The small circular temple culminates the long axis of the sanctuary.

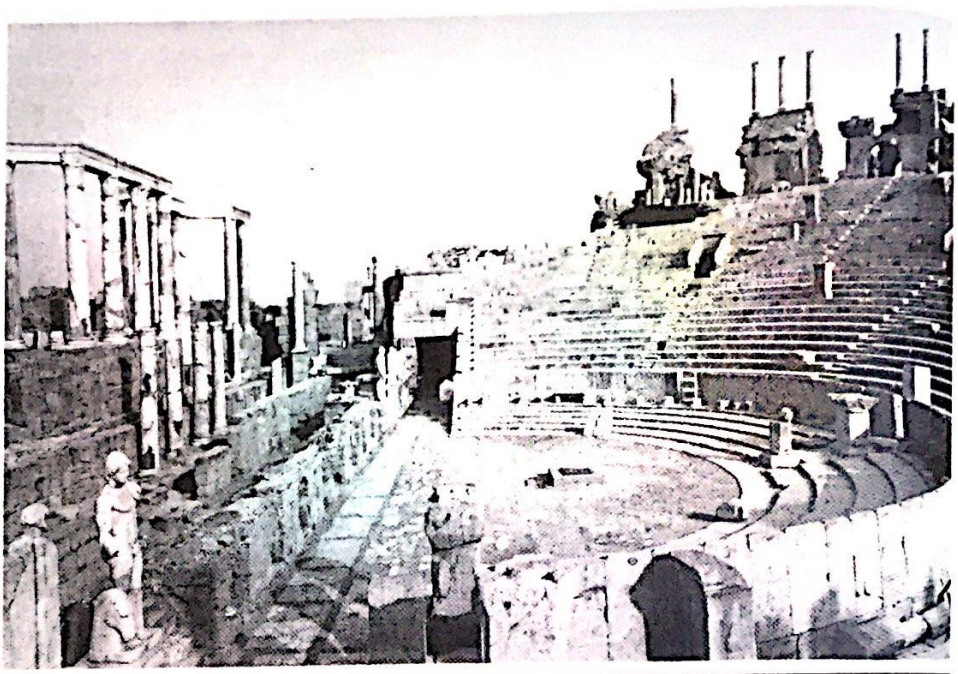


Fig. 9.20 Leptis Magna, theater, A.D. 1–2; interior.

forum in a crescendo of seven terraces that were resolved in a semicircular recess with a double portico and the round temple of Fortune at the summit. A straight axis ran through the topmost terraces, its forceful course softened in a typically Roman manner by the curve at the top and the countercurve of the temple. Two smaller semicircles flanked the axis at the lower level of the narrow terrace, just below the huge piazza that preceded the terminal curve and the theater it embraced. The columns and the attic that make up the facade of these semicircles conceal coffered barrel vaults of concrete. The trabeated and vaulted systems thus come together in a marriage of opposites. A similarly prophetic blend occurs at the upper level of this terrace where a row of shops is prefaced by a run of arches, each framed by engaged columns. This will become the main unit of facade design, often stacked in several storeys. We will see it applied to the exteriors of theaters and amphitheaters built on flatland, the arches briskly sweeping across the broad curve, while the half-columns, sometimes used in combination with piers, slow down this lateral rhythm and provide the vertical definition for the superimposed storeys. (Fig. 9.22)

Places of Entertainment

The theater proper, a ubiquitous building form in all provinces of the empire, was very close to its Greek prototype. (Fig. 7.12) Many Roman theaters, Pompeii's among them, are in fact remodeled Greek theaters. The differences came in the arrangement of the stage building and the relation of that element to the auditorium or cavea. The Roman cavea did not extend beyond a semicircle, and it was united with the stage building to form a single structure. (Fig. 9.20) The Greek *parodoi,* the principal entrances tangent to the stage building, were roofed over by the Romans and boxes situated above them. A portico behind the stage building or, as at Pompeii, a complete colonnaded court acted as a kind of foyer. But the crowds now entered primarily from the outside of the cavea and reached their seats by means of covered passageways. This was especially true of theaters built on flatland, without benefit of a hillside, in which the seating fan rested on vaulted substructures.

Internally, at the top of the cavea, ran a row of freestanding columns which held up a partial roof over the uppermost tiers of seats. The stage building was similarly roofed. Fully covered theaters also exist, the

one at Pompeii next to the main theater being an early survivor of the type. They were usually small and specialized in musical events. The stage of a Roman theater was low and deep. The back wall was modulated into a facade with three main entrances, the central one cut into an apse. In some instances this wall was left plain and in front of it was erected a stage set (called *scaenae frons*) in several storeys. This was composed of a remarkable assembly of columns and niches capped by alternating segmental and triangular pediments. The inspiration is Hellenistic stage design, translated into permanent stone frontispieces.

Gladiatorial games, beast fights, and even a spectacle that involved a mock sea battle were sometimes staged at the theaters, in addition to the farcical shows so popular with Roman audiences. For these special purposes the orchestra, which was always paved, was enclosed by a low wall all around. But the amphitheater was the standard building type in those cities that could afford one, or merited that level of state patronage, for gladiatorial combat and *venationes*, the pitting of wild animals against men. The former sport originated in Campania and derives ultimately from the bloody funeral games of the Etruscans. The gladiator contests were held in the forum at first, with improvised bleachers for spectators, and this is the reason, according to Vitruvius, for the long and narrow space of the early forums. *Venationes* are thought to have started with the Second Punic War, when a contingent of Carthaginian elephants were captured by the Romans.

The amphitheater, despite its Greek name which implies two theaters set end to end with the stage buildings removed, was a Roman invention. They are immense stone constructs (though there were probably wooden predecessors) designed to hold anywhere from 15,000 to 80,000 people. Both because of their size and because the type was formalized rather late, they appeared at the edge of town. The elliptical arena, often sunk into the terrain and paved with sand, was surrounded by continuous stone bleachers that sat either on banked mounds of earth held behind retaining walls or on an elaborate maze of radial substructures which housed the circulation system. At Pompeii the amphitheater, the oldest surviving example, is a compromise. (Fig. 9.21) The building is only partly freestanding; half of it, from northeast to southeast, is propped against the city wall, saving much buttressing labor. Outside staircases led to a corridor at the summit where the seats for women were. The best seats, here as well as in the theaters, were at the lowest level. At Pompeii these were reached by vaulted corridors that led directly into the arena and were separated from the rest of the tiered seating by a high balustrade.

Fig. 9.21 Pompeii, amphitheater, first century B.C.; aerial view.

The Look of Empire: Rome at the Millennium

The most famous of Roman amphitheaters, and one of the world's best-known buildings, is the Colosseum, dedicated in A.D. 80. (Fig. 1.6) It was an entirely freestanding structure, 188 meters long by 156 meters wide (617 by 511 feet), in the hollow of three encompassing hills east of the Roman Forum. Eighty arches all around its girth swallowed the more than 50,000 spectators that came to the games—first, into two annular corridors at ground level, and then by means of three storeys of stairs to the different levels of the cavea whose stone seats rested on an immense skeleton of radial walls at a 37-degree incline. (Fig. 9.22) The floor of the arena and the metal barrier around it are now gone, exposing to our

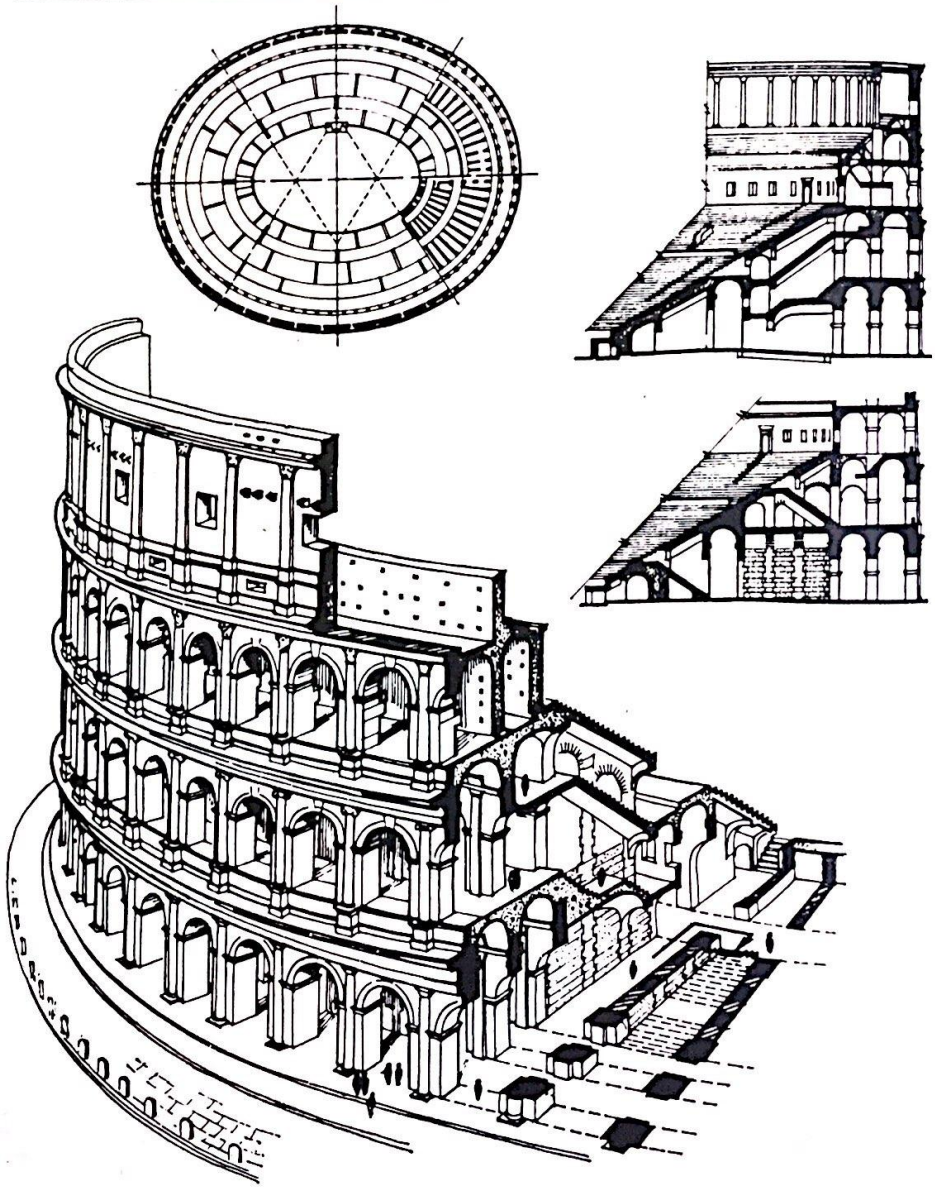
view a nightmarish warren of hundreds of subterranean chambers that once housed beasts as well as staff, machinery, and services. The clifflike exterior, of travertine blocks fastened with iron clamps, is composed of three storeys of arches framed by piers and three-quarter columns, and a fourth storey, unprecedented for this type of building, in which bays displayed alternately bronze shields and windows in a manner reminiscent of the bouleuterion at Miletus. (Fig. 8.21) A row of brackets at this level served to moor the awning that shielded the upper third of the cavea. The four storeys employed the principal Roman orders: Tuscan first, which is the ancient Italian variation of Doric; Ionic and Corinthian for the second and third storeys, respectively; and tall Corinthian pilasters for the attic.

This was not Rome's first amphitheater. Its predecessor, the *amphitheatrum Tauri*, stood in the Campus Martius, the flatland in the crook of the Tiber, north of the republican city, where the first emperors continued the tradition of creating buildings of a popular nature: the amphitheatrum Tauri, at least two theaters, an odeum and a stadium, porticuses, two sets of baths, and a circus for chariot races auxiliary to the ancient Circus Maximus in the valley between the Palatine and Aventine hills. (Fig. 9.23) These programs strove to satisfy the insatiable appetite of the populace for diversion during the frequent holidays that accounted for nearly one-half of the year. The vast proletariat, once a self-governing people in theory at least, now had to be appeased and kept under control through bread, circuses, and the presence of an imperial home guard. A fifth of the population, about 200,000 in all, were on the public dole. Real power was in the hands of the emperor and the bureaucracy of appointees that had replaced the old elective offices of the republic. To curry favor with the volatile public and to impress his image on the city, each emperor lavished moneys on places of leisure and public amenities.

The Emperor's Palace

The Colosseum was sponsored by the Flavian emperors (A.D. 71–96), whose dynasty rose victorious after the precipitous end of Nero's rule. Under Nero (A.D. 54–68) this section of the city between the downtown and the villa-strewn eastern hills, wiped out in the fire of A.D. 64, had been appropriated by a rambling palace, the Domus Aurea or "Golden House." An artificial lake occupied the hollow of the later Colosseum. Around it, pavilions were erected representing prominent cities of the empire. A 36 meter (120 feet) high statue of Nero as the sun-god stood between this

Fig. 9.22 Rome, Colosseum, amphitheater built under the Flavian dynasty, A.D. 72–80; sections and sectional view (see also Fig. 1.6b).



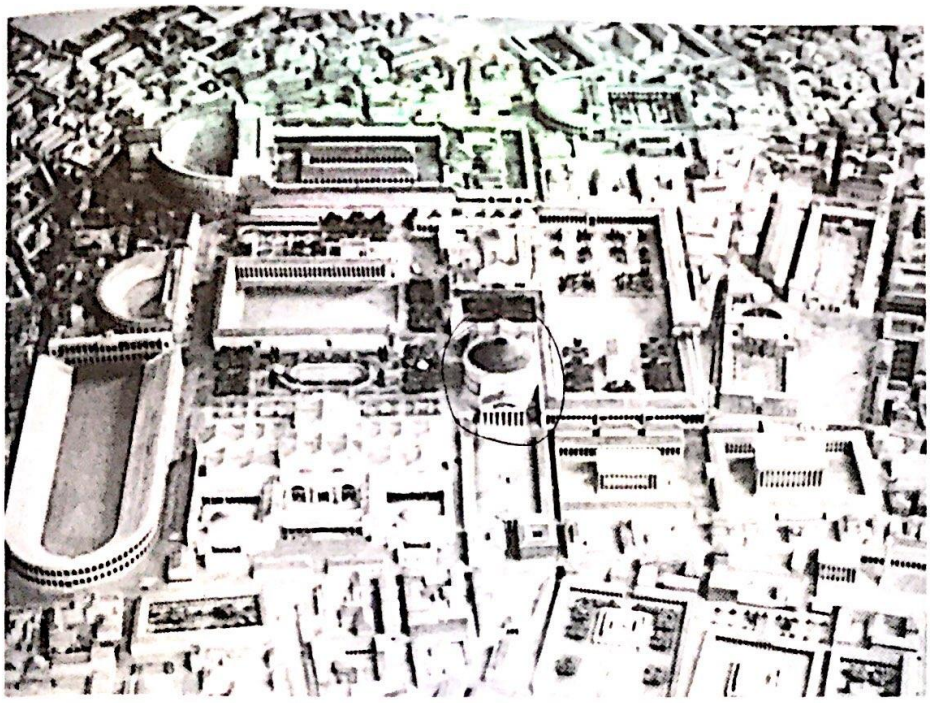


Fig. 9.23 Rome, as it appeared at the end of the imperial period, early fourth century A.D.; detail of a model. (Museo della civiltà romana, Rome) The Pantheon is in the center; to its left are the baths of Nero (A.D. 54–68) as rebuilt in the third century, and further left is the Stadium of Domitian (A.D. 81–96) whose outline survives in the present Piazza Navona (see Fig. 21.7a).

ensemble and the Forum, whose sacred way had been reorganized in this direction into a broad processional avenue lined with multiaisled porticoes. The main residential quarters were on the Palatine and the Esquiline.

A wing of some one hundred rooms has been unearthed on the Esquiline. Its design and structure, credited to Nero's architects Severus and Celer, were of astounding virtuosity. Here for the first time we have the unabashed flowering of vaulted architecture—no longer with the excuse of practicality but as conscious high art. The object was an exciting and mystery-filled drama of inwardness that made use of manipulative lighting, running water, and a gamut of geometric shapes realized in concrete and clad with curtains of color—marbles, painted stucco, and mosaic.

The octagonal hall in the east half of the Esquiline wing should suffice to characterize this new language. (Fig. 9.24) It lies to one side of a pentagonal court edged with rooms where Nero's fabulous collection of sculpture may have been displayed. The hall, seen from above, consisted of two octagons inscribed one inside the other. Clerestory lighting that came in between them illuminated a series of rooms radially arranged around the central octagon. A viaduct bridging a service corridor that ran behind the hall carried water that was allowed to cascade down into one of these rooms. The central octagon was covered by a dome rising from eight corner piers and pierced by a large oculus. On sunny days a shaft of light moved around this pavilion of concrete, beyond which water fell and pools of indirect light picked out statuary set in the niches of the subsidiary rooms.

It is easy to ridicule the Golden House; along with other excesses of Nero, as the fantasy of an unbalanced mind overwrought by power. In one sense, however, this bombastic country villa in the center of town must be taken seriously, in spite of its flamboyant rooms that had ceilings of movable parts, which, we are told, changed patterns like a kaleidoscope or opened to sprinkle guests with blossoms, and its banquet hall that "was circular and constantly revolved day and night, like the heavens." Since the first emperor Augustus, the environment of Rome was trying to adjust to a new political reality, a world empire governed by the authority of a single individual in the way of Eastern autocracies. This meant nothing less than the overhauling of a whole system of old values and the creation of new rituals. Just as Alexander had loosened the Classical balance of Greek cities, so less precipitously Augustus and his successors were dismantling the republican ethos of Rome. "The rough simplicity of the past is gone," Ovid wrote, "now Rome is golden."

Gold was the traditional substance of the divine ruler. And Nero's Golden House was, at one level, the idealization of an official residence for a Roman ruler who had begun to assume extrahuman prerogatives. If the Roman Forum had been the focus of republican sentiment, the Golden House posed as the traditional setting of absolutism. It was the stage for ritual ceremonies involving the imperial person. These acts were not altogether different from the duties of an eminent citizen of the republic which would be performed in the setting of his town house or his villa: receiving clients and wards daily, dining in the company of peers, dispensing household justice. But now these acts were transformed into dazzling, operatic performances with an eye toward impressing and intimidating or, more specifically, glorifying the aims and power of the new regime. This, as we have seen before, is a purpose of autocratic states: to equate the extent of their authority with the size and magnificence of their official quarters.

But the effort was too flamboyant and came too soon. Nero was toppled, and the Flavians set out to make amends by burying the Golden House under a populist architecture. The lake was turned into an amphitheater and the colossus of Nero given a new head representing the legitimate deity of the Sun. Over the Esquiline

property the emperor Titus erected a small set of baths, overshadowed shortly by the baths of Trajan close by on the famous palace wing. (Fig. 9.25) They became the model for a splendid run of imperial baths in the next two hundred years. The cold, warm, and hot rooms were now arranged on a strict axis and flanked by courts. This core was then placed in a vast enclosure that contained stadia for races, *xysti* or covered gardens, libraries, and refreshment rooms.

The question of the imperial residence still had to be faced. Thirty years after the demise of Nero, the decision was taken to locate it on the Palatine where the imperial family owned considerable property. There were other reasons. The hill, isolated by valleys on all four sides, was the least crowded area in the center of town, having always been the aristocratic quarter where senators and other dignitaries had houses. It was here that the history of Rome began eight centuries earlier with Romulus' furrowed city, and a hut was venerated as his. Augustus lived in a modest *domus* next to it, and his successors until Nero were all involved with building projects in the vicinity. The environmental symbolism was irresistible. The hill towers over the Forum like a banner of imperial dominion over republican rule. It is separated by a mere gap from the Capitoline, the citadel of state religion.

Now under Emperor Domitian (A.D. 81–96) a formal complex was laid out occupying most of the hilltop. (Fig. 9.26) It had facades toward the Forum, where the main approaches were, and toward the Circus Maximus, to which the emperor would repair to attend the major games from his box. The architect was Rabirius. There were two parallel parts to his scheme, both organized along central axes. The *Domus Flavia* was the official residence. A colonnaded facade on the Forum side gave way to three parallel halls: an apsed and barrel-vaulted basilica where imperial justice would be

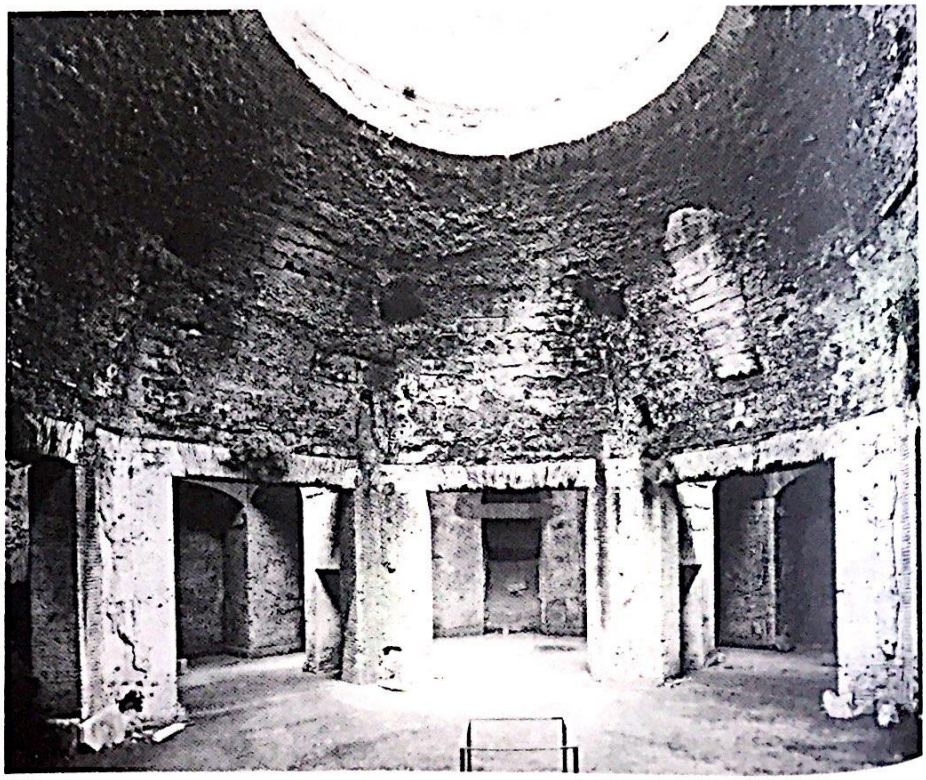


Fig. 9.24 Rome, Nero's Golden House (Domus Aurea), A.D. 64–68, Severus and Celer; the octagonal room: (a) exterior of the superstructure; (b) interior. For the plan and section of this remarkable room, see Fig. 11.13.

dispensed, a grand throne room on the central axis, also apsed and with a span of one hundred Roman feet, and a chapel. The next band was mostly taken up by a large peristyle court with walls of Cappadocian marble and an octagonal, maze fountain in the middle. Further back was the state dining room whose lateral walls were opened up by large windows, beyond which were two small courts with oval fountains. The *Domus Augustana* was more private. It was arranged on two levels, that of the Domus Flavia, which held two peristyle courts and some summer rooms, and that of the lower Augustana with the living quarters of the imperial family, conceived in playful geometries of form around a small court framed by barrel-vaulted colonnades. The facade on the Circus Maximus side was a two-storey concave exedra, and alongside the Augustana stretched a walled, sunken garden made to look like a stadium. (Fig. 9.27)

In the emperors' projects to house themselves we see the evidence of a major architectural revolution, the maturing of what has been called the Roman vaulted style. It combines the most monumental effects of Hellenistic architecture—columnar facades, peristyles, terraces through which galleries run—and a rich assortment of vaulted spaces, small ones and large, polygonal, circular or directional, which are grouped for maximum surprise and delight. Water, brought within the interior spaces, is relied on as a positive design element that animates inert matter and makes connections through sound and movement. Light is used with dramatic and expressive power: single oculi revolving in closed interiors like mysterious searchlights, indirect diffuse light through distant apertures, the dematerializing of whole walls by banks of windows.

The key aim in all this was the molding of interior spaces that would be juxtaposed by shape, orchestrated through interpenetration, dilated by means of columnar screens and through-views. And the medium was concrete, capable of being made into artful vaulted ceilings—seamless canopies that matched the intricacy of the ground plans. Even though Roman concrete could not, in the manner of modern concrete, simply be poured or used independently of other materials, but had to be applied in layers, it was strong and enormously flexible. Through decades of trial and error, builders had mastered its properties and behavior in warehouses and baths, shops and tenements. They could now sing with it. The basic vault forms were played with, pleated, and warped for effect. The best of them swelled effortlessly like wind-puffed sails, their workings obscured by illusionist devices.

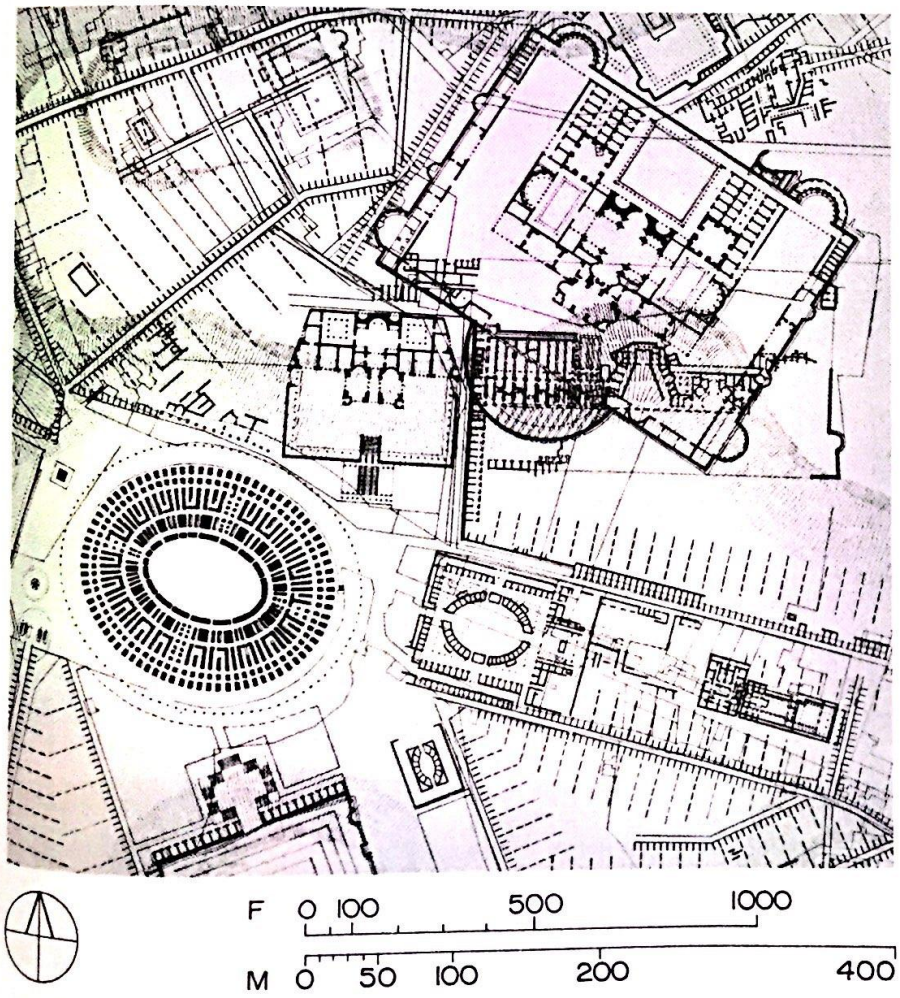


Fig. 9.25 Rome, detail of the plan of the imperial city showing the area initially occupied by Nero's Golden House. The Colosseum at the extreme left was built over an artificial lake that was part of the palace. Higher up, on the Oppian hill, the suite of rooms which included the octagonal room (Fig. 9.24) was buried under the baths of Trajan, dedicated in A.D. 109. The smaller baths between these and the Colosseum were built by Emperor Titus (A.D. 79–81). The complex to the right of the Colosseum, with the small amphitheater, is the Ludus Magnum, the training quarters for gladiators.

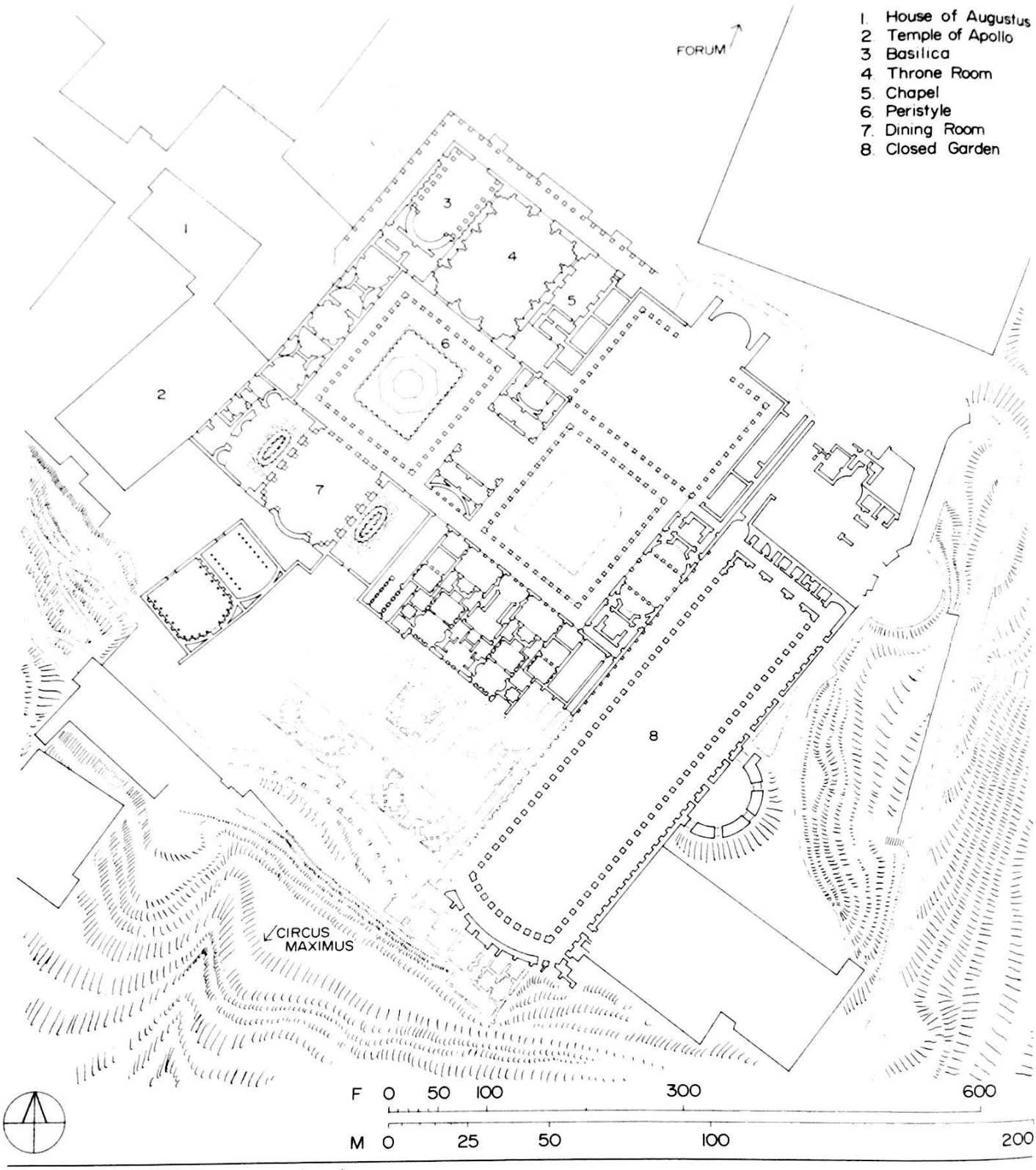


Fig. 9.26 Rome, the imperial palace on the Palatine hill, inaugurated in A.D. 92, Rabirius; ground plan.

The People's Palace

To imperial patrons and their architects, two distinct languages of form were available by the end of the first century A.D. Hellenistic design relying on colonnades, ashlar masonry, and the timber truss still reigned in the Eastern provinces and produced superb results in Rome—for example, in the series of imperial forums that began with Julius Caesar and Augustus as an extension of the congested old Forum. (Fig. 9.28) But the passion of the capital was the Roman vaulted style. To be sure, externally as well as within, the newfangled buildings dressed their walls in Hellenistic decor. Facades were not in the least revealing of interior arrangements, and the surprise of entering into the unconventional spaces that lay behind these familiar screens was the principal reward. And within, the sheathing of functional piers and walls of concrete with Hellenistic trappings gave the vaulted superstructure a feigned advantage of lightness and magic. Concomitantly buildings in the Hellenistic mode freely admitted curves in their plans and the vaulted shells that responded to them. Still each one of the two design options, the heritage of Greece and the conceit of Rome, conjured fundamentally unique environments.

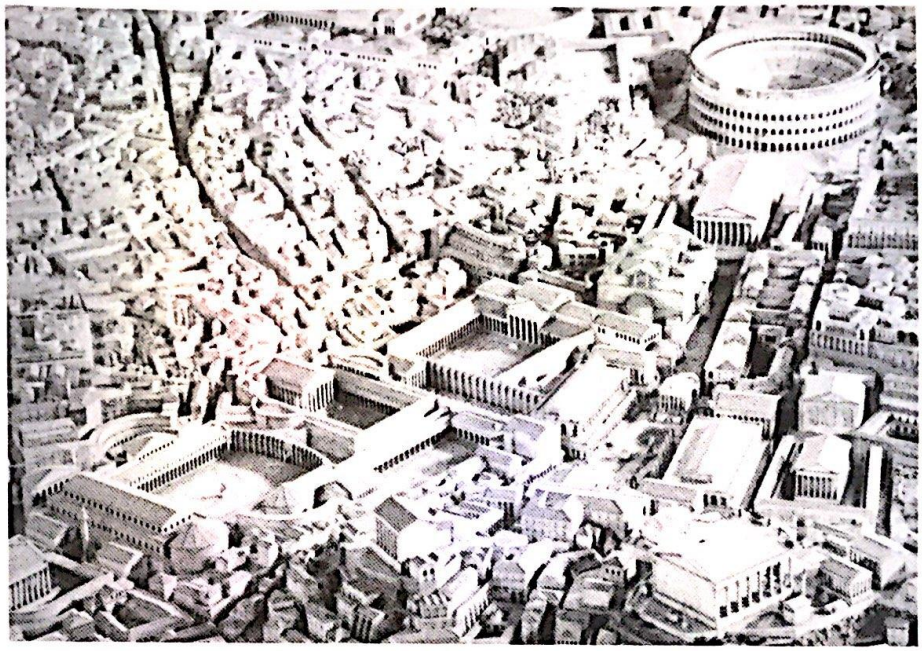
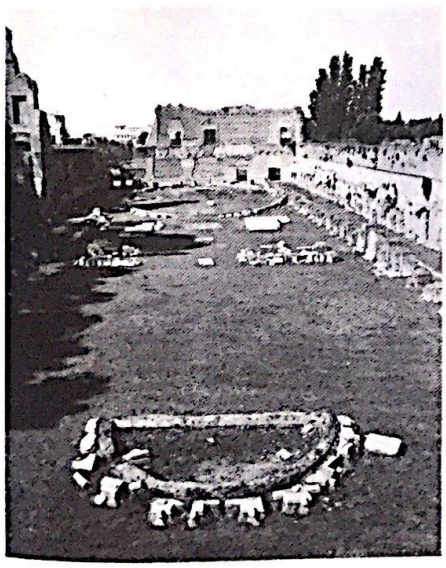


Fig. 9.28 Rome in the early fourth century A.D., detail of the center of town; model. (Museo della civiltà romana, Rome) The imperial forums stretch from lower left to center; the old Forum continues their line until the Colosseum in the upper right-hand corner. Immediately in front of the Colosseum is the temple of Venus and Rome from the time of Emperor Hadrian (A.D. 117–138), which was rebuilt in the early fourth century.

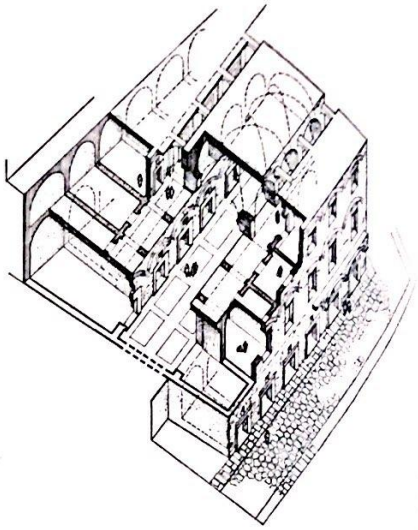
Fig. 9.27 Rome, the imperial palace on the Palatine; the Hippodrome or enclosed garden (no. 8 in Fig. 9.26).



The contrast was sharper when the Hellenistic courts and timber-roofed halls stood side by side with vaulted buildings of a utilitarian nature that forewent visual luxuries in favor of a columnless frame of brick. This is the case with the markets built by Emperor Trajan (A.D. 98–117) that stand next to his forum complex, the last of the series we mentioned. The structure was extraordinary in many ways. (Fig. 9.29) It was a multilevel, intricate commercial facility steeply terraced on the slope of the Quirinal hill facing the center of town. Three lower storeys of shops, standard barrel-vaulted *tabernae,* were fitted into a semicircular exedra, a concave facade that echoed the curved forms of the forum and basilica of Trajan. The shops on the ground level opened directly onto the street; those of the second storey were set behind an annular corridor which offered through arched windows the prospect of forum activities and the city's center beyond. The third-storey shops turned in toward a street halfway up the slope, the Via Biberatica, on the other side of which rose the irregular mass of the upper market block with three more storeys of shops and an impressive market hall.

This hall, the Aula Traiana, is comprised of a vaulted longitudinal space, something like a roofed street, with tabernae on the two sides arranged in two storeys, the upper ones behind an open gallery broken up into bays by transverse arches. (Fig. 9.30) The vaulting system is very complex. A longitudinal barrel vault over the central space is cut into by six transverse barrel vaults that spring a little higher up on the piers than the main barrel. Since the bays of the cen-

Fig. 9.29 Rome, the Markets of Trajan, ca. A.D. 100–12, Apollodorus of Damascus.



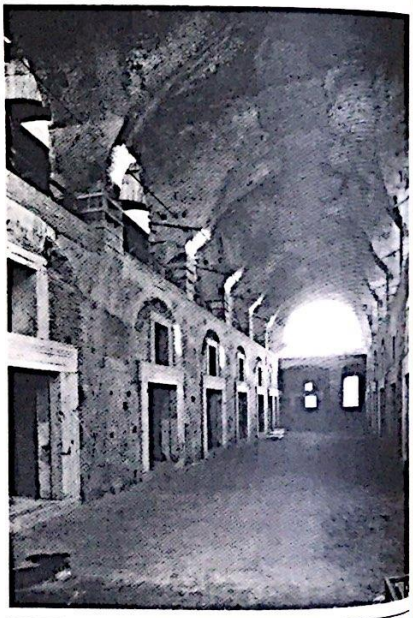


Fig. 9.30 Rome, Markets of Trajan, main marke hall: (a) axonometric view; (b) interior.

tral space are wider than they are long, semicircular vaults raised over them in two directions would not have risen to the same height. By having the transverse vaults spring further up, the architect could attain a continuous and level crown line. The arches flanking this great vault remove some of its thrust, shifting it to the heavy outer walls of the two storeys of shops. The vaulting of rectangular bays and the relieving arches will become central issues again in later medieval architecture, and we will speak of them there in terms of rib vaults and flying buttresses.

This bold architecture of commerce, matched nowhere in the empire, made amends for the demolition of many shops during the necessary land-clearing for Trajan's forum, a process that also entailed the leveling of a spur of land between the Capitoline and the Quirinal, and the drastic reduction of the Quirinal. We must remember that the entire spread of the imperial forums, of which Trajan's was the largest and most resplendent, materialized in the thick of old Rome at the expense of dense neighborhoods. Symbolically the scale and stately order of the redevelopment vividly contrasted an image of imperial magnificence with the congestion and disorder of the Roman Forum and its often squalid environs. The visual contrast, by implication, pointed up the determined control of empire as against the scattered energies of collective government. Functionally, the forums met the urban needs of a phenomenal concentration of people in the hear of town whose religious, commercial, ju diciary, and cultural activities had long ou grown the provisions made for them unde the republic. The individual temples tha crowned the forums eased the crush on the

sacred precinct of the Capitoline. Porticoes, exedras, the Trajanic basilica, and the great markets absorbed in their noble symmetry various services untidily packed in the older city core—commerce, banking, government business, courts, schools, libraries, and public lavatories.

But the bulk of the demolition necessary for this expansive program affected residential buildings. Thousands of people had to be displaced, but we have no record of their orderly relocation. The state, as often before in the past, condoned hardship for the sake of what it decided was the common good. Individual needs were subsumed under a picture of group affluence: the people were given their own palace, built on an impressive scale and sumptuously appointed, in return for their acquiescence. Whatever else they might profess to be, the forums were boasts of state; they spoke of the might and munificence of rulers whose prerogative it was to reorder and monumentalize urban patterns regardless of adversities and inconvenience.

The overall plan was not the result of forethought or grand design. Each forum rose next to its predecessors as an act of blatant competition and was informed with propaganda relevant to the particular reign that sponsored it. Except for axial or orthogonal relationships, the grouping is neither carefully coordinated from within nor thought about in connection to a broader, improved network of circulation and suitable access. Each complex functioned as an inward-looking entity. It was designed to be bigger than the rest, or at least to look distinctive. Julius Caesar's which started it all was about 10,000 square meters; the last, the forum of Trajan, measured four times that, excluding the markets. Each honored a deity appropriate to the aims of the regime. In addition, each forum commemorated a military achievement of note. The Temple of Peace to the southeast of the Forum Transitorium was inspired by the crushing of the Jewish rebellion in A.D. 79 and the transporting to Rome of the holy objects from the temple of Jerusalem. Trajan's culminating program recalled his triumphs over the Dacians, the campaigns which are depicted on a helical frieze that wraps itself around a triumphal column. (Fig. 10.9) Indeed, the point was made in the accompanying inscriptions that the cost of the forum was defrayed *ex manubiis,* by the spoils of war. The emperor fought against the enemies of the Romans and converted his victories into tangible assets for the public good.

The cost of such immense projects could be staggering. Cicero, who handled land purchase for the forum of Caesar, paid out 100 million sesterces to claimants, perhaps $20 million or so in today's inflated currency—and that was for the smallest of the forums and for the site alone. The custom was to insist that the emperor meet outstanding expenses out of his own pocket. In theory the distinction could be made between the personal wealth of an emperor and the state treasury, but in reality this distinction soon became specious. It was nonetheless of paramount importance to maintain the fiction of personal munificence and to reinforce it with showy gestures. It is likely that the Aula Traiana was the setting for Trajan's *congiaria,* or periodic distributions of public largesse; and it was in the forum of Trajan that Hadrian (A.D. 117–138) at his accession had the notes of debtors to the state burned in a calculated act of magnanimity.

It is important to review the motivations at work in context as we admire the series of imperial forums at Rome, one of the great creations of antiquity. They broke through the Servian walls to marry the republican city with the entertainment quarter of the Campus Martius. They carved out a spacious lung for the choking crowds of the capital. Above all, they developed piecemeal a peerless civic center where, for the resident population, the triumphs of its armies and the genius of its artists could be put on bountiful display; and for the visitor from Syria, Cyrenaica, Britain, Spain, or any other of the far-flung provinces, the might, wealth, and culture of an empire shone through and added substance to the boast of Roman citizenship.

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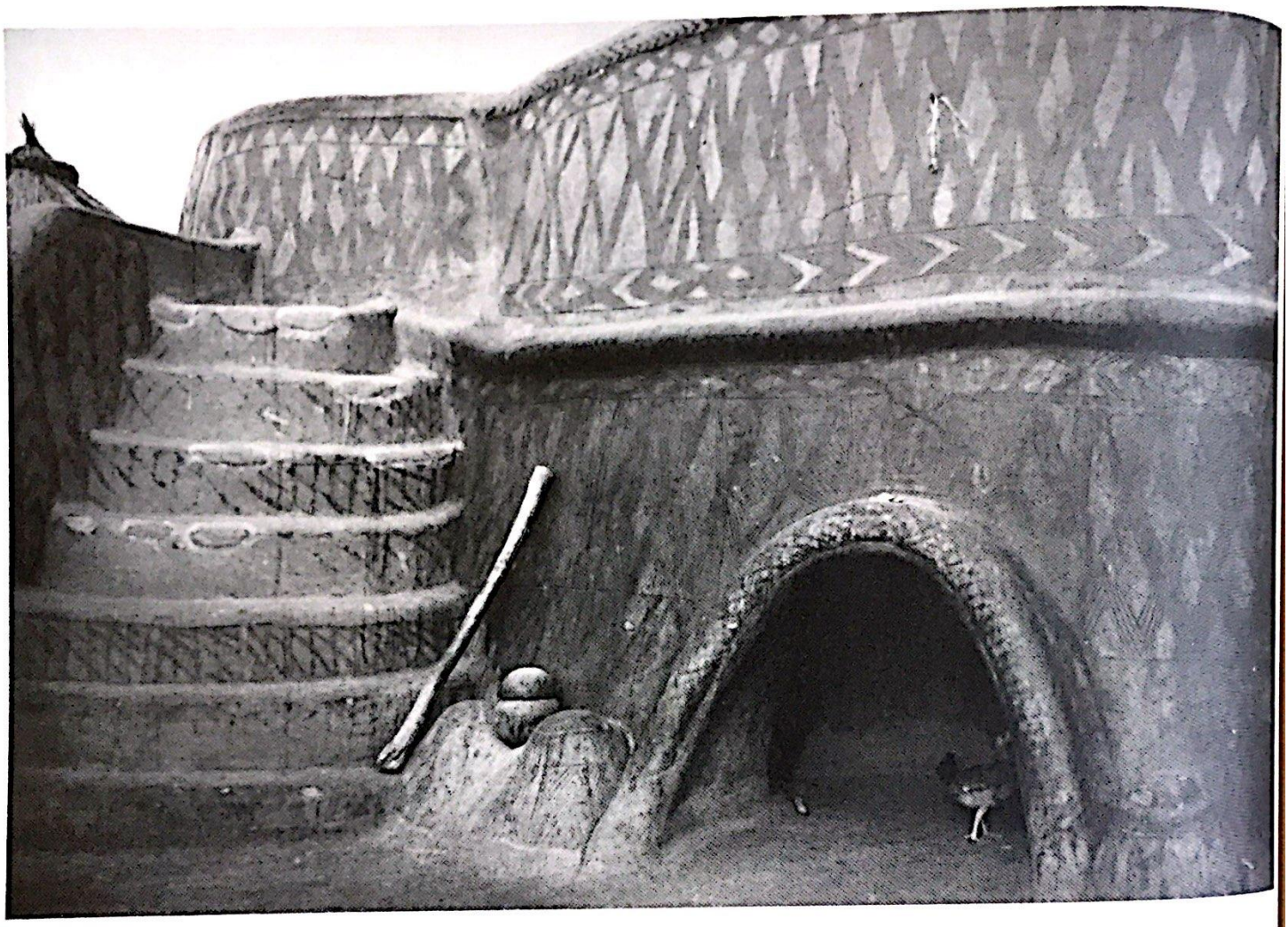


Village of Ziou, Burkina Faso (Upper Volta), woman's dwelling unit of the Nankani people; one example of traditional African architecture. It is made of puddled earth clods and painted with an earth pigment of ground laterite.

10

THE WORLD AT LARGE: ROMAN CONCURRENCES

During the reign of Hadrian, the Roman Empire attained the zenith of its material prosperity and the outermost limits of its growth. (Fig. 10.1) The Euphrates formed the natural border in the East beyond which Persia, the long-time adversary of Western ambitions, lived precariously under Parthian rulers. Along the length of North Africa, the Egyptian desert and its continuation determined the width of coastal land subject to Rome, its numerous cities fattened by maritime trade. Hadrian strengthened the most unstable boundary for the empire, the northern frontier, with a system of fortification that included a wall between England and Scotland and strongholds along the Rhine and Danube. Mounted peoples—Sarmatians, Alamanni, Visigoths—ranged restlessly across central and eastern Europe harassing settled agrarian communities and seeking any advantage against their formidable neighbor to the south. Westward the world ended with the Atlantic.

It was a time of peace, a happy time. The provinces were contented and, for the most part, quiet. The troublesome spirit of Jewish independence flared briefly, but their revolt was crushed in 135. Jerusalem, renamed Aelia Capitolina after Hadrian's family name, was disciplined architecturally with a cross-axial scheme, a proper Roman forum, and the usual catalogue of theaters, circuses, and baths.

There were buildings under construction in every corner of the empire. Hadrian himself sponsored hundreds of public structures, most notably in Athens and Ostia. (Fig. 10.2) He traveled around, so an ancient source tells us, with a contingent of "geometers, architects, and every sort of expert in construction and decoration . . . whom he enrolled by cohorts and centuries, on the model of the legions." An amateur architect, he found time to work on his favorite villa at Tibur, the modern Tivoli, a short way east of Rome, and for the capital he oversaw the design of several monuments—among them a temple to his predecessor Trajan, which completed the cycle of the imperial forums, a temple to Venus and Rome, confronting the Colosseum on the west, and a unique creation in the heart of the Campus Martius called the Pantheon. (Figs. 9.28, 10.3, 11.2)

The Roman Cosmos

It is the Pantheon, perhaps, that best stands for the crowning moment of the Roman Empire. It faced north toward the incoming traffic of the coastal highway, the Via Flaminia. The approach was commonplace: a closed forum, long and narrow, at the south end of which rose a standard temple front. But passing through this porch of smooth monolithic columns of Egyptian granite, one entered a mighty domed rotunda, 150 Roman feet (43 meters) both in height and diameter, that enclosed a vast, unobstructed, thoroughly ordered space suffused with the even light that shone through an oculus and the open bronze doors. (Fig. 10.4) The hemispherical concrete dome, with five diminishing rows of coffers verging toward the oculus and harboring gilded bronze rosettes like gleaming stars, rested on a multicolored wall arranged in two storeys. Niches carved in the thickness of the wall, each screened by two columns of colored marble and flanked by pilasters, alternated with small tabernacles or "temple fronts," which stood in front of the wall plane and were crowned by segmental and triangular pediments. At the entrance niche and the apse across the way, the screening columns were omitted. The apse semidome and the barrel vault over the entrance lifted their arc into the second storey. This second storey was actually a broad frieze of blind windows and triplets of tall thin panels patterned with colored marbles. The floor was paved with disks and squares of granite, marble, and porphyry set in a grid that was aligned with the main north-south direction of the building and reflected the grid armature of the coffering overhead.

The easy grace of this superb interior is entirely deceptive. Behind the tapestry of Classical niches and precious stones that wraps around the rotunda is a tremendously thick wall, 6 meters or 20 Roman feet across, which is what really supports the approximately 5,000 tons of weight exerted by the dome. The relationship of load and support is not direct. The wall, rather than being solid, has been riddled with stacked chambers. These chambers helped to hasten the drying process of the concrete, and

transverse barrel vaults over some among them distributed the weight of the superstructure onto eight points of the perimeter, so that in effect the dome is held up by eight thick piers like some gigantic canopy. The octagonal hall in Nero's Golden House is the logical prototype, but the Pantheon, being free of abutting structures, was forced to resolve its statics wholly within its own big frame. It then proceeded to camouflage the elaborate precautions, so that the user might be duly amazed by the unstrained elegance of this calmly billowing space.

Faultless organization, daring, and a prodigious amount of labor were called for to achieve Hadrian's design, and the effort was thought justified by the uncommon message the building was to convey. The first theme was of course cosmic. This was a temple to all the gods, and the appropriate symbolism was that of the heavens where they resided. The statues of the gods, probably including those of the planetary deities, were arrayed on the edges of the great circle, and the eye of the sun, the central opening in the dome's swell, shone upon them one by one during the course of the day, highlighting their presence.

But the building also had a political content. There were images of Augustus in the entrance vestibule and of the deified Caesar within, and Hadrian held judicial court in the rotunda. The empire, it was being implied, was an analogy for the cosmos, and the Pantheon—like the empire, a structure of many units but one pervading unity—described this analogy in visual terms. The true religion was Romanism, the force that held the Mediterranean world together in a smoothly and reliably functioning order like the harmonious workings of the celestial sphere. Hadrian's, then, was an intellectual statement of what the state was all about. It was his answer to the applied populism of the Colosseum or the billboard swagger of the imperial forums.

As with Persepolis and other central monuments of empire, the Pantheon was also the physical repository of universal tribute from subject lands. It used the granites and porphyries of Egypt, the colored marbles of Africa, the white marbles of the Aegean, pavonazzetto from central Asia Minor. What held it all together and gave it the authority of a single-minded conception was the Roman vaulted style and its versatile medium, concrete.

In the provinces where this technology was not employable, the effects of the vaulted style were aped in stone and on a small scale, within the predominantly late Hellenistic frame of public architecture. Interiors of Pantheon-like grandeur or interlocked configurations of the playfulness displayed in rooms on the Palatine and in Hadrian's villa at Tivoli were beyond the range of cut stone and wood, and where these enticing cages were modestly and laboriously reproduced they remained massive and earthbound. (Fig. 10.5) A technique of mortared rubble achieved some limited success in Asia Minor, and plain brick vaults were also experimented with both here and also in Syria and Egypt. But, for the most part, the strength of provincial work drew upon decorative virtuosity, notably in the carving of stone, and theatrical flare and sweep.

Hundreds of cities, large and small, thickly and prodigally dotted the shores of the Mediterranean and lands beyond in the north and east. They were linked by a network of paved highways. Some were old towns rehabilitated by their Roman masters; some were colonies founded by government decree; some had grown around army camps or to exploit a natural resource like a river port or mineral waters (for example, Bath in England). All enjoyed a

Fig. 10.1 Map: The Roman Empire at the time of Hadrian (A.D. 117–138). Dotted lines indicate major land routes.

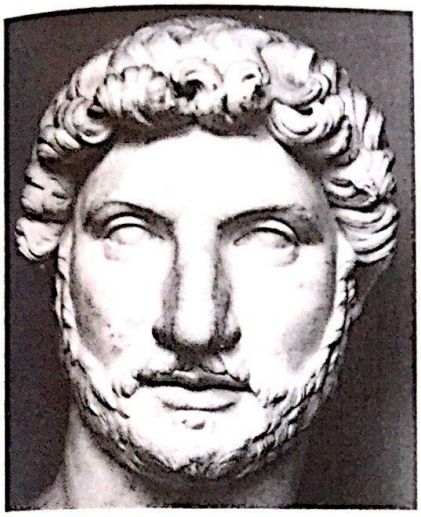


Fig. 10.2 Emperor Hadrian; marble bust. (Vatican Museums, Rome)

measure of local self-government. The majority of towns made do handsomely with agriculture and local trade. A smaller number manufactured goods for distant markets, such as cloth, pottery, and metal objects. In the eastern frontier, towns like Petra, Palmyra, and Gerasa capitalized on the caravan trade that dealt in spices and exotica. Major ports along the shores, equipped with breakwaters, walled basins and docks, handled grain, oil, wine, building materials, and slaves.

By and large cityscapes were not dense. (Fig. 10.6) Skylines were low and the urban fabric generously aired with public spaces and parks. Safe under Roman auspices, towns broke through their walls with large public buildings and affluent suburbs. Luxury villas and handsome funerary monuments lined the highways for several miles beyond city edges. Manors and small efficiency farms blanketed the countryside between towns. The land bore the scars of resounding progress. There were colossal works of agricultural terracing. Dams, canals, tunnels, and aqueducts tamed the natural waterways, carrying fresh spring and stream water to the citizenry and diverting less pure sources to the fields, where pumps and wheels sent it where it was needed. Lakes and marshes were drained and forests felled to extend usable land. Wood was essential for construction and for heating houses, baths, brick kilns, and mines, but logging denuded the mountain slopes. The fact is that several centuries of Greek and Roman urbanization had profoundly transformed the face of the Mediterranean from what it had been at the time of Stonehenge, Knossos, and Troy.

Beyond the Empire

This costly prosperity stopped short at the borders. On the other side, peoples untouched by Roman technology lived simple lives that made only the gentlest demand on natural resources and left the land without permanent markings. That is why it is hard to recover their traces.

Africa

The African continent, outside of the northern littoral, behaved in the traditional ways of the Stone Age. There were hunters and gatherers, pastoral nomads, and farmers. They shaped a broad range of environments depending on the particular geography of a region, its mode of sustenance, its beliefs, and social arrangements. So there was no question of a pervasive pan-African architecture. The earthen round house with its thick insulating walls and soft patterns of shade and shadow was appropriate to the inland savannah; the rectangular house with its light screen walls, raised on a platform and oriented to the cardinal points to catch cross breezes, to the humid rainforests of the coast.

Mud was a prevalent building material. So were poles, brushwood, grass, and loose stones. The variety was seemingly inexhaustible. A recent taxonomy lists thirty-two basic forms for houses alone, from cave houses and underground or semiunderground dug-in buildings to tower houses that consisted of coalescing mud cylinders of one, two, or three storeys. Plans could be round, oval, or rectangular. Roofs might be flat or else conical, trumpet-shaped, or hemispherical with convex, concave, or asymmetrically peaked profiles; or they could be saddle-back or lean-to, hipped, pyramidal, or wagon-shaped. Construction methods ranged from *banco*, a wet-mud process akin to coil pottery, to a frame of poles and skins, which was used in the tents of seminomad tribes of the sub-Saharan belt.

Groupings of homesteads and villages reflected fine nuances of social structure, defining spheres of responsibility, territoriality, and ownership. (Fig. 10.7) Each function of an extended homestead would be allotted its own building: a building for each wife, with a grinding house and granary of her own, the goat house, the stable, the beer store, all arranged in simple constellations and linked by straight walls or embraced by an enclosure wall. In West Africa courtyard houses have abetted speculation about cross-cultural ties. Four buildings, singly or continuously thatch-roofed, faced one another across a courtyard, which in some cases was geared to collect rainwater. This latter feature seems to echo the impluvium in a Roman domus, and there are Egyptian parallels too.

But whatever the balance of indigenous and incursive elements, mainland Africa was the polar opposite of the Roman Empire. Hundreds of self-reliant tribes fended for themselves in the arid zone of the sub-Sahara and the tropical savannah land, in coastal forests, and in benign river basins. They were tied by the same basic verities: "a house, a family and the respect of old age." They built few religious structures. Material permanence was not a fundamental concern. On the contrary, built forms were something that responded to the changing circumstances of daily life and the domestic family cycle; they could be adapted, extended, replaced, or moved. A new wife was entitled to her own addition in the homestead compound; the departing dead and the young who set up their own households reduced the compound. Since no fixed administrative building was thought necessary, the election of a new chief might require the reorientation of the village away from the dead chief's house and toward that of the new chief. The permanence was in the land and its spirits, the

generational patterns of self-preservation and reverence. The act of building was a personal right and a collective enterprise. Materials were ready at hand; the labor force was the village.

We should recognize in all this a fundamental premise. Cities are not the only means of claiming stability. Monumental architecture is not the only way people can symbolize their desire to stay together and be remembered. To talk of "savages" or "the unsettled continent" is license for exploitation.

Europe

Although Rome may have known little of this other world, she actively engaged kindred territories of the "uncivilized" world in Europe, England, and the Balkans. For centuries the nomad peoples of the northern steppes, from Hungary to Manchuria, swept in great migratory waves toward regions whose advantage beckoned, or wherever they were forced to move under pressure from others. These restless stockbreeders and herders, who had domesticated the horse and conquered and ruled their vast, fluid empires with their cavalry, had no use for settled permanence except as their last resting place. Under great mounds of earth they would finally lay still, surrounded by their precious objects of gold and their live possessions of servants and horses. In life they spent their time on horseback and in tents—and that, naturally enough, was their architecture. "Having neither cities nor forts," the Greek historian Herodotus wrote of them, "and carrying their dwellings with them wherever they go; accustomed, moreover, one and all of them, to shoot from horseback; and living not by husbandry but on their cattle, their wagons the only houses that they possess, how can they fail of being unconquerable, and unassailable even?"

As long as Rome was strong, these steppe riders preyed on the sedentary belts of agriculture that were comprised of loose tribal aggregations of villages and single homesteads. This was the situation in much of northern and eastern Europe and the British Isles. The rural way of life had taken root over centuries of continuous adaptation and experiment since the Neolithic revolution,

Fig. 10.3 Rome (Italy), the Pantheon, ca. A.D. 120–27; view from the north. The inscription refers to an earlier rectangular sanctuary on the site built by Augustus' great minister Marcus Agrippa, ca. 25 B.C. See also Fig. 9.23

and a stable economy of farming prevailed everywhere, overriding tribal differences. Two distinct outside forces worked on this inveterate European culture. From the south, Greco-Roman urbanization made inroads in search of fresh resources. From the east, invasions of nomadic marauders caused disruptive migration and called for an architecture of defense.

Once again, as in Africa, the same level of existence and social organization did not bring about a uniform building pattern. There were ubiquitous dwelling structures, certainly. The round house with the thatch roof was very pervasive, as it had been in less developed societies everywhere since the days of Khirokitia. Their traces survive all over England and Scotland, and the form lived on in the Christian monasteries of Ireland. But construction methods for them vary, and so do settlement patterns. What is more important, however, is that several other forms—residential, utilitarian, and ceremonial—have left unequivocal remains, as have planned communities other than farming villages. Wooden rectangular houses built on artificial platforms responded to the challenge of the salt mud-

Fig. 10.4 Giovanni Paolo Panini, *Interior of the Pantheon*, ca. 1750. (National Gallery of Art, Washington)

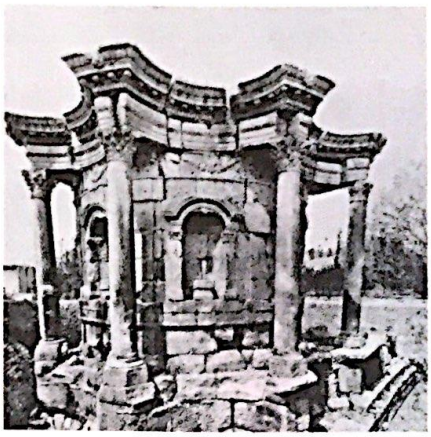
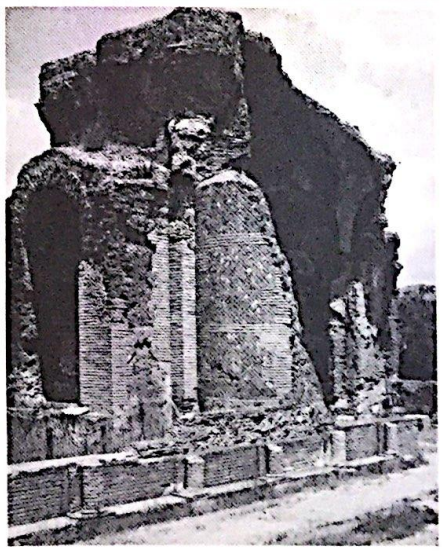


Fig. 10.5a Baalbek (Lebanon), temple of Venus, third century A.D.; view from the south. The temple consisted of a circular cella roofed with a shallow stone dome and encircled by a free-standing colonnade that extended to form a rectangular porch facing the north. This is a provincial attempt to emulate in cut stone the concrete forms of Rome, like the one in Fig. 10.5b below.

Fig. 10.5b Tivoli (ancient Tibur, Italy), Hadrian's villa, ca. A.D.118–134; vestibule of the Piazza d'Oro at the northeast corner of the villa.



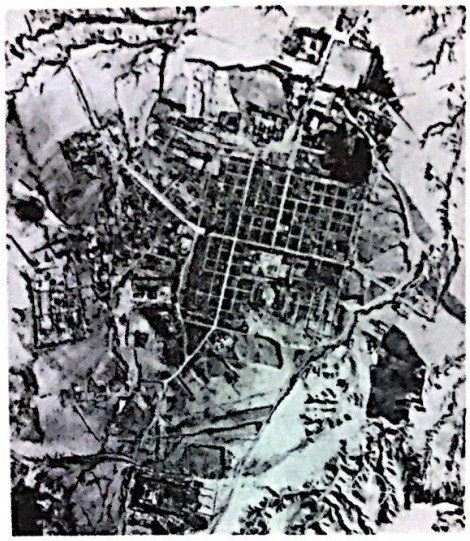


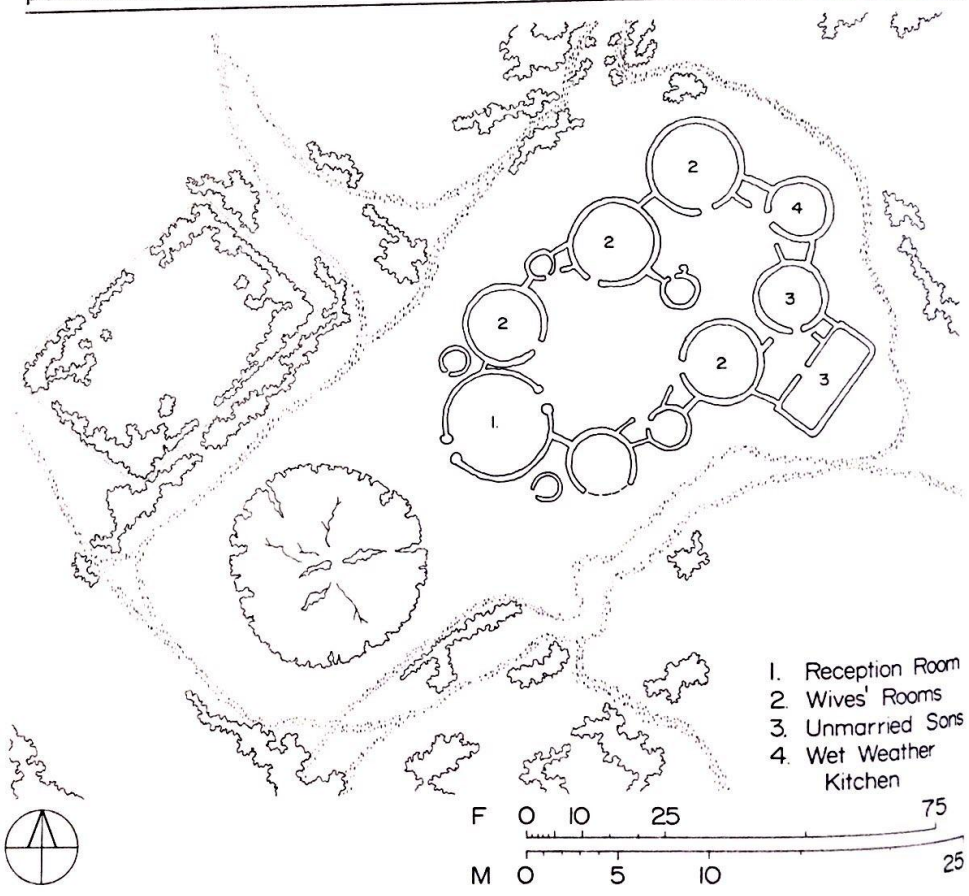
Fig. 10.6 Timgad (Thamugadi, Algeria), Roman city founded in 100 B.C.; aerial view. A colony of military veterans laid down a rigid orthogonal plan; the city later developed along the highways outside the gates.

flats of northwest Europe when they were being occupied a century or two before Caesar's invasion of Gaul. In Scotland, close to the sea, homesteads were built in the shape of circular, drystone-walled citadels of up to three storeys (called *brochs*), with outer defense works like banks and ditches. (Fig. 10.8) In Poland there were great centers of iron-smelting, their furnaces arranged in regular rows like some metallurgical Carnac.

But the most lasting testimony of this European alternative to Romanism are the *oppida* and their defensive systems. These were wartime refuges and centers of tribal gathering. Two natural locations were preferred, for good strategic reasons: hilltops, the commoner by far, and river promontories in deep, precipitous valleys. Some were colossal, enclosing an area of as many as 40 hectares (100 acres). In sling-stone warfare the object was to discourage the attacking force before it had a chance to reach the defenses. A hill-fort gave the upper hand to the occupants, since they could hurl their missiles further downhill than the adversary could send his uphill. Earth was the principal medium in the design of oppida—massively dug ditches, running earth walls. Wooden palisades and stone aprons were secondary.

To see in Roman imperial reliefs representations of bearded, unkempt natives in long bulging pants throwing themselves pell-mell against disciplined rows of legionaries or huddling in fear, one would believe, as the citizens in Rome were doubtless meant to, that the arms of the empire were opening up savage tracts to civilization. (Fig. 10.9) But that of course was hardly the case. Aside from the land-based order of Iron Age Europe with its satisfying way of life, the design of some oppida belie the notion of rude, uncivilized innocence. Deep in the Carpathian mountain range of modern Rumania, on ably terraced slopes, lie the ruins of Sarmizegethusa, the capital of the Dacians destroyed by Trajan's legions in A.D. 106. The walls of the citadel are 3 meters (10 feet) thick and are made of a rubble and timber core faced with dressed stone. From it issues a partially stone-paved road to terraces that supported the houses of the chieftains of King Decebalus' state as well as a sacred

Fig. 10.7 Yankezia (Ghana), living compound; ground plan. This hamlet of the Konkomba people in northern Ghana was surveyed in 1961.



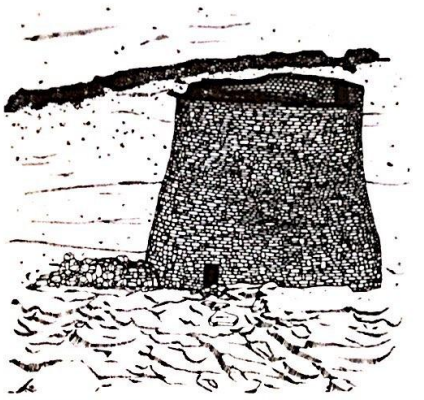
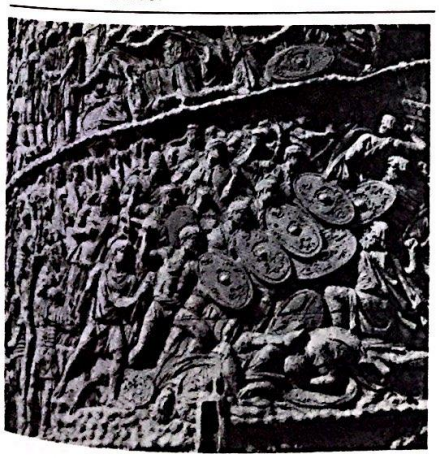


Fig. 10.8 Mousa (Scotland), broch or walled citadel, ca. 300 B.C.–A.D. 400; reconstruction drawing. The thick walls tapering toward the top had hollow upper levels and the space spanned by flagstones defined superimposed galleries. The form recalls Sardinian *nuraghi* (see Fig. 6.1). About 500 brochs are known in Scotland.

Fig. 10.9 Rome, Column of Trajan, dedicated in A.D. 113; scene representing the Roman army victorious over the Dacians. The 38 meter (125 foot) high marble column was erected as part of Trajan's forum complex to commemorate Trajan's campaigns against the tribes of Dacia, modern Rumania, under the leadership of a chief named Decebalus.



enclosure containing at least five sanctuaries. Three sanctuaries are rectangular buildings, probably open to the sky, and are filled with stone bases on which originally stood wooden columns, no less than sixty in the largest of the temples. The arrangement brings to mind, if anything, the columnar halls or apadana of Persepolis, without the roof.

But more intriguing still is a large circular shrine. (Fig. 10.10) It had an outer ring of stone blocks with a ring of small uprights just inside. There were 180 of these uprights, the number of days in half of the Dacian year. Within this outer frame was a concentric ring of timber stakes, originally sheathed with fine terra-cotta, interrupted by stone blocks at four points on the cross-axes. In the center was a horseshoe of smaller stakes that set the main direction of the complex in a northwest-southeast orientation. All the stakes had iron nails driven through them with terminal rings, from which to hang ornaments and votive offerings. Close by stood a stone sun made up of ten wedge-shaped slabs radiating from a circular slab at the center.

This circular shrine recalls Stonehenge. But we are now no longer in the Neolithic age. The time is the first two Christian centuries; the place, the orbit of the Roman Empire. Decebalus' people, about 1,200 meters (4,000 feet) high in the southern Carpathians, seem to be mooring their state to a solar cosmology just as Hadrian's Romans did with his Pantheon. There is, to be sure, an unbridgeable gap of structural and visual sophistication between the Pantheon and the circle of Sarmizegethusa. But technology and subtle design are not always the proper gauges for assessing the quality of people's views of the world and their place in it.

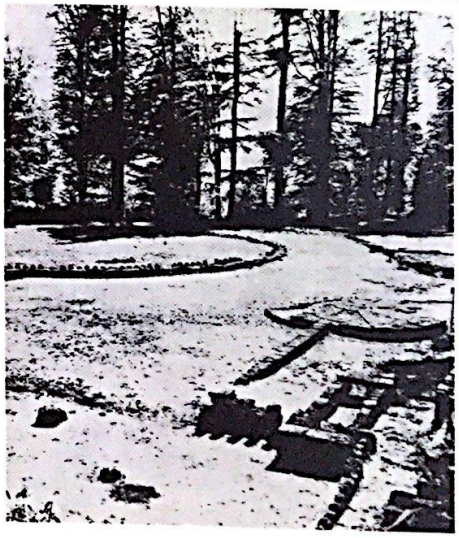
Persia

In Persia at this time, the circle occurs in two contexts on the land—religious and urban.

Mazdaism, the official faith of the great Achamaenid rulers, which centered on a triad of deities—Ahuramazda the creator, Mithras the sun-god, and Anahita, the Persian equivalent of the mother-goddess of the Near East—was still in force, despite two centuries of Greek occupation that started with the conquests of Alexander. When the Greek yoke was thrown off in the later second century B.C., a site in the highlands of modern Azerbaijan began to figure as one of the holiest places of Mazdean practice. The object of reverence was a magic lake whose depth could not be plumbed and whose waters held steady even as they were being emptied continually by seven streams. Here, too, burned the sacred fire from which all others were kindled in the fire temples of the land.

The altars, ritual buildings, and annexes of Takht-i-Suleiman, the Throne of Solomon, as this haunting shrine is now called, have disappeared: only the lake and the manmade boundary survive. It is enough. In the midst of a lofty, epic terrain, away from human habitation, the three holy elements of water, fire, and earth, long worshipped in greater Persia, are spectacularly embraced within a circular wall of enormous stones. (Fig. 10.11)

Fig. 10.10 Sarmizegethusa (Rumania), Dacian capital from ca. 100 B.C. to its destruction by the Romans in A.D. 106. This view shows the Stonehenge-like circular sanctuary and the nearby stone sundisk.



Even in Parthian times, the built component of Takht-i-Suleiman was probably modest. Persia's religious worship always took the form of an open-air cult. Lakes and rivers were unrestrained water sanctuaries. In the fields northeast of the Persian Gulf, at Masdjid-i-Suleiman or Badr-i-Nishandah, the oil-rich earth blazed miraculously. The priesthood, the very ancient fraternity of Magi, administered these natural sanctuaries and tended the fire altars that marked assembly places for regular worship. The fire altars were to be found on the roofs of temple towers that were usually square. Later on, the fire would be sheltered in small domed structures open to all four sides by single arches. The only example that might go back to Parthian times, Rabat-i-Safid, stands today on a rugged height southeast of Mashhad. (Fig. 10.12) The construction is rudimentary, but it prefigures an insistent concern of these late Persian builders to place a dome on the walls of a four-sided building.

The transition from the square plan to the circle of the dome was attempted at Rabat-i-Safid by bridging the corners with wooden beams, which in turn supported rather awkward masonry squinches. In Persia full-blown squinches, which are arched or have corbelled corners, must await the Sassanians who displaced Parthian rule in the third century A.D.; but they were hardly new in the history of building. (Fig. 10.13) Hemispherical vaults over square rooms were commonplace in the Roman Empire by this date, and the transition element, rendered in stone, mud-brick, or concrete, was either the squinch or the more polished pendentive, a spherical triangle that continues the curve of the dome down to the four points of the square chamber.

Round cities were known even before the Persians, in Syria and eastern Anatolia, although geometric thinking does not seem to have affected the layout inside. The curve responded for the most part to the hilly topography of the sites and to defensive expedience. In their state reliefs, Assyrian military camps are shown as being round, presumably in flat territory as well as on prominences; and it may have been from this source that Parthians derived their circular cities. Indeed, each one had a purely military origin. Ctesiphon in northern Mesopotamia was built as a camp for the Persian army on the left bank of the Tigris, across from the Hellenistic city of Seleucia. It became in time the Parthian capital and that of the Sassanians after them whose mighty palace, the Taq-i-Kisra, we will look at in a later chapter. Gur-Firuzabad, south of Shiraz, was built as the fortified headquarters of the pretender to the Parthian throne, Ardashir I, who got the upper hand in A.D. 224 and founded the Sassanian dynasty.

Persian kings were indifferent city builders. Capitals, Persepolis included, were equipped with substantial palaces and other accommodations for royal sojourns, but they were surrounded by shanty towns. Central Iran, an arid waste, could barely meet the needs of the nomad. The valleys of the great mountain chains that ring this majestic, wind-swept plateau with its salt deserts sustained the only settlements. Rainfall, good pasturage, and tilling land encouraged the settlements, and they in turn attracted the trade of major caravan routes. City life proper, however, was mostly confined to old centers in conquered territories. The countryside remained in the hands of a landholding aristocracy, and this ruling class, ensconced in fortified castles, headed a feudal society very like that which we later find in medieval Europe.

In this unsteady political climate where central authority was on the defensive, the Hellenistic cities founded by Alexander and his Seleucid successors played an equalizing role. They provided bureaucrats and an enterprising bourgeoisie, and their reve-

Fig. 10.11 Takht-i-Suleiman (Azerbaijan), Parthian sanctuary, first century A.D.; aerial view. The great circular wall once enclosed the supreme fire called Adhur Gushnasp, which means "fire of warriors" or "royal fire."

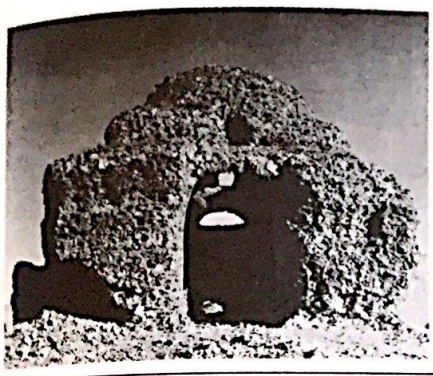


Fig. 10.12 Rabat-i-Safid (Iran), fire temple, ca. A.D. 200.

nues enriched the royal coffers. The King of Kings supported the Greek cities, therefore, even after the overthrow of the Seleucid dynasty. Hellenistic grid plans can still be seen in sites like Dura Europos on the Euphrates, founded by the Macedonians in 300 B.C. and occupied by the Parthians about 100 B.C. But the Greek veneer is thin. Private houses revert to the old Mesopotamian solution of irregular rooms grouped around a small courtyard. These coexisted with the native house unit—the columned hall preceded by an open portico. And now under the Parthians a new component was introduced into residential design, which may in fact have been common earlier in the vernacular idiom of eastern Iran. This feature was the *iwan*, a rectangular barrel-vaulted hall open at one end to its full width and height; it was often employed as a triple chamber, the central one usually larger than those on the sides.

The architectural expression of majesty continued to be the ceremonial palace. That at Hatra might be a century later than the Palatine complex in Rome. (Fig. 10.14) A look at its plan will reveal how different it was from the Achaemenid model of Persepolis. (Fig. 6.23) There are no apadana and no monumental staircases, but the new basic unit, the iwan, is used in various combinations. The initial scheme involved two large iwans separated by two-storey sections of smaller rooms. Behind the southern iwan was a temple tower, a kind of vaulted palatine chapel, situated in much the same way as the ziggurat was attached to Assyrian palaces, like the one at Khorsabad. At Assur, the old Assyrian capital, we encounter the first instance of an extremely influential formula: four cross-axial iwans around a court. This scheme, developed by the Sassanians, will carry over to the Islamic period and will become standard for mosques, schools, and caravanserais alike.

The vaulted forms of the royal palace, at this monumental scale, must have been affected by Roman example. But the only two vault types known to the Parthians were the barrel and the dome. They made no effort to have vaults intersect or to create the kind of spatial sequence and interpenetration characteristic of the Roman vaulted style. They set principal rooms one next to the other, with isolating corridor spaces or bands of auxiliary units between them. Columnar screens, banks of windows, and similar Roman devices to permit the flow of space from one unit to the next are totally absent. Facade design was openly indebted to the Greco-Roman vocabulary of columns and niches, interpreted rather idiosyncratically. (Fig. 10.15) With the rise of the Sassanian dynasty, a nationalist mood began to prevail in architecture. But even then Roman facade conventions lingered like snatches of an old tune.

The Other Ancient World

Parthian Persia stood, Janus-like, between the ancient world that has so far in this book been our chief concern and the equally enduring body of nations in the Far East. (Fig. 10.16) It collected the goods of the Mediterranean at Red Sea ports and transported them from there to the mouth of the Indus; they then traveled upriver as far as

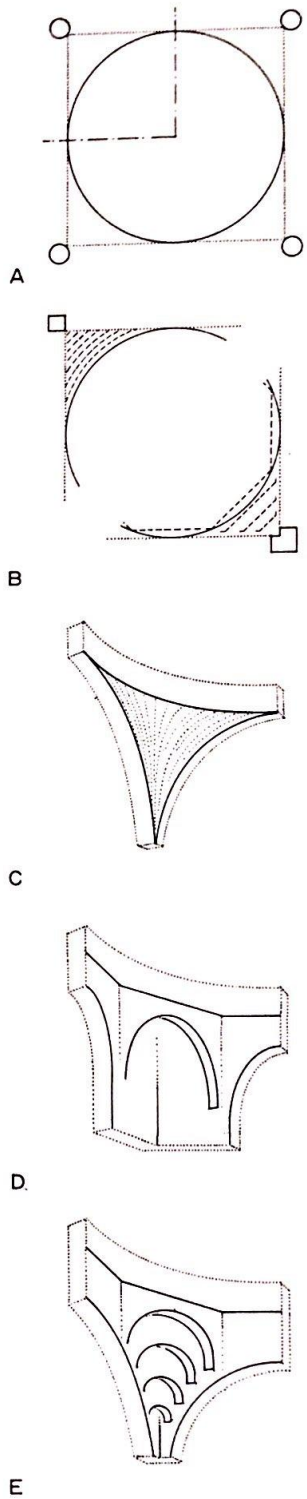
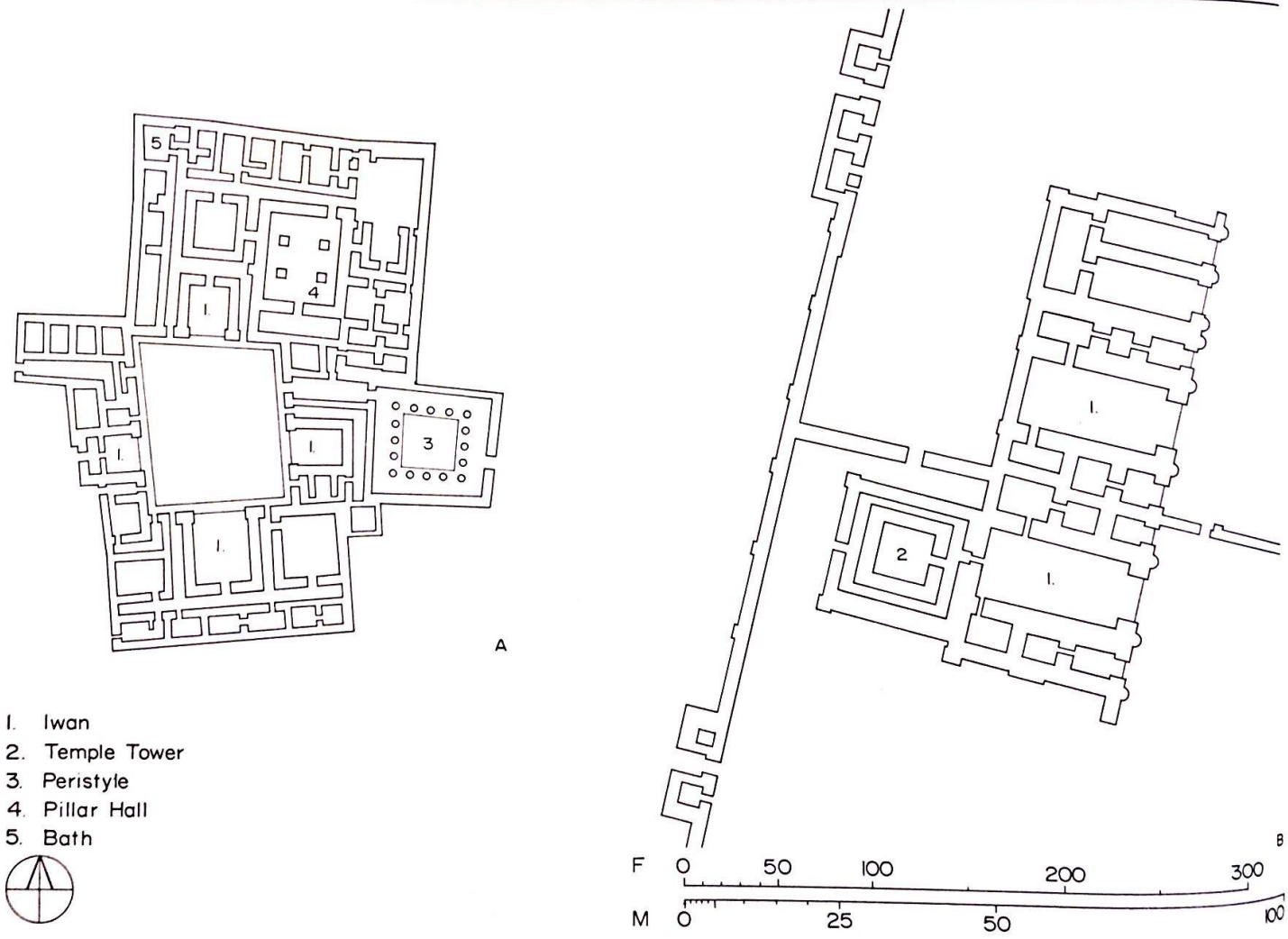


Fig. 10.13 The placing of a dome on a square bay; diagrams. As the basic plan of the bay shows (**A**), the problem is how to make the transition from the cube, defined by the walls, to the circular base of the dome. (**B**) is a diagrammatic plan of the two principal solutions: top left, the pendentive; bottom right, the squinch. The pendentive (**C**) is a spherical triangle. The squinch spans the corner with an arch (**D**), or a series of arches (**E**).

modern Peshawar, crossed the Hindu Kush and the Pamir range in caravans, and via Chinese Turkestan reached the edges of the broad expanse of China. Special Chinese and Indian commodities found their way to Roman markets along a second, overland, route that made use of the Oxus River, traversed the Caspian Sea, proceeded along the Cyrus (Araks), and after some days' portage arrived at the Black Sea. Finally, there was the famous Silk Road that passed through Merv, Hekatompylos, Ecbatana, and Ctesiphon and then forded the Euphrates, unloading its precious Eastern cargo into the Roman entrepots of the Syrian coastland.

India in this period had no unified rule. China, by contrast, had been a cohesive empire for more than two centuries under the Han dynasty (206 B.C.–A.D. 220), whose capital was the city of Ch'ang-an in the Shensi Province of northwest China, by the Yellow River. But for both spheres of continental Asia, these were only the latest episodes of a hoary past. Human life in China goes back one-half million years to the so-called Peking Man. It has continued without interruption ever since. A rich, long

Fig. 10.14 Parthian "palaces," first–second centuries A.D.; ground plans: left, Assur (Iraq), the four-iwan scheme; right, Hatra (Iraq), the parallel-iwan scheme, part of a larger complex now thought to be a sanctuary of the sun.



Neolithic phase is only now being pieced together by archaeologists. And the literate age of the two millennia before Christ shaped many of the environmental attitudes of the Han, which we will be looking at shortly.

Indian prehistory embraces a European-like megalithic culture, with stone avenues and mound-encased dolmens, in the south and central regions of the subcontinent, as well as a brilliant urban culture in the Indus valley that corresponds to the experiment of Mesopotamian city-states. The towns of Harappa and the gridded Mohenjo-Daro were already at least 1,000 years old when they succumbed about 1500 B.C. to an invasion of light-skinned Aryans who enslaved the indigenous Dravidian population and ushered in the tenacious caste system. The new master race brought with it the faith of Brahma, the unimageable ultimate reality on which all things are based. Hinduism, which still has many millions of adherents, evolved out of the idol-loving earthy exuberance of native beliefs and the more purely transcendental idealism of the Aryan overlords.

India

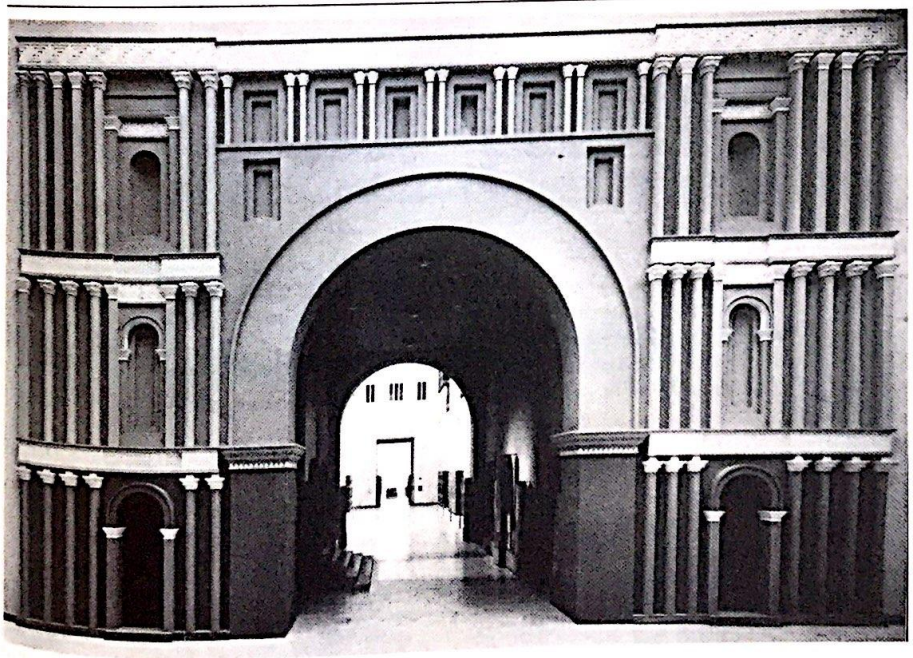
The cerebral aspect of the Indian world view affected architectural theory, especially the design of temples and cities that were considered a diagram of universal order. Vastuvidya, the science of architecture, already constituted a branch of occult knowledge around 1000 B.C. The earth was round, and the circle was its primal form. But an absolute, extramundane order resided in the square in which was manifest the supreme principle, Brahma. The sides of this perfect form, duly fixed by the cardinal points, could be divided by any number up to 32, thus yielding between 1 and 1,024 units or *pādas*. (Fig. 10.17) It was for the priest to select one of these variants or *mandalas* as the basis of a temple design or the layout of a city. Despite the extraordinary surface richness of later Hindu temples, their exterior mass pleated and honeycombed hypnotically with ornament and sculpture, the holy diagram still rules, and every detail is subject to a strict system of canonical proportions. (Figs. 16.26b, 16.27) Early town schemes, if the architectural books are to be believed, conformed to mandalas with as many pādas as there were to be residential quarters, and only within each pāda, which was inhabited by members of a particular professional group, might a looser subdivision of alleys and footpaths be countenanced.

With the architecture of the alternative Indian religion, Buddhism, we slip out of the stern abstractions of the circle and the square and revive the emotional strains of the mountain of god. The Buddha lived in the sixth century B.C., and when he died at the age of eighty at Kushinagara, his body was cremated, and over his relics a mound was raised in the manner traditional in early India for kings and heroes. Out of this primordial symbol of the earth's embrace and the human reach skyward, present in the environmental thinking of old cultures everywhere, the *stupa* was canonized as the most revered monument of Buddhism. Freestanding or rock-cut, single or in numbers, the stupa fixed the permanent havens of families of monks outside of the big towns where the brothers would go begging for half of every day.

The three components of a Buddhist monastery were enunciated quite early. The stupa was the pivot, both reliquary and cosmic egg, atom and universe. On a circular base sat the tall hemisphere of a dome, a cast of the infinite cosmos transfixed to the depths of the earth by an axial pole that ran through it. On the tip of the pole, which showed outside the dome's crown, was hoisted the royal emblem of the umbrella and under it the sacred relic nested, surrounded by a square railing. In addition, there had to be an assembly hall for communal activities like public confession. This hall, called *chaitya,* was often combined with the stupa into a single structure. (Fig. 10.18) The third element was the *vihara,* a large rectangular space entered from the outside along one side and lined on the remaining three sides with dormitory cells.

A whole series of these monasteries can

Fig. 10.15 Assur, Parthian "palace," facade of west iwan; reconstruction model. (Staatliche Museen, Berlin) The facade was originally stuccoed and brightly painted.



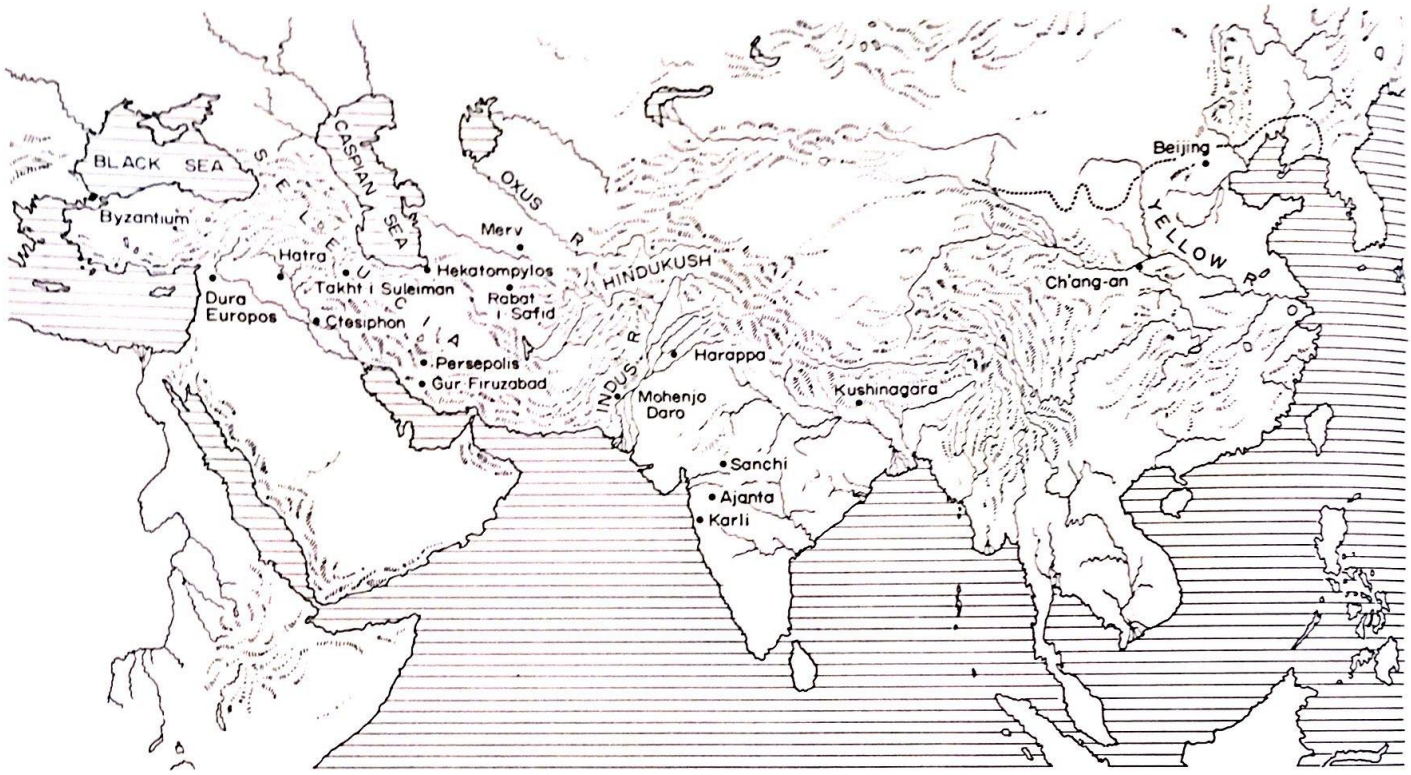


Fig. 10.16 Map: The Middle East and Asia in the second–third centuries A.D.

be seen at Ajanta, in the gorge of the Waghora River which cuts through the plateau of the western Ghats. (Fig. 10.19) They were carved into the rock-cliffs over several centuries starting in the second century B.C. They were accessible from the valley floor by means of narrow flights of rock-cut steps. The stupas here were fashioned in the earth itself and out of its primal rock substance. They were given a protective shell overhead, which was then extended longitudinally to form the barrel-vaulted chaitya. Rows of vertical supports described a continuous U-shaped path along the edges of the hall, behind the stupa, and across the entrance front.

Pilgrims traveled great distances to reach this remote sanctuary, followed the river gorge for a spell, and in files negotiated the difficult path upward to the mouth of the cave. They probably entered from the left, since the ritual circuit around the stupa was to coil clockwise. They moved slowly between the rock wall of the cave, polished smooth and hospitable to the touch, and the row of receding pillars that were wooden, treelike uprights at their simplest or, in the case of the largest and deepest chaitya of Karli, rock columns with intricately wrought imposts of guardian animals and paired lovers from which sprang a wooden armature of transverse ribs underlying the scooped barrel of the nave. The darkness thickened at each step: the certainties of time and place elapsed. Then, at the edge of the fathomless, the dome of the stupa glowed suddenly, as if the cosmic egg was being unveiled in the heart of the earth.

The source of light was in actuality a hole at the top of the rock shell through which

Fig. 10.17 Indian mandala, the *vastu-purusha*; from an old Indian manual of architecture.

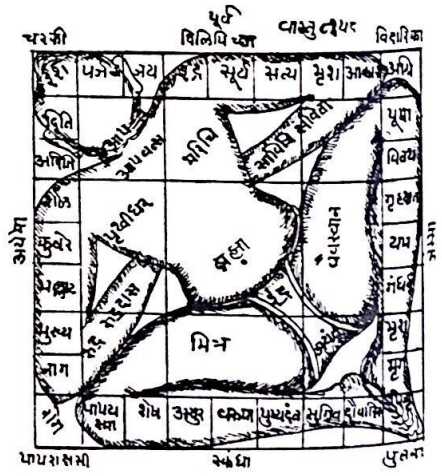


Fig. 10.18 Karli (India), rock-cut chaitya hall of the Buddhist sanctuary, A.D. 100–25; interior.

the builders had first tunneled their way into what was to become the chaitya. This "sun window," functioning like the oculus of the Pantheon in admitting nonworldly light, came first in the process of construction; the Pantheon oculus was instead the final outcome of the laboriously made building. Indeed, the quality of vaulted architecture hollowed out of natural matter sharply differs from that of Roman vaulted forms.

The practice of scooping out an environment in the given forms of nature is more frequent and universal than we might think. There were ancient rock-dwellers in the Red Sea, Ethiopia, and Armenia. In the vision of Obadiah, the Lord admonishes the land of Edom, "thou that dwellest in the clefts of the rock, whose habitation is high." Rock tombs abound in the Near East. In Sicily whole towns are rock-cut structures: Siculiano, Caltabelotta, Bronte. And in the loess belt of China millions of people have traditionally lived in dwellings hollowed out of the silt that had been formed by the action of the winds in the remote Great Ice Age. In terms of monumental achievement we could point to the Egyptian temples of Abu Simbel, rock-cut Byzantine churches in central Asia Minor, and of course Buddhist monasteries like those at Ajanta and Karli.

These buildings are not inhibited by the force of gravity; problems of loads and thrusts here are negligible. The structure stands intact, as it were, before the carver-builder starts work on it. Columns and vaults are no more than structural symbols liberated from raw matter in the way a sculptor liberates form from a lump of stone.

The Buddhist carver-builders at Karli used pointed chisels and iron mallets, and flat chisels of varying width for the final polish. They scooped out the barrel-vault first, removing the rubble through the sun window. Then they hewed the lower section, probably beginning at the entrance. Next they hoisted the heavy teak ribs, weighing as much as 3.5 tons each, into place and secured them to the polished surface of the vault by strong dowels. The act of sculpturing the chaitya and its holy shrine was regarded primarily as a rite, and no detailed description of the process has survived in the old manuals of architecture.

In the open air, the stupa behaved differently. The subterranean voyage of discovery gave way to the celebration in broad nature of a cosmic trophy; revelation was exchanged for processional homage. Set up on prominences and outlined against the sky, the stupas beckoned magisterially. At Sanchi, a monastery near the important trading center of Vidisha, three stupas were built over a period of about two hundred years, from the second century B.C. to the first century A.D. (Fig. 10.20) The original monastic buildings have disappeared and the stupas have been repeatedly done over. Still, they stand with tremendous presence in the highest point of the plateau, each rivetted to the hillscape by its central mast.

The largest of the three, built in brick and subsequently enlarged and encased in stone, had four cardinal gateways, or *toranas*, intricately carved with guardian spirits and the miracles of Buddha. The main entrance was probably on the south side. The high balustrade that stands in front of the base of the stupa blocked the stairway within, until one full circle on the ground level brought one to it naturally. The ascent began at this point, and then tightened at the level of the base of the dome. This upper circumambulatory path also has

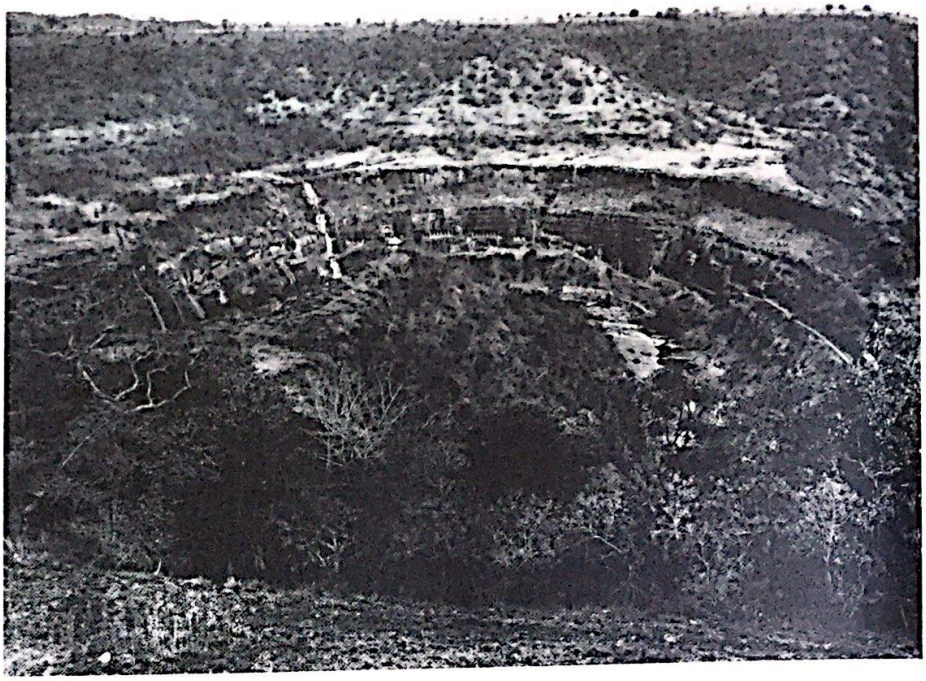


Fig. 10.19 Ajanta (India), Buddhist cave sanctuary, second century B.C.–seventh century A.D.; aerial view.

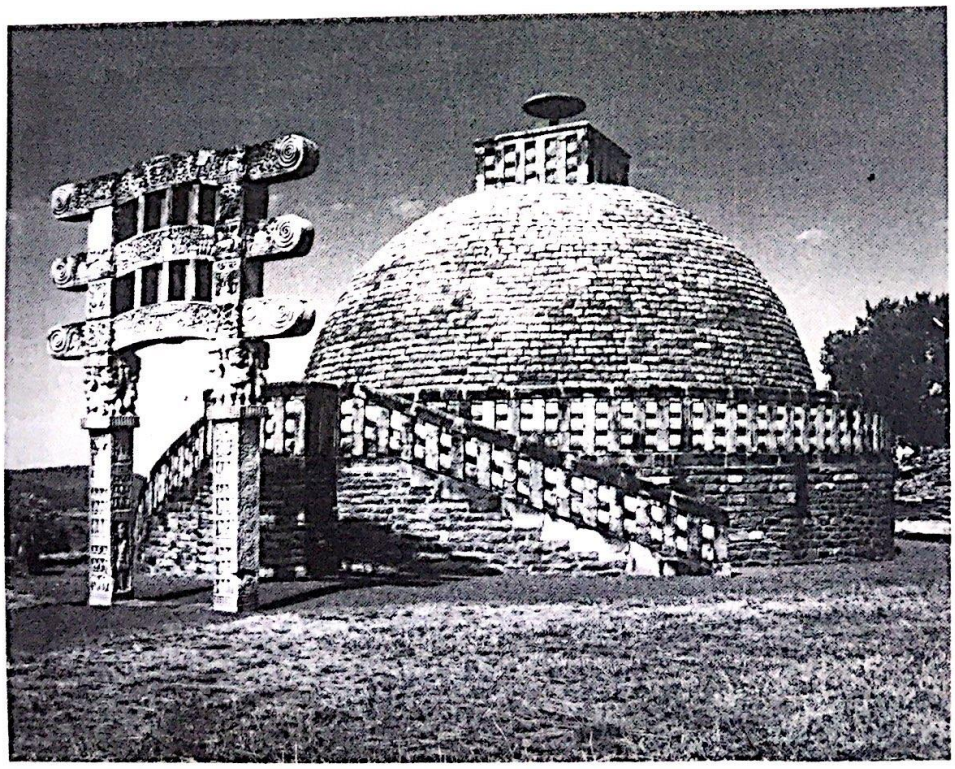


Fig. 10.20 Sanchi (India), stupa 3 and entrance gate of the Buddhist sanctuary, second–first century B.C.

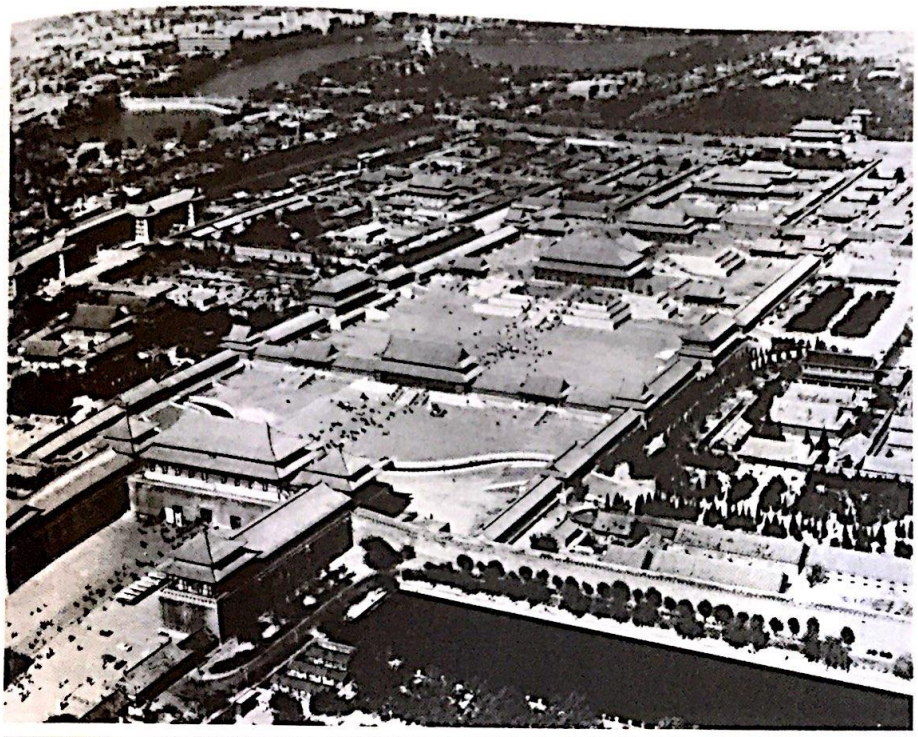


Fig. 10.21 Peking (Beijing, China), the Forbidden City; aerial view.

a high balustrade modeled, as are the toranas, on wooden prototypes. Here, on this narrow and paved path, the pilgrims went around the axis of the universe in its domed cosmic shield, touching the source of their faith that would make benign the real world on their way back home.

China

Buddhism was introduced into China under the Han dynasty. By the fifth century A.D., it had begun to bring a note of compassion and devout humanity to the discrepant world view of this ancient people and their inflexible built environment. Unlike their Indian neighbors, the Chinese had little sympathy for the mystical or the infinite. Theirs was basically a secular, intellectual order; unmoved by any need to search for some ultimate truth, they plotted their own precise, clear-cut place on earth. The society at large, dominated by a ruling class of literate officials, was fundamentally agrarian. But it was in royal walled cities that human hierarchies and values were expressed in codified spatial settings.

Chinese cosmology pictured the heaven round and the earth as a stable cube. Space was conceived as a series of imbricated squares, at the center of which lay the capital of the empire strictly oriented toward the points of the compass. And in its center the palace commanded the main north-south axis, facing southward (as did all important buildings) in the direction of the Red Phoenix of summer and fire. To the east was the region of the Blue Dragon, of spring and growth and the upright tree. In this sector of the capital would be the Temple of the Ancestors. Autumn and its harvest, but also wars, the harvest of men, and memory and regret were all symbolized by the White Tiger of the west, and in the urban layout by the Altar of the Earth. From the north came cold winter and marauding hordes bent on destruction; its color was black. The emperor faced away from it, and in the northern sector of the city, confined behind the palace, would be situated dubious activities including commerce and its markets.

Rectilinearity and axiality—these were the operative principles of Chinese design. (Fig. 10.21) And with them went the horizontal aesthetic, the conscious preference for a uniform range of heights that shifted the environmental burden of social distinctions to the placement of buildings in the general scheme of the city, the level of the terraces on which they invariably stood, the area they covered, and the degree of their ornamentation. All of these were officially prescribed. Han sources set down the specific code, based on status, that controlled where a house was allowed to be in its *fang* or neighborhood, how big it was to be, and how involved its design.

This system of rigorous discriminations carried over to the frame of the single building or compound. The house, humble or princely, had as its pivot an inner courtyard. (Fig. 10.22) Rooms looked in onto it, their back walls defining the exterior boundary of the household. Or else free-standing pavilions were set within the courtyard and a separate, walled envelope thrown around the compound. The aim always was to screen the intimate world of the house from the bustle of the streets, to observe internal rules of behavior, and to unfold spatial sequences according to what has been called "graduated privacy." The front gate, cut into the perimeter wall, was as far as the peddler or the stranger would be allowed to contact the residents. Friends and relatives came into the courtyard and expected to be entertained in the porched central room (the *ming*), corresponding to the Roman *tablinum*, which sat on its own platform a little higher than the rest of the house. Deeper still were the rooms reserved for the womenfolk and the rituals of family life. The etiquette of the royal palace, with its many courtyards and pavilions, differed only in degree.

Like the Roman domus, the Chinese house had the dual function of a home and a setting for social ceremony, but the patterns of formal behavior were choreographed with unflinching correctness. A

Han dynasty compilation delineates in the greatest detail the movements of a visit, the overriding duty of everyone concerned "to humble oneself in order to honor others." We read:

> At each gateway the host must respectfully urge his guest in until they arrive at the door of the inner courtyard. The host excuses himself to enter first so that he may place the mats personally. . . . The host enters the doorway and . . . proceeds to the eastern stairway, while the guest proceeds to the west. . . . As the host lifts his left foot to ascend the eastern stairs, the guest lifts his left foot to ascend the western stairs.

And so it continues.

In Chinese architecture it is the ritual and its diagrammatic plot that endure, not the actual physical structure. Materials were by and large impermanent—rammed earth, mud-brick, timber—and the expected life of any building, public or private, was a generation or so. The structures decayed fast and their material was reused, or they were renewed periodically with or without respect for their original purpose. This recycling was possible because the architectural plans hardly varied: a long and shallow rectangle divided into rows of bays by stone or timber pillars that sustain a superstructure of ceiling beams and a truss roof. Perhaps we should not speak of a truss here in the same way that we speak of the rigid triangles of Western roof construction, with their bracing diagonals. In China the skeletal armature between ceiling and roof pitch consisted of progressively shorter lateral beams and a vertical spine at the top that held up the ridge.

All basic roof types were already present in the Han period: the gable roof with or without overhang, the hipped roof of four slopes, the pointed roof, the so-called "Nine Spines." (Fig. 10.23) The curve of the eaves, so characteristically Chinese, seems to postdate Han practice, but already roofs were being built with a decided change of pitch half way up, as if they had given way under their own weight. The roof covering was tile. The roof, whatever the degree of flare, did not depend on the walls. They were spatial or seclusive panels, little more. The roof, for that reason, appears to float over its building, anchored to its terrace by the skeletal frame of the uprights.

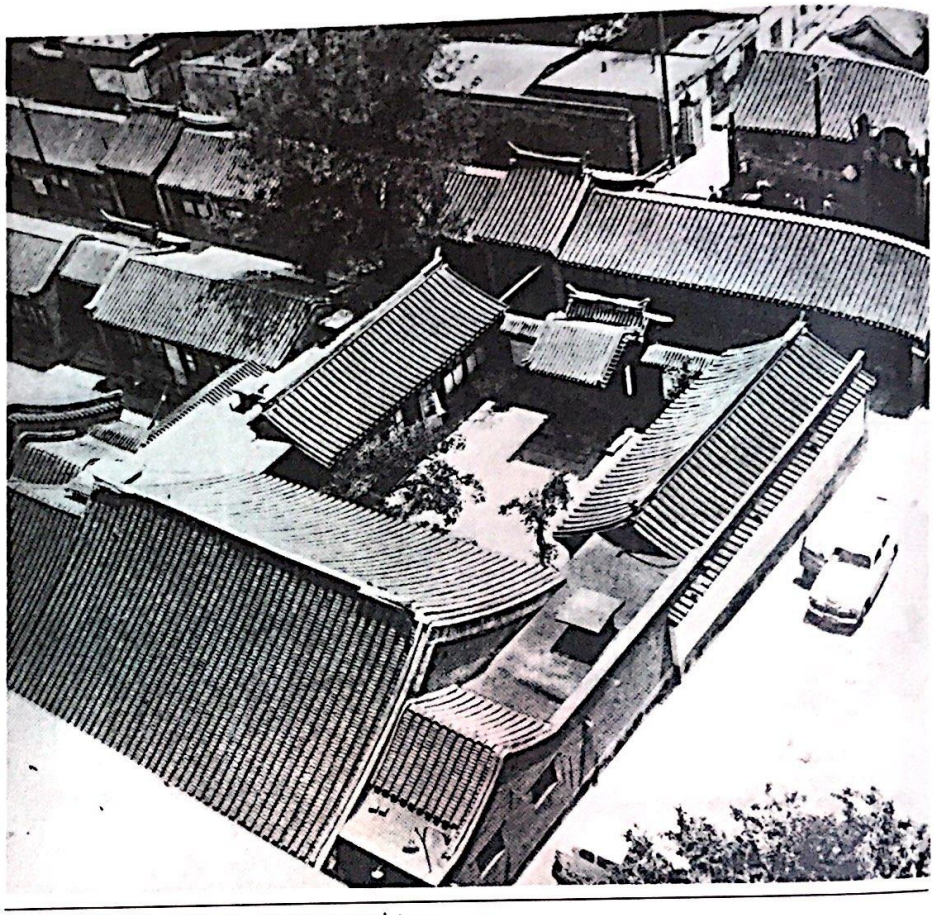


Fig. 10.22 Peking (Beijing), one-courtyard town house; aerial view.

At the juncture of pillar and roof, both externally under the eaves and in the interior space, bracket clusters mushroomed thickly to reduce spans and reinforce joints. In Han buildings these brackets were not yet incorporated in the structural frame, but formed separate supports. The perfection and refinement of the system called *tou-kung*, which entailed both bracketing and cantilever action via members that extended parallel to the rafters directly under the roof, constitute the chief points of interest in later Chinese architecture. (Fig. 10.24)

China built with earth and wood, but not because it had to. There is plenty of architecture in stone to examine from all periods; it is mostly utilitarian—for example, bridges and defensive works. The Great Wall is universally admired. (Fig. 10.25) Some 3,220 kilometers (2,000 miles) long, it wends its way from Tun-huang to the Yellow Sea, shielding Kansu, Shensi, Shansi, and Hopei provinces. The original curtain goes back to the reign of Emperor Shih Huang Ti of the Ch'in dynasty who unified the country in 232 B.C. and to Han rulers who improved on the wall and planted

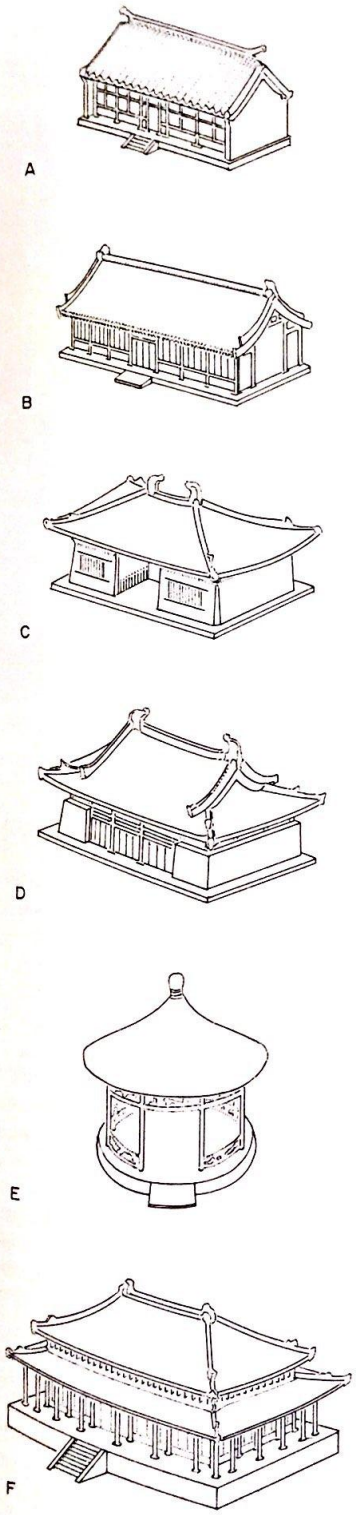


Fig. 10.23 Chinese roof types; isometric diagrams. **(A)** Ying-shan (Ying-shan), without overhanging gables; **(B)** Hsüan-shan (Xuanshan), with overhanging gables; **(C)** Wu-tien (Wu-dien), also called Wu-chi, with five spines and four slopes; **(D)** Hsieh-shan (Xieshan), also called Chiu-chi, with nine spines; **(E)** Tsan-chien (Zanjian), the pinnacle type, shown here on a round structure; **(F)** Ch'ung-yen (Chongyan), with double eaves, an elaboration of type **(C)**.

permanent veterans' colonies along its length to control the passage of nomads and regulate their trade, but also to prevent the exit of settled populations.

The permanence and continued enhancement of this official project are, however, exceptional. Chinese rulers usually built for themselves alone and with an almost fatalistic transitoriness in view. In this and in the character of their official building programs their attitude was totally different from that of Rome. They trusted their majestic tombs and the judgment of written history, as revealed in scrupulously kept archives, to carry their name to posterity. Roman emperors built to be remembered. And most of what they built had the public good or leisure activities in mind.

The notion of architecture as public service, or the instrument of the state, or a transmitter of culture was alien to the ruling dynasties of China. Concern for the people might be evinced through gifts to the poor, amnesties, or the remission of some taxes. One did not undertake to supply them with baths, theaters, or forums. Unlike the strong urban legacy of the Roman Empire, there had never been a tradition of independent cities in China attentive to public amenities and civic display. Behind imperial power here was the peasant masses. In the cities the central task of government was social control. Residential grids look to be in the spirit of Hippodamus—on paper. In reality, the blocks were walled individually, to keep the population inside at night and to facilitate census-taking and recruitment for military service and forced labor.

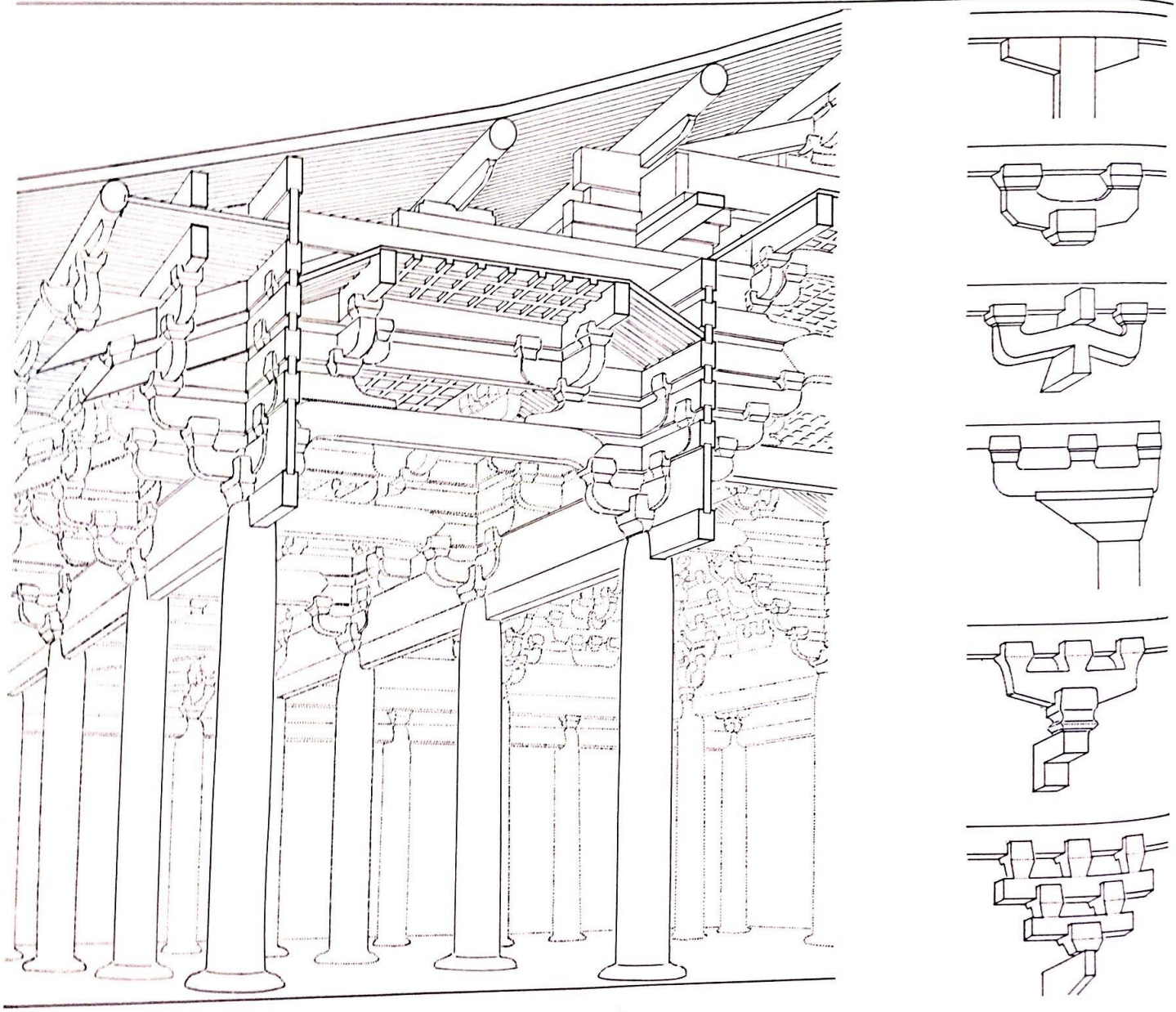
The public image of the city manifested itself in the royal palace alone. The main avenue led directly to the emperor's presence, not to a civic and religious center like a Roman forum. No religious architecture competed for attention; no priesthood diverted centralized power. The Temple of Ancestors and the Altar of Earth were palace adjuncts, and so was the Ming-Tan where the emperor performed pious ceremonies for the state. At Ch'ang-an, in the very center of a circular moat that enclosed a square platform was a four-winged structure around a court set on its own circular terrace. (Fig. 10.26) Here the Han emperor adjusted his behavior to nature's cycles, moving from hall to hall as the seasons changed and completing a revolution in the course of the year—the lord of many millions across a wide, expanding land, and the pivot of their universe.

A Continent Alone

Despite their cultural disparity, the continents of Europe, Asia, and Africa were interconnected by trade and war. America stood alone. Contacts with what is collectively called the Old World were superficial. The "Indian" tribes of North America and the more complex states of Central America and the Andes probably developed independently, exploiting what indigenous talent and resources they possessed, with minimal interaction even among themselves.

There had been a time, some 30,000 years ago, when America was in communication with the Old World. (Fig. 10.27) A land bridge existed then between Asia and Alaska, and a Mongoloid race of people moved across it in several waves; and through a glacier-free corridor between the continental ice sheets, they penetrated into the land mass that is now Canada and the United States. They moved mostly on foot, knowing no beasts of burden; they hunted big game, foraged, and in the vast sandstone formations of the Southwest called *mesas* (tables, in Spanish), they practiced rudimentary agriculture perhaps as early as 4,000 B.C. Pit houses partly sunk into the ground for protection against cold and wind were common. But in the Northwest country (British Columbia, Washington, Oregon) foraging tribes mastered a technique of building rectangular, gabled houses of cedar. And in the far north, in the unfriendly frozen tundra of the Arctic circle

Fig. 10.24 Chinese bracket system, called *tou-kung (dougong)*; diagrams. The right-hand column shows the progressive complication of the primitive bracket. The left-hand drawing is of the main hall of Fo-Kuang Ssu in Wu-t'ai Shan, A.D. 857.



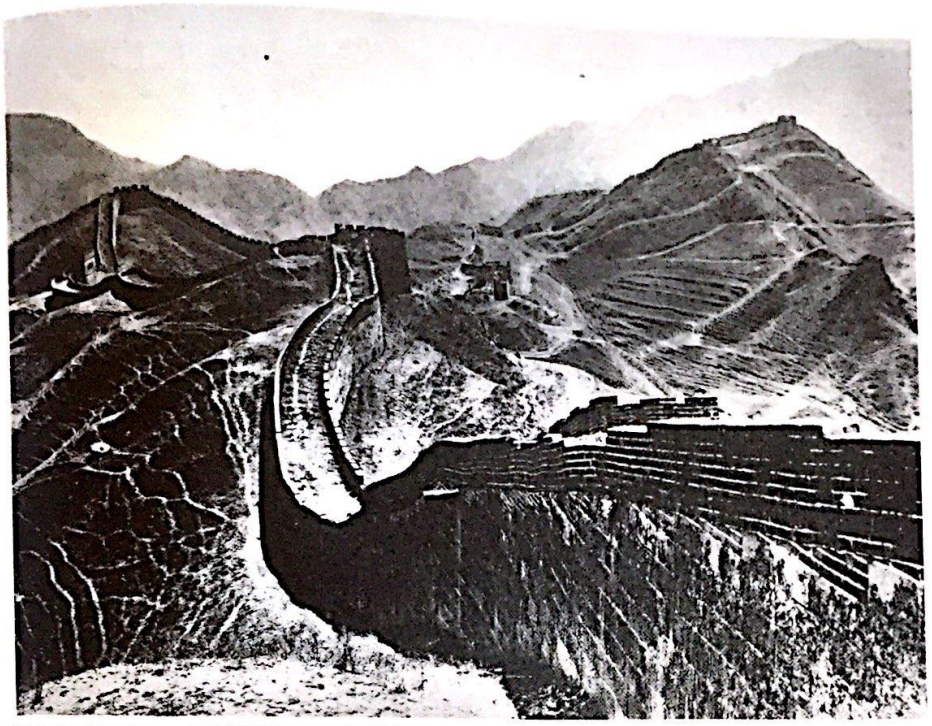


Fig. 10.25 The Great Wall (China), third century B.C. and following. In its present form — rubble faced with stone; a brick-paved roadway on top edged with parapet and battlements — the Wall is substantially a Ming dynasty reconstuction (four-teenth–seventeenth century). Its function as a communication spine through inhospitable mountain regions was from the start as important as its defensive function.

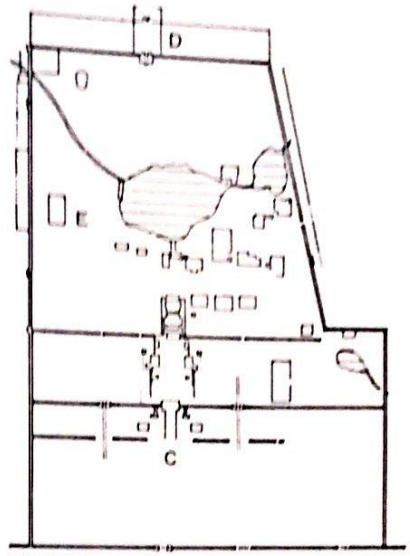
and the areas just below, ingenious responses to the local challenge produced the pit houses of Alaska, with stone domes braced with whalebone and topped by an insulating layer of earth, and the igloo, a house constructed of snow blocks and ice. The Eskimos shaped firm snow as others elsewhere did rocks and earth. The rectangular building blocks of the igloo were arranged in an ascending spiral that closed to form a dome without any need of centering. A window of clear ice placed near the entrance brought in some light.

But shelter has never been the sole objective of built environment, however rude the community. At the time of this survey, defensive, utilitarian, and ceremonial structures had been discovered in several corners of North America. A desert valley in Arizona, occupied by the Hohokam people who were practicing flood irrigation by 100 B.C. was found scored with dikes, ditches, and earth dams having head gates of tightly woven grass mats backed by stakes that could be raised or lowered as needed. But a type of ritual center was also uncovered: a court with an oval playing floor that had stone markers or basins for goals. On the basis of earlier evidence from Central American sites, these must have been fields for a game played with rubber balls that was to have a long history.

More remarkable were the earth works of the Adena or the Hopewell people in the Midwest, who settled along the Ohio Valley. (Fig. 10.28) Here fortified hilltop enclosures might have served the same function as the European *oppida*. The main impulse, however, seems to have been a growing mortuary cult. At first it was a relatively modest matter of erecting conical earth mounds over individual burials. Soon groups of these mounds were surrounded by great ridges of piled up earth and approached through earth-enclosed avenues. The Hopewellians were rich and sophisticated. They traded widely; their imports included copper from the Upper Great Lakes region, quartz crystals, mica and schist from the Lower Allegheny, flint from Indiana, and obsidian from as far away as Mexico. They also built lavishly. The earth walls around ceremonial centers described circles and rectangles, were layered self-consciously by alternating sand, earth, and rock, and stretched over an immoderate expanse. The largest center, Newark, covers 10 square kilometers (4 square miles).

We can only speculate: first, that a ruling class managed and manipulated the mortuary cult, and second, that enough agricultural surplus became available to free the manpower to undertake such gargantuan tasks. The model may have been central Mexico or the Gulf Coast where since at least the fifth century B.C. a theocratic system commanded monumental environments for ritual practice, and these in turn fostered limited urbanization. The priests were authorities of the calendar and weather, and intercessors with the divine on behalf of the land-tilling populace. Put mundanely, this means crop management. In return, the farmers shouldered the labor for superlative settings that magnified the religion and the state. The scale of these enterprises impresses manifestly. But the technology in use remains basically Neolithic, deprived of aids like the wheel or the smelting of iron.

The foremost architectural products of this Central Amerrican commonwealth of states were the mounds loosely called "pyramids." One of the earliest, in Cuicuilco in the Pedregal, near the new University of Mexico, is circular. It has four conical stages, the result of two separate campaigns of building, and the earth is faced with stone slabs set in clay. The date of this structure is probably around 500 B.C. On the small island of La Venta, situated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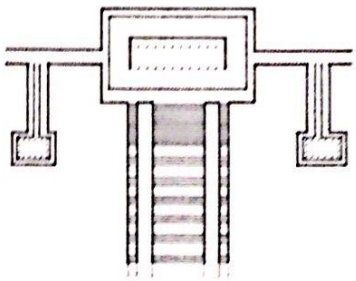
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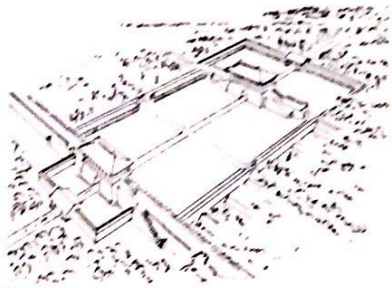

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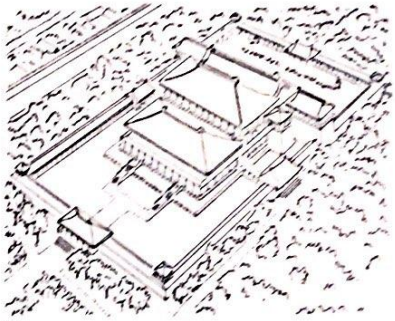

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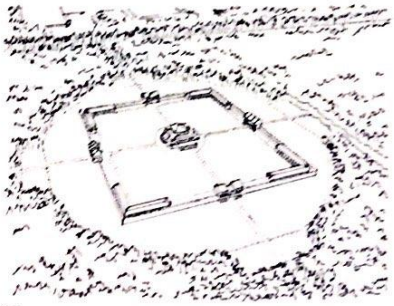

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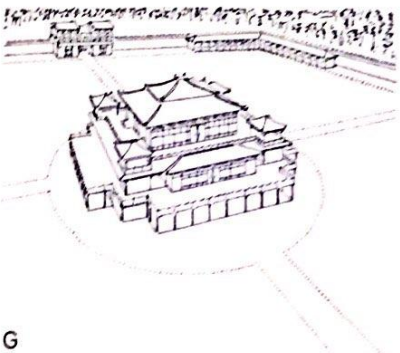

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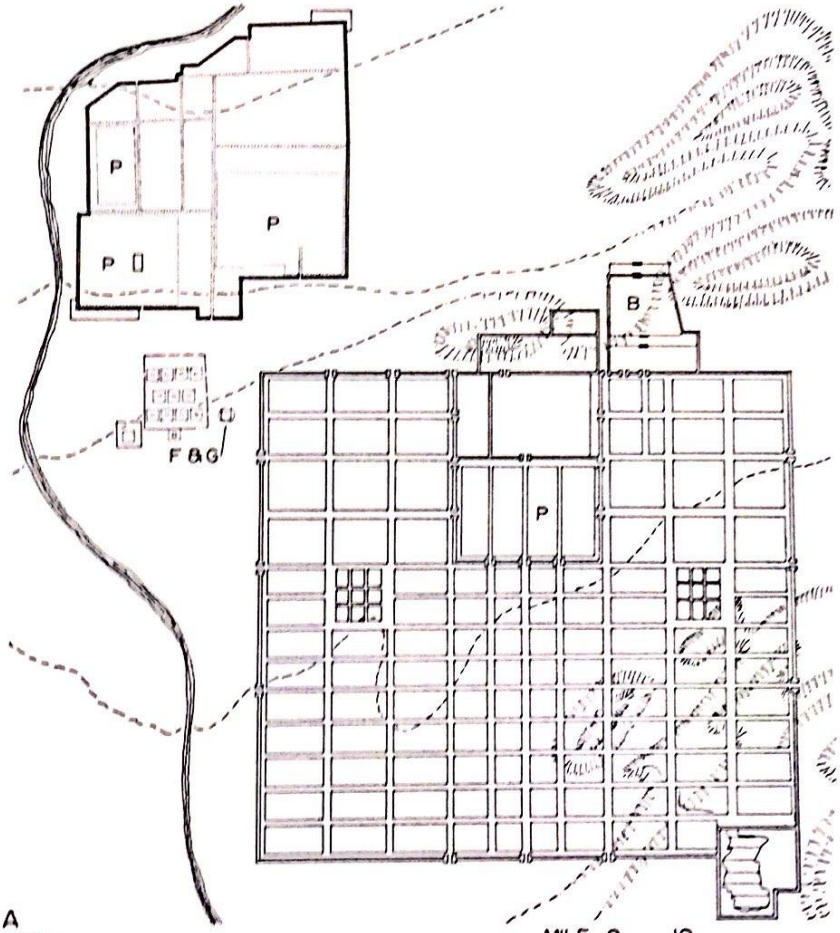
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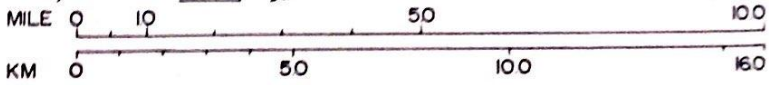
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among the mangrove swamps of northern Tabasco, on the Gulf Coast, is a rounded and fluted pyramid that might even be earlier.

These determined pilings were one component of carefully thought out group designs. To the north of the pyramid of La Venta were two adjacent courts, one behind the other. (Fig. 10.29) The first was framed by parallel mounds on the east and west sides; the second was a sunken rectangle paved with colored clays and edged with columns of basalt. Further north another circular mound rose over an elaborate tomb, and beyond this three colossal heads of basalt faced the north like guardian figures. The whole site, about 1.5 kilometers (1 mile) long, was organized on a north-south axis. In addition to the features we have mentioned, it contained a manmade rectangular hill, enormous pits whose bottoms were lined with stone, and monolithic, flat-topped altars.

La Venta was apparently a religious and civic center for villages in the area, with a small resident population of priests and their staff who managed the cult. The labor force may also have been housed on the site. This may well have been the case for early Teotihuacán as well, which became in time the greatest religious nucleus of Middle America and its premier market town. Its ruins lie 40 kilometers (25 miles) northeast of Mexico City in the high, semiarid Valley of Teotihuacán. (Fig. 10.30) This town is a match for the grandest ensembles of the Old World—Giza, Persepolis, the Hellenistic or Roman city-form. The elements of planning were anticipated at La Venta: the pyramid, the court defined by platforms, the north-south regulating axis. But nothing can quite prepare us for the size, conviction, and majesty of Teotihuacán as it first assumed its principal traits between 100 B.C. and A.D. 200.

Fig. 10.27 Map: North and Meso-America, up to A.D. 200

Fig. 10.26 Ch'ang-an (China), the cities of the Han and Tang; plans and views. The two cities are shown at the lower left; the smaller of the two is that of the Han dynasty (206 B.C.–A.D 220); the larger, that of the Tang dynasty (618–907). **(P)** refers to administrative palaces. **(B)** is Ta-ming Kung (Daming Gong), a pleasure palace of which the main building, Han-yuan Tien (Hanyuan Dien), is shown in a detail plan **(C)**, and the principal gate complex is shown in a restored view **(D)**. The building shown as **(E)** was a multipurpose component of the palace, used for receptions and some religious rituals. **(F–G)** is the Han dynasty palace, Ming-Tan, described in the text: **(F)** indicates the general layout of the palace complex within its circular moat, and **(G)** a view of the central structure.

The axis at Teotihuacán is a full 5 kilometers (about 3 miles) long. It runs about 15 degrees east of true north, probably to align with the extinct volcano of Cerro Gordo whose springs were a major source of water and whose fertility was celebrated. The ground rises from south to north, and with it the axis—a sunken avenue now called "Street of the Dead." The avenue presses forward in level stretches that are terraced upward, toward the fertile mountain. It is stopped short by the Moon Pyramid that echoes the shape of Cerro Gordo. To the south the avenue concludes without a focus, as if it intended to shoot beyond, inflexible in its direction, toward the southern highlands of Guerrero and the Pacific. Toward this end it is flanked by two generous monumental groups. The Great Compound to the west, which is arranged around a court, appears to have been the city's chief marketplace and administrative center. Across from it is the precinct of Lord Quetzalcóatl, whose stock image as a feathered serpent was popular in mural

Fig. 10.28 Ohio, Serpent Mound of the Adena, ca. 800 B.C. onward; aerial view.

paintings and sculptural ornaments. Halfway between the temple of Quetzalcóatl and the Moon Pyramid, on the east side of the avenue, towers the Pyramid of the Sun, the oldest and largest public building on the site. It stands over a natural cave and faces 15 degrees north of west, where the sun sets on the day of its zenith passage (June 21). It thus unites the sources of the land and the workings of celestial bodies—twin inducements for the orientation of the master plan and mainsprings of growth for the community.

Although all major buildings relate directly to the Street of the Dead, there is a subsidiary cross-axis, where the Great Compound and the Quetzalcóatl pyramid are, that helps divide the city into quadrants. Urban settlement began at the northwest quadrant before the great cruciform layout was decided upon. Part of the area of this old city was abandoned by A.D. 150 as development shifted to the south and east. By then the population may have approached 200,000.

The urban fabric was divided into barrios or neighborhoods, each, it seems, engaged in some dominant craft. Obsidian work was pervasive, but there were also potters, painters, masons, merchants, and of course the priesthood for whom gracious accommodation was provided in the vicinity of temple precincts. The common people lived in one-storey apartment compounds, several to a barrio, that were grouped around patios. A chapel on the east side faced into the patio, and there were also one or more barrio temples. The main urban temples usually occurred in threes: more than twenty of these three-temple complexes dotted the sprawling city in the second century A.D. The Pyramids of the Sun and the Moon may have been the key temples of such triads.

The Sun Pyramid still exhibits the old

technique of horizontal layers of clay faced with unshaped stones. (Fig. 10.31) A new technique made its appearance in the Moon Pyramid. The core was now built of tufa piers, the shafts between them filled with rubble. This core was buttressed by fin walls, which also determined the slope of the main terraces. By using a broad axial staircase, five terraces were joined on the side overlooking the Street of the Dead. This complex was linked to a series of platforms that abutted the pyramid, cut into its terrace lines, tempering their enormous scale at the same time as they augmented the general impression of height and monumentality, and set up a rhythmic crescendo of level and rise that is still ineluctable. In these ceremonial platforms of low rise, horizontal projections called *tableros* were cantilevered on stone slabs, their edges vertical to the pyramid slope. The tableros were framed by stone cornices and were the standard repositories of architectural decoration.

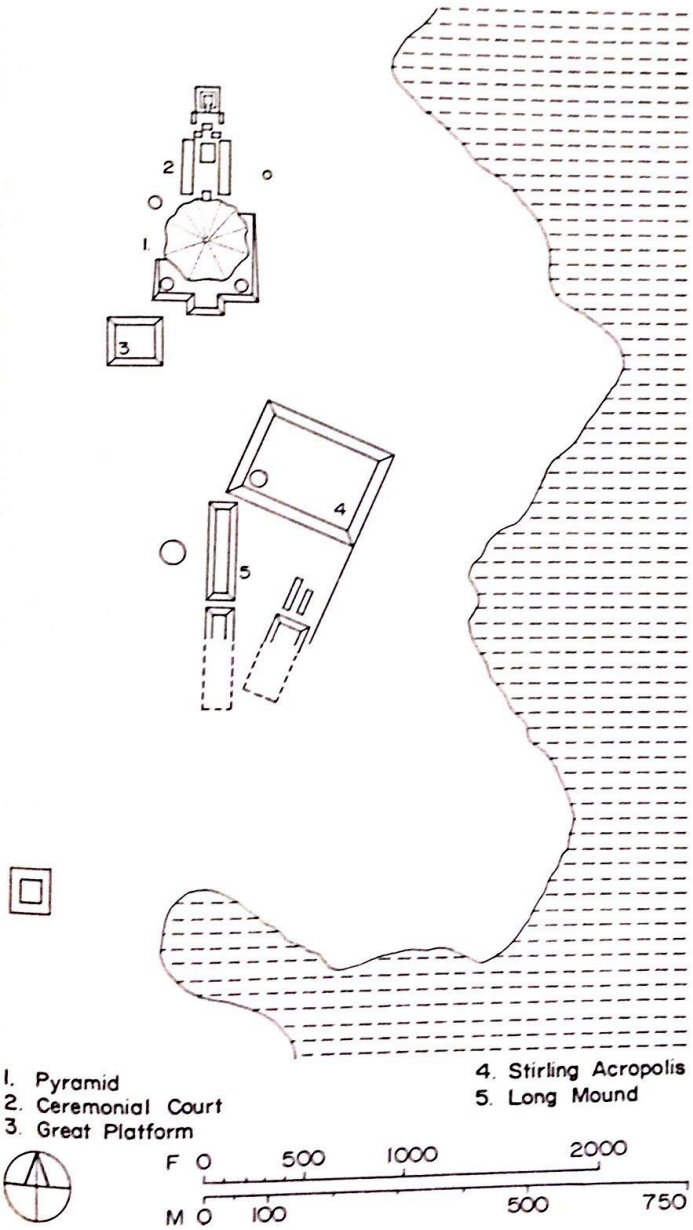

Fig. 10.29 La Venta (Mexico), ca. 800–400 B.C.; general site plan.

But the power of Teotihuacán is hardly conveyed through descriptions of structure and ornamentation. Size comes first: the confident fit of the city in the open flatland with its soft edges that let the city shade away in places. Without the unremitting circumscription of a walled enclosure, the city sits much as the surrounding mountain ranges, low and quietly undulating, dipping to ground level here and there to let the valley floor move on toward distant, hazy counterpoints. The pyramids, which up close appear monumental, are temperate and spreading like the mountains when viewed from afar. They are preceded by lesser platforms and other structures that negotiate the transition to the intimate scale of the urban fabric beyond the banks of the Street of the Dead. More than anything else, these lesser structures are sculptural masses affirming the open volume of the avenue, the plazas, and the precinct grounds. There is no thoughtful shelter, no wholesale enclosure, in the manner of Hellenistic colonnaded avenues or Roman forums. The main pyramid clusters relate to one another in this same volumetric way, without adjacency or axial interlocking. The only axis, the Street of the Dead, is anything but Roman. Shunning bilateral symmetry, its course set by the Sun Pyramid whose own axis fords it like a river, the Street of the Dead serves less as a grand processional way for the Moon Pyramid and its plaza where it terminates and more as a baseline for certain cosmic alignments of the three pyramids and the hundreds of smaller platforms that scan its path.

Once more, then, architecture seeks to apprehend a cosmic order, as it had in the Pantheon, the circle of Sarmizegethusa, the stupas of Sanchi, and the Han capital of Ch'ang-an with its Ming-Tan. Casting a quick

Fig. 10.30 Teotihuacán (Mexico), first century B.C.–eighth century A.D.; aerial view. (From *Urbanization at Teotihuacán, Mexico*, vol. 1, pt. 1, copyright © 1973, René Millon)

glance around the built world at an arbitrary moment of history verifies what we should have expected: multiformity in every physical detail. Materials run the gamut from earth, grass, and snow to basalt, tile, and concrete. Techniques are just as varied. The buildings are hewn out of native rock, piled up from loose earth and stones, framed by beams or poles, laid in brick, or molded into seamless shapes of concrete. They brood massively and ponderously, inscribe lightly, encase airily, mount, billow, or burrow. They are viewed as ephemeral, renewable, or permanent.

But universal postulates are at work. To chart a place on earth—that is the supreme effort of the built environment in antiquity. Shelter, of course, always takes precedence. But its issue transcends self-preservation and comfort. Shelter engages human alliances and rank, and so it becomes the task of residential architecture to advance the pattern of collective existence. From family to empire, the stages of social and political gradation affect the scope and intricacy of this extendable pattern. But in the end organization only tidies up; it cannot satisfy darker anxieties of being afloat in a mysterious design which is not of our own making. To mediate between cosmos

Fig. 10.31a Teotihuacán; platforms as seen from the Moon Pyramid.

Fig. 10.31b Teotihuacán, temple of Quetzalcóatl; detail view from the south showing tableros and architectural sculpture. The projecting stone heads represent feathered serpents and a cubic, geometric figure, possibly a rain god.

and polity, to give shape to fear and exorcize it, to effect a reconciliation of knowledge and the unknowable—that was the charge of ancient architecture.

It is a charge that is no longer pressing, that no longer has meaning. Geomancy had no place in the laying out of New York or Teheran; Buckingham Palace was not planned to be the pivot of the cosmic universe. At some point we chose to keep our own counsel, to search for self close at home. This is the last, modern phase in the history of the built environment. Between antiquity and this modern phase comes a long period of passage which eases us from an ancient, universal wholeness to an all-consuming atomism. This period concentrates the once pervasive and boundless call of earth and sky into a single godhead and invites us to measure up to it. This is the period, of Christ and Muhammed, that we must now turn to.

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