

**THE ORIGINS OF
THE GREEK
ARCHITECTURAL
ORDERS**

BARBARA A. BARLETTA

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Much of our understanding of the origins and early development of the Greek architectural orders is based on the writings of ancient authors, such as Vitruvius, and those of modern interpreters. Traditionally, the archaeological evidence has been viewed secondarily and often made to fit within this literary context, despite contradictions that occur. Barletta's study examines both forms of evidence in an effort to reconcile the two sources, as well as to offer a coherent reconstruction of the origins and early development of the Greek architectural orders. Beginning with the pre-canonical material, she demonstrates that the relatively late emergence of the Doric and Ionic orders arose from contributions of separate regions of the Greek world, rather than of a single center. Barletta's reinterpretation of the evidence also assigns greater importance to the often overlooked contributions of western Greece and the Cycladic Islands.

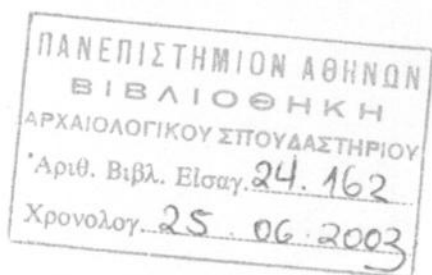
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...since I have observed that our citizens are distracted with public affairs and private business, I have thought it best to write briefly, so that my readers, whose intervals of leisure are small, may be able to comprehend in a short time.

Vitruvius, The Ten Books on Architecture (V, praef., 3), translated by M. H. Morgan

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PREFACE

MODERN VIEWS OF THE architectural orders take as their basis the writings of ancient sources, especially Vitruvius. His treatise, *De Architectura*, defines the orders and explains their early emergence from wooden forms. He sets this development within a general evolution of architecture from primitive origins to perfection. Each order arises within its own geographical region and is the creation of a single ethnic group whose name it bears. Other ancient sources offer refinements of certain points, including chronological development. The arts are generally viewed as culminating in the Classical period and declining in Hellenistic times, a pattern considered especially relevant for Doric architecture. These basic ideas have been adopted and further elaborated in later times. The Renaissance contributed a more rigid definition of the orders than Vitruvius envisioned, but one that fit better with their own interests. In the eighteenth century, J. J. Winckelmann set the development of art, including architecture, within a broad historical and cultural context that appealed to the contemporary emphasis on rationalism and has persisted to the present day.

Despite criticisms of individual issues and the advent of archaeological excavation, which has considerably increased our knowledge of early Greek architecture, the essence of these initial theories remains. We still accept an evolution for the orders and often cite links with Bronze Age traditions. Although their actual appearance is placed somewhat later than Vitruvius implies, a long history in wood may bridge some of the gap. Indeed, many scholars continue to seek wooden origins. The discovery of seventh-century temples at Corinth and Isthmia has yielded fresh evidence for the "petrification" of temple architecture and raised the possibility of the emergence of the orders not in a wooden but in a stone tradition. Long-held views are, however, difficult to overcome. Although no evidence exists for the Doric order in the Isthmia temple, its excavator reconstructs it as such by assuming the existence of now-lost canonical elements in wood and other materials.

Recent investigations of other buildings from the eighth and seventh centuries offer a new perspective on the development of the temple, and help to define surrounding events and their chronology more precisely. Likewise, our knowledge of architecture in different regions of the Greek world, such as the Cycladic Islands and western Greece (southern Italy and Sicily) has been expanded through both excavation and study. Articles and books have appeared

that elucidate the development of individual building components, such as the peristyle, the Ionic capital, and the Doric geison. Yet a comprehensive examination of this material is still lacking.

My work draws on the contributions of these excavations and previous studies in an attempt to reconstruct the early history of Greek architecture and the emergence of both the Doric and Ionic orders. The third early order, Aeolic, is not discussed in any detail, since, despite its initial importance, it was never fully executed in stone and did not survive the Archaic period. It was thus unknown to later theorists and was not incorporated into their views. Because of the enormous impact of such theories, both ancient and modern, on our own understanding of the orders, the literary tradition is explored first. This is followed by the archaeological evidence, beginning with the earliest periods of Greek architecture and continuing through the appearance of the orders in stone at the end of the seventh and into the sixth century B.C.

Although this study advocates a primary role for the physical evidence, our interpretation of that material necessarily relies on theoretical principles. Buildings are generally dated according to a determined stylistic evolution, sometimes in other media (as associated pottery or architectural sculpture) but also on the basis of their own components, such as column capitals and mouldings. This study traces the development of each member of the order over time and place. Some repetition results in the case of better known or preserved structures, which are thus well represented in the discussion. Yet this approach allows consideration of poorly preserved temples. It will be seen that not all parts of a building evolved at the same pace. Likewise, different solutions may be arrived at simultaneously in separate geographical regions. An important theme of this book is thus the emergence of regional styles and their contributions to the development of the orders.

The catalyst for each order, and its precise sources, remain obscure. An attempt is nevertheless made to sort out these issues in the final chapter. My aim is to present a coherent reconstruction of the early orders in accord with the archaeological evidence and, insofar as possible, also with our literary sources. It will certainly not be the last word on this difficult subject, but, I hope, will further its discussion.

As with any project of this nature, this book owes a considerable debt to previous studies. Some of these exist in the form of unpublished dissertations, which are not widely circulated or known. Two are of particular importance because of their broad scope and, although they are cited in the endnotes, they deserve special mention here: N. L. Klein, "The Origin of the Doric Order on the Mainland of Greece: Form and Function of the Geison in the Archaic Period" (Diss. Bryn Mawr College, 1991) and T. N. Howe, "The Invention of the Doric Order" (Diss. Harvard University, 1985).

Likewise, many scholars have graciously lent me their time, materials, and/or expertise. I thank Tod Marder for having suggested the project long ago. Jeffrey

Burden and Kim Hartswick discussed various points with me and provided helpful clarification of ideas. A. A. Donohue, Mark Wilson-Jones, Thomas N. Howe, and Alex Alberro read and commented on portions of the manuscript. As always, I have benefited greatly from Brunilde S. Ridgway's thorough review of the manuscript and detailed comments. Others have assisted in various ways with the illustrations. Gottfried Gruben has been particularly generous in allowing me to reproduce numerous images. J. J. Coulton and R. W. V. Catling made available their own materials and assistance. I thank also, in alphabetical order, Anton Bammer, both Catharina Flämig and Hans R. Goette of the DAI Athens, Gerhard Joehrens of the DAI Berlin, Amalia G. Kakissis of the British School at Athens, Alexander Mazarakis Ainian, Dieter Mertens, Aenne Ohnesorg, Erik Østby, Brian Slawson, Burkhardt Wesenberg, and Penghua Zhu, as well as Kalliopi Christofi of the *École Française d'Athènes*, Kerri Cox of the American School of Classical Studies at Athens, and Carola Ruschinzik of Gebr. Mann Verlag, who responded to an especially large number of requests. Funding for this project was provided in part by grants from the Graham Foundation for Advanced Studies in the Fine Arts and the University of Florida Scholarship Enhancement Fund. Finally, this work would not have been possible without access to excellent libraries, for which I am particularly grateful to the American Academy in Rome.

THE LITERARY EVIDENCE

MANY OF OUR views on the origin and early development of the Doric and Ionic "orders" are derived from literary sources. Particularly important is the book, *De Architectura*, of the Roman architect Marcus Vitruvius Pollio. Although written in the time of Augustus, toward the end of the first century B.C., Vitruvius's work reflected as well the intellectual climate of the late Hellenistic period¹ and drew overwhelmingly from Greek sources. As the only surviving treatise on ancient architecture, it provides valuable information on the definition, origin, and early history of the orders. After its "rediscovery" in the fifteenth century, *De Architectura* held considerable prestige among Renaissance theorists. Their interpretations of ancient architecture were supplemented by evidence from other ancient authors as well as contemporary views. More modern theories have continued to draw on these same sources. In addition, archaeological exploration within and outside the Greek world has resulted in new theories. Yet the basic principles elucidated by Vitruvius are still generally accepted.

In order to set the background for our investigation of the emergence of the architectural orders, it is necessary to examine first the theoretical context in which our understanding arises. Vitruvius's treatise remains fundamental in this context. Whether subsequent investigators followed him or not, they certainly had to take his statements into account. It is appropriate therefore to begin with Vitruvius. We will examine his points on the early orders in some detail, with the dual aim of assessing the extent of their validity and of demonstrating their impact on later, including modern, interpretations.

THE "ORDERS"

For our investigation, the most fundamental issue raised by Vitruvius is his definition of distinct architectural systems, or what we have come to understand as "orders." These are treated in a rather disjointed manner, Ionic in Book III and Doric (along with Corinthian) in Book IV. According to Vitruvius, the orders are identified by their column forms (IV, 1, 3), but he describes their distinctive

entablatures as well. Thus, the Doric entablature possesses triglyphs and metopes, the former placed above column centers, and a geison with mutules that correspond in location to the triglyphs. In Ionic, the column rests on a base of either Attic or Ionic type and is crowned by a capital with a volute member. Above appear a three-fascia architrave, a frieze, a line of dentils, and the corona, each with its own kymation. For both orders, strict rules are to be followed in placement, execution, and proportion.

Such rules have led to the belief that the two systems of architecture were rigidly defined. The English word "order," from the Latin "ordo," therefore seems appropriate. Yet the word used by Vitruvius was "genus," which suggests a more flexible relationship of parts to the whole. Each system was not so much prescribed as it was defined by its family. Only in the early sixteenth century was the term "ordo" first applied.² The reason for this shift seems to be the Renaissance, and particularly papal, interest in more absolute or "eternal" truths that reflected the divine.

As I. D. Rowland suggests, Vitruvius's emphasis on a fundamental harmony of proportions may not be far from this concept. Yet Vitruvius's aim, at least in regard to the architectural styles, was very different from that of Renaissance architects. His goal was to present in a "complete and orderly form" the "established rules" and "usage" of these styles (IV, *praef.*, 1),³ thus to elucidate what one might consider the ideal form, but from existing temples and the treatises written on them. Renaissance architects worked in the opposite direction, from theory to practice. Their goal was to define a system that reflected the ideal, as a manifestation of the divine, in architecture. Their "ideal" was thus much more immutable than Vitruvius's.

Vitruvius also makes it clear that usage, rather than prescription, stood behind the separation of components in the Doric and Ionic orders (I, 2,5-6). He notes that the adoption of dentils in a Doric entablature or triglyphs in Ionic would spoil the effect of the building, since the "usage in each class" had been fixed "long ago." On the other hand, Corinthian, which was "produced out of the other two orders," could employ Doric mutules and guttae or the sculptured frieze, dentils, and corona of the Ionic entablature (IV, 1, 2-3). At least initially, then, some flexibility must have existed in the orders. Although Vitruvius clearly viewed Doric and Ionic as distinct types, for him that distinction arose during the process of evolution.

Each order originated in its own area of the Greek world and at an early time (IV, 1, 3-12). Corinthian, which was the invention of Callimachus, clearly followed, and since tradition places him in the second half of the fifth century B.C., this date serves as a *terminus ante quem* for the other styles. Yet Vitruvius's chronology is not entirely consistent. He attributes the initial use of the Doric style to Doros, "the son of Hellen and the nymph Phthia," for a temple in the sanctuary of Hera at Argos. Hellen is the eponymous ancestor of the Greeks and his offspring, Doros, Xouthos (through his stepson Ion), and Aiolos, were the

leaders of three Greek tribes.⁴ The term "Doric" was applied to the architectural style of this first temple since it was constructed in the territory of the Dorians, so named for Doros. At a later time, with the migration of the Ionians to the coast of Asia Minor, the style was transplanted there. Afterwards it was replaced by Ionic for the construction of the Temple of Artemis at Ephesos.

These statements conform generally with the early diffusion of the two orders: Doric in mainland Greece, specifically the Peloponnesos, and Ionic in Asia Minor and the Aegean Islands. The ethnic association implied by Vitruvius is not, however, fully verified, since Doric settlements in both east and west Greece may use the Ionic style, while Ionian Athens typically uses Doric. It is also not clear at what point the Greeks began to define themselves as "Dorian" or "Ionian".⁵ These terms appear occasionally in the early literature in reference to the ethnic groups or their characteristics, but as yet with vague, and sometimes contradictory, connotations. Two passages dealing with dress exemplify this point: Anakreon's equation of female nudity with Dorian dress and Herodotos's statement (V, 88) that all Greek women initially wore Dorian dress but later many adopted the Ionian – originally Carian – costume. It would appear that neither author possessed a firm understanding of what was "Dorian" in this regard, a point reinforced by E.B. Harrison's conclusion that Herodotos was actually referring to seventh century Daedalic dress in both Dorian and Ionian territory.⁶ The events surrounding the Persian Wars of the early fifth century seem to have made the Greeks more aware of the dichotomy between east and west, and accordingly between the Greeks of Asia Minor and those of the mainland. Still, the latter division was often construed in geographical rather than ethnic terms, with "Ionian" used to signify all Asiatic Greeks. Indeed, Herodotos (I, 142–46) is at pains to offer a succinct classification of these Ionians, who speak different dialects and are of mixed Greek and even Carian origins. His tendency to focus instead on the city as the basic unit of Greek society may further indicate that the broader concept is as yet poorly developed.

It is only with Thucydides's account of the Peloponnesian War in the later fifth century that the terms "Dorian" and "Ionian" become crystallized and set in opposition.⁷ Whether Thucydides himself accepted arguments based on ethnic identification and kinship is debated, but his use of them in (reconstructed) speeches certainly indicates his awareness of this line of reasoning. Our sources thus betray an increasing demarcation over time of these ethnic groups, which applied also to their customs and artistic products.⁸ Even so, the process does not seem to have reached fruition until the later fifth century, long after the evolution of the architectural orders.

Vitruvius's sequence of events is also open to question. He seems to have considered Doric as the original, archetypal, form of Greek architecture. To be sure, other authors credit the city of Corinth, which is located in "Doric" territory, with innovations in temple architecture: Pindar (*Olympian Odes*, xiii, 21–22) implies that the pediment was invented there and Pliny (*HN* 35, 151–52) assigns

to this city a leading role in the development of architectural terracottas. Since the Doric order lacked rules of proportion at this point, perhaps Vitruvius is alluding only to the transmission of general architectural components, such as those cited by other authors.

Accepting a more literal interpretation of this passage would require one to posit the existence of a Doric temple in Asia Minor that preceded the earliest Ionic construction. Such a temple, which according to Vitruvius was dedicated to Panionion Apollo, has been identified by P. Gros in an as yet undiscovered predecessor to the Hellenistic Doric Temple of Apollo at Klaros.⁹ Ironically, Gros's argument provides equal support for interpreting Vitruvius's statement in regard to the later building. An architectural connection with Delphi would apply in any period, but perhaps even more so in Hellenistic times, as the oracular function of the Klaros temple gained in importance. The Doric order was also undergoing criticism at this time, particularly by Asia Minor architects, as Vitruvius himself states only slightly later (IV, 3, 1). The fundamental role ascribed by Vitruvius to Doric architecture in Asia Minor may therefore arise as much from a Hellenistic justification of the style of this temple as from an awareness of a presumed predecessor.

CHRONOLOGY

Vitruvius's comments further imply that the two major architectural orders originated very early, apparently in the period currently labeled the Dark Ages. This is the time of presumed migrations, when the designation of three separate tribes for the Greeks would be most appropriate. Doros, the eponymous leader of the Dorians and the founder of the Temple of Hera at Argos, may have lent his name to the tribe upon their arrival in Greece. Tradition places the Dorian invasion at the time of (and perhaps contributing to) the fall of Mycenaean civilization, between 1200 and 1100 B.C. This movement, in turn, spawned the Ionian migration, which is dated around 1000 B.C.

According to this reconstruction of events, the Doric style of architecture must have originated sometime between 1200 and 1000 B.C., since it was already in existence at the time of the Ionian migration. Ionic would appear somewhat later. On the other hand, it is difficult to place the temples mentioned by Vitruvius in the same period. We know that the sanctuary of Hera at Argos was sacred from an early date, but probably not before the Geometric period (ca. 900–700 B.C.). The terrace supporting its earliest temple was initially identified by modern scholars as Mycenaean because of its "Cyclopean" masonry. It is now thought to have been constructed in the eighth or even seventh century, perhaps as an imitation of Mycenaean construction aimed at imbuing the site with the sanctity of the past.¹⁰ The first Heraion cannot, therefore, date before the eighth century and, as will be discussed later, is more

likely to belong in the second half of the seventh century.¹¹ By the time of Vitruvius, such a difference in the age of the sanctuary would be negligible. Yet this inconsistency raises questions about the weight that should be given to his implied chronology.

A similar situation exists in regard to the first Ionic temple, that of Artemis at Ephesos. The site may have been sacred already in Mycenaean times, thus even before the Ionian migration. On the other hand, the first temple so far attested dates to the second half of the eighth century B.C.,¹² considerably after the arrival of the Ionians. In this case, Vitruvius allowed for an indefinite lapse of time, which may account for the difference. Moreover, if the proposed reconstruction of the building is correct, it would be the earliest known peripteral temple in Ionia and thus worthy of some acclaim. Yet this is not the structure to which Vitruvius referred. During the sixth century, it was replaced by a much larger, marble temple, which in turn served as the model for the famous dipteros still standing in his own day. Pliny (*HN* 36. 179) confirms that this older Temple of Artemis was the first to combine a moulded base and capital with the shaft. Additionally, the column described in IV, 1, 7 reflects the elaboration and proportion (1:8) consistent with the sixth century building.¹³

These discrepancies suggest that Vitruvius was not altogether familiar with early developments in Greek architecture. Another piece of evidence to support this view is the fact that he omits any reference to the third early "order," which modern scholars call Aeolic.¹⁴ He does admit (IV, 1, 12) that "there are other kinds of capitals," but the fact that those capitals are "set upon these same columns" indicates that Aeolic is not among them, since it was placed on a smooth shaft. The most likely reason for this omission is that he was simply unaware of Aeolic architecture. Although a vital style in northern Asia Minor throughout the sixth century B.C., it did not survive into later times. Its distance, both chronologically and geographically, likely meant that Vitruvius had no first-hand acquaintance with the order. His silence on the topic may also indicate that it was not discussed by his sources.

Moreover, it was not the aim of Vitruvius to present a history of architecture. Rather, as he states in the preface to Book I, his goal is to explain the rules of architecture that will enable the emperor to judge the quality of buildings already constructed as well as those to be built. A great deal of emphasis is placed on those rules, particularly as they regard proportions (III, 1, 3-9; 3-5; IV, 3-4). Although the building components and the rules governing them were established through practice and over time, the respective dates at which they were introduced have little bearing on his treatise. Therefore, he also neglects to inform the reader that "Ionic" and "Attic" bases developed at vastly different times, but instead treats them as equals. This disregard for chronology has been recognized in other authors of the period as well, who choose to focus on objects that are recognizable and valuable to their discussion, rather than on those occurring synchronistically.¹⁵ The modern concept of architectural history, with

its emphasis on chronological development and inclusion of related events – in this case the emergence of a third order – was far from Vitruvius's mind.¹⁶

Instead, his motives in discussing the history of Greek architecture were quite limited. By his own account, his knowledge and writings were aimed at winning the approval of the emperor (II, *praef.*, 4). Vitruvius himself was the recipient of some of the imperial commissions and presumably sought to ensure their continuation. He argues for education, rather than popularity, as the criterion for bestowing commissions on artists (III, *praef.*, 3) and explains the broad training of the architect (I, 1, 1–17). In this way he attempts to elevate architecture to the realm of the liberal arts and the education of the architect to that of other learned men.¹⁷ It is thus in his interest to demonstrate his own awareness of the past and his historical understanding of the profession.¹⁸ Yet at the same time, Vitruvius makes it clear that the breadth of information required precludes the depth of understanding that might be found in one trained in a single field, and admits that he “has had only a dip into those studies” (I, 1, 17). Such confessions should serve as a direct warning to the reader about the limitations of the author and his text.

THE ENTABLATURE: A WOODEN BACKGROUND

This point becomes particularly important in regard to another historical issue raised by Vitruvius – his claim of a wooden origin for architectural forms. In IV, 2, 1–5, he discusses the “ornaments” of the orders, that is, the components above the columns, all of which represent “imitations” of “carpenter's work” in stone and marble. Thus, the Doric triglyph represents boards or plaques fastened to the ends of beams and the metope originated in the closure of the space between. In subsequent developments, mutules and the horizontal cornice were derived from the projection of the principal rafters. Ionic dentils, on the other hand, imitate the projection of common rafters. Since neither type of rafter continued into the pediment, its cornices were smooth. Later scholars have expanded on this theory. Some interpret the banded architrave as a translation into stone of horizontal wooden beams placed one above the other to achieve the proper height.¹⁹ Others link columns and capitals with structural components in wood.²⁰

As an architect, Vitruvius must have been well aware of the use of wood in roofing. It is therefore perhaps natural that he might accept wooden origins for what he himself defines as decorative members (“ornaments”). Whatever meaning originally existed had clearly been lost by his time, and these members were reproduced in stone simply as imitations of original inventions (IV, 2, 2). There even seems to have been some disagreement as to what was imitated, at least in the case of triglyphs, which some identified with windows (IV, 2, 4). Nor has it been any easier for modern scholars to correlate many of these ele-

ments with structural components or with forms that might naturally occur in wood. Instead, one can argue that Vitruvius's explanation for the "ornaments" of the orders is based more on historical theory than on knowledge of early practice.

Yet why would he, as an architect, perpetuate such theories? One concern of theoreticians is in justifying the existence of individual forms. To accept a purely decorative purpose would be to admit that there is no fundamental need, and thus no real justification, for that form. This is inconceivable in a system based on logic. Vitruvius's reconstruction, although apparently erroneous, provides a logical explanation, since both orders derive their essential forms from a single construction: ceiling beams and primary rafters become the frieze and mutules of the Doric order, while secondary rafters become the dentils of Ionic.²¹ Moreover, in such a system, an explanation is assumed to exist in the remote past and to derive from some earlier need.²² Wooden roofing members serve that role for Vitruvius, that is, they "legitimize" the entablature, even though by his time they have become purely ornamental.

VITRUVIUS'S HISTORICAL DEVELOPMENT

The early use of wood also fits with Vitruvius's evolutionary view of architectural development. Both materials and technology are assumed to progress over time toward a state of perfection. In Book II, 1, 1-3, 6-7, he briefly traces the development from primitive shelters to increasingly more sophisticated huts and finally to houses. This development coincides with the evolution of humans from a wild beastlike origin and results from their increasing mastery of techniques and materials. Within this system, wooden forms would be the natural predecessors of the canonical architectural components in stone.

The link between the progress of human culture and the development of its arts has been traced back as far as the Classical period in Greece.²³ This theory must have been well accepted by Roman times, since it appears also in the works of authors writing about another medium, sculpture. Here, again, wood is seen as the predecessor of stone. Pliny (*HN* 12, 5) states that trees were once used for divine images, while Plutarch (from Eusebius) and Pausanias (2, 19, 3) refer to the earliest statues as being of wood.²⁴ To all these authors, an early date could entail only limited human technology, and thus materials that were easy to handle.

As A. A. Donohue argues, however, the evidence from sculpture does not support a relationship between the use of wood and either a necessarily early date or a primitive level of technology.²⁵ Instead, wood and stone could be used interchangeably in various cultures, even from earliest times, while wooden figures may be as stylistically advanced as their stone counterparts. If the origins of sculpture can provide any guide to those of architecture, they

certainly raise doubts about wooden predecessors. Just as significantly, the widespread assumption that material dictates form is not borne out. If we can thus dispel an association between "flat" statues and a wooden background or sharp shapes and a derivation from metal, might we also doubt a connection between the geometric components of an entablature and their presumed origins in wood?

Related to this evolutionary view of materials is that of a historical development of forms. That development is conceived in terms of "invention and innovation," which leads to perfection. Vitruvius applies this approach to the creation of the architectural orders. Their components seem to appear fully formed at the moment of creation, but proportions and arrangements were left to the contributions of later architects. A comparable view is found in various passages in Pliny (*HN* 34,54; 35,15-16; 35, 151-53; 36, 15), when he speaks of innovations by artists in individual media. Yet it certainly had antecedents in Greek thought, which was typically concerned with inventions. This interest is attested perhaps as early as the fourth century B.C. with a treatise on the subject by Skamon of Mytilene entitled *Peri Eurematon (On Inventions)*.²⁶

For Vitruvius the goal of these developments in architecture was perfection (II, 1, 8). This perfection seems to have existed in a system of principles, derived from the truth of Nature (IV, 2, 6). This rather scientific basis for architecture justifies its inclusion among the liberal arts,²⁷ a requirement that had existed for such disciplines already in the Hellenistic period.²⁸ Yet the underlying concept, of an "ideal," appears much earlier among the Greeks, as in the forms elucidated in Plato's *Republic*. It is attested in art by the High Classical period and was apparently first set down in writing in a treatise by Polykleitos (*The Canon*), which probably dates to the third quarter of the fifth century B.C. For Polykleitos, perfection was based on mathematical proportions, a concept likely derived from theories on the fundamental role of numbers espoused by the late sixth-century philosopher Pythagoras and his followers.²⁹ Vitruvius implies that perfection can exist both in the components of a building, through their fitness as he has just described, and in its proportions. In relating the proportions of a "perfect building" to that of a human body as designed by nature, and in acknowledging the derivation from the body of the "perfect number" ten (III, 1, 4-5), he may be reflecting the theories of both Polykleitos and Pythagoras.³⁰ Certainly the Augustan period was a time of revitalization of interest in the High Classical past and it is not a stretch to suggest that Vitruvius, in trying to curry favor with Octavian, would have based some of his theoretical principles on those of Classical period authors.

Vitruvius's evolutionary view thus seems to be consistent with the thinking of earlier and contemporary writers. It is also inherently logical, which may account for its relatively unquestioned acceptance in modern times. Yet it remains a theoretical construct, which was passed down in the sources and accepted without verification.

SOURCES

The exact sources available to Vitruvius are uncertain. Particularly in the preface to Book VII, he names a number of authors and their subjects. It would appear from Vitruvius's list, however, that the majority of their works concerned individual buildings and thus were probably on the order of specifications. This seems to be especially true of the early treatises. From preserved evidence, such treatises place more emphasis on technical aspects of construction than on issues of design or theory, which become important in the Late Classical and Hellenistic periods.³¹ Only to Silenus, Arcesius, and Philo³² are attributed general texts, on Doric, Corinthian, and temple proportions, respectively, and to those listed as less celebrated men, treatises on symmetry. No mention is made specifically of his sources for the origins of the architectural orders and since none of the texts cited is extant,³³ it is impossible to speculate on them.

Some indication of the variety of Vitruvius's sources has been gained through an examination of the structure of the two main books in question, III and IV. Gros points to a much greater coherence and precision in Book III, which discusses the Ionic order, as evidence that Vitruvius relied heavily for this portion on the treatises of Greek architects in Asia Minor.³⁴ Indeed, Vitruvius mentions among his list of authors both Pytheos and Hermogenes, whom we believe to have been active in Asia Minor during the second half of the fourth century and in the late third or second century B.C., respectively.³⁵ Yet even in Book III, there are inconsistencies and these probably reflect the diversity of sources used. They have especially been noted in regard to the Ionic capital, which according to R. Carpenter may depend on treatises by Pytheos and unknown late Hellenistic sources for its proportions, the writings of Hermogenes for its plan, and surviving tradition in Asia Minor for its design.³⁶ Even if, as F. W. Schlicker argues,³⁷ much of Vitruvius's information had already been compiled by a single major source, it nevertheless remains an eclectic tradition.

Book IV is much more disjointed. Gros attributes this to the need for Vitruvius to develop for the Doric and Corinthian orders a treatment comparable to that of Ionic, as well as to provide additional information on all three, without the benefit of such thorough and well-organized treatises. Indeed, in some cases, as the derivation of the Corinthian capital from acanthus leaves growing around a basket above a maiden's grave, he seems to have resorted to anecdotal accounts.³⁸ Clearly the quality of information conveyed was very much dependent on the sources used, some of which were more valuable than others.

Although the names of Vitruvius's sources go back as early as the mid-sixth century B.C. with Theodoros on the Temple of Hera at Samos and Chersiphron and Metagenes on the Temple of Artemis at Ephesos, the earliest authors with whom information on the orders can be reliably linked are relatively late. Where the sources for particular details can be identified, they are likewise late. The architect Pytheos, active in the second half of the fourth century B.C., is among

the earliest. Additionally, the Ionic entablature prescribed by Vitruvius, which includes both a frieze and a dentil course, does not, on present evidence, appear until the early fifth century, and is not common before the end of the fourth century B.C.³⁹ If, as generally acknowledged, Vitruvius's own sources are rooted in the Late Classical and Hellenistic periods, any information they conveyed regarding the origins of the architectural orders must have been already several centuries removed. Indeed, it was not unusual for scholars of the period to rely on secondhand sources, especially since original texts were often inaccessible. Even when the originals were consulted, technical terminology must have posed problems in interpretation.⁴⁰ Thus, the advantages over modern scholars that Vitruvius gained through proximity in time may not be as great as we assume.

There is no doubt that Vitruvius offers valuable information on the architectural orders as well as the motivations that gave rise to them. Yet inconsistencies clearly exist in his statements, especially in the precise circumstances, early date, and wooden antecedents of the orders. These suggest that he may not have fully understood his sources or that they were inadequate. Like him, many of these authors were writing long after the fact. Moreover, their approach to architectural history differed significantly from our own. We cannot therefore accept Vitruvius as the final authority on these issues, but rather should see him as a compiler and transmitter of the prevailing views regarding them in the late first century B.C.

LATER INTERPRETATIONS: RENAISSANCE

Despite the problems thus enumerated in Vitruvius's account of the origin of the architectural orders, his impact on the study of ancient architecture has been enormous. One reason is the authority that his work held in later times. The treatise was certainly known to architects and transcribed in monasteries through the Middle Ages, but it received particular attention in the Renaissance, following its "rediscovery" in the fifteenth century.⁴¹ As the only architectural treatise from antiquity to survive, it enjoyed a near monopoly on information within its purview. Additionally, Vitruvius's theoretical approach to his subject matter was very much in line with that of other writers of his day, who therefore provided reinforcement and elaboration of his statements. More important, this approach was also generally consistent with that of Renaissance artists and theorists, who looked to Vitruvius for confirmation of their own evolving views, sometimes to the point of dogmatism.⁴²

Even in later times, with the introduction of more critical analyses and an increased understanding of the monuments themselves, Vitruvius has remained an important source. Yet each period has considered his ideas and statements within the context of their own theories of architecture. Their understanding of Vitruvius as well as the concepts they choose to transmit are thus very much reflections of their own times. Because of their impact on current opinion, it is

important for us to examine first Renaissance and then more modern interpretations of the Vitruvian text and the issues that it raises.

The first purely architectural treatise after that of Vitruvius was L. B. Alberti's *De re aedificatoria*. It is usually assumed that this book was complete by 1452, but Alberti must have continued work on it until his death and it was only published posthumously in 1485. In many ways this work demonstrates its debt to the ancient author, especially in its emphasis on rules and its division into ten books.⁴³ Yet it is also a reflection of its own time. As such, it serves as a springboard for our discussion of the reception and interpretation of Vitruvius's principles during the Renaissance.

As with other writers of this period, Alberti's theories of architecture derived from a combination of ancient sources, including Vitruvius, as well as Medieval and specifically Christian traditions.⁴⁴ Under influence of these last, he carried further Vitruvius's analogies of columns to human bodies, as shown by his derivation of terms.⁴⁵ This was an important point for Renaissance architects, since they believed that man was an image of God. By accepting the same relationship in the forms of columns as in members of the human body, they created a more rigid system. It is understandable how Raphael would have taken the next step during the sixteenth century in the application of the term "ordo" to the styles that Vitruvius defined. Likewise, the Vitruvian emphasis on "correct" proportions was elaborated and even codified in the Renaissance. Alberti already prescribes rules for the size and shape of architectural components. Since Renaissance theorists believed that proportional relationships exemplified the order of nature, and thus of God, the need to adhere to them was much stronger in this period. Architecture becomes a mathematical science.⁴⁶ Both the components of the orders and their proportions thus become viewed as fixed.

Renaissance architects also accepted and even expanded Vitruvius's historical perspective. Whereas the ancient author limited himself to Greece and Rome, Alberti (VI, 3) traces the successive development of architecture in the ancient world from Asia to Greece and finally to Italy. Significantly, it was in this last location where architecture reached perfection. He (VII, 6) also viewed each of the Greek orders as emerging in a sequential manner as an improvement over the one before. At least Doric was accepted by Raphael and his contemporaries as originating in wooden forms.⁴⁷

Vitruvius's ideas of progress toward perfection thus found a receptive audience in the Renaissance. Yet their own period was generally regarded as having advanced beyond antiquity.⁴⁸ Probably the best known proponent of this approach is Giorgio Vasari. His sixteenth-century book, *The Lives of the Artists*, was concerned with art much closer to his own time, but he sets those developments against the background of ancient traditions, particularly in Greece and Rome. As elaborated in his preface, the arts evolve in a cyclical manner, from their beginnings, to their height, and finally a decline, as in stages of human life. He also sees a restoration, or rebirth, that follows the ruin and that allows him to draw parallels

between antiquity and his own time.⁴⁹ The artists whose lives Vasari discusses are divided into three periods, which progress "step by step" from the rebirth after antiquity to two successive stages of perfection. This same framework is applied to Greek art, with the final stage of perfection reflected in the sculpture of Polykleitos and the paintings of such artists as Apelles. Perfection is here defined as the reproduction of the truth that is found in nature. Although Vasari treats the development of architecture in his own period, with the move toward perfection distinguished by greater adherence to ancient principles of plan, style, and proportion, he does not trace a comparable evolution for ancient architecture.

The views discussed here are important for our investigation since they preserve certain concepts from antiquity. Yet while incorporating the theories of Vitruvius and other ancient sources, these writers expand on and often reformulate them. Thus, Renaissance theorists imbue the orders with even stronger rules regarding components and proportions. Vitruvius's definition of perfection as reproducing the truth in nature now takes on divine implications and provides reinforcement for these rules. Renaissance authors further pass on to us confirmation of wooden origins and an evolutionary development. For them, as for Vitruvius, Doric preceded Ionic and innovations were to be credited to particular individuals. Even Vitruvius's emphasis on a theoretical (scientific) basis for architecture, in order to raise the visual arts to the same level as the liberal arts, was strongly embraced in this period.⁵⁰

New ideas also arose during the Renaissance that set the stage for subsequent discussion. Some are important even today. One of those is the distinction made by Alberti between structure and ornament, which has resulted in modern times in the diminished importance of the latter.⁵¹ Another is a recognition of the architect's ability to make judgments. By the sixteenth century, the perception of the viewer, and especially the eye of the architect, became even more important than adherence to abstract rules.⁵² This opened the way to a questioning of traditions, including those transmitted by Vitruvius. Also appearing in the Renaissance was a nationalistic view of architecture. This is assumed to be the motivation behind Alberti's designation of Italy as the location of architectural perfection. By contrast, S. Serlio views Roman works as inferior to those of the Greeks. Additional support for Alberti's nationalism is found in his assignment of a simultaneous invention for the Tuscan and Doric columns (VI, 3; VI, 6).⁵³ These views, and the nationalism behind them, become particularly virulent in the eighteenth century.

LATER INTERPRETATIONS: MODERN

The individual most responsible for the modern study of art history is J. J. Winckelmann. His *History of the Art of Antiquity*, initially published in 1763,⁵⁴ laid the foundations for the discipline of classical archaeology. Although he dealt pri-

marily with sculpture, the framework that Winckelmann established remains in effect today. What made his book so important was the connection he drew between the study of the object and the historical information contained in ancient texts. He was thus able to provide, for the first time, a context for the monuments.

Winckelmann's theory of historical development viewed art as moving through a beginning, a rise, and a decline. This pattern clearly drew on earlier sources. Besides Vasari in the sixteenth century, others immediately preceding Winckelmann, including the comte de Caylus and M.-A. Laugier, also envisioned a cyclical development of culture.⁵⁵ This idea can ultimately be traced to the ancient authors.⁵⁶ Both Cicero (*Brutus* 70) and Quintilian (*Institutio Oratoria* 12, 10, 3-9) discuss the accomplishments of individuals within an evolutionary development of the visual arts, which accompanies that of oratory. Their accounts of painting may name different individuals, but they follow the same chronological scheme, with the greatest contributions in the later fourth century by Apelles and others. A correspondence also exists in their treatments of sculpture, at least in its early phases. For Cicero, sculpture reaches its perfection in the second half of the fifth century with Polykleitos; Quintilian views Polykleitos's contemporaries, Pheidias and Alkamenes, as surpassing him in ability, but considers the fourth-century sculptors Lysippos and Praxiteles supreme in another category, their "faithfulness to nature." Thus, while both authors envision a development over time, Quintilian allows for perfection in more than one period, as does Winckelmann. This is possible because he avoids judging art by a single standard, since "one single form will not satisfy all critics" (12, 10, 2).⁵⁷

Similarities between these two accounts have led J. J. Pollitt to suggest that they derive from the same source, for which Quintilian's version is more complete.⁵⁸ Such a source must have been different from that used by Pliny, since his evolution reaches its stage of perfection in the later fourth century for both media, with Lysippos in sculpture and Apelles in painting.⁵⁹ Pliny's discussion is also important for its view of later sculpture: he specifically states that it declined after the start of the third century, only to revive somewhat in the mid-second century B.C. (*HN* 34, 49-52).

Within this general development, Winckelmann specified individual periods, which remain in effect even today in studies of Greek art. Innovations were assigned to particular artists, following the approach set out by Pliny and used also by Vitruvius for architecture. Contemporary scholars of ancient art still often group sculpture, and to a lesser extent architecture, around the contributions of individuals.

Winckelmann's initial period preceded the time of Pheidias, and is generally equated with what we now call Archaic. It was exemplified by both style and material. Although he had no physical remains, he assumed a primitive form and more easily workable materials, such as wood, for both sculpture and architecture.⁶⁰ These views reflect a reverse projection of the evolutionary theory and are

supported by ancient sources working on similar assumptions. Thus, according to Vitruvius (II, 1, 2-3), architecture originated in the primitive wooden hut. This pattern of development was also accepted during the Renaissance and formed the basis of Laugier's noted essay on architecture already in 1753. Laugier, however, equated the simplicity of the primitive hut with true perfection.⁶¹

We have already noted how this reverse evolutionary concept, when taken to its full development, has led to erroneous conclusions, such as the acceptance of primitive wooden figures as the predecessors of stone sculpture. We will, in a subsequent chapter, explore the problems associated with the presumed wooden background of temple entablatures. Yet extant remains of temples have generally confirmed the view that the earliest architecture was of simple form and materials. What is not so clear, but is widely accepted, is the corollary: a sophistication in plan as well as in the durability of materials, and consequently complexity of workmanship, moved in lockstep with time. Winckelmann himself contradicts the strict adherence to this view when he states that the earliest material employed by artists (in this case clay) continued in use throughout the history of art.

From these primitive beginnings, Winckelmann saw the rise of a period of perfection, which we now call Classical. It was characterized by the proximity of its art to the "truth of nature",⁶² a definition familiar from both antiquity and more recent times. This was achieved in its earlier phase, referred to as the Grand Style, by harmony of proportions, as noted especially in the works of Polykleitos. The later phase, which is referred to as the Beautiful Style, is distinguished by grace, which resulted from a less rigid adherence to proportions and an increased correspondence with nature. This division was based on textual evidence that attributed grace to both Praxiteles and Apelles,⁶³ as well as a passage from Pliny that suggested Lysippos's representation of men went beyond those of Pheidias and Polykleitos.⁶⁴ Clearly, two phases were needed for this period.

A distinct division exists today between the phases set out by Winckelmann, which we term High and Late Classical. Harmony of proportions is considered an achievement of the first in regard to sculpture, but of both periods for architecture. The proportional relationship of parts, from stylobate to roof tiles, is introduced into the Doric order in the Early Classical Temple of Zeus at Olympia, whereas Ionic only adopted such regularity in the Late Classical Temple of Athena at Priene, by Pytheos.⁶⁵ Each of these temples today represents a model for its architectural style, thus reflecting Winckelmann's view that the essence of a tradition occurs with its perfection and that perfection exists in proportion.⁶⁶ Indeed, handbooks will usually illustrate these buildings as "typical" for their respective orders (Figs. 1 and 2).⁶⁷

Another factor for Winckelmann in the attainment of artistic vitality was political freedom.⁶⁸ The democratic system of government initiated by Athens at the end of the sixth century B.C. created in this city the proper climate for art to flourish beyond that of its neighbors. This climate was subsequently enhanced by the Athenian victory against the Persians, and culminated during the time of

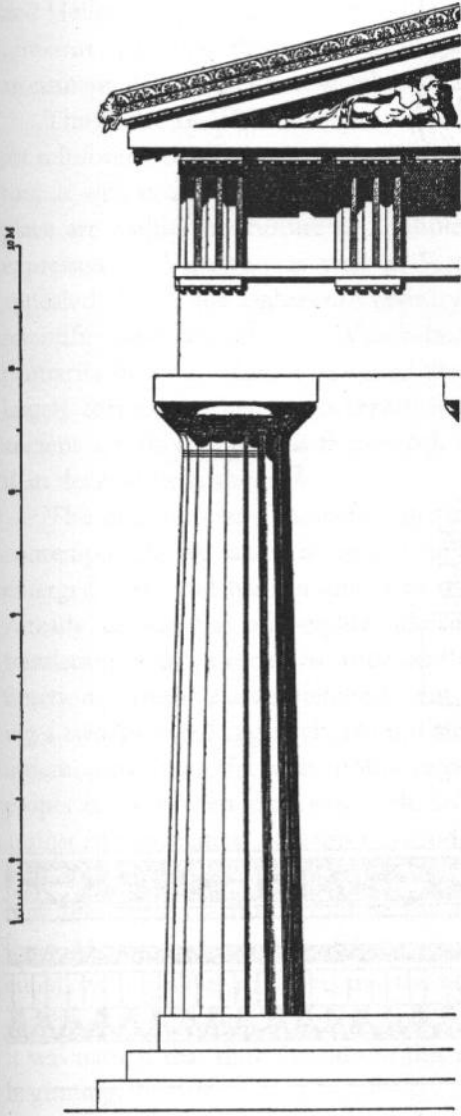
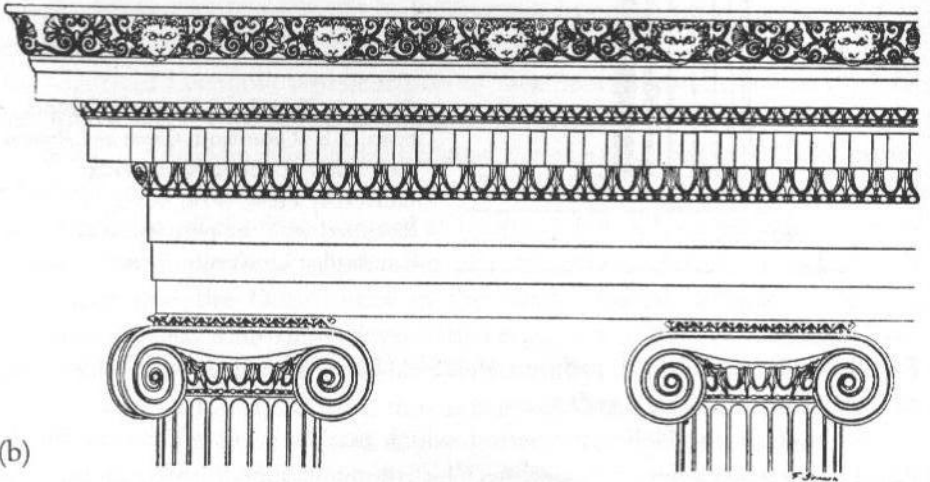
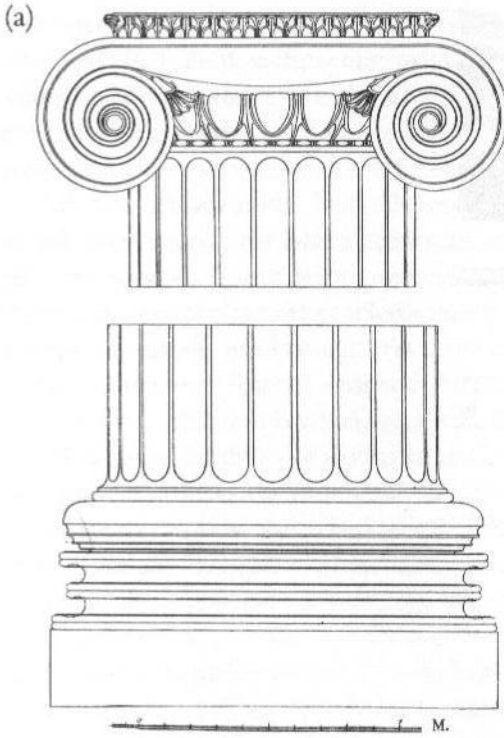


Figure 1. Temple of Zeus at Olympia, from D. S. Robertson, *Greek and Roman Architecture* (London: Cambridge University Press, 1974) 40, fig. 17, reprinted with the permission of Cambridge University Press.

Perikles and the Sicilian Expedition of 415–413 B.C. The view of Athenian artistic superiority is still held today.

By contrast, the Hellenistic period, which marked a loss of freedom for the Greeks, represents a period of decline. This is supported by Pliny's comments on the stagnation of art at the beginning of the third century and by those of Dionysius of Halicarnassus regarding the demise of Attic rhetoric following the death of Alexander the Great.⁶⁹ Yet these authors speak of a subsequent reemergence of art or rhetoric, which for Winckelmann is coupled with the reattainment of political freedom. For Vitruvius as well, architecture experienced a decline, at least in the use of the Doric order. It is to architects of the later fourth century



(b)

Figure 2. Temple of Athena Polias at Priene: (a) column, (b) entablature, from D. S. Robertson, *Greek and Roman Architecture* (London: Cambridge University Press, 1974) 44, fig. 18, and 45, fig. 19, respectively, reprinted with the permission of Cambridge University Press.

and Hellenistic period, Pytheos and Hermogenes, respectively, that he attributes criticism regarding the frieze. Modern scholars have generally accepted this assessment, despite archaeological evidence to the contrary.⁷⁰

The desire of Winckelmann to establish a broad context for the history of art reinforced the framework that he proposed. It allowed him to draw on history as well as the other arts for his own reconstruction and at the same time to place art within the culture as a whole. A broad perspective on art had been expressed by Vitruvius as well as Vasari and other Renaissance thinkers. It appealed also to the eighteenth century in its ability to place art on a rational, scientific foundation.⁷¹ Yet Winckelmann's understanding of his subject was primarily literary. In fact, it is argued that the basic principles of his history were largely formulated before his arrival in Italy and his consequent experience of ancient art. As a result, his framework was imposed on the monuments rather than derived from them.⁷²

The emphasis on rationalism in this period led several of Winckelmann's contemporaries to take a more critical approach to the sources. One issue that emerged early and has continued to inspire debate is that of wooden origins. Already around the mid-eighteenth century, C. Lodoli criticized the idea of translating wooden forms to stone on the grounds that the material must suit its function.⁷³ In the early nineteenth century, H. Hübsch expanded the attack, taking a two-pronged approach. He initially points out the logical inconsistency of imitating one material with another, especially when the two have such different properties. He then discusses each architectural element in turn and argues against its explanation in terms of wooden antecedents.⁷⁴ M. Viollet-le-Duc follows suit, once again emphasizing the lack of logic in this process and noting how inconceivable this would be for a people who invented the discipline of logic. Moreover, he argues that the manner in which Greek temples are executed, with a series of superimposed blocks, is consistent with both the nature and function of stone. Since the Greeks possessed stone quarries, but few forests, it was natural that they should use this material for their temples, even from the beginning.⁷⁵

Other scholars came to the defense of wooden origins on the basis of the same evidence, especially logic and adherence to nature. Thus, F. Milizia placed the origins of Greek architecture within an evolution from the primitive hut, as expounded by Vitruvius. Because architecture is an imitative art, it would naturally derive the temple from initial habitations in wood. Only with an increase in knowledge over time was it possible for man to move to stone.⁷⁶ J.-I. Hittorff takes a similar view. He offers a detailed explanation for the individual components of the orders as arising from perishable materials and construction principles, and assumes that the same logic existed in their translation to stone.⁷⁷

A middle ground arose in this debate in an attempt to integrate the two opposing views. A. Choisy, for example, likens Greek carpentry to a masonry of

wood, which allows for the same forms in either material. He also recognizes the alteration of original, wooden elements by free interpretation.⁷⁸ J. Durm, writing about the same time, likewise attributes the inconsistencies of the two traditions to changes in form and even location of members with their translation from wood to stone.⁷⁹ For G. Semper, the formal elements of architecture were generally derived from its "cover" rather than its underlying core. But as Greek construction evolved from mixed materials to stone, these elements assumed a more structural character, as symbols of earlier functional components.⁸⁰

Although challenges have thus been raised to the theory of wooden origins, the weight of opinion over the years has been in its favor. The strongest evidence consists of the statements of Vitruvius. This theory also conforms to the evolutionary development accepted by both ancient and modern scholars. Furthermore, Lycian tombs provide compelling physical evidence for the imitation in stone of wooden members.⁸¹ Consequently, many archaeologists reconstruct early wooden members as canonical, and architectural historians often speak of wooden origins as accepted.⁸² The issue no longer inspires debate, but it is far from resolved. Archaeologists and specialists in the field have increasingly raised doubts about wooden predecessors, as will be discussed in later chapters.

Theories on the origins of the orders are also affected by the relationship of Greek architecture to that of other cultures. Already the Renaissance had recognized the impact of earlier civilizations on those of Greece and Italy as well as the possible contemporaneity of Greek and Etruscan innovations. These ideas gained ground in the eighteenth century. Particularly Egypt assumed an important role in theories on the origins of architecture.⁸³ As stated in a letter from A. Paoli published in 1784, it was hard to imagine that this art began among people with such a long tradition of building huts in wood.⁸⁴ In his exploration of Egypt, J.F. Champollion likewise notes a connection. Letters written in 1828 and 1829 mention columns similar to early Doric, which he eventually comes to call "proto-Doric".⁸⁵ By the mid-nineteenth-century publication of his handbook, J. Fergusson clearly accepts Egyptian influence on Doric as well as Asiatic, especially Assyrian, models for Ionic architecture.⁸⁶

This widened perspective gave rise to a debate over styles. As noted previously, already in the Renaissance opinions differed on the respective contributions of Greek and Roman architecture. Those differences reached a head in the second half of the eighteenth century. By that point the two camps were generally divided along national lines. The French espoused Greek superiority, while the British and Italians remained partial to Roman traditions. Thus, according to one side, perfection was reached by the Greeks, with a decline under the Romans; to the other side the climax occurred with the Romans. G. B. Piranesi was perhaps the most vocal advocate for the Italian contribution. He argued for Etruscan priority as well as excellence, and reasoned that the Romans inherited from the Greeks an illogical tradition derived from the imitation of wood and corrected its faults.⁸⁷

Since investigations of the Greek world were only beginning in this period, much of the argument remained theoretical. As more evidence for Greek architecture emerged, the emphasis shifted to a contest of Roman ornament and originality versus the simplicity and elegance of Greek buildings. Already Alberti had noted a distinction between structure and ornament. This was reinforced by Laugier, who accepted as essential elements of architecture only the column, entablature, and pediment. Additions to and elaborations of these elements that could not be justified by need and reason represented faults. Similarly, Milizia labeled decoration that did not arise from necessity as "artifice" and proof of bad taste.⁸⁸ Within this environment, Piranesi's opponents were certain to prevail. In the process they initiated the Greek revival of the early nineteenth century and an acceptance of the superiority of Greek art that has lasted to the present day.⁸⁹

The interest in Greek architecture was focused on Greece, particularly Athens, and Ionia, defined as Asia Minor and its offshore islands. Additionally, the label of elegance was applied to the slender Classical, rather than the squatter columns and buildings of the earlier Archaic, period.⁹⁰ Winckelmann likewise promoted the superiority of Classical Athens. This opinion is still generally held today. Two of the most widely read textbooks, by W. B. Dinsmoor and A. W. Lawrence, assign the culmination of architectural development to Periklean Athens and emphasize the perfection of its constructions.⁹¹ By contrast, western Greece, that is, Southern Italy and Sicily, was largely ignored and its great temples in Poseidonia (Paestum) and Akragas (Agrigento) remained little known. Even at the end of his life when Piranesi worked at Paestum, his aim was to demonstrate how the arts could flourish as well in Italy as in Greece. He thus fails to mention that the temples were Greek.⁹² This geographically and culturally intermediate position likely accounts for the paucity of attention given to western Greek architecture even today.

The nationalistic divisions reflected in this debate were rooted in the preoccupation of Europeans of the later eighteenth century and into the nineteenth century with their own national and ethnic identities. Investigations sought to elucidate the distinctive characteristics of population groups and determine the effect of climate and geographical conditions on their formation. This approach was applied to the Greeks especially by K. O. Müller, whose *Die Dorer*, published in 1824, has had a profound impact on modern perceptions of the Dorians. Even into the twentieth century, scholars have attempted to discern in various artistic media the distinctive footprints of the Dorians and Ionians.⁹³ Their presence in architecture was already affirmed by Vitruvius in attributing to each ethnic group the creation of its own order.

The premises on which this line of inquiry were based have been called into question, especially as a result of World War II. E. Will, writing in 1956, denied the existence of true ethnic consciousness among the Greeks and considered the divisions and antagonisms noted by others to be anachronistic. Yet recent histor-

ical events have caused scholars to reassess the significance of ethnicity. Both J. Alty and J. M. Hall argue for its impact, although in a considerably circumscribed form. Hall in particular sees ethnic identity as consciously constructed and capable of change. He therefore warns of the problems in equating ethnic groups with specific artifacts or artistic styles.⁹⁴ The implications of this warning on attempts to interpret the use and meaning of the architectural orders will be explored later.

CONCLUSIONS

Vitruvius, and to a lesser extent other ancient sources, provided the basis for modern views of ancient architecture. Because the earliest inquiries concerning antiquity were launched before the rediscovery of Greek art, and at a time when Roman art was still incompletely known, they necessarily depended on the ancient texts. Even in the eighteenth century, Winckelmann drew from the statements and theories of ancient authors to construct the framework of his historical development. The inheritance from antiquity thus remains fundamental.

As a result, scholars generally accept the existence of two distinct orders, Doric and Ionic, which emerged in different locations of the Greek world, Doric in the mainland and Ionic in the east. They also generally assume an early development and chronological priority of Doric over Ionic. The evolution of architecture with time is accepted as fact. Most scholars further accept a culmination of development in the Classical period and a decline, certainly for Doric, in Hellenistic times.

Later inquiries have led to modifications of some ancient views or have raised new issues. Among them is a more rigid definition of architectural styles. Certainly the claim of wooden origins has generated considerable controversy. A shift in aesthetics has made possible a greater appreciation of certain periods, especially Archaic. As a result of archaeological explorations the possibility of foreign influence in the evolution of the orders becomes stronger. Explorations have also increased the emphasis placed on certain regions of Greece as leaders of architectural developments.

With increased excavation and the discovery of ever earlier remains, questions have been raised about the reliability of our sources, both ancient and modern, and the applicability of their theories, especially to the earliest periods. We must therefore turn to the archaeological evidence to determine the validity of this literary tradition, and the scholarly views it has generated, on the origins of the architectural orders.

THE ARCHAEOLOGICAL EVIDENCE: PROTO-GEOMETRIC THROUGH THE SEVENTH CENTURY B.C.

THE DISTINCTIVE COMPONENTS of the architectural orders are present in stone by the second quarter of the sixth century B.C. This date thus provides a *terminus ante quem* for their development. Yet at what point did they emerge, and in what form? These questions are very difficult to answer because prior to the use of stone, the Greeks constructed their buildings of perishable materials that leave little trace in the archaeological record. Nevertheless, this chapter explores the existing evidence for the earliest remains of Greek architecture, treating in turn materials, plans, and elevations. This approach leads to some repetition, in that a single building is discussed from different perspectives and thus sometimes in several sections, but it aims to establish a clearer context for existing remains and thus to allow for a better interpretation of them.

The reader will recall that Vitruvius implies a very early construction date for the first temples in each order, around the time of the Ionian migration, which we place ca. 1000 B.C. As discussed in the previous chapter, however, this chronology more likely derived from a desire to link important events than from any historical awareness. Indeed, the buildings that Vitruvius cites as the initial examples of each order do not belong before the seventh century B.C. No modern scholar would accept a date at the beginning of the millennium for a canonical temple. Yet many are willing to find the antecedents of temple plans, as well as individual components, in Bronze Age forms. General textbooks on art history note the similarities of the Mycenaean megaron (Fig. 3) with the core of the "typical" Greek temple (Fig. 4), since in each case there exists a porch with two columns in antis leading on axis into a deeper main room. Even the Doric capital, distinguished by an abacus crowning a wide, spreading echinus, resembles its

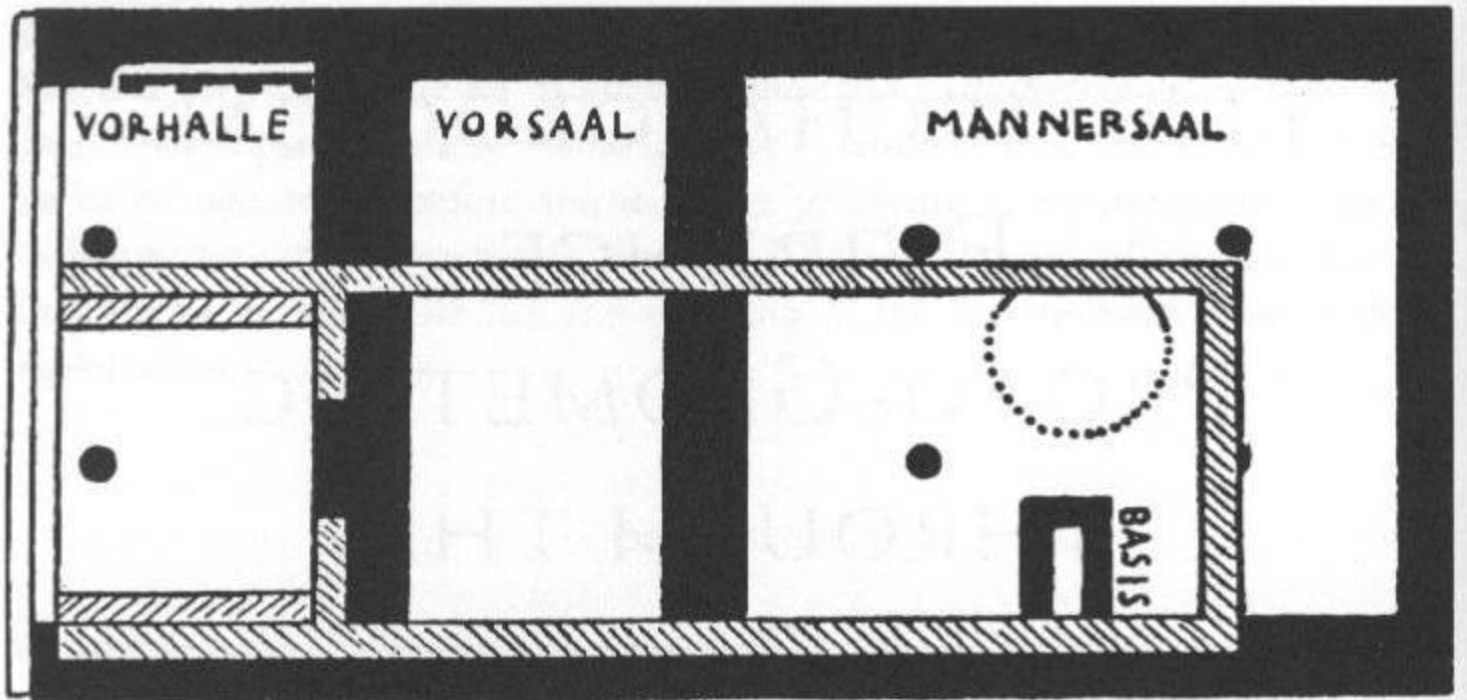


Figure 3. Mycenaean megaron at Tiryns (solid lines) with Building T (hatched lines), from A. Frickenhaus, *Tiryns I*, 1 (Athens: Eleutheroudakis and Barth, 1912) 3, fig. 1.

Mycenaean counterpart, with a rounded torus and abacus above. Such correspondences, in architecture as well as other arts, lead the authors of handbooks on Greek art to begin with the Bronze Age and raise the question of its relationship with historical periods. As will be shown in this chapter, links do exist, most notably in materials and to some extent in plans. Yet following the collapse of Mycenaean civilization around 1100 B.C., the Greeks experienced a series of disruptions and a lowered standard of living. Only toward the end of the period under consideration did increased technology and prosperity, as well as a new interest in creating a separate house for the god, open the way for the introduction of Doric and Ionic architectural components.¹

Before examining the evidence from this period, we must define certain terms. One is the temple.² As known from later times, it is a freestanding struc-

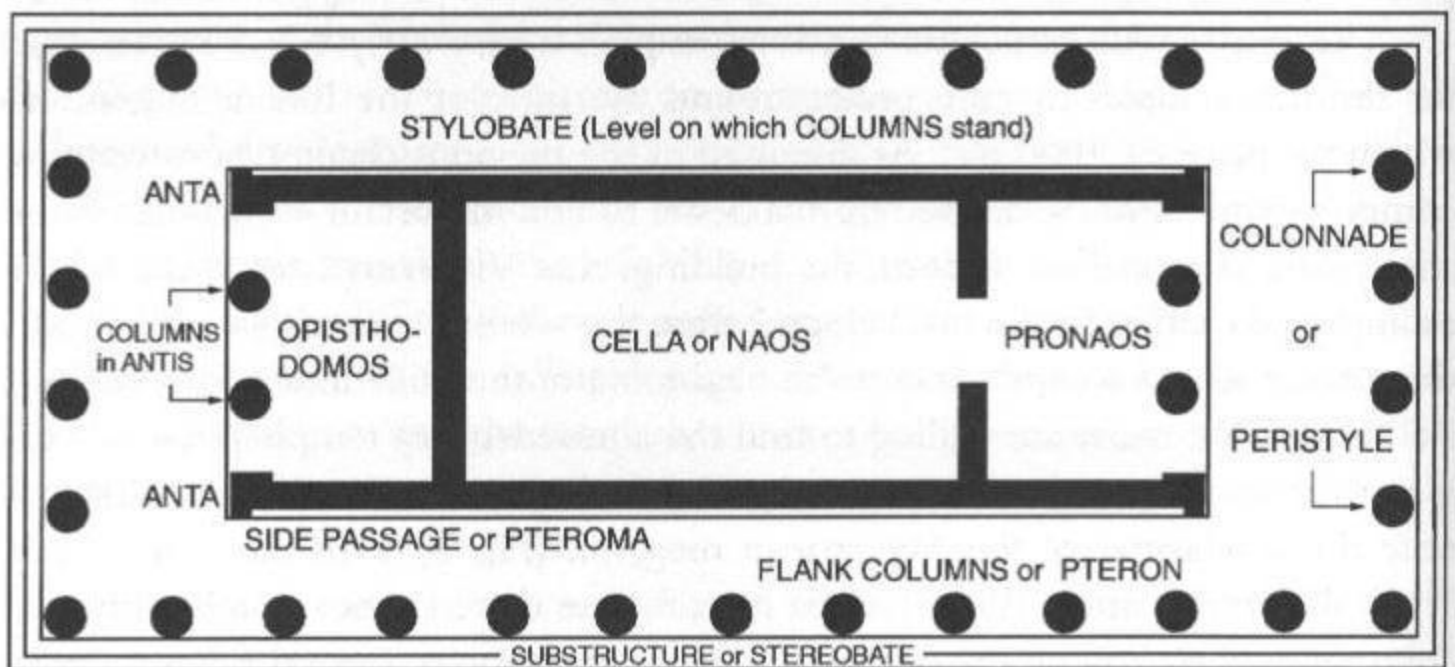


Figure 4. Typical Greek temple plan, drawn by Brian Slawson.

ture that served in the worship of the deity. As such, it may contain an image of the god as well as votive dedications. The actual practice of religion, on the other hand, was focused on the altar, where the sacrifice and offering of animals were carried out. During the Bronze Age, such distinctions did not exist. The line between rulers and priests is likewise blurred. It appears that the king, or "wanax," who governed a Mycenaean state also had religious responsibilities. Various pieces of evidence point to this role and to the use of the megaron, the most important and public room of the palace, for the conduct of certain ceremonies. That evidence is both literary (i.e., mentions in Linear B tablets) and archaeological (e.g., the relatively large size of the megaron and an open area in front, both of which would be suitable for public gatherings; the presence inside of a substantial hearth and cultic equipment; and the subject matter of its wall decoration). It would seem, however, that the ruler was not the sole religious leader. The discovery elsewhere of small shrines suggests the simultaneous celebration, perhaps by priests, of other religious ceremonies.

Dark Age communities, although much smaller in size, were also ruled by kings, who now take the name of "basileus." Since they apparently assumed the political responsibilities of their Bronze Age predecessors, one may conclude that at least some of their religious functions remained unchanged. The archaeological evidence supports this contention. Elaborate palaces no longer exist, but structures distinguished by size, construction technique, location, and furnishings are often identified as the house of the ruler. Until the second half of the eighth century, and in some locations even the seventh century, there is no separate building within the settlement for the conduct of religion, although such may exist outside the urban area. It is therefore argued that religious activities continued to be carried out in and around the ruler's home. These would consist primarily of animal sacrifice, followed by the appropriate offering to the god and the consumption of the remainder by leading members of the community.³

Certain events coincide during the eighth and seventh centuries B.C. to change this situation. One is the breakdown of monarchical rule initially in favor of an aristocracy and over time of a broader constituency.⁴ The house of an individual was therefore no longer an appropriate gathering place. Another is the rise of the *polis*, and of its looser counterpart, the *ethnos*, with the accompanying increased emphasis on group identity.⁵ It was now necessary to construct public buildings that served the community. These included a separate structure – a temple – as a home for the patron deity of the city or federation. It has been claimed that the deity became the new monarch of the state.⁶ Indeed, A. Mazarakis Ainian raises convincing archaeological evidence to suggest that the introduction of an urban temple coincided with the abandonment or conversion of the ruler's house.⁷

The presence of a hearth in some early temples suggests that ritual meals were, at least initially, transferred to this new location. Yet the temple differs in other ways. Scholars have long recognized one of its functions as housing a statue

of the god, the earliest evidence of which begins at this time, in the late eighth century. Although recent studies conclude that such an image was not always present, the provision of a place specifically reserved for the god must nevertheless have been fundamental.⁸ The temple also served to store and protect votive offerings to the deity. Its role as a treasury, for the cult as well as for the community, seems to become especially significant in later times.⁹ While functionally the temple differed in many respects from the ruler's house, architecturally it remained very similar. As a result, any attempt to examine religious architecture during this early period must consider domestic buildings as well.

Two other terms that require definition are "Doric" and "Ionic." As noted in the previous chapter, Vitruvius uses these terms to designate the two major types of columns and their corresponding entablatures. Archaeological evidence allows us to form a more complete picture. Thus, the Doric column is characterized by the lack of a base and the use of a four-sided capital composed of a rounded echinus and square abacus (see Fig. 1 from Chapter 1). The Doric anta, or enlarged wall-end, is treated comparably, with no base and a crown decorated with the same moulding on its visible faces. In Ionic architecture, the column possesses a base, often moulded, and a two-sided volute capital (see Fig. 2 from Chapter 1). Its anta, or unenlarged wall-end, likewise rests on a moulded base and is crowned by a capital that shows a different treatment on front and sides, consisting, respectively, of three superimposed rolls and corresponding volutes. The entablatures are also distinctive. Doric is characterized by its frieze, formed of an alternation of triglyphs and metopes. The frieze is bordered below by a smooth band, or taenia, from which hang short fillets (*regulae*) with pendant *guttae*. Above, the horizontal cornice is embellished on its underside by a series of pendant plaques (*mutules*), each centered above a triglyph or metope and equipped as well with *guttae*. The raking or pedimental cornice is, by contrast, smooth and slightly concave on its underside. One version of the Ionic entablature, called Island- or Attic-Ionic, includes a frieze in the same location as its Doric counterpart, although this takes the form of a continuous band, either smooth or sculpted. The other version, Eastern-Ionic, uses dentils instead, at least in its canonical form. The accompanying architrave is typically articulated with three fascias, as opposed to the smooth form of Doric. In later times, the Ionic entablature incorporates both dentils and a frieze, which is the arrangement described by Vitruvius.

Distinctions also come to exist in the plans of temples constructed in the respective styles, but they do not appear during the period under consideration. Instead, variations in plan are linked more to construction material and geographical location. Similarly, we should not expect at this early date to find the full array of canonical components in the preserved elevations. If the orders emerged, as sources suggest, according to an evolutionary process, only the most salient characteristics, or their incipient forms, may exist initially. Our examination in this and succeeding chapters will thus focus on individual components rather than the entire syntax of each order. Here we must distinguish

between members that served a purely structural role, regardless of "order," and those that may be antecedents to the more canonical forms. Thus, although bases appear relatively early as supports for columns, they cannot necessarily be labeled as "Ionic" because they lack articulation and are not limited to Ionic territory. Indeed, as this chapter will show, the individual components only begin to take on their distinctive forms at the end of the seventh century, and in no case is that form fully achieved in the period under discussion.

MATERIAL

In general terms, the remains from this period support the evolutionary theory propounded by Vitruvius and reflected as well in Winckelmann's more modern history of art. That is, the materials used in architecture gradually gain in durability and in difficulty of workmanship, while the buildings themselves become increasingly more regular and complex. Yet this development does not seem to occur in the neat, linear fashion suggested by theorists.

For example, wattle and daub, which is generally considered to be the simplest method of wall construction, is also assumed to be among the first used.¹⁰ In fact, it has been identified in some of the earliest preserved buildings of our period. These identifications are, however, not without problems. In a tenth-century apsidal structure at Asine, both the recognition of the technique by K. Fagerström and the existence of this phase of the building have been questioned.¹¹ At Nichoria in Messenia, the excavators opt for construction of Unit IV-1 with walls of wattle and daub in its first phase, during the tenth century B.C., and mud-brick with wooden reinforcements in phase 2 (ninth century).¹² Yet others argue for mud-brick from the beginning.¹³ Perhaps the most controversial example of wattle-and-daub construction is also one of the latest identified. The so-called Bay Hut at Eretria is assumed to be a mid-eighth-century Temple of Apollo constructed, appropriately, of laurel (Fig. 5).¹⁴ On the other hand, the remains of mud-brick near the stone wall socle as well as the placement alongside it of flanking wooden posts have led to a more likely explanation of reinforced mud-brick walls.¹⁵ Additional examples of the wattle-and-daub technique may have escaped detection, since its remains are generally difficult to trace in the archaeological record. Even if this is so, the meager evidence for its use, along with the contemporary appearance of mud-brick construction, speaks against equating the simplicity of the technique with an initial step in the development of wall construction.¹⁶

In fact, throughout the Early Iron Age, there is little evidence to support the theory of a serial progression in materials. From the beginning, walls are generally constructed either of mud-brick, raised on a stone socle, or stone. Although mud-brick would appear to be technically easier to use, the preference for one over the other seems to be more regional than chronological.

THE ORIGINS OF THE GREEK ARCHITECTURAL ORDERS

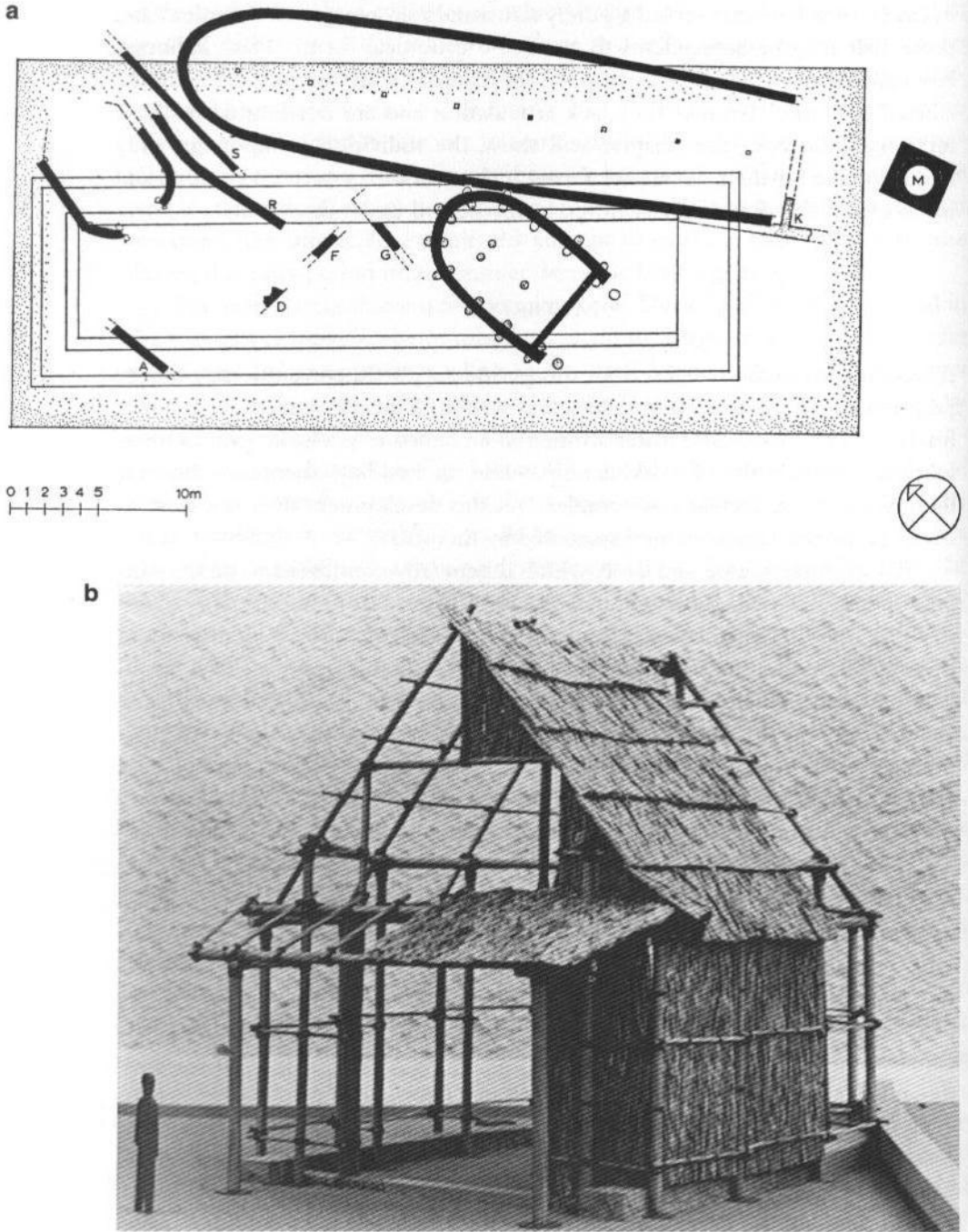


Figure 5. Bay Hut (Daphnephoreion), Eretria: (a) plan, (b) reconstruction, from P. Auberson, "La reconstitution du Daphnéphoréion d'Érétrie," *Antike Kunst* 17 (1974) 70, fig. 1 (plan) and pl. 14 (reconstruction), reproduced by permission of *Antike Kunst*.

Thus, during the Early Iron Age and even through the seventh century, Mainland Greek architects worked primarily in mud-brick. This was a favored material in the preceding Mycenaean period as well. Some chronological significance has been accorded to the incorporation of wooden posts as reinforcements, as opposed to fully mud-brick walls.¹⁷ The former technique is identified in Proto-Geometric buildings noted previously at Asine and Nichoria as well as in the so-called Heroön at Lefkandi, of the first half of the tenth century, where the spacing of posts is coordinated with a "peristyle" on the exterior of the building (Fig. 6). Fagerström implies that the advantage provided by this technique in relieving stress from the walls may have allowed the architect sufficient confidence to move to unreinforced mud-brick. Yet the continued use of wooden posts in the walls of seventh-century temples demonstrates that the original technique was not entirely replaced and thus one cannot assume a strict chronological sequence.

In Crete, fully stone walls appear in buildings constructed just after the end of the Bronze Age, as in the refugee settlement of Karphi, Building A at Smari, and Temple B at Prinias, perhaps as a continuation of earlier (Bronze Age) techniques.¹⁸ Stone was also commonly used for walls in the Cycladic and east Greek islands, although the evidence is later, generally falling into the eighth century B.C.¹⁹ In all areas of the Greek world, then, it would appear that the choice of materials was linked to factors beyond chronology or technical sophistication in other arts, and that additional criteria, such as availability, local traditions, and even plan, played an important role.

This situation changed with the introduction of techniques for quarrying and dressing stones. Although some rudimentary working of stone may have taken place early on, the appearance of ashlar blocks, allowing for regular coursing, is certainly attested in the late ninth-century City Wall 1 at Old Smyrna.²⁰ Limestone sculptures from the end of the century in Crete also confirm that island's ability to quarry and work stone blocks.²¹ By the eighth and seventh centuries, an increasing expertise leads to the production of polygonal walls in east Greece and to ashlar masonry for east Greek (Samos) and mainland (Corinth and Isthmia) temples. The ashlar technique at this point is, however, still in its beginning stages.²² Furthermore, because of the expenditure of labor involved in the quarrying and installation of cut-stone blocks, their use is generally restricted to public works, especially structures dedicated to the gods.

The introduction of cut-stone blocks opened the door to the development of the fully stone temple typical of later times. Yet that development was not achieved on a large scale until the sixth century B.C. Despite the use of stone blocks in the two Corinthian temples already during the first half of the seventh century, those elsewhere in the Peloponnesos continued to employ mud-brick into the sixth century and even later, including for such important works as the Temple of Hera at Olympia, dated ca. 590 B.C. Clearly this cannot be the result of a lack of awareness of developments elsewhere or of access to new technology,

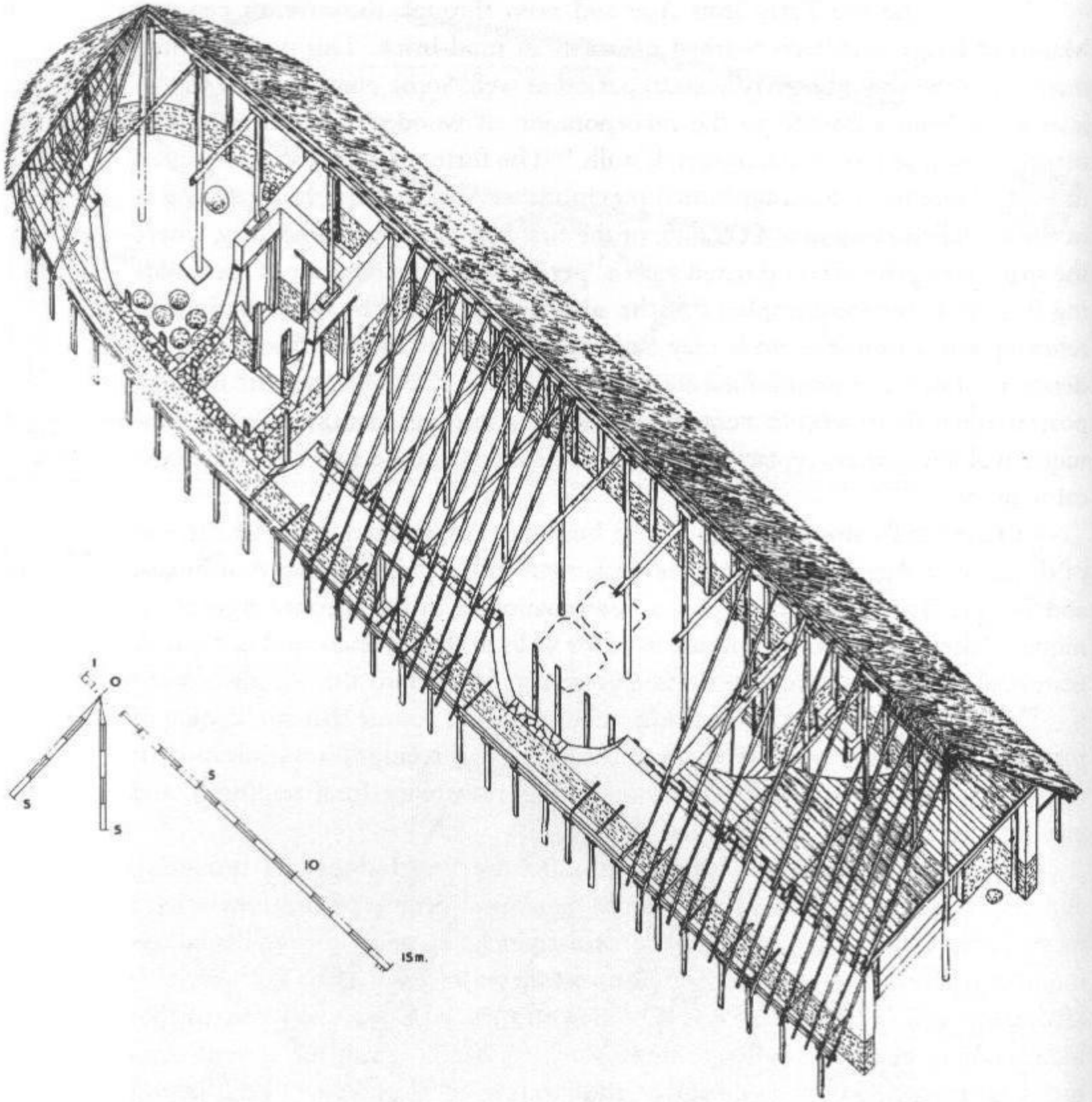


Figure 6. Reconstruction of the Heroön at Lefkandi, from J. J. Coulton, in M. R. Popham, et al., *Lefkandi II*, 2 (London: British School of Archaeology at Athens, 1993) pl. 28, reproduced with permission of J. J. Coulton and the British School at Athens.

since many of the temples in question were roofed with tiles, another Corinthian innovation of the same period. Instead, an explanation must be sought in local traditions and preferences,²³ as well as presumably cost.

Even with the adoption of stone for walls, wood continued to be used for architectural supports and in roofing. Thus, the mid-eighth-century Temple of Artemis at Ephesos employed wooden peristyle columns on stone bases, surrounding its stone walls. One of the earliest stone temples in mainland Greece, that of Poseidon at Isthmia, is also assumed by its excavators to have had wooden columns. Both the slightly earlier Temple of Apollo at Corinth, and recently this

temple as well, are argued to have employed wooden piers in conjunction with stone walls.²⁴ With notable exceptions, ceilings and roof structures continued to be made of wood long after the petrification of the rest of the building.

It is clear from this survey that over time Greek architecture did, indeed, employ increasingly more durable, and demanding, materials, presumably as a result of increasing technical expertise. By the end of the period under consideration, this evolution culminated in the introduction of stone blocks, which enabled construction on a monumental level. It should be stressed, however, that this development was not a step-by-step progression from "primitive" to advanced. Rather, the two primary materials, mud-brick and stone, coexisted for the entire period, and the adoption of one over the other is largely the result of regional practices. Only with the introduction of techniques that allowed for regularly cut blocks did one material – stone – come to prevail, but during the period under consideration, its use was still limited to certain structures and specific geographical areas.

BUILDING PLANS

A similar scenario exists in regard to building plans. That is, curvilinear shapes appear early, with gradual replacement in later periods by rectangular forms, but the preference is clearly regional, with the former type more popular in mainland Greece and the latter in the Cyclades, Crete, and, to a lesser extent, east Greece.²⁵ This situation may be attributed in part to construction methods. It is generally assumed that curvilinear buildings would be roofed with thatch placed at a steep angle. In mainland Greece, where mud-brick walls prevailed, the curved end of the roof could provide protection from the elements.²⁶ There was no need for such protection in the Cyclades and Crete, with their largely stone walls. Moreover, flat roofs were preferred, and were more compatible, with the agglutinative constructions and rectangular shapes found in the latter areas.²⁷

Previous traditions must also have played a role. The apsidal building form has a long history in mainland Greece, going back to the Neolithic period. Although not common during the Late Bronze Age, it continued to exist on the periphery of the Mycenaean world. With the collapse of that rigid society, it reemerged throughout the Mainland and even beyond, perhaps under the influence of those peripheral regions. In Crete and the Cyclades, however, the form was rare or nonexistent. Even with the move toward rectangular structures from the mid-eighth century onward, some of the more remote areas of the Greek world continued to construct houses in the apsidal form.²⁸ Yet in settlements such as Eretria in mainland Greece, Pithekoussai in the west, and Old Smyrna and Miletos in the east, the period beginning ca. 700 B.C. witnesses a gradual substitution of rectilinear for curvilinear buildings.²⁹

The decline in popularity of the curvilinear structure has been associated with the rise in population during the Geometric period and the resulting increase in the density of settlements. By the mid-seventh century, rectangular houses had generally become the norm, since they allowed for a better utilization of space.³⁰ Temples, which stood alone, could be constructed with either an apsidal or rectangular plan. Still, even for these structures, the apsidal form was more likely to be found in remote areas or in association with early cults.³¹

Since, functionally, temples seem to have evolved from the houses of rulers and served as houses for the gods, it is natural that their plans would likewise reflect those of domestic architecture. Of the range of possibilities, only the apsidal and rectangular plans were capable of the monumentalization required for such an important structure. The increasing role of rectangular architecture explains why this plan was preferred from the beginning, while religious conservatism may be behind its perpetuation into later times. Yet both plans show variety in their arrangements (Fig. 7). Two types of facade are possible, the open-front anta-building and the closed-front oikos. Either may make use of columns in the facade, although these are more likely to appear, singly or as a pair, in the anta-building. The number and relative size of rooms also offer various combinations, which for the most part do not differ from the configurations of domestic buildings.³² There is thus no "distinctive" temple plan at this time. Even in later periods, when the temple is more clearly separated from domestic architecture, variations in the treatment of the facade and the layout of rooms will continue. The "typical" temple plan illustrated in handbooks therefore represents merely a combination of the most common of the possible forms.

Such evidence suggests that the resemblance in plan between the cella building of the "typical" temple, at least from the Archaic period onward, and the Mycenaean megaron likely arises from the transmission of the anta-type building through the Early Iron Age. The facade with two columns in antis, as opposed to the single column often found in the intervening time, would reflect the monumentalization of architecture in both periods. A similar explanation may account for the appearance of three rooms in each structure, creating a larger and more complex building than many of those from the Early Iron Age. Despite this similarity in number, it must be recalled that a difference exists in the placement of the main room in each type, at the back of the Mycenaean megaron and in the center of the temple, as well as in the treatment of the rear facade, which in mainland temples often consists of an open opisthodomos. A direct connection is thus unlikely.

The other possibility, of rediscovery and revival of the Bronze Age form, does not alter this conclusion. The best evidence for this scenario is provided by Building T at Tiryns, if it is, in fact, an eighth-century temple. At some point, the ruins of the megaron at Tiryns were cleared and a new structure installed using some of the same walls and column bases (Fig. 3). Although simpler, with only one column in antis and two rooms, the building clearly adopted the megaron

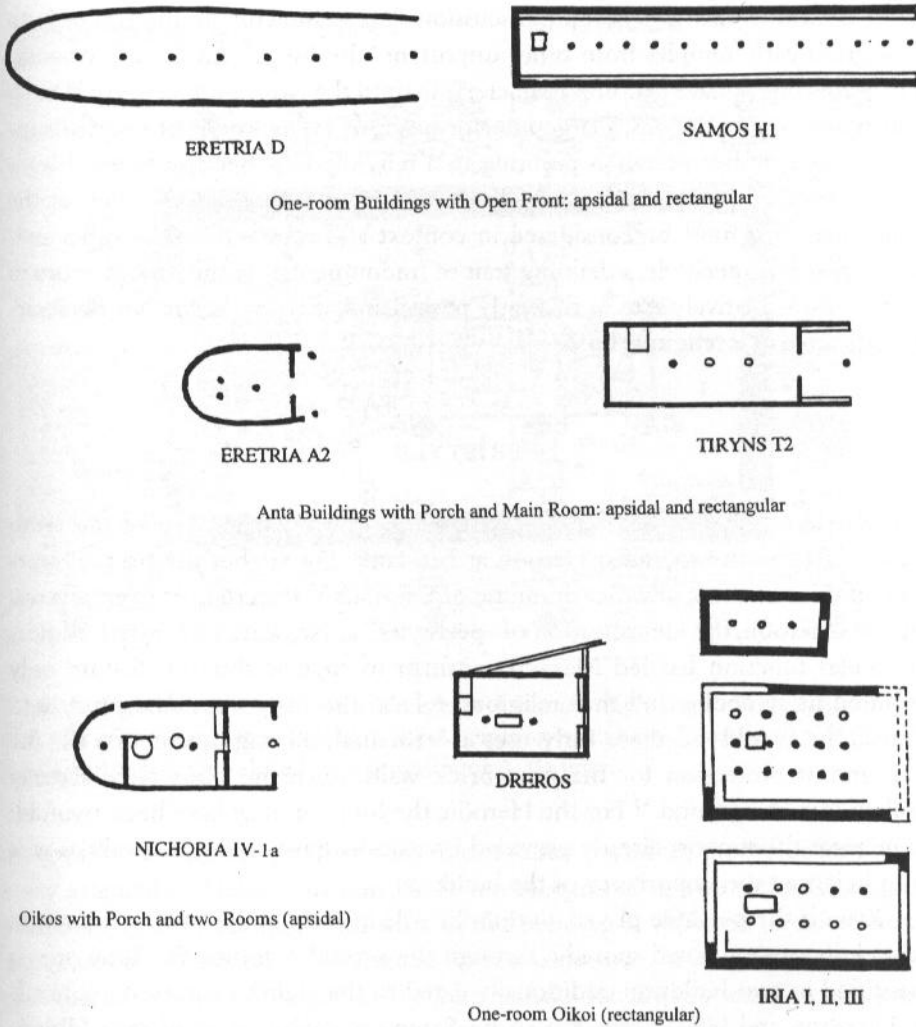


Figure 7. Sample plans of early buildings. One-room buildings with open front: Eretria D and Samos H 1; Anta buildings with porch and main room: Eretria A2 and Tiryns T2; Oikos with porch and two rooms: Nichoria IV-1a; One-room oikoi: Dreros and Yria 1, 2, 3, from A. Mazarakis Ainian, *From Rulers' Dwellings to Temples: Architecture, Religion and Society in Early Iron Age Greece (c. 1100–700 B.C.)* (Jonsered: Paul Åströms förlag, Studies in Mediterranean Archaeology, vol. 121, 1997) tables I, 1 and 10; II, 1 and 12; VI, 1; IV, 12 and 26, respectively, reproduced by permission of A. Mazarakis Ainian.

plan. If, as now seems likely, it was established at the end of the Bronze Age, its possible conversion to a temple in the eighth century would argue for transmission of the form.³³ On the other hand, a Geometric installation might suggest a deliberate effort in this period to imitate Mycenaean forms. Even so, the plan adopted was simpler than that of the megaron, with only two rooms and a single central colonnade, and thus reflects the architecture of its own time.

It is clear from the preceding discussion that architecturally there is little to distinguish early temples from other important "dwellings." An eastern orientation seems not to have become characteristic until the late eighth century.³⁴ Such factors as size, proportions, a large interior space, or even closely set internal supports,³⁵ have all been cited as pointing to a religious use. Because these characteristics could equally apply to the house of an important person, such as the local ruler, they must be considered in context and substantiated by other evidence. Even the peristyle, a defining trait of (monumental) temple architecture in later times, is relatively rare in this early period and, it would seem, not necessarily indicative of a religious function.

PERISTYLE

A peristyle or veranda has been identified already in the first half of the tenth century B.C. in the so-called Heroön at Lefkandi (Fig. 6), but the original purpose of this structure, whether domestic or religious, is uncertain.³⁶ Even if it was built as a heroön, the identification of "peristyles" in two Late Geometric edifices of secular function has led Mazarakis Ainian to suggest that this feature only acquired its symbolic, and thus religious, role in the early seventh century B.C. Instead, he would see these early uses as structural, serving as supports for the roof and as protection for the mud-brick walls, since the posts were actually sunken into the ground.³⁷ For the Heroön, the function may have been twofold: to increase the support already provided by wooden posts along the walls as well as to heighten the importance of the building.

Even if the peristyle played a symbolic role as early as the Proto-Geometric period, its use remained sporadic through the seventh century. For long, it was identified in two buildings traditionally dated to the eighth century, Megaron B at Thermon and Hekatompedon IA on Samos, in each case as a later addition. Both these examples are now questioned. The elliptical arrangement of bases surrounding Megaron B has been dissociated from that structure by several scholars. Alternative assignments for the bases include supports for an open-air enclosure, wall-posts of a subsequent building, and remains of a paved cult place.³⁸ No solution is entirely satisfactory, since it is unclear why posts for an enclosure should stand on bases or why foundations for the walls of a building have entirely disappeared while the bases remain. Since new excavations reveal that the bases were installed only after the destruction of Megaron B, it would seem that whatever purpose they served was not in its peristyle.³⁹

Revisions to the Samian Hekatompedon are even more dramatic. Doubts have been raised about the existence of two separate structures, generally labeled I and II. Instead, A. Mallwitz argues that there was only one Hekatompedon, with two phases.⁴⁰ That building would belong in the first half of the seventh century, eliminating its eighth-century predecessor entirely. Even if one does not

PERIPTEROS 8. JH. v. CHR.,

1. PERIODE

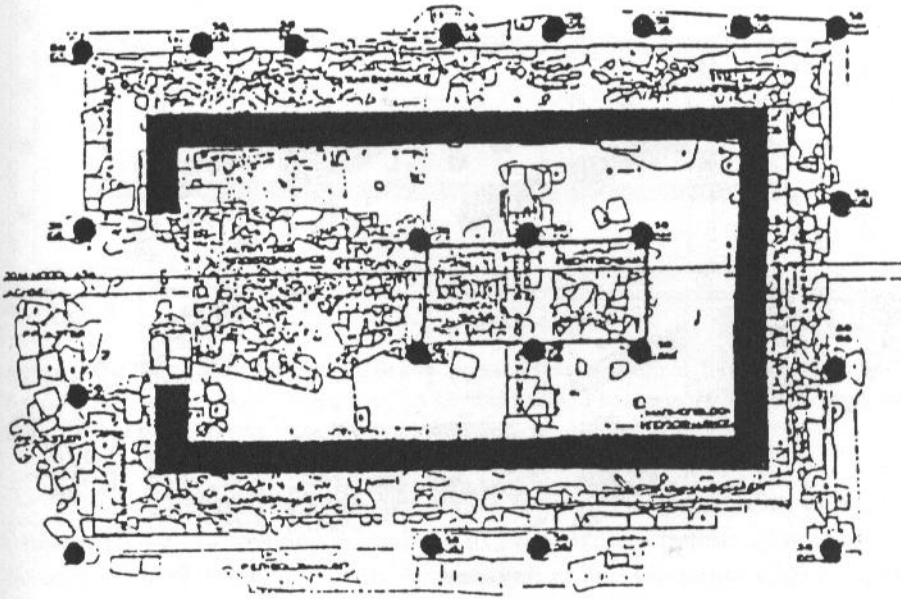


Figure 8. Eighth-century peripteral Temple of Artemis at Ephesos, from A. Bammer, "A Peripteros of the Geometric Period in the Artemision of Ephesos," *AnatSt* 40 (1990) 147, fig. 14, upper left, reproduced by permission of A. Bammer.

accept this new dating, problems have been raised regarding the stylobate previously assigned to Hekatompedon IA. It was recognized in two series of plaques found along the west and south sides of the building at different distances from the cella wall. These are now deemed both too narrow and too shallow to support the stone bases of the peristyle columns. Additionally, the setting marks previously attributed to a column base are disputed. The "stylobate" is therefore identified simply as a protective pavement, as found also around other buildings in the sanctuary.⁴¹

The preceding evidence leaves the Temple of Artemis at Ephesos as the only certain example of an eighth-century peripteros (Fig. 8). Wooden columns enclosed its cella building in a 4×8 arrangement, resting initially on bases of, for the most part, green schist and in a second phase raised up on intervening discs of yellow limestone.⁴² These would represent the earliest known examples in temple architecture of column bases, which at this point are irregular in shape and only roughly worked. The compact form of the peristyle and relatively small size of the building also differ from later examples, where monumentality is expressed by scale in addition to the surrounding colonnade.⁴³

In the seventh century, the peristyle appears more frequently, but its use is still limited and controversial. An example probably from the beginning of the century comes from the relatively remote Achaian site of Ano Mazaraki (Fig. 9).

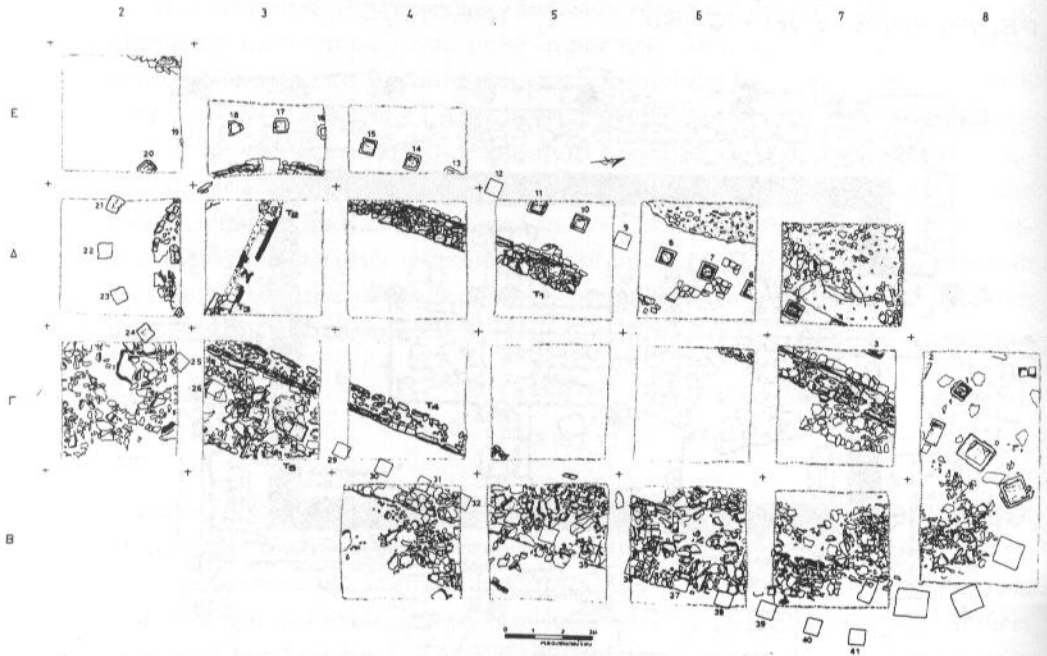


Figure 9. Plan of the Hekatompedon at Ano Mazaraki (Rakita), from M. Petropoulos, "New Elements from the Excavation of the Geometric Temple at Ano Mazaráki (Rakita)," *Peloponnesiaka, Journal of the Society of Peloponnesian Studies*, Suppl. 22: *Acts of the Fifth International Congress of Peloponnesian Studies, II* (1996–97) 178, fig. 1, reproduced by permission of M. Petropoulos.

Here the Temple of Artemis is apsidal at both front and back, with a line of columns on separate bases forming the porch. A second series of bases, over a meter from the face of the wall, constitutes the "peristyle," which, however, stops short of the front porch. Each base is formed of one or two superimposed rectilinear blocks, with a circular depression on top for insertion of a wooden column. The use in mainland Greece of separate bases, rather than a continuous stylobate, is an early feature.⁴⁴

A peristyle is also attested for the Old Temple at the Argive Heraion (Fig. 10).⁴⁵ The building seems to have been largely of perishable materials and is today poorly preserved. The stylobate of its peristyle was of a single course of stone, which acted also as a euthynteria or leveling course. On the upper surface of a preserved segment from the southern side appear slightly recessed circular depressions for four columns. Because the diameters were rather small (approximately 0.80 m), the columns were assumed by L. Tilton to have been of wood, although their placement within recesses has led some later scholars to suggest that they stood on stone socles.⁴⁶ Similarly, their wide spacing, with an interaxial of 3.50 m, suggests a wooden entablature. Traces of carbonized wood and mud-brick make it likely that the cella walls were of reinforced mud-brick.

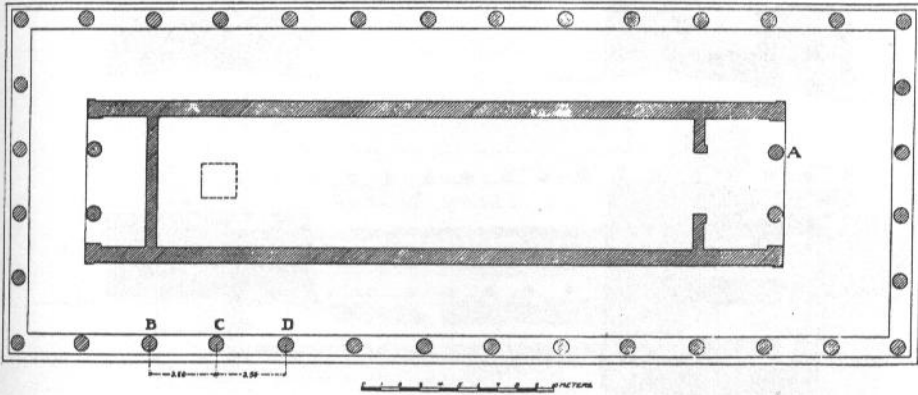


Figure 10. Plan of the Old Temple in the Argive Heraion from E. L. Tilton, "The Architecture of the Argive Heraeum," in C. Waldstein, *The Argive Heraeum* (Boston and New York: Houghton Mifflin, 1902) 111, fig. 50.

Technical features, including the simple form and irregular joints of its stylobate, the shape of the lifting bosses, and its primitive anathyrosis, as well as stylistic traits such as the wide spacing of the columns and the presumably elongated form of the temple, provide the only evidence for its date, which ranges throughout the seventh century.⁴⁷ Little assistance is offered by the chronology of the terrace on which the temple stood. That structure was long argued to have been built in the late eighth century B.C. Scholars often explained the discrepancy in dates by assuming that the terrace served initially for a temple that left no trace but may have been imitated in a terracotta building model from the site (see Fig. 14).⁴⁸ More recently, an attempt has been made to reconcile the evidence of the two monuments with a date for both in the third quarter of the seventh century B.C.⁴⁹

Other seventh-century temples that have been identified as peripteral are problematic. Mallwitz has presented arguments against many long-accepted examples, while M.-F. Billot has dismissed nearly all of them, arguing that the peristyle may not appear before the beginning of the sixth century.⁵⁰ Following is a discussion of these as well as others for which identifications are tenuous at best.

One example from the latter group is the Temple of Hera on Mt. Kynthos, located on the Cycladic island of Delos (Fig. 11). It was originally dated ca. 700 B.C., but is probably somewhat later. As many as ten conical bases for wooden supports were found in its vicinity and assigned to either a peristyle or a separate portico. H. Drerup refined the first possibility, tentatively attributing to the temple a peristyle of 3×4 or 4×4 columns.⁵¹ Yet the relatively small size (2.85–3.40 m \times 2.80 m) and irregular shape of the building, as well as the wide variations in the dimensions of the column bases (0.29–0.42 m diameter; 0.12–0.17 m height, with one example 0.26 m), pose real problems.⁵² The lack of a peristylar tradition in the Cyclades, even in later times, casts further doubt on this hypothesis.

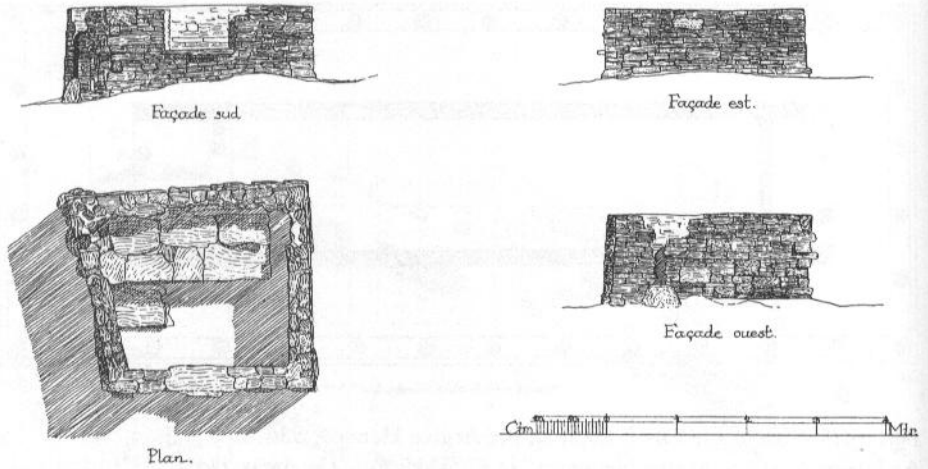


Figure 11. Plan and elevation of the Temple of Hera on Mt. Kynthos, from A. Plassart, *Délos XI*, (Paris: de Boccard, 1928) 151, fig. 104, reproduced by permission of the French School in Athens (École Française d' Athènes).

Within east Greece, the second Hekatompedon at Samos has until recently been identified as a seventh-century peripteral temple. As already mentioned, Mallwitz combined both Hekatompeda (I and II) into a single structure of the early seventh century and assigned to it the stone walls and frieze traditionally attributed to Hekatompedon II, but as yet no peristyle. According to this view, a renovation toward the middle of the seventh century resulted in the addition of that feature. Subsequent research by H. Kienast has altered the picture still further. Kienast argues against the identification as part of a stylobate of plaques reported on the south and east sides of the Hekatompedon, thus eliminating its peristyle altogether. Even the porch columns are now placed not on a continuous line, but on separate bases. The conical stone bases originally assigned to the peristyle are reattributed, one to the interior of the temple, and the two others to entirely different monuments.⁵³

Mallwitz has also raised questions regarding the peristyle of the Temple of Apollo at Eretria, likewise labeled a Hekatompedon and dated ca. 660 B.C. The building is poorly preserved and was reconstructed from traces of its foundations as well as its apparent resemblance to Hekatompedon II at Samos. The peristyle was identified in foundations higher than those of the cella, a situation that was reconciled by assuming columns of wood. Instead, Mallwitz attributes these stones to the paving of the terrace on which the temple stood.⁵⁴ In view of the new reconstruction of the Samian temple and the scanty remains of this one, the existence of a peristyle at Eretria is difficult to defend.

The most prominent, and controversial, example from this period is the Temple of Poseidon at Isthmia, dated in the second quarter of the seventh cen-

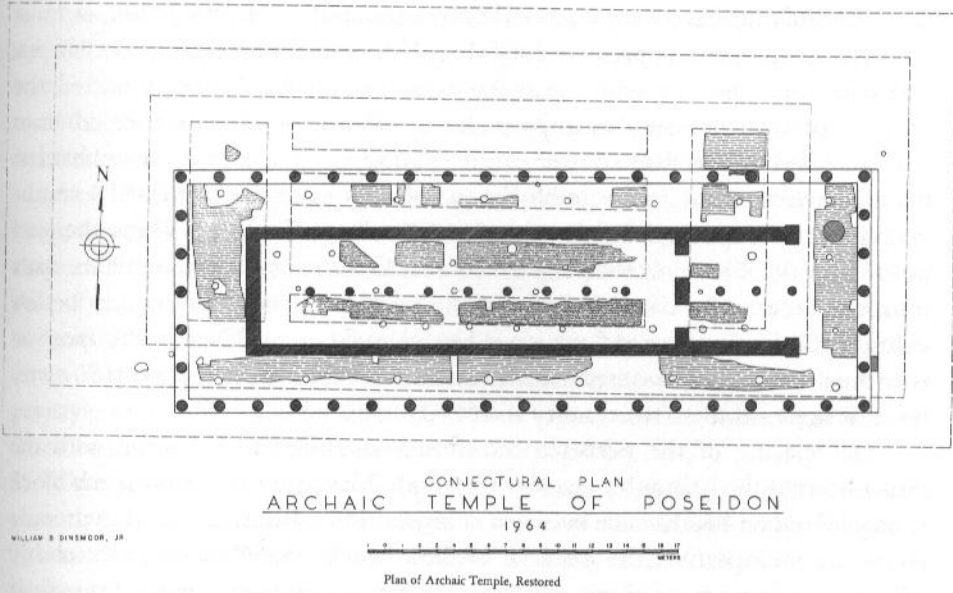


Figure 12. Plan, Temple of Poseidon, Isthmia, from O. Broneer, *Isthmia I: Temple of Poseidon* (Princeton, NJ: American School of Classical Studies at Athens, 1971) pl. 3, reproduced by permission of the American School of Classical Studies at Athens.

ture B.C. (Fig. 12).⁵⁵ As previously noted, its walls were executed in cut-stone blocks of ashlar masonry, making it among the earliest monumental temples of Greece. More important, many of these blocks are preserved and therefore allow for a more detailed reconstruction than in other, contemporary buildings. Nevertheless, controversy exists, particularly in regard to the existence of the peristyle. In support of this member, the original excavator, O. Broneer, cited foundation trenches as well as some blocks that he attributed to its stylobate and crowning geison. In the intervening space, he proposed wooden columns carrying a fully Doric entablature, also largely in wood. Because of the perishable nature of wood, little evidence actually exists for the peristyle, in striking contrast to the cella building.

Criticisms leveled against Broneer's reconstruction have been addressed in part by further excavation, although this work has raised new issues, such as the presumed wall-piers, noted previously. In particular, these excavations have identified additional foundation trenches for the stylobate and have offered further support for the existence of a peristyle in the conjectured coordination of the wall-piers with the proposed columns.⁵⁶ Yet many of the original questions remain unanswered. Thus, while the foundation trenches support the existence of a single course of blocks surrounding the temple, both Mallwitz and R. Rhodes have raised the possibility that these may delineate a terrace. In favor of this proposal is the fact that Broneer himself recognized that the dimensions of

the cella building, excluding a peristyle, were those of a hekatompedon, or hundred-foot temple.⁵⁷ The presumed stylobate blocks might be equally suitable as a wall base, since they are wider than the usual wall blocks. As reconstructed, the peristyle presents problems in its proportions and spacing. The exterior columns are calculated to have had a lower diameter of ca. 0.70 m, that is, somewhat less than the width of the stylobate blocks and analogous to the presumed seventh-century wooden peristyle of the Temple of Apollo at Thermon. Using the proportions of the Thermon temple, Broneer placed his columns about 2.20 m apart from axis to axis. By contrast, those of the interior are now assumed to be less than 0.35 m in diameter and yet spaced twice as far apart.⁵⁸ Neither proportion is in line with seventh-century architecture, and that of the "peristyle" seems more at home in the sixth century B.C.⁵⁹

The spacing of the peristyle columns is also hard to reconcile with the dimensions of the geison blocks. With a length of only about 0.80 m, each block is unable to span the distance between columns. Thus, Broneer placed them only above the metopes. Yet the material of these blocks, stone, makes them clearly unsuited for placement above wooden and brick members. Furthermore, their location between columns requires that they be supported on the portion of the architrave that is most vulnerable to breakage.⁶⁰ Finally, this arrangement would result in a distorted form of Doric entablature, since the wooden sheathing that Broneer attached to each geison block as a mutule would be less than half the width of the intervening space, or *via*.⁶¹ A more likely solution is that the geison blocks crowned the walls. Because all the components of the "peristyle" can be accounted for, and in a more logical manner, elsewhere, no reason exists for its reconstruction in this temple. In addition, one might note that evidence for peristyles is likewise lacking in temples at Corinth and Nemea, which show many of the same construction features and are assumed to date on either side of the Isthmia temple.⁶²

Although the Temple of Apollo (C) at Thermon is generally accepted as peripteral, questions about its plan have also been raised recently.⁶³ The building is dated ca. 630–620 B.C. on the basis of its painted terracotta panels and roof decoration. The extant peristyle, however, is a late third-century B.C. construction. For long it was assumed to replicate a seventh-century predecessor, since its elongated plan and 5 × 15 arrangement are more typical of early constructions, while the findspot of some terracottas and the Hellenistic reworking of one of the "metopal" panels indicated that these members continued in use.⁶⁴ G. Kuhn has even identified in the stylobate and fluted columns on the west the remains of original members, as demonstrated by their different treatment.⁶⁵ This association has now been challenged, in part because of the discovery at another Aitolian site, Kallipolis, of a Hellenistic building constructed in Archaic style.⁶⁶ That artists could and did emulate earlier styles is supported by R. A. Stucky's proposal that the panel previously noted represents not a reworking but a creation of the Hellenistic period following Archaic traditions. If this region chose deliberately

to revive the past in its architecture, at least some portions of the Thermon plan might be attributed to Hellenistic period introductions rather than to faithful restorations of its seventh-century predecessor.

The excavator of the Temple of Athena Alea at Tegea, E. Østby, has reconstructed that structure with a peristyle although, as he readily admits, no traces of it exist.⁶⁷ Remains of the cella building, and even parts of its two interior stylobates, are preserved beneath its Classical successor. Because the two buildings share an identical alignment, the Archaic peristyle could have been located below that of the Classical period and its remains consequently obliterated, as Østby suggests. He also cites correspondences with the Hera temple at Olympia in favor of this reconstruction. Without any evidence, however, the presence of a peristyle cannot be taken for granted, even in a temple of relatively large size and dated to the last quarter of the seventh century B.C.

One additional example of a seventh-century peripteral building that has recently come into question, although in this case for its date, is the Temple of Athena Pronaia at Delphi.⁶⁸ Its peristyle is clearly attested by the remains of twelve column capitals and a comparable number of pieces from the shafts. The temple was dated early on the basis of the proportions of these members as well as the shape of the lifting grooves. E.-L. Schwandner, however, has challenged the reconstruction of the capitals and columns, and consequently their assignment to the seventh century. Parallels for the newly proposed form of the capital and proportions of the column lead him to suggest instead a date in the second quarter of the sixth century. Although this may be somewhat late, as will be discussed in the next chapter, the evidence certainly favors a sixth-century, rather than seventh-century, assignment.

Before the discovery of the temple at Ano Mazaraki, Mallwitz had concluded that the Argive Heraion was one of, if not the, earliest temples to possess a peristyle. This accorded well with Vitruvius's identification of the Heraion as the earliest "Doric" temple. While it may have been the most renowned example of early Doric architecture, it seems not to have been the first to display a feature that later would become so characteristic of Greek temples. At the same time, the evidence for peripteral temples in the eighth and seventh centuries is in general extremely limited. Despite its early appearance, the peristyle was apparently rather slow to be adopted and remained sporadic until the sixth century B.C.

ELEVATION

Because of the perishable nature and often poor preservation of buildings from this period, little is known of their elevations. Nevertheless, it is important to examine the evidence available, since, according to Vitruvius, this would have been the time when the architectural orders first emerged. From Vitruvius we also learn that those components forming the upper parts of buildings originated in wood and

were later imitated in stone. Since the petrification of the temple largely occurs in the sixth century B.C., his wooden constructions should fall into our period.

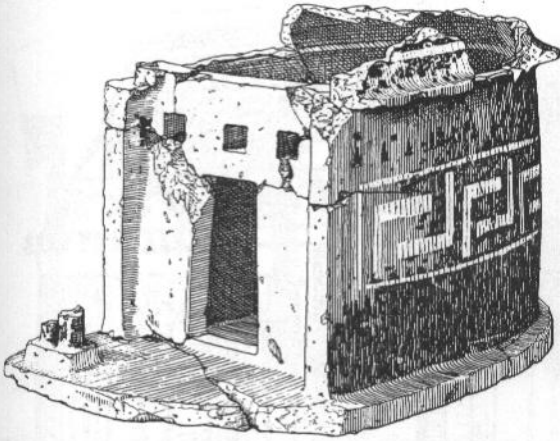
The earliest structures to be elaborated with architectural orders were those of religious nature. Even in Vitruvius's time, more rigid prescriptions existed for the application of the orders to temples than to other types of buildings. Yet, as noted throughout this chapter, it is often difficult to distinguish houses from temples. One important group of material, building models, must be considered in this light.

ARCHITECTURAL MODELS

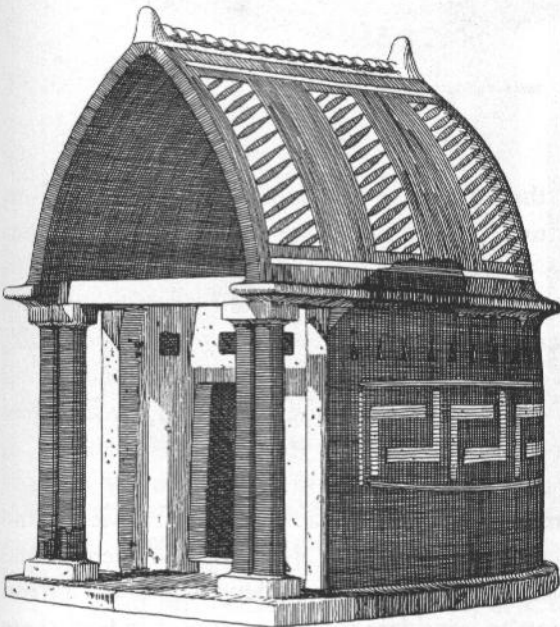
Small-scale representations of buildings are known as early as the Bronze Age. In historical times, they are characteristic of the Geometric and Archaic periods.⁶⁹ By far the majority were dedicated in sanctuaries as votive offerings, but it is unclear whether they represented the temple or a house. In favor of the former designation is the discovery of at least four examples of apsidal plan and similar elevation in the sanctuary of Hera Akraia at Perachora (Fig. 13). Since the temple there was likewise apsidal, and was standing during the first half of the eighth century when these dedications were made, it is generally assumed that the models portray that building. Several scholars have also accepted model remains from the Argive Heraion (Fig. 14) as a reflection of an otherwise unknown eighth-century temple. On the other hand, the variety of ground plans in models dedicated in the Samian Heraion, with no clear imitations of its most famous building, the Hekatompedon, has been cited as evidence that they represent houses of the dedicators.⁷⁰ The recovery of models primarily in Hera sanctuaries would support this view, since a house model would be an appropriate gift for the goddess of the household. Yet they are not found exclusively in sanctuaries to Hera, nor in all of her sanctuaries. The conclusion of T. G. Schattner, that some represent temples and others, houses, would seem to fit the evidence most accurately.

The relatively good state of preservation of models, as opposed to actual buildings, makes them one of the best sources available for architectural elevations in this early period. It is generally understood, however, that the models are abbreviated representations and not necessarily faithful to all the details and components of the original. Moreover, some characteristics may arise more from the art of the coroplast than from that of the architect.⁷¹ Keeping in mind these warnings, we may nevertheless make a few remarks particularly regarding the Perachora and Argive Heraion models.

Both represent anta buildings, the former apsidal and the latter rectangular. These plans, as well as the prostyle porch at the front, are known from large-scale architecture. The steep pitch of the roof would suggest thatch, as was apparently commonly used in Geometric buildings. Only the doubled form of the porch supports on the Perachora model would seem to be inconsistent with traditions



a



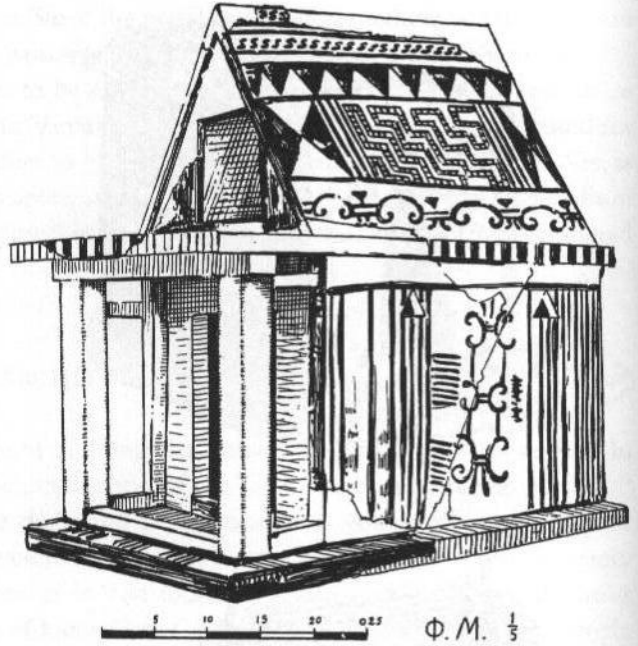
b

a, present state; b, reconstruction

Figure 13. Building model from Perachora, present state and reconstruction, from H. Payne, et al., *Perachora I* (Oxford: Clarendon Press, 1940) pl. 9, reproduced by permission of Oxford University Press.

of the period.⁷² In addition to the apparent openings at the front of the roof, the buildings are depicted with windows, rectangular in the doorwall of the Perachora model and triangular in the side walls of both. These are not generally documented in extant wall remains, but a triangular window is known from Zagora on Andros,⁷³ and, as noted in the previous chapter, windows provide one explanation for the Doric frieze.

Figure 14. Building model from the Argive Heraion, from G. Oikonomos, "Ho ek tou Argeiou Heraiou pilinos oikiskos kata nean simplirosin," *ArchEph* (1931) 15, fig. 15, reproduced by permission of the Archaeological Society at Athens.



Although the decoration on the sides of the buildings derives generally from the ceramic repertoire, a structural interpretation has been given to certain motifs. The painted bands on the wall-end of Perachora model D are thought to represent a wooden covering for the anta. On the Argos model, vertical lines on the sides are identified as imitations of timber reinforcements in mud-brick walls, while alternating black and white squares on the roof edge are said to be ceiling beams.⁷⁴ Since Vitruvius identifies ceiling beams as the catalyst for the triglyph-metope frieze, this pattern may represent an incipient form of that member. If so, it lacks the distinguishing characteristics, as well as the accompanying components, of later times. An alternative explanation is that the squares, as well as the vertical lines, are simply decorative elements, as those appearing elsewhere on the models. In that case, neither model would offer any evidence for Doric forms. Although negative evidence must be considered with caution, if indeed these models represent temples, the omission of such important, and defining, characteristics would be significant.

This is especially true because models do exist that represent Doric elements. What arguably may be an example, and if so the earliest of the series, comes from Sparta. A fragmentary model, in terracotta, is painted on the lower part of the wall with side-by-side rectangles, each enclosing an "X" (Fig. 15). Above runs a smaller band with a repeating pattern of three vertical strokes, spaced so that the intervening space is approximately square. R. W. V. Catling associates both motifs with structural forms, possibly a timber frame for the walls and more certainly a frieze of either triglyphs or barred windows above.⁷⁵ Since the Temple of



Figure 15. Painted building model from Sparta: (a) reconstruction, (b–c) exterior and interior views, from R. W. V. Catling, "A Fragment of an Archaic Temple Model from Artemis Orthia, Sparta," *BSA* 89 (1994) 270, figs. 1–3, photographs courtesy of R. W. V. Catling, drawing and photographs reproduced by permission of R. W. V. Catling and The British School at Athens.

Artemis was likewise executed with timber-reinforced walls, he proposes that the model depicts that building and was dedicated to ensure the success of structural work on it.

Problems exist, however, in accepting this model as a faithful representation of the temple and even as an early depiction of a Doric frieze. One is the presence of diagonal cross-beams in the wall, which would be inconsistent with mud-brick construction. Another is the lack of alignment of wall timbers with the "triglyphs" above. Although Catling counters these objections,⁷⁶ maintaining

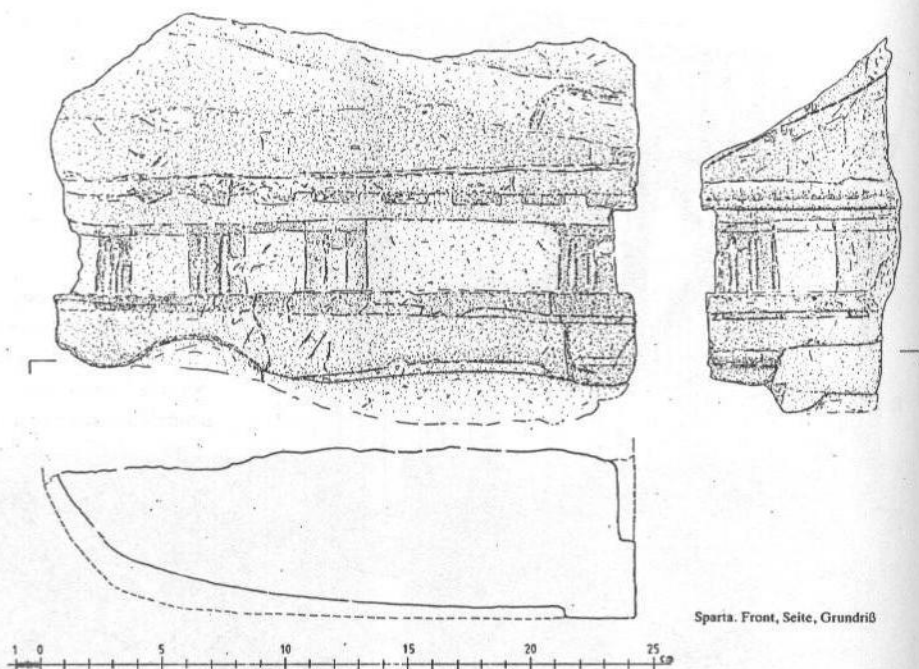


Figure 16. Relief building model from Sparta, from T. Schattner, *Griechische Hausmodelle: Untersuchungen zur frühgriechischen Architektur* (Berlin: Gebr. Mann Verlag, 1990) 93, fig. 44, reproduced by permission of Gebr. Mann Verlag.

the reliability of the model, we must also consider the possibility that if the artist did indeed represent the temple, he aimed only for a general portrayal. In that case, one must not place too much emphasis on the “frieze.”

It is unfortunate that the evidence here is not clearer, since the model seems to be relatively early, perhaps still in the seventh century. Its findspot provides no indication of chronology, but Catling’s association of it with the votive material from the early temple would place it between the early seventh century and ca. 570/560 B.C. If, then, the model could be taken as evidence for a Doric frieze in this temple, it might predate our earliest incipient frieze component in architecture, the Thermon panels, of around 630–620 B.C.

A second model from Sparta provides a certain depiction of the frieze, along with other Doric elements (Fig. 16).⁷⁷ It displays the alternation of triglyphs and metopes above a wall architrave with a taenia and regulae. The irregular spacing of these components has led Schattner to label the frieze “precanonical.” Yet it is not clear that this irregularity is due to an incipient stage of the frieze rather than carelessness on the part of the producer. Mutules appear only on the sides, not the pedimental end, and are coarsely executed, as is the Doric anta capital. One triglyph and two metopes are omitted entirely and the roof as well as one

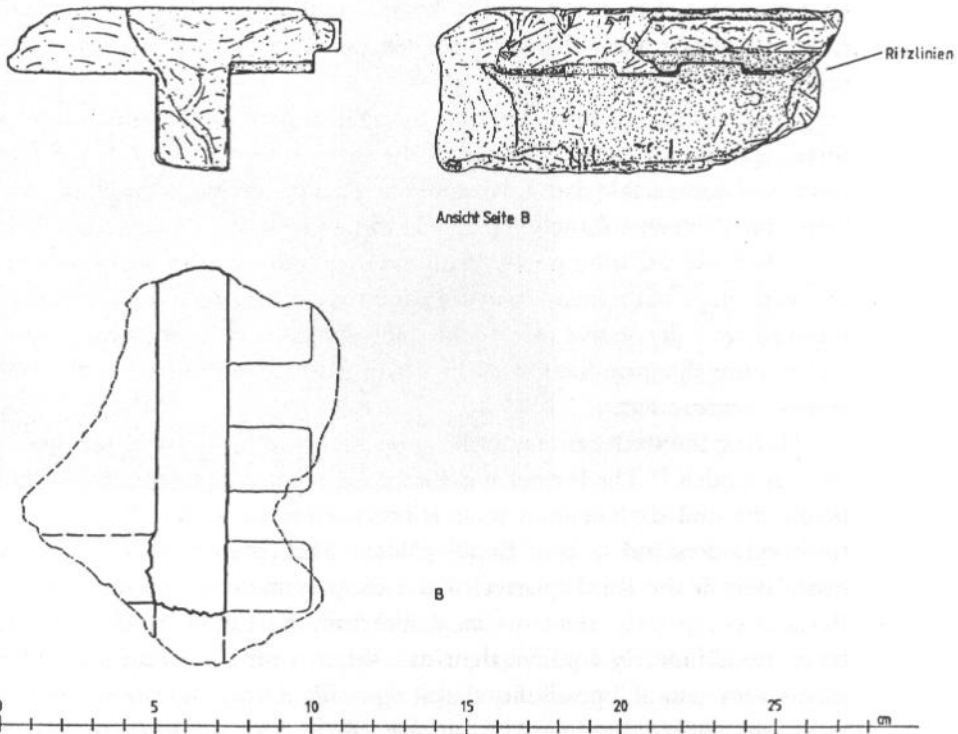


Figure 17. Fragmentary relief model from Samos, from Schattner, *Hausmodelle*, fig. 31, reproduced by permission of Gebr. Mann Verlag.

triglyph are unfinished. Its date of execution might also favor the latter interpretation. Schattner places it at the latest ca. 570/560 B.C., the construction date of the second temple, but in the original report the model, along with other representations of Doric elements, is dated contemporary with or slightly later than that construction. Because its apsidal plan excludes this model as a representation of either temple, it provides little information about the development of Doric architecture, but does confirm the existence of such forms in building models by the sixth century B.C.

The evidence from building models in mainland Greece, while tentative, thus offers no support for an architectural order in the eighth century B.C. Only one component has been recognized in a possible seventh-century example, and it is not until the sixth century B.C. that Doric elements are certainly present. Models from east Greece show a similar situation. They appear here, too, as early as the eighth century, but only in the seventh century do they begin to display Ionic traits. We cannot rule out the possibility that the lack of such traits is a factor of the type of building represented, such as a house, rather than the absence of canonical forms in temple architecture. By far the majority of models known come from the Hera sanctuary at Samos, where the cult buildings offer no match

for the diverse plans of the models. Yet the gradual introduction of Ionic characteristics makes it likely that these models document the emergence of the Ionic order.

Thus, a fragment from Samos is thought to have displayed dentils on at least three sides already before the end of the seventh century (Fig. 17).⁷⁸ Two other models of comparable date may represent a prior step in the development of that form. They likewise show what appear to be projecting beams below a flat roof, but only above the front porch. With the extension of these beam ends from one to several sides, but remaining in the same course, their structural role seems to be replaced by a decorative one. If this model reflects developments in large-scale architecture, the introduction of the dentil must have occurred by the end of the seventh century B.C.

During the sixth century, Ionic anta and column capitals make their appearance in models.⁷⁹ The former is depicted on a Samian example, probably datable before the mid-sixth century, in an abbreviated form, with only two of the usual three cylinders and lacking lateral volutes. The column capital is first attested even later, in the third quarter of the sixth century, on a model from Sardis. Because comparable elements in architecture are extant by the sixth century, these models merely confirm their use. Yet, as with those displaying Doric elements, they raise the possibility that it was only during the late seventh and into the sixth century that many of the characteristics of the Ionic order came into existence.

ARCHITECTURE

Support for a relatively late appearance of canonical elements comes from the buildings themselves. Certain forms that will later become elaborated in the architectural orders are already present in the Early Iron Age as structural components. One is the column, which is attested inside the tenth-century B.C. Heroön at Lefkandi in cylindrical form, as shown by the shape of the post-holes.⁸⁰ A second is the base, which becomes characteristic of the Ionic, but not Doric, style. Bases for either columns or posts appear in numerous buildings of the Geometric period, in both "Doric" and "Ionic" territory. Since their purpose is primarily structural, to protect the wood from moisture and diffuse the load from the post, they are generally set into, rather than above, the floor or surrounding surface.⁸¹ They may be given extra support by means of a "plinth" of clustered stones.⁸²

Most of these bases are no more than roughly worked. That is true even for those of the peristyle in the eighth-century Temple of Artemis at Ephesos, despite its religious importance. In some cases, bases are executed in a cylindrical or even conical shape, which may give rise to the later Ionic spira, or disc. Yet they are not limited to Ionic territory. One especially well-known example



Figure 18. Interior base, third Temple of Dionysos at Yria, from G. Gruben, "Die inselionische Ordnung," in J. des Courtils and J.-C. Moretti, eds., *Les grands ateliers d'architecture dans le monde égéen du VI^e siècle av. J.-C.* (Paris: de Boccard, 1993) pl. 16, 1, reproduced by permission of G. Gruben.

appears in the eighth-century Temple of Apollo at Dreros on Crete,⁸³ an island that, although known for the early appearance of monumental temples, remained outside the developments of canonical Greek architecture.

In Doric architecture, the structural role played by bases will be assumed later by a continuous stylobate, although separate bases still appear in the seventh century, as already noted in the temple at Ano Mazaraki. In the Ionic order, the base is retained as a decorative element. It takes on greater elaboration as early as the beginning of the seventh century. In the third Temple of Dionysos at Yria on Naxos, the interior columns rested on marble slabs that rose above the surrounding floor and were rounded at the edges, thus creating an incipient torus (Fig. 18).⁸⁴

According to the traditional reconstructions of the Hekatompeda on Samos, both IA and II incorporated cylindrical bases resting on a stylobate for their peristyles. Because the stylobate alone would have been sufficient to elevate and thus protect the wooden supports, this combination must be understood as decorative. As previously noted, recent reconstructions have eliminated the first temple as well as the peristyle and accompanying stylobate of the second. Each of the porch supports now rests on a stepped base, without a stylobate. The previously-identified column bases are reduced to a single example, comprising a slightly tapering cylinder, which would have stood inside the temple on a plinth of packed stones. In its shape and placement above a stone packing, this base would continue eighth-century practices, but might also form a link to the spira supported on a more regular, circular plinth, as found in later Ionic architecture.⁸⁵

Wooden posts placed at the ends of walls in the position of later antae also appear in Greek architecture by the eighth century. They are attested today only by the evidence of their supporting bases. Examples of this treatment are also found in both "Doric" and "Ionic" regions, as in Thermon (Megaron B), Antissa on Lesbos (Building III) and Emporio on Chios.⁸⁶ Although both the column

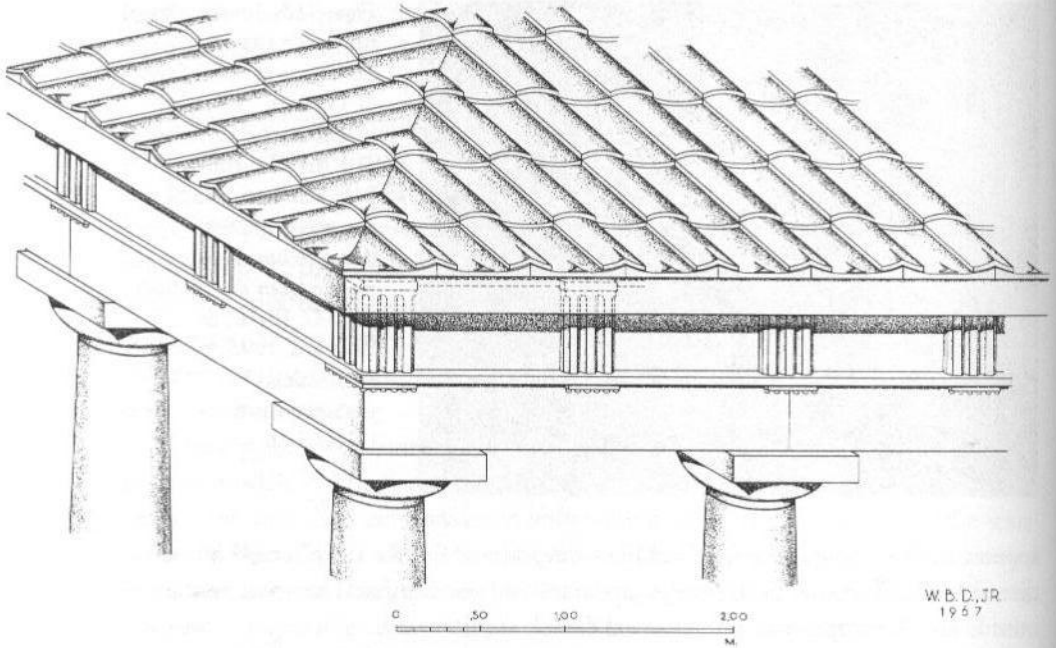


Figure 19. Reconstructed elevation of archaic Temple of Poseidon at Isthmia, from O. Broneer, *Isthmia I: Temple of Poseidon* (Princeton, NJ: American School of Classical Studies at Athens, 1971) 48, fig. 64, reproduced by permission of the American School of Classical Studies at Athens.

and anta would thus seem to have been introduced early in Greek architecture, there is no evidence that they were elaborated in more than a rudimentary way before the late seventh century.

This is true also for the walls of buildings, as demonstrated most clearly in two early (first half of the seventh century B.C.) temples in the Corinthia. Both represent the beginnings of monumental stone architecture in mainland Greece, but Doric forms are not yet attested in either.⁸⁷ The first temple, at Corinth, is known from fragmentary remains, which have been dated ca. 680 B.C. on the basis of associated pottery.⁸⁸ It presumably stood on Temple Hill, but the construction there of the sixth-century Temple of Apollo seems to have obliterated all traces of its plan. Since the preserved remains include parts of wall blocks and perhaps some mud-brick, but no evidence for columns or capitals, it is assumed that the building was a simple *sekos*, without surrounding peristyle or perhaps even porch columns.⁸⁹ The walls were probably constructed fully in stone, which according to Robinson was reinforced by wooden timbers.⁹⁰ Painted patterns appeared on the interior of the walls as well as on a possible crowning moulding; the exterior walls may have received an incised ornament. The lack of any distinctive elements of the Doric order, such as architrave, frieze, or cornice, may suggest that they did not yet exist, especially since the temple was constructed in the presumed homeland of Doric architecture.

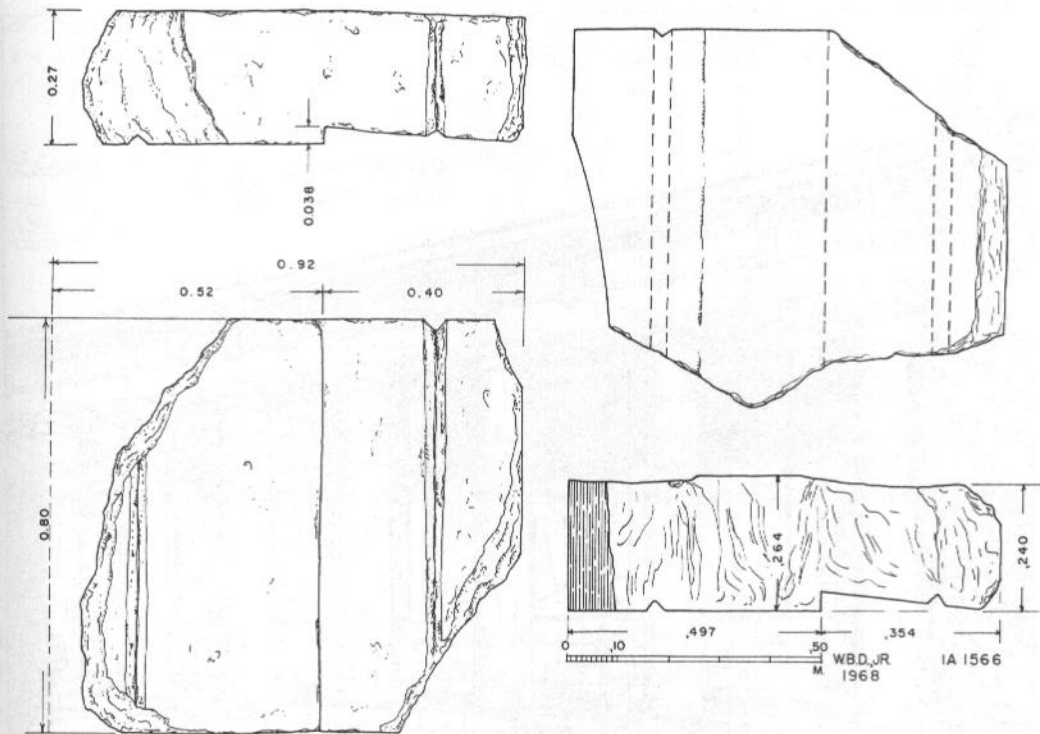


Figure 20. Group 10 geison blocks from archaic Temple of Poseidon at Isthmia, from O. Broneer, *Isthmia I: Temple of Poseidon* (Princeton, NJ: American School of Classical Studies at Athens, 1971) 24, figs. 43 Ar72 and 45 Ar74, reproduced by permission of the American School of Classical Studies at Athens.

Another possibility, that these components were of perishable materials and did not survive, has been raised in conjunction with a temple erected only slightly later and within the same architectural tradition,⁹¹ at nearby Isthmia. That temple, probably dedicated to Poseidon,⁹² can be dated in the second quarter of the seventh century, on the basis of its more advanced construction techniques and roof tiles, as well as its stratigraphy.⁹³

As already noted, Broneer reconstructed a peristyle of largely wooden members. These members were assumed to be Doric in style (Fig. 19), even though the only preserved element, the geison, completely lacked the articulation of mutules and viae characteristic of Doric architecture (Fig. 20). In accord with Vitruvius, Broneer created an entablature consisting of a wooden epistyle, triglyphs comprised of three beveled, vertical boards attached to the end of each ceiling beam, and metopes formed of stucco or wooden facing for mud-bricks. The unarticulated stone geison was sheathed in wood along its face, over which the roof tiles were fitted, and its underside was covered in another, unspecified, material,⁹⁴ from which mutules and guttae were apparently fashioned (Fig. 21).⁹⁵

It is, however, unnecessary to assume that the geison displayed Doric traits. Broneer based his covering on the desire to hide the lifting grooves as well as to

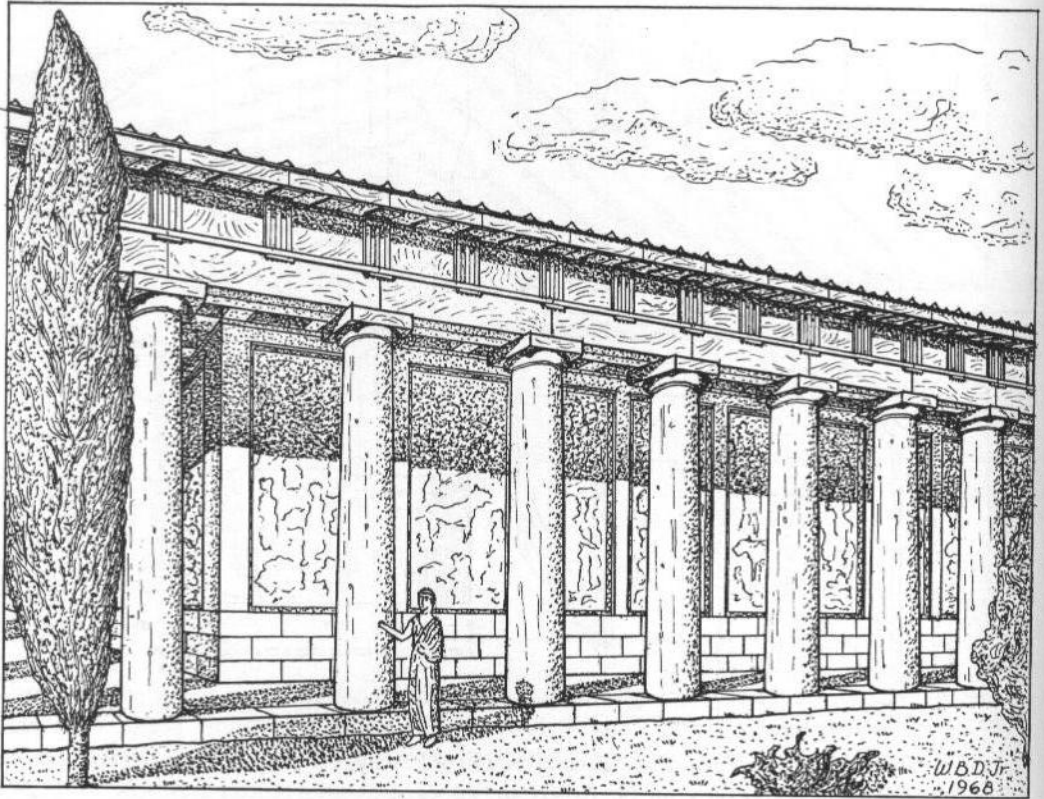


Figure 21. Restoration of archaic Temple of Poseidon at Isthmia, at southwest corner, from O. Broneer, *Isthmia I: Temple of Poseidon* (Princeton, NJ: American School of Classical Studies at Athens, 1971) 41, fig. 54, reproduced by permission of the American School of Classical Studies at Athens.

account for the lack of later fire damage to this area. Yet the lifting grooves are only about 2 cm deep and thus would hardly be visible from the ground. The addition of paint and perhaps also stucco to this surface would probably have been enough to cover all traces of the grooves and may likewise have protected the area from damage by fire.⁹⁶

Moreover, with the elimination of the peristyle, as previously discussed, the remaining Doric elements find even less explanation, since one would have to assume that they were the only wooden members in a fully stone elevation. Instead, the geison blocks must have rested directly on the wall of the sekos, which rose completely in stone. Such a reconstruction has been proposed by Rhodes. The geison blocks, which are similar in length to those of the wall, would now find adequate support. As envisioned by Rhodes, however, they would alternate with a type of wall block that carried transverse horizontal timbers beyond the wall face (Fig. 22).⁹⁷ This is considered necessary to anchor a wall plate at the back of the geison blocks as well as the wooden sheathing at the front,⁹⁸ but the alternation within a single course of two different types of

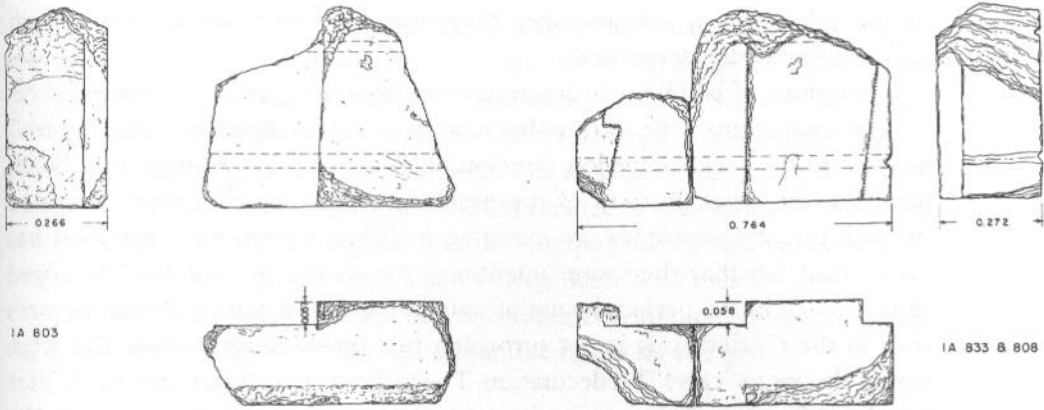


Figure 22. Group 6 blocks of archaic Temple of Poseidon at Isthmia, from O. Broneer, *Isthmia I: Temple of Poseidon* (Princeton, NJ: American School of Classical Studies at Athens, 1971) 21, figs. 27 Ar53 and 29 Ar56, reproduced by permission of the American School of Classical Studies at Athens.

blocks would be unusual. N. L. Klein solves the problem by assigning the blocks to separate walls, with the projecting geison only at the front.⁹⁹ A more uniform appearance would instead be created by superimposing the blocks in separate courses, one carrying the ceiling beams and the other, the rafters. Any of these possibilities accounts for the extant blocks satisfactorily within the wall.¹⁰⁰

These new reconstructions leave no justification, or even space, for the "Doric" entablature. One must conclude, then, that the Isthmia temple was as yet uncanonical, lacking such distinctive components as the triglyph-metope frieze or the mutular geison. It did, however, possess decoration on its walls, consisting of framed, painted panels. These, as well as other elements of this temple, may have provided inspiration for Doric forms, which begin to emerge at the end of the century.

A step in that development may be found in the painted terracotta panels from the Temple of Apollo at Thermon, ca. 630–620 B.C. Projecting tangs on several of these slabs could only have served for insertion in a frame. As will be discussed in the next chapter, this method of installation differs from that of actual metopes; nevertheless, these panels may represent an incipient stage in the development of the metope. They are usually assigned to the entablature of the peristyle, but if, as previously suggested, the seventh-century building was non-peripteral, they may instead have appeared in the wall. Parts of ten slabs are preserved, the decoration of which can be identified in all but one. H.G.G. Payne has suggested that some of the scenes extended beyond a single panel.¹⁰¹ The desire for narrative within a restricted field may account for the execution of several panels for the building. This arrangement also reflects, on a smaller scale, the separate wall panels at Isthmia. If, as often assumed, the Thermon slabs served in

the same location as later metopes, they would represent the transition from wall- to entablature-decoration.

Elevations of buildings in Ionic territory likewise provide no evidence yet for canonical forms. One feature that deserves mention, however, is the "frieze" assigned to the Hekatompedon (previously II) at Samos.¹⁰² A single wall block preserves the upper portions of the heads and spear points of three warriors. Because the representations are executed in light incision, some question has been raised whether they were intentional decoration or "doodles." We have already noted in this period the use of wall decoration, in paint and perhaps incision, in the Corinthia. It is not surprising that on these stone walls, the artist would choose to "carve" his decoration. The wall frieze is, in fact, attested in later temples at Samos and becomes a characteristic type of ornament in this area. Yet it is not a component of the Ionic "order," for which no evidence exists before the dentils of the late seventh-century building models.

CONCLUSIONS

Early Iron Age architecture betrays its association with the preceding Bronze Age traditions in its materials and, to a lesser extent, in its plans. A change occurs, however, in the later part of this period. The introduction of techniques for quarrying and cutting stone blocks in the second half of the ninth century allowed for increasingly regular construction and the development of different styles of masonry. This opened the possibility for a more widespread use of stone and for fully stone walls in place of mud-brick. Yet that transition to stone did not occur simultaneously in all areas, and the new techniques were only beginning to be employed for temples in the seventh century. Building plans as well demonstrate a gradual change. In mainland Greece, they generally move from apsidal to rectangular. Still, these buildings show variety in the arrangement of the facade and the number and size of their rooms. Although general correspondences exist throughout the period with the Mycenaean megaron, they more likely arise from the persistence of the anta-type building than from a continuous connection with or revival of Bronze Age forms.

For much of this period, there is little indication of specific religious structures. Even the function of the large and elaborate "Heroön" at Lefkandi is uncertain. Indeed, it is argued that the need for separate religious buildings did not exist before the eighth century. Only during the eighth and seventh centuries should we then expect to find traits emerging that distinguish religious from secular structures.

One such trait may be the peristyle, although its strict association with religious buildings is questioned. It appears in the eighth-century Temple of Artemis at Ephesos and becomes more common in the seventh century. Yet questions raised about its identification suggest that the presence of the peristyle even in

the seventh century is less frequent than generally assumed. Little is known of elevations from this early period. Models may be used as evidence, but the type of structure they represent cannot be identified with certainty. Since during the sixth century they often show components of the orders, it is likely that at least in some cases they portray religious buildings. The absence of any indication of the orders during the eighth century, and the appearance of only limited traits in the seventh century, may thus suggest that the components themselves were only beginning to emerge at that time. Their emergence would thus accord with the rising level of technology and the corresponding development of monumentality, as well as with an increased emphasis on the house for the god.

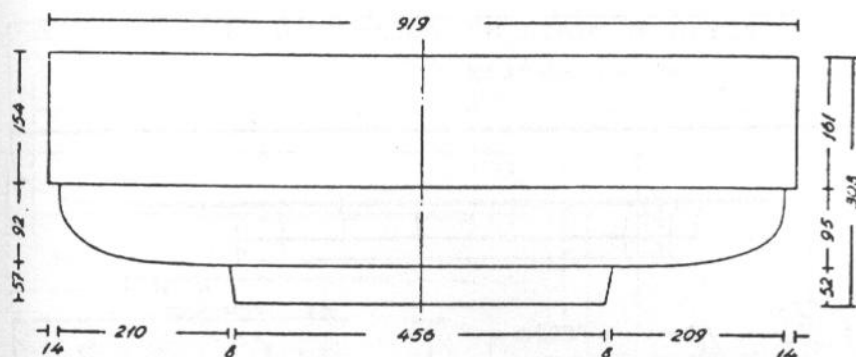
THE EMERGENCE OF THE DORIC "ORDER"

AS STATED IN THE last chapter, it is not until the later seventh century that we witness even an incipient Doric element, in this case what may be a predecessor of the metope. By around 575 B.C., all the characteristic components are present in a single structure. Their "correct" forms and arrangement allow for the identification of the Doric "order." In the past, scholars have tended to assume that the various members developed as part of an entire system. Thus, those who identified the panels belonging to the Temple of Apollo at Thermon as the earliest "metopes" also reconstructed the building as fully Doric, despite the fact that virtually nothing is known of it. The evidence instead suggests that canonical elements often appear for the first time in isolation. Although this situation may be attributed in part to poor preservation, the pre-canonical form of several of these members points to an evolutionary process and a piecemeal development. This is particularly well demonstrated by the mutular geison, which shows experimentation still into the sixth century. Thus, the Doric "order" came into existence over a period of about two generations, from the end of the seventh until the early sixth centuries B.C.

This chapter traces the emergence of that order. Because of the fragmentary and often isolated nature of the remains, we will treat each member in turn. Our aim is to elucidate both the date of the initial appearance of each component and the diverse forms it may take. Since more is now known of the elevation of such buildings, which largely dictates their identification as Doric, we will focus first on elevation and later on plan.

ELEVATION

Among the earliest evidence of Doric architecture is a series of column capitals from various sites, all of which have traditionally been placed in the seventh-century B.C. on the basis of style and proportions. This group includes solitary examples from the sanctuary of Hera at Argos (Capital C), Aigina (votive capital), and Tiryns, as well as twelve capitals from the Temple of Athena Pronaia at Delphi (Figs. 23–26). Each bears a squat, widely spreading echinus that contrasts



Reconstruction of Capital C

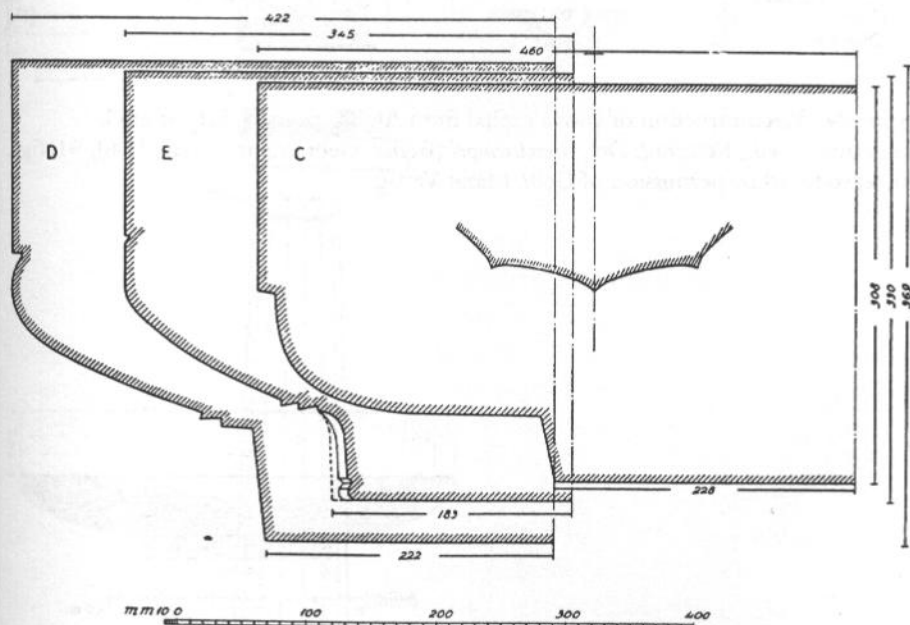


Figure 23. Reconstruction of Capital C and profiles of Capitals C, D, E from the Argive Heraion, from P. Amandry, *Hesperia* (1952), 230, fig. 3, and 233, fig. 4, respectively, reproduced by permission of the American School of Classical Studies at Athens.

markedly with the tauter form generally associated with sixth-century works. Although scholars have tended to view this flattened shape as early, no agreement exists regarding precise dates. Earlier studies, such as that of P. de La Coste-Messelière, favored a high chronology, with the first pieces placed around 650 B.C. A more recent analysis of the Doric capital by B. Wesenberg has argued for its initial appearance in stone in the last quarter of the seventh century.¹ In addition, reexaminations of individual members of this group have led to lower

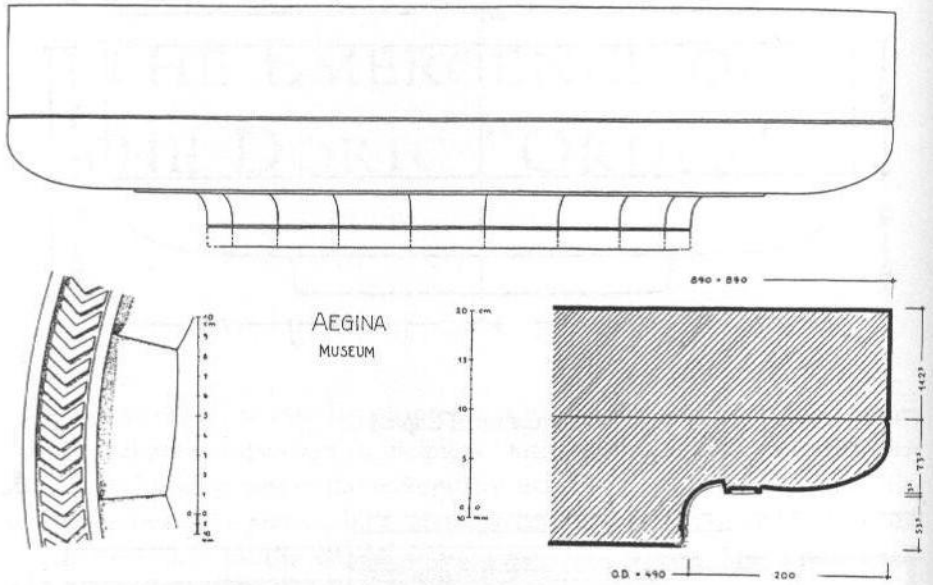


Figure 24. Reconstruction of votive capital from Aigina, from H. Schleif in G. Rodenwaldt, ed., *Korkyra I: Der Artemistempel* (Berlin: Gebr. Mann Verlag, 1940) 91, fig. 70, reproduced by permission of Gebr. Mann Verlag.

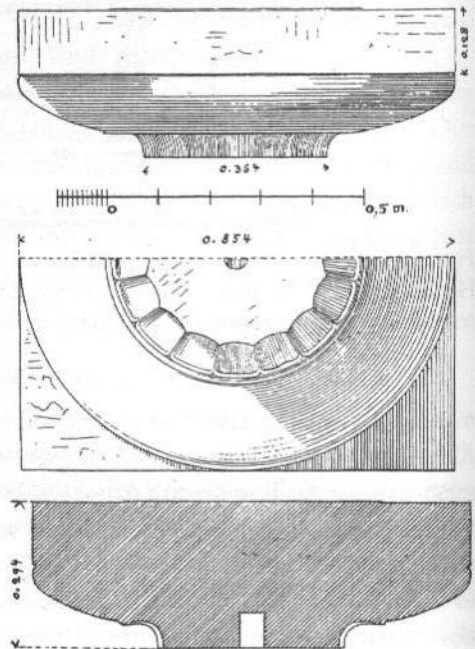
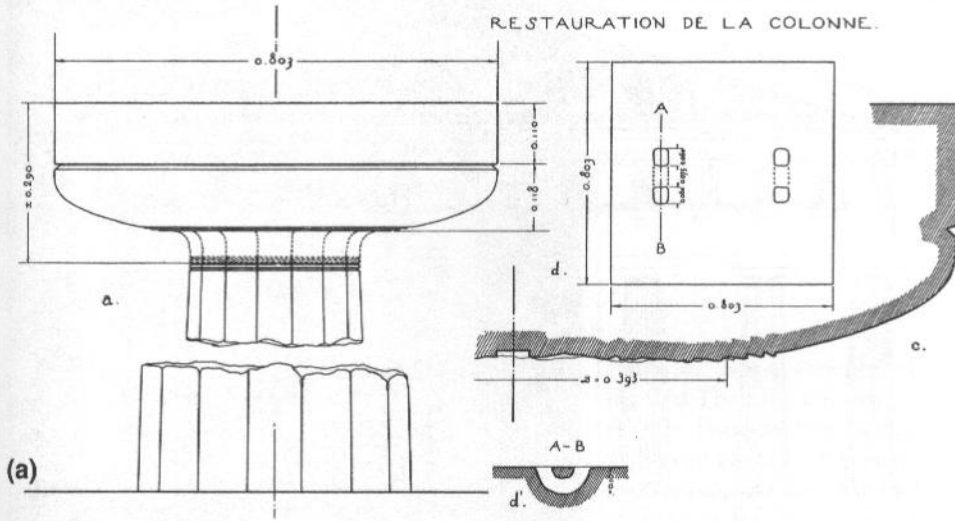


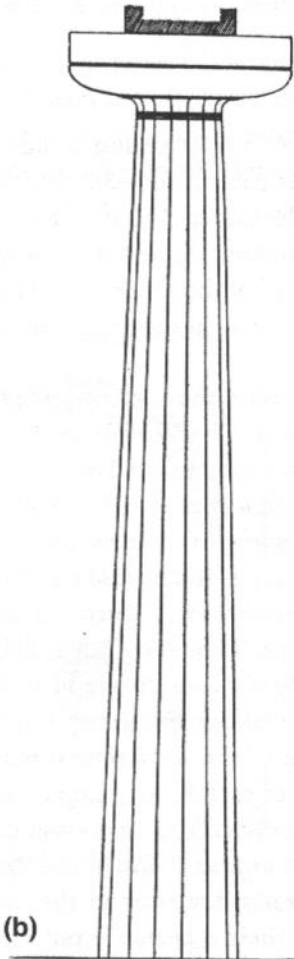
Figure 25. Reconstruction of capital from Tiryns, from A. Frickenhaus, *Tiryns I, 1* (Athens: Eleutheroudakis and Barth, 1912) 7, fig. 6.

SANCTUAIRE D'ATHÈNA PRONAIA A DELPHES — TEMPLE 1

RESTAURATION DE LA COLONNE.



(a)



(b)

Figure 26. (a) Capital of the Temple of Athena Pronaia, Delphi, from R. Demangel, *Les Temples de tuf, FdD II: Topographie et Architecture, 3: Le Sanctuaire d'Athéna Pronaia 1* (Paris: de Boccard, 1923) pl. 13, reproduced by permission of the French School in Athens (École Française d'Athènes), (b) Reconstructed column of the Temple of Athena Pronaia, Delphi, from D.S. Robertson, *Greek and Roman Architecture*, (London: Cambridge University Press, 1974) 65, fig. 25, reprinted with the permission of Cambridge University Press.

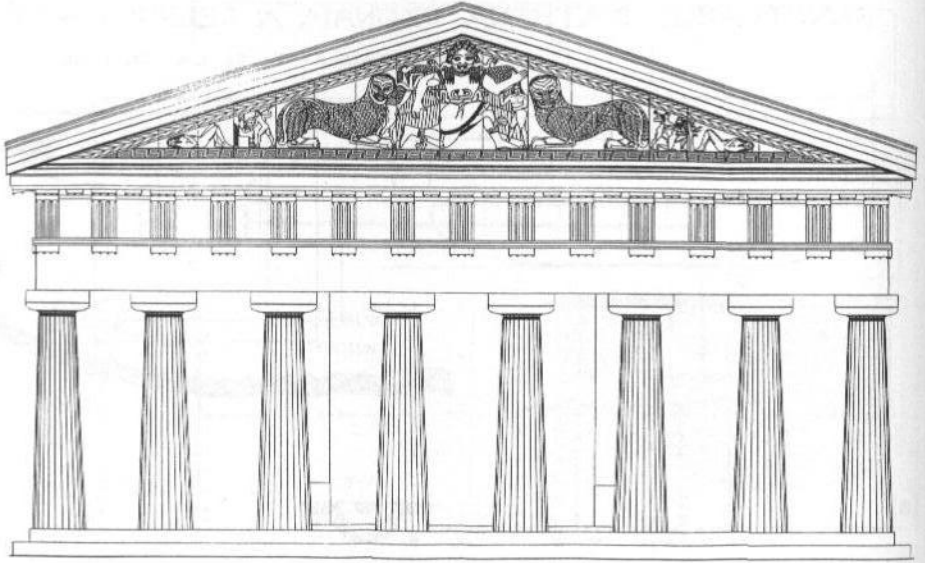


Figure 27. Temple of Artemis at Korkyra, from Schleif, *Korkyra I*, pl. 26, reproduced by permission of Gebr. Mann Verlag.

dates. J. J. Coulton places the Heraion capital C in “the period around 600 B.C.” on the basis of its profile, while K. Hoffelner dates it 590–580 B.C. He assigns the Aigina votive capital to the end of this decade, ca. 580 B.C., and the Tiryns capital even later, 580–570 B.C. E.-L. Schwandner argues for an assignment of the Tiryns capital in the early sixth century and of those from the Athena Pronaia temple, for which he offers revised proportions, in the second quarter of the sixth century.²

This new chronology is more consistent with the dates accepted for other capitals on the basis of accompanying material. The Temple of Hera at Mon Repos, on the island of Korkyra, has yielded fragments of Doric columns that may belong to the same phase as the roofing terracottas, which are placed ca. 610 B.C.³ Around 580–570 B.C., in the nearby Temple of Artemis, the stone capital appears for the first time in a reliably dated context, in this case based on its pedimental sculpture (Fig. 27). Several other structures with Doric capitals are also assigned to this same period, including the Old Tholos at Delphi (Fig. 28) and Temple E 1 at Selinous (Fig. 29), both ca. 580 B.C., and in the next decade, the Older Temple of Aphaia on Aigina. We may add to this group the Temple of Apollo I on Aigina. In his recent publication of the architectural remains from this building, Hoffelner has argued for a date of ca. 600 B.C., largely on the basis of its “uncanonical” members. Although it is difficult to find close parallels for several of these forms, those that exist suggest instead a date in the years around 580–570 B.C.⁴ Unless we are to assume an early flowering in the use of stone capitals followed by a hiatus or, alternatively, their appearance only sporadically



Figure 28. Reconstruction of the Old Tholos at Delphi, from H. Pomtow, "Die beiden Tholoi zu Delphi," *Zeitschrift für Geschichte der Architektur* 4 (1911) 197, fig. 25.

over a seventy-year period, it is unlikely that any of the initial Doric capitals previously cited dates as early as first suggested, that is, the mid-seventh century B.C. Instead, a shorter interval of time seems more reasonable. All evidence thus points to the introduction of the Doric capital not before the end of the seventh century B.C.

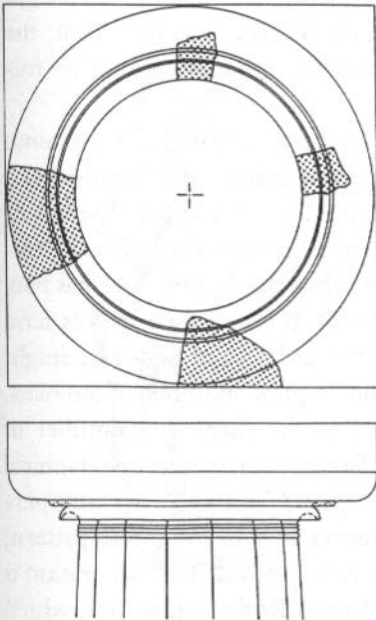


Figure 29. Capital of Temple E 1, Selinous, from G. Gullini, "L'architettura," in G. Pugliese Carratelli, ed., *Sikanie* (Milan: Istituto Veneto di arti grafiche, 1985) pl. II 4 b, reproduced by permission of G. Gullini.

Figure 30. Capital from Akragas (photo: author).



The chronological problems associated with these earliest capitals raise some interesting points. Proportional relationships are generally considered a fairly reliable guide for determining date. In the case of these examples, however, attempts to order, and thus date, them on the basis of their internal proportions have proven contradictory. This may not be surprising in view of Coulton's demonstration that proportional change is not necessarily consistent with time.⁵ His Archaic group is especially diverse, suggesting that the rules applied in later periods may not have been at work so early. The issue is further complicated in regard to the initial examples by the fact that so few representatives are known. Yet one important factor in both the proportions and shape of such works may be the local traditions from which they arise. This situation is demonstrated especially well by a capital from Sicilian Akragas, which seems early because of its extremely flat, spreading echinus, but is unlikely to predate the foundation of that city around 581 B.C. (Fig. 30).⁶ A similar shape seems to have been preferred for Doric capitals in the Cyclades even into the Late Archaic period.⁷ Thus, the incremental development assumed by the evolutionary theorists cannot be followed too strictly.

The diversity in the shape and proportions of these early examples extends also to the treatment of the lower echinus, where the capital typically displays a series of three or four projecting rings or annulets. Heraion Capital C seems to have no articulation at all and the Aigina votive capital displays a raised band consisting of a line of chevrons framed by raised fillets, while the Tiryns piece has two, and the Delphic capitals three, annulets (Fig. 23–26). Because these pieces have recently been assigned dates that roughly follow the order cited here, one might be tempted to see a gradual evolution toward the "typical" number of annulets. Yet even in later times there is little consistency in the shape and number of annulets, which instead seem to be dictated by factors such as the geographical location, architectural placement, and size of the capital.⁸ To this list we may perhaps add function. That may explain the application of a herringbone pattern, rather than annulets, to the echinus of the Aigina votive capital. This decoration is paralleled on the contemporary Xenvares capital from Korkyra (Fig. 31), which

also crowned a free-standing, in this case funerary, column. Indeed, Herrmann's study of ornament on Doric capitals finds that a relatively large number of decorated examples served a votive use.⁹

Although architects were unlikely to have been striving for the creation of a "canon," their experimentation during the early sixth century may nevertheless have led them to introduce the number of annulets that would subsequently become canonical. This occurs at least by the time of the Delphic capitals, which, according to Schwandner, would be the second quarter of the sixth century. Three annulets also embellished the echinus of capitals from the Old Tholos at Delphi, ca. 580 B.C., and the Temple of Apollo I on Aigina (probably ca. 580–570 B.C.), while four existed on those from the Old Aphaia temple on Aigina, ca. 570 B.C. Despite these developments, variations were still possible. The herringbone pattern is found in architectural capitals from both Korkyra and Kalapodi around 580–570 B.C.¹⁰ Some of these same Korkyrean capitals, along with that of the Xenvares column (Fig. 31) and capitals from Temple E 1 at Selinous (Fig. 29), of ca. 580 B.C., display a decorative "overfall" below the echinus.¹¹ Yet another device popular on Korkyra is the use of beads in this location.¹² Such evidence suggests a flexibility in the approach to Doric forms that belies the concept of a canon.

The necking of these earliest capitals likewise shows diversity. Normally, the flutes of the shaft continue into this area. On Heraion Capital C, however, the necking is smooth, which is explained by Schwandner as allowing for the application of a ring of metal leaves.¹³ A similar treatment and explanation are noted by Hoffelner for the extant capital of the Temple of Apollo I on Aigina. Two examples of bronze relief bands have been recovered at Olympia, where they are believed to have decorated the necking of wooden columns, perhaps even one of those from the Heraion (Fig. 32).¹⁴ Yet neither is securely dated and the leaf necking in stone is not certainly attested in the Peloponnesos until the second half of the sixth century. On the other hand, a smooth necking continues in capitals from the Argive Heraion, including D, dated ca. 570 B.C., as well as elsewhere.¹⁵ The lack of flutes on the capital, and probably also on the shaft, of a Doric column may thus be a matter not of date but of regional preferences, especially since this trait continued into the late Archaic period in the Cyclades.¹⁶

In the remaining capitals under discussion, the necking is fluted, which suggests that this treatment of the shaft appeared as early as the Doric column itself. The number of flutes varies, from sixteen at Tiryns and Delphi to twenty on the Aigina votive capital. Sixteen flutes are often found on Doric columns of the early sixth century, whereas twenty becomes the standard number later.¹⁷ The difference here may be related less to chronology than to size. In the Older Temple of Aphaia at Aigina, columns with twenty flutes were used on the exterior, while the smaller interior columns had only sixteen flutes. Early capitals from Corinth suggest that columns in the lower tier of a stoa or of a temple cella bore twenty flutes and those above, sixteen.¹⁸ The roughly 10 cm difference in

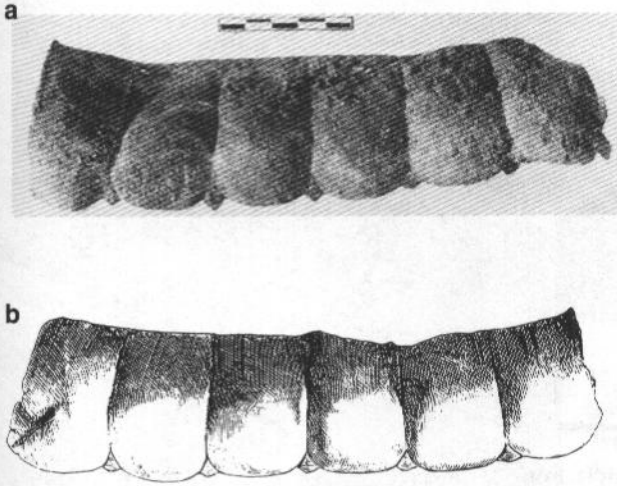


Figure 32. (a–b) Bronze leaves from Olympia, from R. Hampe, "Ein bronzenes Beschlagblech aus Olympia," *AA* (1938) 364, figs. 4–5, reproduced by permission of the German Archaeological Institute (Deutsches Archäologisches Institut), Berlin.

the upper diameter of the Aigina votive column in comparison with the others in this group may therefore account for its larger number of flutes. Even after the "canonical" number was attained, Greek architects continued to experiment, as perhaps best demonstrated by capitals assigned to the Temple of Artemis at Korkyra, which attest to twenty-four, twenty-eight, and even thirty-two flutes.¹⁹

The preference for sixteen flutes in some of the earliest Doric columns is noteworthy. This is one of the simplest numbers to execute, since the placement of flutes can be determined by successive subdivisions of the circular shaft. It is also a number frequently used for Egyptian column shafts.²⁰ As with those, early Doric columns employed very flat, and even faceted, flutes. Egyptian architecture thus likely provided a model for the Doric column. That this treatment was not, however, completely satisfactory to Greek tastes is shown by the evolution of the fluting over time to the more characteristic concave grooves with pointed arrises, as well as the experimentation in the number of flutes.

Like the column, the anta, or projecting wall end, takes on distinctive characteristics in Doric architecture.²¹ Early buildings of rubble and mud-brick construction often employed a wooden post at the end to reinforce the wall and assist in carrying the beams of the roof structure above. By the time of the Temple of Apollo at Thermon, ca. 630–620 B.C., this wall end becomes enlarged, as shown by the projection of foundation stones a few centimeters beyond the face of the socle. According to A. D. Brockmann, the projection at Thermon was insufficient to support a wooden covering of the socle; instead, the covering probably rested on the socle in order to protect the wall above, which was presumably in mud-brick.²² The anta achieves its canonical form in the Temple of Hera at Olympia, ca. 600–590 B.C. Wooden planks are here attached to the wall end, extending to its base and projecting on its three faces (Fig. 33).²³ Since the upper portion of the

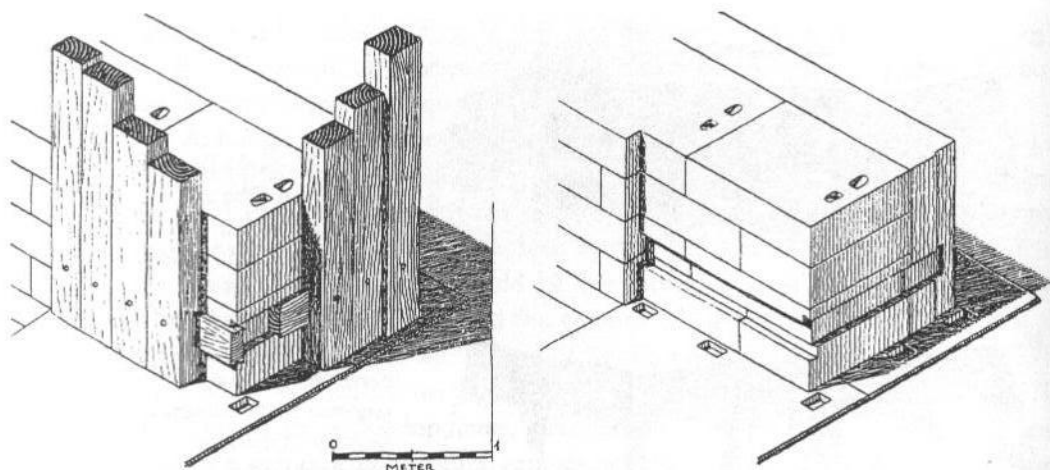


Figure 33. Anta, Temple of Hera at Olympia, from W. Dörpfeld, *Alt-Olympia I* (Berlin: E. S. Mittler & Sohn, 1935; Osnabrück: Zeller, 1966) 173, fig. 42, reproduced by permission of Zeller Verlag.

wall was in mud-brick, the covering continued to serve a protective function, but its application to the stone socle may suggest a decorative role as well. Indeed, the anta now begins to emerge as a distinctive component of Doric architecture. Its tectonic function is demonstrated by its greater width than the rest of the wall and its asymmetrical plan, deeper on the inside than the outside. Initially, as at Olympia, the exterior projection reflects the size of the planks covering it; by the late Archaic period it will be coordinated with the width of the triglyph.²⁴ The deeper interior projection is in response to columns placed between the antae, or "in antis," which act together as supports for the epistyle. The increasing importance of the anta will also be demonstrated in the adoption of a capital.

In its canonical form, the Doric anta capital consists of a smooth surface crowned by a moulding on three sides. That moulding is usually a hawksbeak with an abacus above. In what may be the earliest extant examples of the type, from the Temple of Artemis at Korkyra and the Older Temple of Aphaia on Aigina (Fig. 34), the hawksbeak is already present, although in each case without the crowning abacus.²⁵ Furthermore, in the Aigina anta capital, the overfall of the beak is relatively shallow and apparently did not receive a continuation of the characteristic Doric leaf decoration, which instead is fully contained within the concave cavetto. Both traits suggest that the Doric anta capital had not yet achieved its canonical profile. On the other hand, the fragmentary remains from Aigina include corners that display identical decoration on adjacent sides, suggesting that the moulding continued around all three visible faces. This uniformity of design becomes characteristic of the Doric anta capital, perhaps as a counterpart to the usual asymmetry of its plan.²⁶

There also developed very early in Doric architecture another type of anta capital, referred to as a sofa or proto-Ionic capital (Fig. 35). It is characterized by

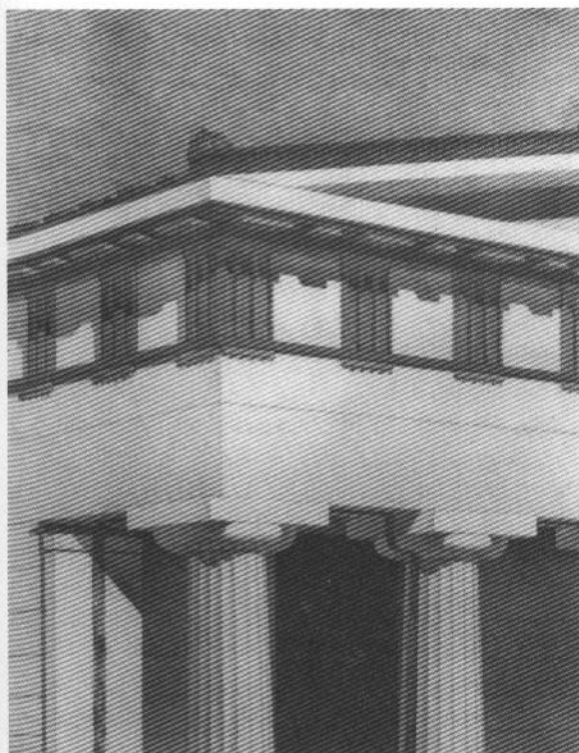


Figure 34. Reconstruction of southeast corner of Older Temple of Aphaia, Aigina, from E.-L. Schwandner, *Der ältere Porostempel der Aphaia auf Aegina* (Berlin: de Gruyter, 1985) frontispiece color plate, reproduced by permission of the German Archaeological Institute (Deutsches Archäologisches Institut), Berlin.

a cavetto shape, often with a small cylinder suspended from each side.²⁷ In most, but not all, examples, the cavetto is limited to the sides, while the front face is flat and bears decoration. The result is a two-sided arrangement with a symmetrical plan, which is well suited to the usual employment of this type in a prostyle porch.²⁸ Such porches are defined by the positioning of the columns in front of, rather than between, the antae, and thus the orientation of the epistyle on the anta from front to back. The need for this second type of capital may arise from the same desire to link anta to entablature, but in a different plan.

The origins of the sofa-type capital are unclear. The cavetto profile, ultimately derived from Egypt, was adopted already around 600 B.C. for the crowns of stelai and votive supports.²⁹ Some scholars have proposed Ionic invention for the anta capital, since its decorative forms generally fall within the Ionic repertoire; yet the type is unknown in the East during the Archaic period.³⁰

Others have argued for a Peloponnesian origin. Among this group is E.-L. Schwandner, who recognizes the earliest representative of this type in an example from Tiryns, which he associates with the early sixth-century column capital previously noted.³¹ Although the abaci of the respective members are comparable in length and height, the lower portion of the anta capital is much more massive than that of its presumed counterpart, which tapers to a narrow shaft. More important, the width of the anta wall, as suggested by its capital, must have been

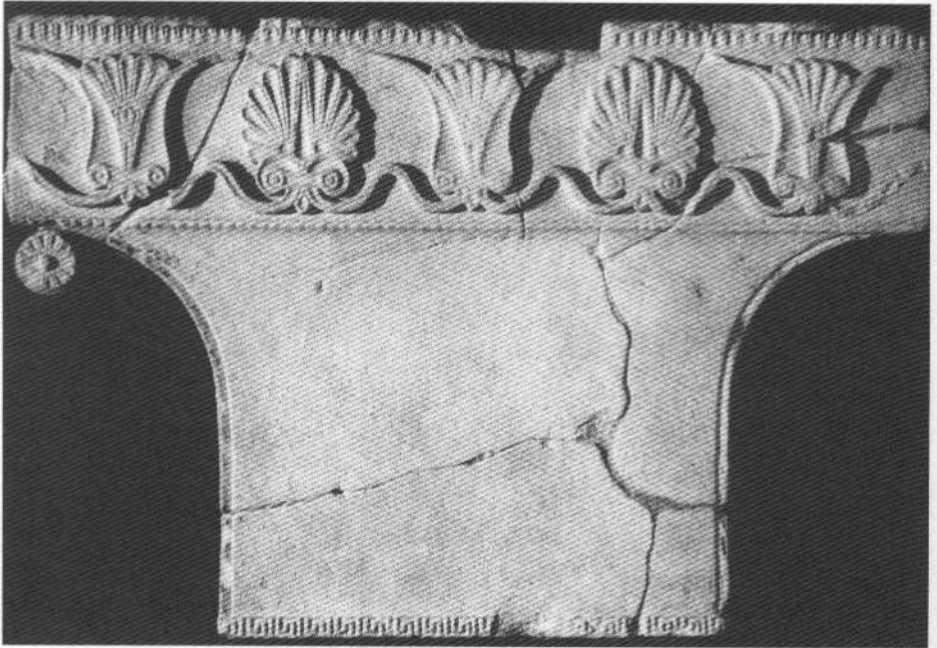


Figure 35. Southern anta capital from "Treasury," or Temple of Hera I, at Foce del Sele, from D. Mertens, *Der alte Heratempel in Paestum und die archaische Baukunst in Unteritalien* (Mainz am Rhein: P. von Zabern, 1993) pl. 67, 1, reproduced by permission of D. Mertens.

about 20 cm wider than the architrave above as determined by the resting surface on the column capital. These two capitals thus appear to be both visually and proportionally incompatible, making it unlikely that they belonged to the same structure. Without this association, the Tiryns anta capital can only be dated by its style. On this basis, nothing speaks against an assignment around the middle of the sixth century, closer in date to the other examples from the Peloponnesos, which are generally placed in the last quarter of that century. This would leave the capitals from the Temple of Apollo I on Aigina, for which a date is accepted here of ca. 580–570 B.C., as the earliest mainland examples. Nevertheless, because of the close ties between Aigina and the Peloponnesos, some association of the sofa-type anta capital with that region might be maintained.

Still a third area of the Greek world must be considered as a possible place of origin for this type. Western Greece has yielded a pair of sofa capitals from Sybaris that are dated already in the first half of the sixth century, with several others from the middle and second half of the century. Chronology might thus favor a Western invention. In any case, the sofa capital became a distinctive form of crowning for Doric antae during the Archaic period in both mainland and western Greece.

Certainly the most characteristic component of the Doric order is the triglyph-metope frieze. We have already mentioned the terracotta panels from

the Temple of Apollo at Thermon³² (ca. 630–620 B.C.) as representing an incipient stage in the development of the metope. Several scholars have recognized these plaques as actual metopes, citing as evidence their findspots along the northern and eastern sides of the temple, as well as their consistency in height, centralized decoration, and method of construction.³³ They generally assign them to the entablature of the peristyle, which from the columns up would have been almost entirely of perishable materials. There is, however, no evidence that these plaques were placed at the level of the entablature or combined with triglyphs, as in a frieze.

Even their existence within a peristyle may be questioned. As noted in the previous chapter, the stylobate for the peristyle seems to have been erected only in the late third century B.C. Although this construction is often assumed to imitate a seventh-century predecessor, the possibility also exists that the temple was originally non-peripteral.³⁴ In that case, the plaques must have been incorporated in the cella building. In fact, their depth of only 6.5–7 cm, thus requiring thick backers, would favor placement in a wall.³⁵

An unusual characteristic of most of these plaques is the presence of a short projection or "tang" on the upper edge. This probably represents the remains of an original pair of such projections. Slots corresponding to the tangs are assumed to have been hollowed out of a wooden beam located above. Yet variations in size and spacing of these projections, as well as their placement on the top of the block, make it likely that the slots were cut only after the beam was in place and thus that the panels were inserted from below into an already assembled structure. This practice differs from the usual insertion of the metope during construction into a space defined by flanking triglyphs. Instead, it corresponds better with the application of decoration to a wall, as in the painted panels of earlier seventh-century Corinthian temples. Moreover, if the builders secured the remaining three edges of the panels with additional pieces of wood, they may have created a model for the overlapping triglyphs and the taenia of canonical Doric entablatures. Thus, although the Thermon panels cannot be considered actual metopes, they may represent a step in the development of such from wall decoration.

The Thermon plaques are also linked with Corinth in their painting style. This, along with their presumed Corinthian inscriptions, led to the long-held belief that they were of Corinthian manufacture.³⁶ It is now acknowledged, however, that they represent local products. Not only is the clay believed to come from local beds, but the inscriptions on the plaques seem to be in the mixed alphabet typical of Aitolia.³⁷ Both literary sources and archaeological evidence claim an important role for Corinth in the development and diffusion of architectural terracottas. The influence present in the Thermon panels and their accompanying roof would seem to support that claim. Yet at the same time, these elements demonstrate the creativity of northwest Greek coroplasts.³⁸

Terracotta continues to be a favored material in this region and is employed for true metopes here during the first half of the sixth century. Two series are

known from Thermon and three from nearby Kalydon. The presence among these of a terracotta panel with attached triglyph leaves no doubt regarding their identification as metopes. Additionally, those from Kalydon, which begin perhaps ca. 600 B.C., were apparently clamped to stone backers. The choice of material must then be largely dictated by regional preferences rather than chronological or technological factors.³⁹ Elsewhere, terracotta metopes appear more sporadically, and stone becomes the canonical medium. Yet metope panels continue to be relatively thin, which requires the addition of backer blocks to carry the actual weight of the upper members.⁴⁰ Such a situation supports a decorative, as opposed to structural, origin for metopes, and is consistent with their presumed evolution from painted wall panels and the Thermon plaques.

Likewise often identified as metopal is a group of eight early reliefs from Mykenai. These are executed in stone rather than terracotta and bear sculpted rather than painted decoration – both traits more characteristic of the canonical type. An architectural use is supported by the large number of reliefs and the presence of anathyrosis on at least some of them. Despite differences noted by some scholars in the types of limestone used, their sculptural style, and perhaps even the subject matter, it is likely that all these panels belong to a single group and time, in the years just before and after 600 B.C.⁴¹ This coincides with the dating of the temple at Mykenai, as derived from its extant geison blocks and single tile fragment. These various members are also united by findspot and technical details. Because there is little evidence for other early stone constructions at Mykenai, one may assume that the reliefs were incorporated in the temple, and, following N. L. Klein's reconstruction, specifically in the walls of this non-peripteral building.

Their means of attachment and exact location remain uncertain, however. As with the Thermon panels, these reliefs are relatively thin and thus were not meant to bear weight. Backer blocks must then have been employed. Yet for at least some plaques, the rough finish of the rear portion of the lateral edges and of the rear faces would have prohibited a tight fit. Moreover, there is no evidence for clamps or cuttings to attach the reliefs to adjacent blocks. Instead, they could have been secured only at the front, where the edges are finished. Klein suggests that this may have been done by means of a wooden framework, as attested in the Temple of Poseidon at Isthmia and proposed here for the Temple of Apollo at Thermon. She makes clear, however, that the adjacent element could not have assumed the form of the canonical triglyph, since the raised borders of the reliefs would have prohibited the usual overlap. Additionally, there is no evidence to support their attribution to the entablature; rather, the panels may have appeared anywhere in the elevation of the temple.

The Mykenai reliefs cannot therefore be identified as metopes, but they nevertheless demonstrate a continued interest in wall decoration and its transition to stone, in this case the same material as the wall itself. Like the Thermon panels and true metopes, they served a more decorative than structural function. They

may thus represent a link between these two groups and another step in the development of the latter. Perhaps more important is the negative evidence that they provide, since the Mykenai panels could not have been accompanied by triglyphs. Like the geison blocks from the same building, they belong to a pre-canonical tradition. It would appear that still around 600 B.C., the Doric frieze had not made its presence felt at this Peloponnesian site.

The earliest confirmed stone metopes are attested about twenty years later, around 580 B.C. Examples are known from the Temple of Artemis at Korkyra and the Old Tholos at Delphi, and in the next decade, the Older Temple of Aphaia at Aigina. On present evidence it seems that even in stone, the metope is introduced earlier outside the Peloponnesos, the presumed homeland of the Doric order.

The triglyph also seems to experience a fairly late development. A series of terracotta examples, from Thermon, Olympia, and Elis, has been dated as early as the seventh century, but largely because of the material used. Since it is now known that terracotta continued to be employed for metopal decoration and perhaps even for triglyphs into the mid-sixth century, such an assignment on the basis of material alone must be questioned.⁴² Some stone triglyphs have also been dated to the seventh century. I. Strøm associates an example from Mon Repos, Korkyra, with the Hera temple, which she places ca. 630 B.C. Triglyphs from the sanctuary of Apollo on Aigina are attributed by Hoffelner to both the façade and porch friezes of the first temple, and dated accordingly ca. 600 B.C. In fact, Hoffelner's early date for the temple is based largely on the attenuated proportions of the exterior triglyphs. Yet proportional relationships provide only one piece of evidence for dating, and one that may be somewhat contradictory, since the triglyph from Mon Repos that Strøm considers even earlier in date has squatter proportions.⁴³

Furthermore, the recent discovery of Temple E 1 at Selinous forces a reexamination of the presumed early date for the evolution of the canonical triglyph.⁴⁴ Wall blocks uncovered from this building are decorated with alternately projecting and recessed panels (Fig. 36). The excavator restores these at the top of the walls, in the manner of a triglyph-metope frieze. Although the panels are painted, red for the projecting surfaces and black for those receding, these are the reverse of colors normally used for the frieze.⁴⁵ Moreover, neither of the two surfaces is articulated in the manner of triglyphs. These panels are also trapezoidal, rather than rectangular, in shape. Trapezoidal components are unusual, but do appear elsewhere in the West, most notably in the frieze of the slightly later Temple of Hera I (so-called Treasury) at Foce del Sele, in southern Italy, where they are joined together, as at Selinous, in a single block.⁴⁶ Despite the differences from canonical triglyphs and metopes, the E 1 panels likely served this same purpose. If so, they demonstrate that as late as ca. 580 B.C., the form of the triglyph was not yet codified, at least in western Greece. In fact, it is only in the decade 580-570 B.C. that canonical examples are attested, in the Old Tholos at Delphi

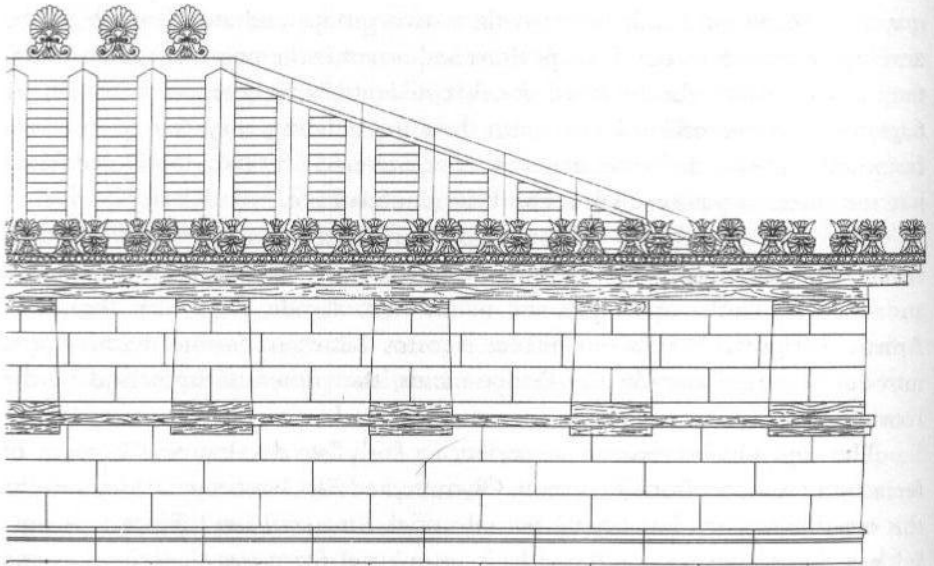


Figure 36. Reconstruction of entablature at southwest corner, Temple E 1, Selinous, from Gullini, "L'architettura," pl. III 2, reproduced by permission of G. Gullini.

around 580 B.C., the Temple of Apollo I on Aigina (dated here ca. 580–570 B.C.), decorating both the Altar and Temple of Artemis at Korcyra (ca. 580–570 B.C.), and at the end of this period in the Older Temple and probable Altar of Aphaia on Aigina.⁴⁷

Even after this point, the treatment of triglyphs may vary. Particularly in sites around the Ionian Sea, a more decorative approach seems to prevail.⁴⁸ The trapezoidal shapes previously noted, although less pronounced, are found in frieze members from other locations in southern Italy and on Korcyra. Western Greek architects may also vary the number of components in the "triglyph," with five (pentaglyphs) in the Doric temple of Casa Marafioti at Lokroi (ca. 530 B.C.) and four (tetraglyphs) on the flank corners of the porches in Temple E 3 at Selinous (ca. 460–450 B.C.).⁴⁹

Perhaps more significant is the divergence from the "canon" in the arrangement of frieze members. Typically, triglyphs are aligned with columns and the centers of intervening spaces. This coordination is completely lacking in both the Tholos at Delphi (ca. 580 B.C.) and the Temple of Apollo at Syracuse (ca. 570–560 B.C.), while triglyphs are associated only with columns in the Monopteros at Delphi (ca. 570–560 B.C.).⁵⁰ F. Seiler explains this peculiarity in the Tholos by an emphasis on proportions over tectonics. He suggests that the architect determined the axial spacing from the entablature height, which resulted in thirteen columns for twenty triglyphs. E. Østby attributes the problem both here and in the Monopteros to an unusually tall frieze. Surely the Apollonion presented difficulties with its massive entablature and widened central inter-

columniation. Nevertheless, the decision by each of these architects to ignore one of the cardinal rules of Doric architecture suggests either that it did not yet exist or that the approach to the Doric frieze was more flexible at this early date. Even in later times, elaborations of the frieze may diminish the vertical articulation of the canonical Doric entablature. Cities along the Ionian Sea were especially enamored of metopal sculpture and a decorative treatment of the triglyph face, both of which created a more horizontal and ornamental conception of the frieze. This member, along with its accompanying mutules and regulae, could even be omitted altogether, as in the otherwise Doric temple at Kardaki on Korkyra, from the last quarter of the sixth century.⁵¹ Thus, as with many elements of the Doric order, even its most characteristic one was susceptible to variation and, on occasion, elimination.

The typically Doric geison seems to undergo an especially slow development, with still more experimentation. A geison is present in stone already by the second quarter of the seventh century in the Temple of Poseidon at Isthmia, but with none of its canonical characteristics.⁵² Instead, this member seems to be a wall block that is modified by extending its top to create a low, sloping projection. The underside of the projection is smooth, showing no trace yet of Doric mutules and guttae. The block does, however, serve the essential functions of the geison, to seat the rafters and deflect rain water from the wall.⁵³ Other extant geisa from the seventh century are of a completely different material (terracotta) and shape, with a flat upper surface, vertical slanting face, and concave underside. This type is often referred to as a geison tile. The earliest known representative of this group is associated with the Temple of Apollo at Thermon, ca. 630–620 B.C.; only slightly later, ca. 610 B.C., examples appear in the Temple of Hera at Mon Repos on Korkyra and Temple B1 at Kalydon. Although the geison tile is known elsewhere, its early appearance and continued popularity in northwest Greece make it a distinctive characteristic of that region.⁵⁴

A. T. Hodge considered these terracotta geisa to be the predecessors of the thick, stone geison blocks more characteristic of Doric architecture.⁵⁵ The subsequent discovery of the latter type from the Temple of Poseidon at Isthmia negates this sequence. More recent studies of the Doric geison have, in fact, completely separated the terracotta geison tile from the entablature and have assigned it instead to the roofing system.⁵⁶ As N. L. Klein points out, these terracotta members cannot perform the role of the geison in supporting the rafters. Additionally, in their slab form and low height, these geisa are more closely related to roof tiles.⁵⁷ Yet the presence of a drip created by the concave shape of the soffit betrays the other function of the geison, to evacuate water away from the walls of the building. We may therefore suggest the evolution in the seventh century of two distinct types of geison, each reflecting in its material and form the building that it crowned. In the Corinthia, the geison arises as a modification of the stone wall block, while in northwest Greece, in buildings

of largely perishable materials, it develops from the more permanent roofing terracottas.

Such an explanation may also account for the two distinct forms of the geison that appear in later times in canonical Doric architecture. That with mutules and guttae is placed horizontally around the temple, that is, along the flanks and below the pediment. A different type, with a smooth, concave soffit, crowns the pediment as a raking geison. Scholars have noted the redundancy of both a horizontal and a raking geison on the front of the building, which thus might be explained historically.⁵⁸ The Temple of Poseidon at Isthmia is generally assumed to have had a hipped roof at both ends. With the tiles extending to the eaves on all four sides of the building, the geison below would be expected to take the same form all around. By contrast, both the Temple of Apollo at Thermon and the Temple of Hera at Mon Repos (Korkyra) possessed a pediment at the entrance end. Although we cannot be certain that the geison tiles used on their eaves also extended along the slopes of their pediments, that situation is likely for the earliest roof from Kalydon (B1, ca. 600 B.C.) and is confirmed for two temples at Kalapodi, dated ca. 570 B.C.⁵⁹ In incorporating the pediment in later temples, architects may also have adopted the accompanying type of geison, while maintaining the modified wall block to crown the walls below.

This theory requires the petrification of the slab-type geison, an event that is demonstrated in two early buildings. One is the Archaic temple at Mykenai, dated around 600 B.C., from which is preserved a small number of geison blocks. These recall the Isthmia examples in their thickness (30.5 cm at the rear and 23.5 cm at the face), but their underside is concave, as in the terracotta geison tiles.⁶⁰ The extant blocks belong to both lateral and horizontal geisa. From the presence of the latter, Klein has determined that the original structure was pedimental. Extant members would represent the continuation of the concave soffit for the geisa acting as wall crowns, but now in stone and, by their size, suitable as rafter supports. They suggest the merging of the two traditions, with as yet no indication of the mutular form that becomes characteristic later.⁶¹ Only the missing raking geison, assuming that it had a similar shape, would correspond to the "canonical" type.

Another example of the transition from tile to stone member may be found in the geison of Temple A at Kalydon, generally dated ca. 570 B.C. (Fig. 37). It retains the characteristic flat profile and slanting face, but adopts the lowered resting surface as on the earlier stone geison at Isthmia. The exposed underside of those blocks assigned to the flanks and base of the pediment is articulated by sunken coffers or cassettes.⁶² K. Rhomaios, following Vitruvius's reconstruction of the Doric entablature, explained these cassettes for the insertion of wooden rafters, which would appear from below as mutules.⁶³ These blocks might then represent the beginning of the mutular geison. Klein convincingly argues against

this theory, but offers no explanation for the cassettes.⁶⁴ Since this is one of the earliest known examples of a stone geison, perhaps the sinkings were attempts by the architect to lighten the load of the projecting portion of each block, a technical peculiarity that might have been considered necessary in a relatively new material.⁶⁵ In any case, such a treatment seems unrelated to the development of the Doric mutule. Nevertheless, if the members with smooth soffit assigned to the raking geison do in fact belong, they would demonstrate the use of two different geison types in a single building, with the slab form, now in stone, along the pedimental slopes.

The "cassette"-type horizontal and lateral geisa at Kalydon can be interpreted in one of two ways: either as local variations of the "norm" or as representatives of a still pre-canonical tradition. Support for the latter interpretation may come from a geison block of the early sixth-century Temple of Zeus at Nemea. Rhodes identifies it as the same type as at Isthmia, likewise lacking mutules and guttae.⁶⁶

Such evidence may allow us to fix the date of the introduction of the Doric mutular geison fairly precisely. It appears, with accompanying regulae but no guttae, in the Old Tholos at Delphi, dated ca. 580 B.C.⁶⁷ It is attested as well, along with the characteristic raking geison, in two temples dated here ca. 580–570 B.C., of Artemis on Korkyra (Fig. 38) and of Apollo I on Aigina, and followed at the end of the decade in the Temple of Aphaia on Aigina.⁶⁸ These three temples display more "canonical" forms in the presence of guttae, but experimentation continues. Thus, the raking geisa of the Temples of Artemis (Fig. 39) and of Apollo do not contain the customary lowered resting surface, but instead the underside is in one level, with a very slight upward taper. The lateral geison of the Artemis temple was constructed in two parts: the lower portion, articulated with mutules and guttae, provided the visual link to the entablature below, while a second block above assumed the structural role of the geison in supporting the rafters and roof tiles. The separate functions of these two elements point to an essentially decorative use for the mutular portion. Moreover, the face of the upper member was covered by an overhanging plaque, or geison revetment, a practice known earlier in Sicily and southern Italy.⁶⁹ The Korkyrean geison would thus represent the combination of two regional traditions, the revetted geison characteristic of western Greece and the newly emerging mutular form of mainland Greece. The geisa of the Apollo temple may likewise reflect two traditions, but distributed on different sides of the building, since the lateral geison is smooth while the horizontal one is articulated with mutules.

Despite the fragmentary state of the mutular blocks of both temples, it has been possible to determine that the guttae were arranged in two rows of four each, thus fewer than the "typical" 3×6 .⁷⁰ The slightly later Older Temple of Aphaia at Aigina, with its canonically shaped geisa, still has a small number of

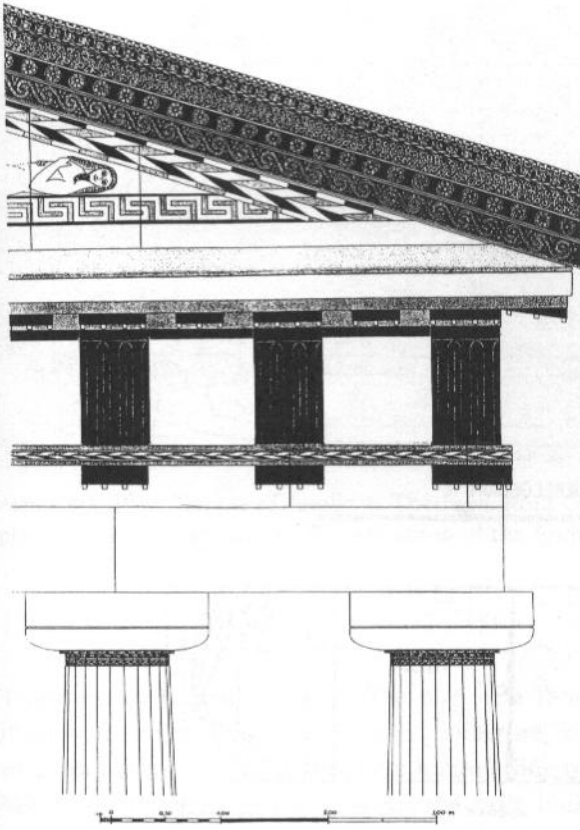


Figure 38. Detail of restored entablature, Temple of Artemis, Korçyra, from Schleif, *Korçyra I*, pl. 23, reproduced by permission of Gebr. Mann Verlag.

guttae: five in two rows over the triglyphs and 2×3 above the metopes, which correspond with the alternating widths of the mutules. Doric architects will experiment throughout much of the sixth century with the number and arrangement of guttae. The canonical six per mutule is attested a few years later (ca. 566 B.C.) in the Hekatompedon on the Athenian Acropolis, but in only two rows and alternating with smaller mutules that exhibit 4×2 guttae. This temple also varies from the "norm" in the application of incised decoration, consisting of alternating birds and lotus flowers, on the soffit of its raking geison.⁷¹ It is not until around 530 B.C. that the mutules become of equal size above both triglyphs and metopes and the standard number of guttae (3×6) is established.⁷²

Even with the codification of forms, regional variations continue to appear.⁷³ These are reflected in the execution of mutules without guttae, their presence only over triglyphs, or their omission altogether.⁷⁴ In certain south Italian "Achaian" temples, mouldings are substituted for the traditional geison. This occurs below the pediments of the "Basilica" (ca. 550–510 B.C.) and Temple of Athena (ca. 510 B.C.) at Poseidonia (Paestum) and on all sides of the slightly later (ca. 510–500 B.C.) Temple of Hera (II) at Foce del Sele.⁷⁵

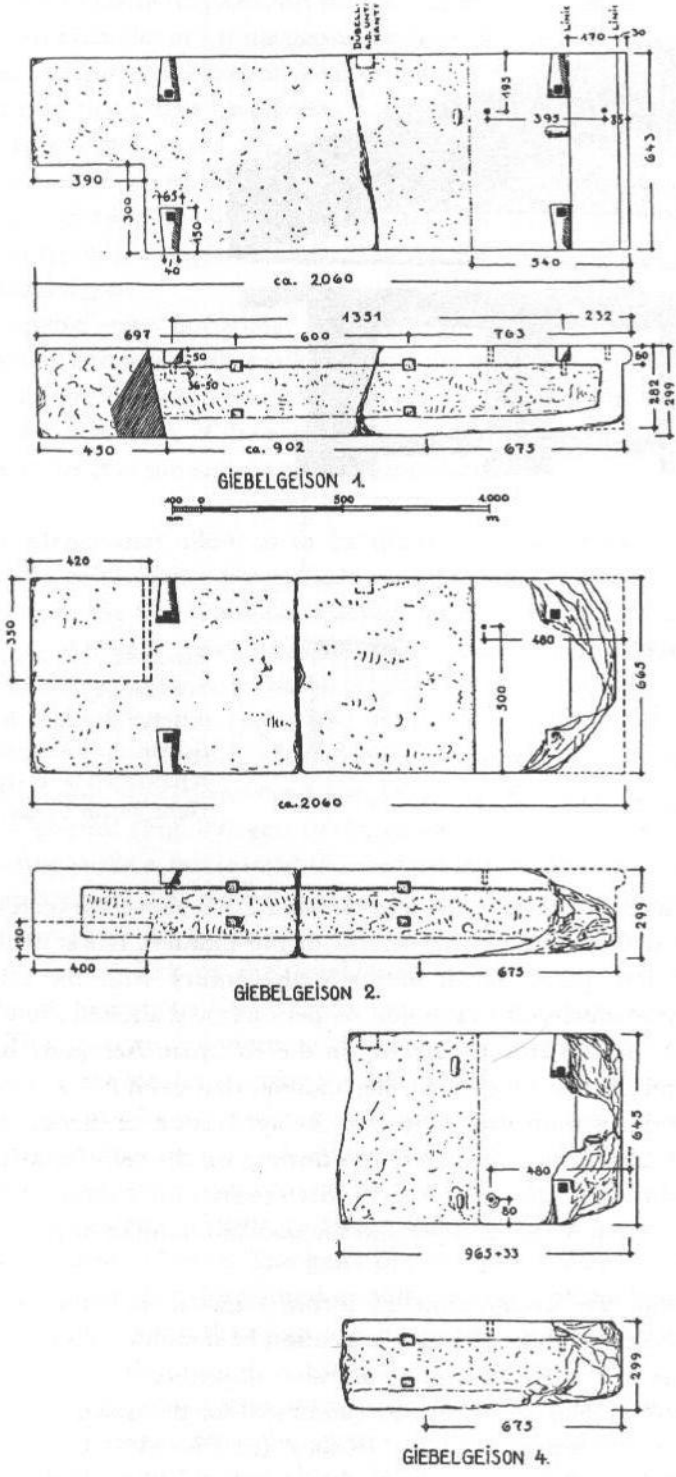


Figure 39. Raking geison, Temple of Artemis, Korkyra, from Schleif, *Korkyra I*, 36, fig. 19, reproduced by permission of Gebr. Mann Verlag.

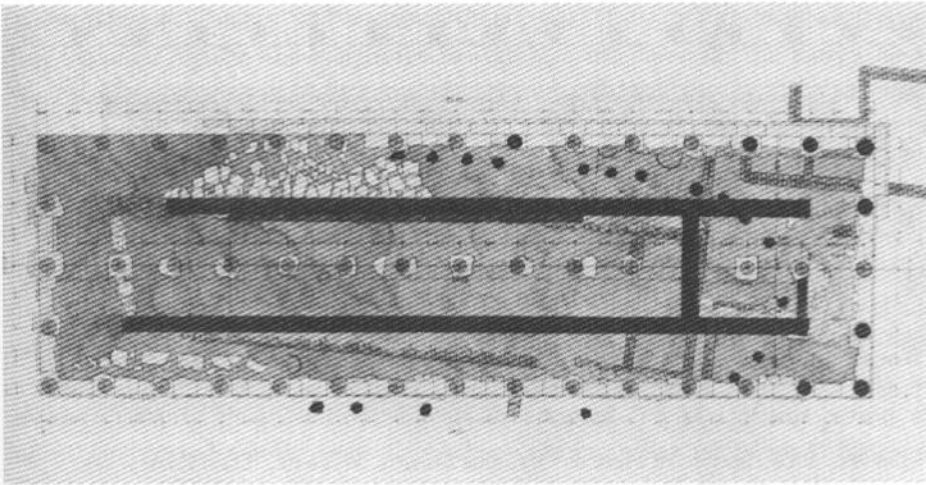


Figure 40. Plan, Temple of Apollo at Thermon, from G. Soteriades, *ArchEph* (1900) plate after p. 174, reproduced by permission of the Archaeological Society at Athens.

PLAN

There exists no real canon for the plan of a Doric temple. The "typical" plan illustrated in handbooks of Greek architecture, a three-part cella building with two rows of interior columns and a surrounding peristyle, may come the closest. Yet variations exist in the form of the cella building, often linked to specific regions and cults, and in the number and arrangement of columns, which is frequently a factor of date and/or location. Nevertheless, we can detect a general preference for the type noted and an evolution toward that type over time.

Temples of the later seventh century do not yet correspond to this model. That of Apollo at Thermon (ca. 630–620 B.C.) may not have possessed a peristyle and its cella building was composed of only two rooms, a "naos" or cella proper and a back room opening to the rear, which is generally identified in the modern literature as an "opisthodomos"⁷⁶ (Fig. 40). This would seem to mark the introduction of the opisthodomos, or back porch.⁷⁷ The pitched roof was supported in part by a single, central colonnade, likewise a feature of early architecture.

A more "canonical" plan appears in the Temple of Hera at Olympia (ca. 600–590 B.C.) (Fig. 41), followed shortly thereafter by that of Artemis at Korkyra (ca. 580–570 B.C.) (Fig. 42). Both buildings are peripteral with a three-part cella building and two rows of interior columns. In the Hera temple, the rear room is the open porch (opisthodomos),⁷⁸ which provides a visual balance to the front pronaos and will continue to characterize mainland Doric plans. The Artemis temple, on the other hand, more likely possessed a closed back room, which scholars refer to as an "adyton;" this arrangement becomes preferred in western Greek Doric.⁷⁹ In both buildings, the interior colonnades

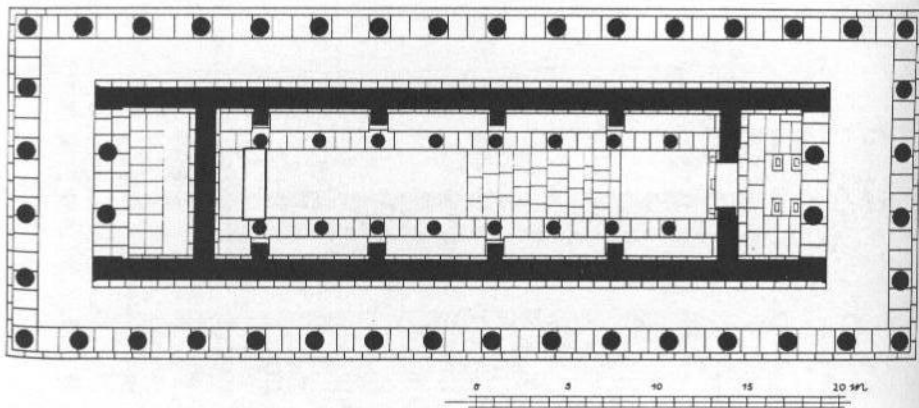


Figure 41. Plan, Temple of Hera at Olympia, from A. Mallwitz, "Das Heraion von Olympia und seine Vorgänger," *JdI* 81 (1966) 310–76, fig. 17, second solution, reproduced by permission of the German Archaeological Institute (Deutsches Archäologisches Institut), Berlin.

may already have been executed in two levels, as typical of later Doric construction, although this is more certain for the Temple of Artemis than for that of Hera.⁸⁰

One deviation from the "typical" plan is the two-step platform of both temples. This will be replaced by the three-step *crepidoma* around the mid-sixth century, beginning with the Temple of Zeus at Syracuse (ca. 560–550 B.C.) and

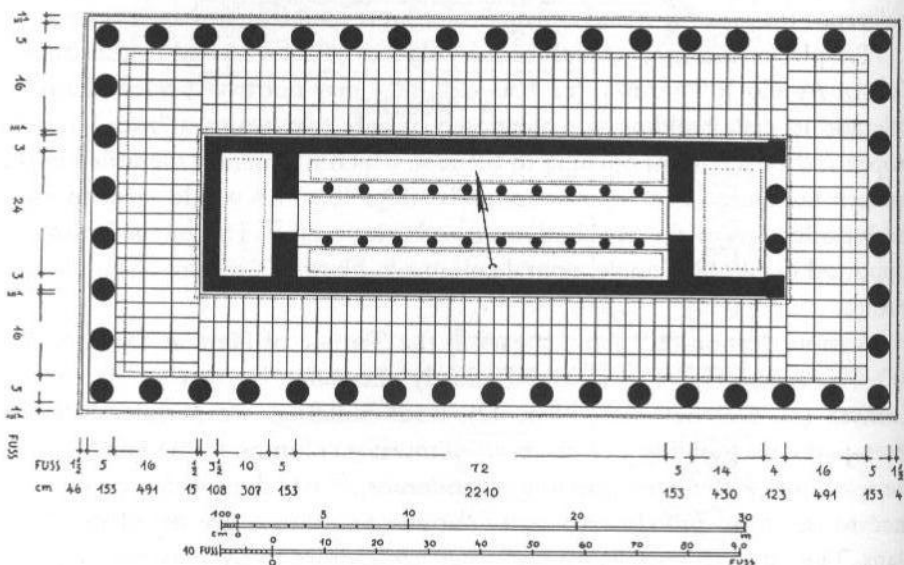


Figure 42. Reconstructed plan, Temple of Artemis, Korkyra, from Schleif, *Korkyra I*, 49, fig. 39, reproduced by permission of Gebr. Mann Verlag.

followed by the "Basilica" at Poseidonia (begun ca. 550 B.C.). This number of steps only becomes regular, however, in the late Archaic and especially the Early Classical and Classical periods.⁸¹ Another early feature of the Hera temple is its elongated peristyle, comprising 6×16 columns. The Artemis temple, however, with its 8×17 columns, already achieves what will eventually become the characteristic proportion of $2x + 1$. It is also innovative in its pseudodipteral spacing, with sufficient room between the cella building and peristyle for an additional line of columns.⁸² This trait will be exploited in both the "propteron" and porticoes of several western Greek temples of the Archaic period and will reemerge as a characteristic of Hellenistic Greek architecture.⁸³

Although "canonical" characteristics were thus achieved relatively early in the sixth century, they were not universally adopted. Temples of this period, as indeed later, may be non-peripteral while exhibiting other "developed" features. This is true of Temples E1 at Selinous (ca. 580 B.C.) and of Aphaia at Aigina (ca. 570 B.C.), both of which are reconstructed with a three-room cella building, containing an adyton at the rear, and two interior colonnades.⁸⁴ Variations may also occur in the number of rooms and in the arrangement of porch columns. The Aphaia temple, for example, is argued to possess a prostyle porch, that is, with columns in front of rather than between wall ends. Such an arrangement is often linked with the sofa-type anta capital, although not present in this building, and thus with particular regions of the Greek world.

CONCLUSIONS

The evidence provided by the plans of early Doric temples reinforces that of their elevations. In both, what will become the characteristic forms emerge over a period of about fifty years, between the last quarter of the seventh century and the first quarter of the sixth. No element that can be considered "Doric" is attested prior to around 610 B.C., but by construction of the Temple of Artemis at Korkyra (ca. 580–570 B.C.), all the characteristic components of the plan and elevation are present. Their assemblage together and in the "proper" locations confirms the existence by this point of the Doric "order."

The extant evidence does not, however, support the creation of the entire system at a single point in time. Instead, it suggests an initial introduction of certain elements, such as thick stone geison blocks, decorated wall plaques, and the terracotta geison tile, which likely give rise to Doric members but differ from truly canonical forms. At the end of the seventh and the beginning of the sixth centuries, distinctively Doric elements make their appearance, first the capital, followed by the metope and triglyph, and subsequently the anta capital and mutular geison. That this piecemeal development is not simply the result of preservation is demonstrated particularly by the remains of early geisa. They exemplify the relatively slow evolution of the form, with precanonical types in

use from the second quarter of the seventh century until perhaps as late as the early sixth century. In other ways as well, our evidence suggests that Greek architects were still striving for satisfactory solutions into the sixth century B.C.

Such a situation is more compatible with a newly emerging, than a long-established, architectural tradition. The preserved remains thus cast doubt on Vitruvius's suggestions of a very early evolution of the order and an original construction in perishable materials such as wood. By contrast, its development appears to be relatively late and to occur at a time when more permanent materials were in use. The total process was comparatively rapid, spanning a period of no more than two generations. Some scholars have already postulated a similar scenario. Coulton argues for a date in the mid-seventh century and invention by one builder or a small group, while R.M. Cook suggests a single generation.⁸⁵ If the material covered in this chapter indeed represents the tentative beginnings of the order, the date for its evolution must be later and the process somewhat slower. Moreover, it seems clear that a number of architects participated in its formation.

Similarly, the localization of the origin of the order in a single part of Greece, as Coulton's northeast Peloponnesos or Cook's Corinth, is not borne out by the evidence. Only the capital seems to have strong connections with this area. Architects working in different parts of Greece contributed other members. Those in the northwest may be responsible for the frieze, or at least the metope portion, as well as the shape of the raking geison. Western Greek architects may have invented the sofa-type anta capital. Despite the important role ascribed to Corinth by literary sources, archaeological evidence for its invention of the pediment, or the Doric style in general, is lacking.

Although the individual components of Doric architecture emerged at different times and places, a coherency was achieved in the "order" through their selection and incorporation into successive buildings. We can envision this as a true evolutionary process, where acceptable forms prevailed while others were simply not followed. Thus, the thickened anta, which served a practical purpose in conjunction with the mud-brick walls of the Hera temple at Olympia, was adopted in later temples with stone walls. The metope may have begun as a decorative element, but eventually becomes a hallmark of the Doric order, with or without ornament. Certainly the coordination of triglyphs and columns arose over time. We can likewise trace the step-by-step development of the raking- and canonical mutular-geison types. The introduction and diffusion of the pediment, initially on one end and then both facades of the temple, can only be the result of shared ideas.

The means by which such ideas were transmitted can probably be ascribed to the architects and artisans themselves. We know that artists in general traveled extensively for commissions. When names are preserved, they indicate that architects sometimes worked far outside their homelands. Already this may be the case with Kleomenes, one of those responsible for the Temple of Apollo at Syracuse in Sicily (ca. 570-560 B.C.), who in identifying himself as the son of Knidieidas

perhaps shows a link with Knidos in Asia Minor.⁸⁶ Bathykles of Magnesia, the designer of the Throne of Apollo at Amyklai near Sparta (ca. 510 B.C.), is certainly of East Greek origin. Travel was necessary because the number of commissions, and therefore probably also architects, was limited. At least in later periods, skilled workmen were also in short supply.⁸⁷ One would expect that these individuals carried with them a knowledge of developments elsewhere and that their movements would have promoted an exchange of ideas.

The motivation for incorporating such innovations into new constructions may, on the other hand, be ascribed to those locally responsible. It has been suggested that rulers used cult as a means of enhancing political allegiance.⁸⁸ Certainly the temple, one of the most important monuments of the city or *ethnos*, served as a continually visible symbol of that political unit. Herodotos (V, 62) tells how the Athenian family of the Alkmeonidai, who held the contract for construction of the late sixth-century Temple of Apollo at Delphi, contributed at their own expense more precious materials for the east facade in order to win favor for their political cause. It must have been in the interest of priests as well to ensure that their temple was worthy of acclaim. Local citizens and adherents to the cult would derive a certain pride from such a building. In later times cities seem to have competed in the size and elaboration of their temples. On a more subtle level, competition may underlie the constant evolution of temple proportions and innovations. It is not hard to imagine civic and religious pride being perhaps even stronger forces during the early years of a city and thus resulting in the incorporation of the latest developments in its temple.

Local pride and custom were probably also at work in the continuation of regional interpretations even after the development of what would eventually prevail as "canonical" forms. Thus, the column capital receives particular embellishment in northwest Greece. Unfluted shafts are preferred for Doric columns in the Cyclades. The sofa-type anta capital is used simultaneously with the "canonical" type, but in the Ionian Sea area. This area also interprets the frieze in a more horizontal and decorative way than elsewhere in Greece. While aware of developments elsewhere and working generally within the same tradition, architects must also have enjoyed a certain local independence, which allowed them to respond in ways that had much more in common with neighboring sites than with those at a distance.⁸⁹

J. N. Coldstream notes a similar situation with the prevalence of regional schools in vase-painting of the late eighth century B.C., despite close contact within the Greek world.⁹⁰ Although it is true that vase-painting never developed the consistency of Doric architecture, Coldstream argues that at certain periods, as from about 850 to 750 B.C., there did exist a type of *koine*. This succumbed to local diversity at a time that scholars associate with the rise of the polis and with emerging civic consciousness. Because construction of a temple was one of the activities of the *polis*, we can imagine the same factors at work there. Significantly, relationships among local pottery styles seem to be unaffected by dialect, a

situation that also prevails in architecture. Such regional diversity within the context of a broader general tradition continues to be the case in the Archaic period, where vase-painting schools often shared techniques and iconography but remained distinct, and monumental sculpture adhered to the "kouros" and "kore" types but executed them in local styles.

The promulgation of regional forms as well as the experimentation attested in the extant remains contradict the idea of a rigid canon for Doric architecture, at least during the early sixth century. Instead, the architect seems able to choose from various models and even to invent his own. This process of experimentation and revision is now confirmed even at Corinth, considered by many as the likely birthplace of the Doric style.⁹¹ The picture seems to change during the second half of the sixth century. Individual elements become more refined, as with the Doric anta capital, which is now coordinated with the entablature it bears. There is a move toward standardization, as in the uniform size of mutules and the canonical number of guttae. A greater consistency emerges in the interpretation of "Doric," particularly in mainland Greece. One may attribute these changes to closer communication among cities and a shift from regional to national identity. A comparable development occurs in sculpture, resulting in the emergence of a more unified tradition, termed the "International Style," around 530 B.C.⁹² This leads in the Early Classical period to the adoption of a canon of forms and proportions for the Temple of Zeus at Olympia that sets the standard for later Doric architecture and will find especially strong adherents in western Greece. Canonical Doric architecture also finds a following in the Cyclades from the beginning of the fifth century B.C., resulting after the end of the Archaic period in the abandonment of the native, Ionic tradition.⁹³

APPENDIX: CHRONOLOGICAL ORDERING OF EARLY DORIC ARCHITECTURE

The dates cited in this chapter for individual components as well as for entire buildings are based largely on style and proportions. Scholars generally accept a progression over time toward tauter forms for the Doric capital and column, and a lower height for members of the entablature. As noted in this chapter, however, such criteria may not be reliable for the earliest Doric capitals and in any case there is little evidence to assume a consistent progression in either shape or proportions.

Chronological assignments become more authoritative when they are supported by those of additional members or confirmed through other media. Thus, we accept as relatively well established the dates of some better preserved structures, such as the Old Tholos at Delphi, the Temples of Artemis at Korçyra and of Aphaia at Aigina, and the Hekatompedon on the Athenian Acropolis. The first and last also receive historical support.⁹⁴ In the case of the Artemis temple at

Korkyra, the style of its pedimental sculpture is considered an even better gauge than that of its architecture. Architectural terracottas provide another method of dating or of confirming the chronology of a building, as with the Temple of Apollo at Thermon and the Temple of Hera at Mon Repos on Korkyra. Although three sets of terracottas have been assigned to the latter building, the column fragments are tentatively associated with the second. Stratigraphical evidence for buildings of this period is limited to the South Temple at Kalapodi.⁹⁵ Its companion to the north (North Temple) is given a comparable date.

A list of the monuments, with dates accepted here, follows:

Temple of Apollo, Thermon	ca. 630–620 B.C.
Temple of Hera, Mon Repos, Korkyra	ca. 610 B.C.
Temple B 1, Kalydon	ca. 610–600 B.C.
Temple, Mykenai	ca. 600 B.C.
Xenvares capital, Korkyra	first quarter sixth century B.C.
Temple of Hera, Olympia	ca. 600–590 B.C.
Argive Heraion C capital	ca. 590 B.C. (?)
Aigina votive capital (Mus. Inv. 2375)	ca. 580 B.C. (?)
Tiryrs capital	ca. 580 B.C. (?)
Old Tholos, Delphi	ca. 580 B.C.
Temple E 1, Selinous	ca. 580 B.C.
Temple of Artemis, Korkyra	ca. 580–570 B.C.
Temple of Apollo I, Aigina	ca. 580–570 B.C.
Temple of Athena Pronaia, Delphi	ca. 570 B.C. (?)
Old Temple of Aphaia, Aigina	ca. 570 B.C.
Temple A, Kalydon	ca. 570 B.C.
Hekatompedon, Athens	ca. 566 B.C.
South Temple, Kalapodi	ca. 570–560 B.C.
North Temple, Kalapodi	ca. 570–560 B.C.
Monopteros, Delphi	ca. 570–560 B.C.
Temple of Apollo, Syracuse	ca. 570–560 B.C.
Temple of Hera I, Foce del Sele	ca. 560–550 B.C.
"Basilica," Paestum	begun ca. 550 B.C.

THE EMERGENCE OF THE IONIC "ORDER"

ACCORDING TO VITRUVIUS, the Ionic order developed later than its Doric counterpart, initially appearing in the Temple of Artemis at Ephesos. Pliny (*HN* 36, 179) confirms that this temple was the first to possess moulded bases and capitals for its columns. Both authors thus imply a single-step creation, at least for the most characteristic components of the order.¹ These points require modification. As with the Doric style, the individual components seem to have evolved at different periods of time, but over an even broader chronological range. Thus, while incipient forms appear throughout the seventh century, most canonical elements are not attested until the second quarter of the sixth century, with additional innovations and refinements still later. This flexibility and willingness to experiment extend also to the rendering of elements, even within a single building. Regional variations are likewise especially noticeable. These give rise to two fairly distinct systems, each linked to a separate geographical area and accordingly termed Island-Ionic and Eastern-Ionic. Far from emerging at one time and in a single building, the Ionic "order" exemplifies a relatively long period of development and considerable diversity.

ELEVATION

Ionic architecture is chiefly defined by its column type. In its canonical form, the column consists of a base, which is absent in Doric, a shaft with fillets rather than arrises, and a volute capital. The base is formed of a cylindrical drum or spira, with a convex moulding or torus above. An astragal adorns each end of the shaft. The capital consists of two parts, a convex element, called an echinus, and an overlying member that ends on either side in a volute. In some capitals, an abacus acts as a crown above the central portion.

The column base was among the first elements to evolve. As already discussed, during the Geometric period, cylindrical and conical stone supports were used to elevate the wooden shaft above the surrounding ground. At this point, and into the seventh century, bases were generally only roughly worked.²

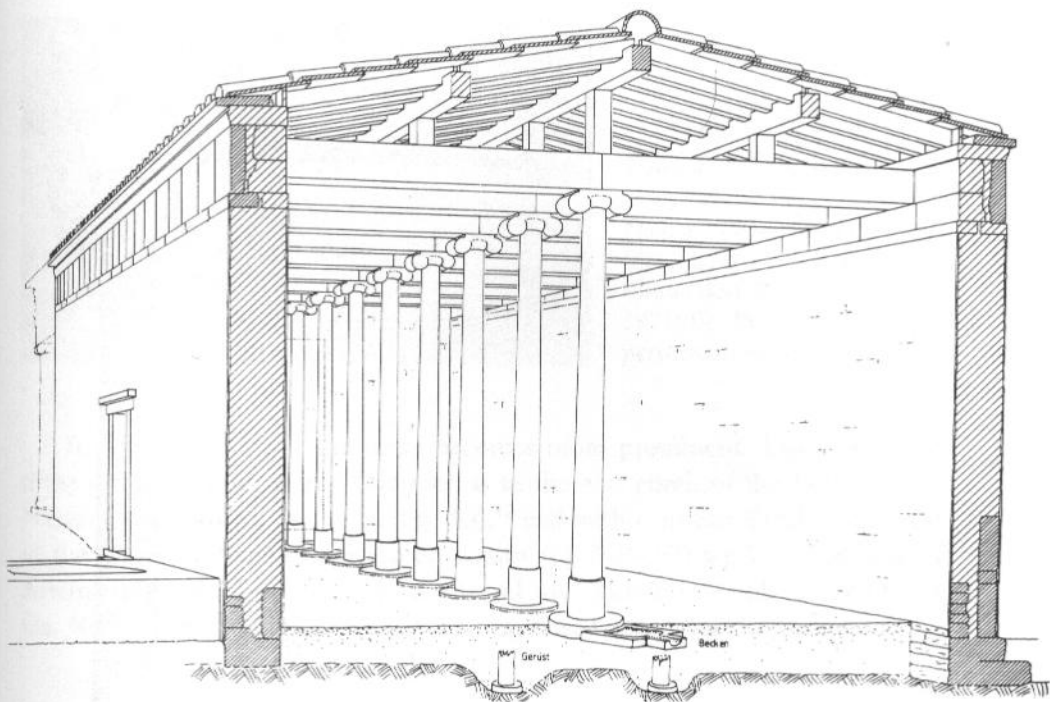


Figure 43. Reconstructed elevation and section of the Oikos of the Naxians, Delos, from G. Gruben, "Naxos und Delos. Studien zur archaischen Architektur der Kykladen," *JdI* 112 (1997) 345, fig. 41, reproduced by permission of G. Gruben.

Developments during the sixth century in both form and execution give rise to the distinctive Ionic base.³

That base seems to have developed from the combination of two different elements, the simple cylinder and the torus crown. The cylinder continues to appear as the support for columns in two buildings of the early sixth century, the Archegesion and the Oikos of the Naxians (Fig. 43), both on Delos.⁴ In the first building, the cylinder is still roughly worked, whereas in the latter it shows a more careful execution, with smooth surfaces. In each case the cylinder rests on a solid foundation consisting of a single, circular plinth, thus distinguishing it from most Geometric supports and generally rendering it functionally redundant.⁵ Since the columns of the Archegesion are of wood, the adoption of both plinth and cylinder may be attributed to a desire for additional protection from moisture, but no such explanation can apply to the Oikos, where the columns are not only of stone, but are also used within the protected interior.

A development may be seen as well in the shape of the spira. The two Delian buildings make use of a somewhat tapered, thus conical, member. With the Naxian Sphinx Column (Fig. 44), it becomes straight-sided. By the construction of the east porch of the Oikos (Fig. 45),⁶ which was added to the building around

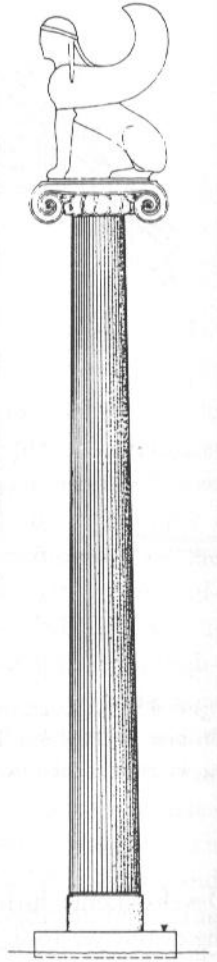


Figure 44. Reconstruction of Naxian Sphinx Column, Delphi, from G. Gruben, "Griechische Un-Ordnung," in E.-L. Schwandner, ed., *Säule und Gebälk* (Mainz am Rhein: P. von Zabern, 1996) fig. 18, reproduced by permission of G. Gruben.

560 B.C., a slight concavity has set in, as characteristic of subsequent spiras, while the surfaces continue to be smooth.

Early spiras lack a crowning torus. Instead, the torus seems to develop as an independent component and, from current evidence, also in the Cyclades. It is identified already in the early seventh century (ca. 680) B.C. as a rounding off of the upper edges of the plinths within the interior of the third Temple of Dionysos at Yria on Naxos.⁷ In its fourth phase (ca. 580–570 B.C.), the temple adopts its predecessor's type of base for the interior columns, but now clearly articulated as a smooth-sided torus carved from the top of a larger, cylindrical plinth (Fig. 46). The latter was mainly submerged within the floor, which continued its role as a plinth rather than a spira.⁸ On the other hand, the spira and torus are combined, apparently for the first time, in the exterior porch columns of this same temple (Fig. 47).⁹ This event marks the introduction of the Ionic base, although with smooth, as opposed to the "canonical" articulated, surfaces.

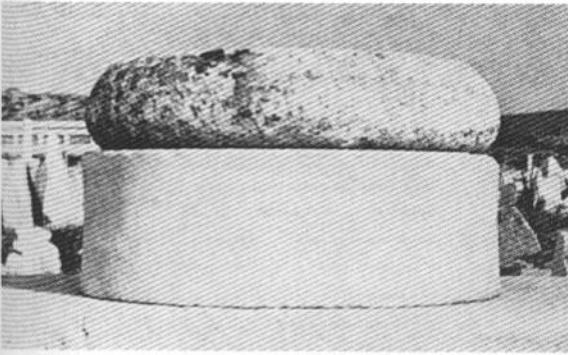


Figure 45. Column base of east porch, Oikos of the Naxians, Delos, from B. Wesenberg, *Kapitelle und Basen* (Düsseldorf: Rheinland-Verl., 1971) fig. 250, reproduced by permission of B. Wesenberg.

In subsequent bases, the torus becomes more prominent. This is true for those produced both in the Cyclades, as in the east porch of the Oikos of the Naxians on Delos (ca. 560 B.C.) (Fig. 45),¹⁰ and within an east Greek context, as in the Rhoikos Temple of Hera on Samos (ca. 570–560 B.C.), the Temple of Artemis at Ephesos (ca. 560–550 B.C.), and the Temple of Apollo at Naukratis (ca. 560–550 B.C.) (Figs. 48–50).¹¹ The increased stature of the torus must be

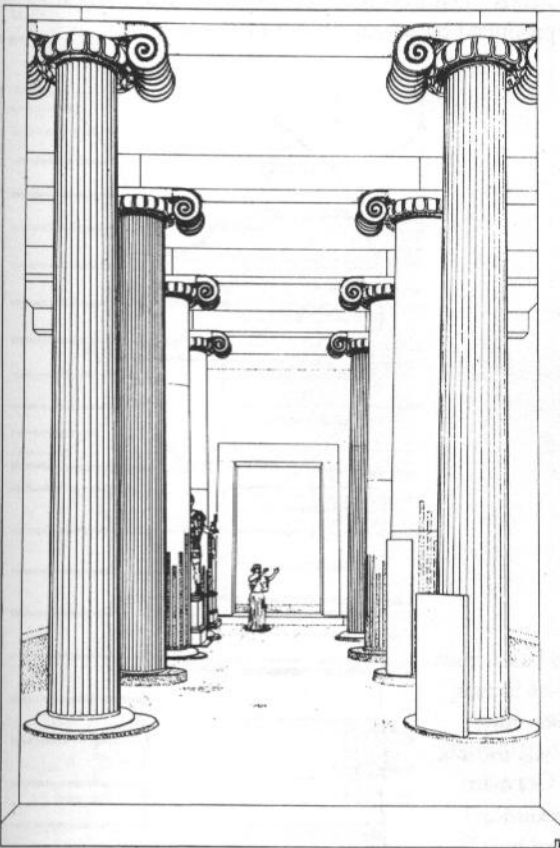


Figure 46. Reconstruction of interior of the fourth Temple of Dionysos, Yria, from G. Gruben, "Die inselionische Ordnung," in J. des Courtils and J.-C. Moretti, eds., *Les grands ateliers d'architecture dans le monde égéen du VIe siècle av. J.-C.* (Paris: de Boccard, 1993) pl. 17, 1, reproduced by permission of G. Gruben.

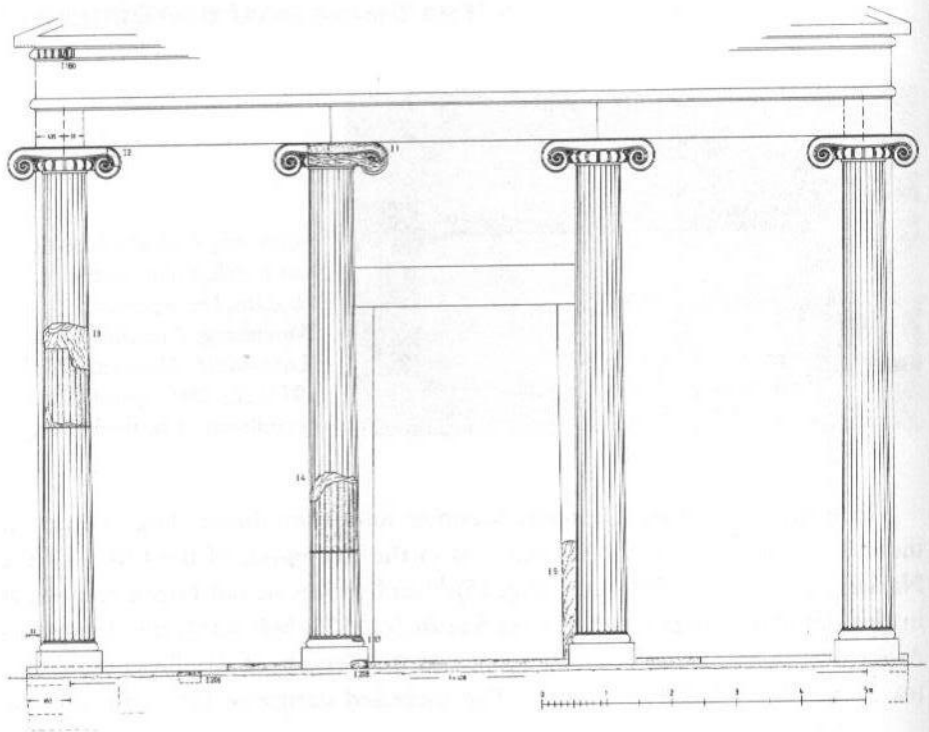


Figure 47. Reconstruction of the south facade of the fourth Temple of Dionysos, Yria, from G. Gruben and V. Lambrinoudakis, "Das neuentdeckte Heiligtum von Iria auf Naxos," *AA* (1982) 594, fig. 39, reproduced by permission of G. Gruben.

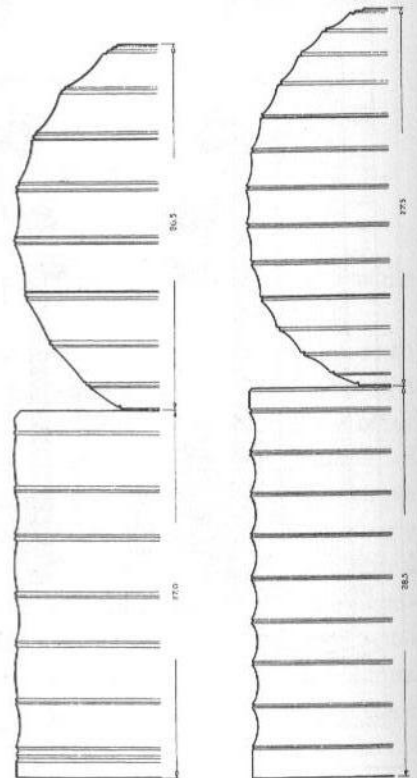


Figure 48. Reconstructed column bases from the Rhoikos Temple of Hera (III) at Samos, from H. Johannes, "Die Säulenbasen vom Heratempel des Rhoikos," *AM* 62 (1937) 26, fig. 7, reproduced courtesy of the German Archaeological Institute (Deutsches Archäologisches Institut), Athens.

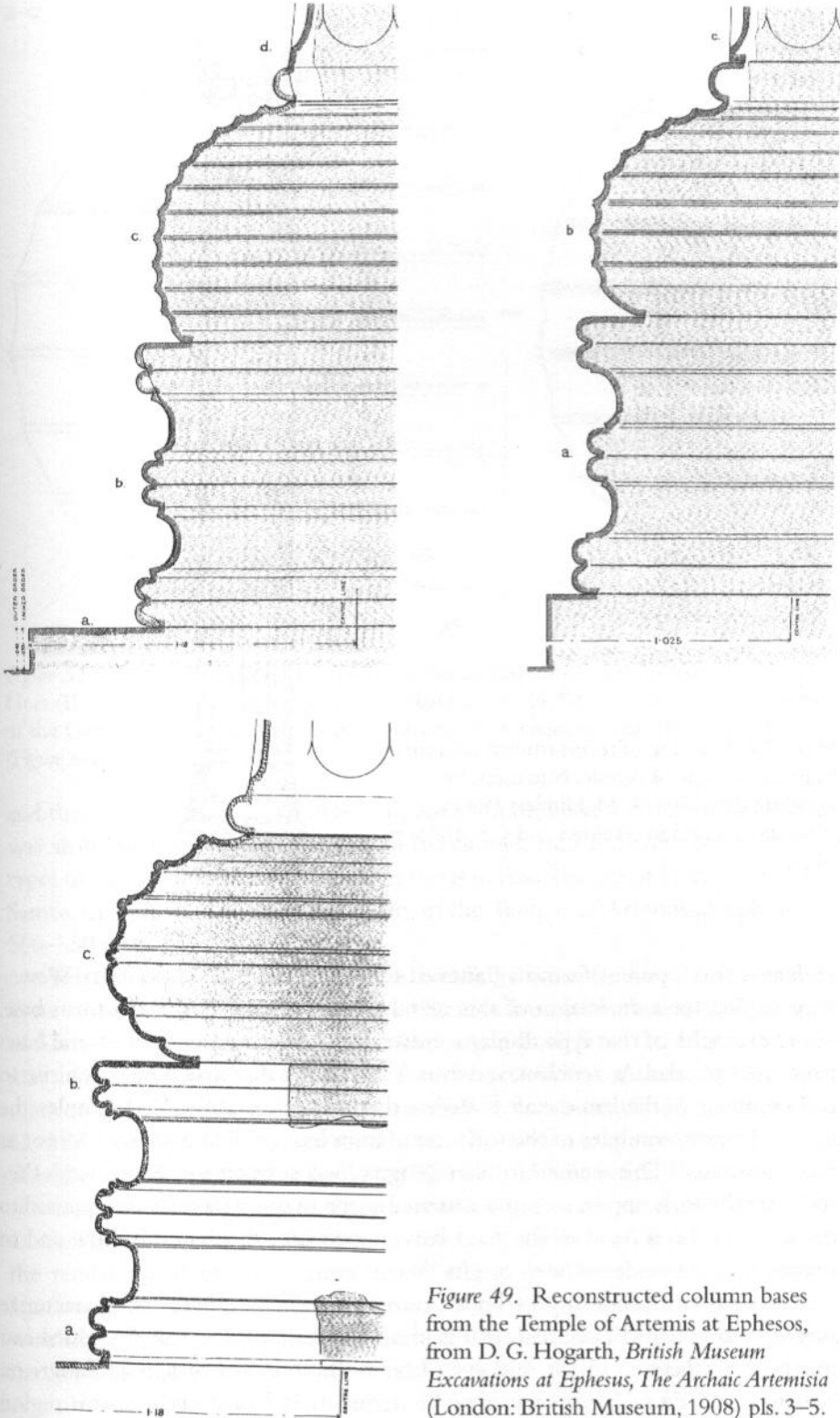


Figure 49. Reconstructed column bases from the Temple of Artemis at Ephesos, from D. G. Hogarth, *British Museum Excavations at Ephesus, The Archaic Artemisia* (London: British Museum, 1908) pls. 3-5.

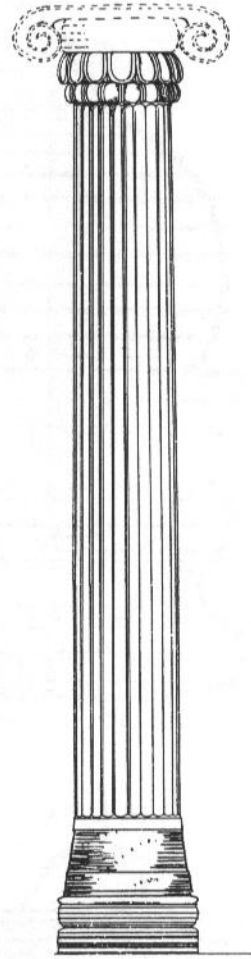


Figure 50. Drawing of reconstructed column from the Temple of Apollo, Naukratis, by Penghua Zhu, after W. M. Flinders Petrie, *Naukratis I* (London: Trübner and Co., 1886) pl. III.

seen as a development from its flattened form at Yria. At one point, B. Wesenberg argued for a derivation of this member from the Near Eastern torus base. Some examples of that type display a crowning astragal, as found on several bases from the Ephesian Artemision, and even a small fillet that may have given rise to the apophyge of the Ionic shaft.¹² Before the excavation of the Yria temples, the earliest known examples of the torus came from bases linked with Asia Minor, as those just cited. This seemed to offer geographical support for Wesenberg's thesis.¹³ Yet the early appearance and flattened shape of the Yria torus, as opposed to the more bulbous form in the East, have caused him to revise his view and to suggest an independent Greek origin.¹⁴

The smooth rendering of both drum and torus continues to characterize Aegean Island bases. This treatment is present in column bases of the added east porch of the Naxian Oikos, and even later in those of the temple at Sangri on Naxos, ca. 530 B.C. It may therefore be considered characteristic of this region

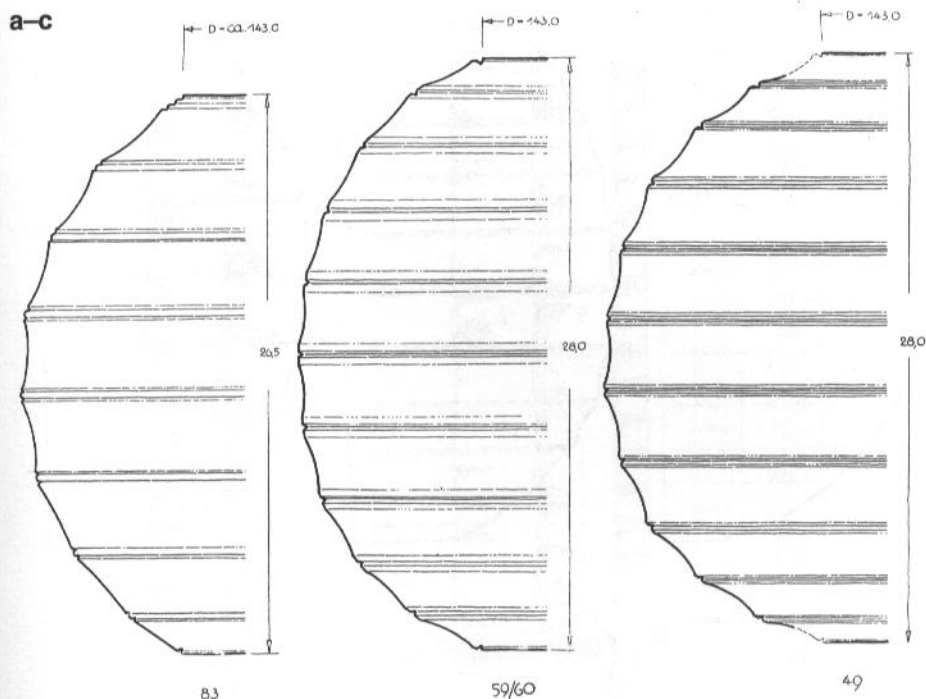


Figure 51. (a-j); Reconstructed toruses of column bases from the Rhoikos Temple of Hera (III) at Samos, from Johannes, "Säulenbasen," 19-24, figs. 1-6, reproduced courtesy of the German Archaeological Institute (Deutsches Archäologisches Institut), Athens. (Figure continues)

and thus of the Island-Ionic style.¹⁵ In Asia Minor, however, the smooth surface was abandoned in favor of horizontal mouldings, thus initiating the two major types of Eastern-Ionic base: Samian, in the Rhoikos Temple of Hera (Hera III) in Samos, ca. 570-560 B.C., and Ephesian, in the Temple of Artemis at Ephesos, ca. 560-550 B.C.

Yet the bases in these respective buildings were far from "canonical" or even uniform. Whereas the traditional Samian base is characterized by a series of horizontal grooves on both torus and spira, those from the Hera III temple may have smooth sides (for the spira) or be articulated with horizontal bands that are either concave or convex, or even a combination of the two (Figs. 51-52). The type of decoration, and even the diameter of the base, seem to be linked to its location in the building. The fully developed Ephesian base consists of a horizontally grooved torus above a spira elaborated with two deep scotiae. In bases from the Artemision, the torus varies both in its profile and in the rendering of the horizontal bands, which may be concave, convex, or a combination (Fig. 53). There also exist members of similar shape but decorated with three different forms of Lesbian leaf. On the basis of their relatively large size, Wesenberg places such elements below the torus, in place of the more typical spira (Fig. 54).¹⁶ He further distinguishes between the two types in

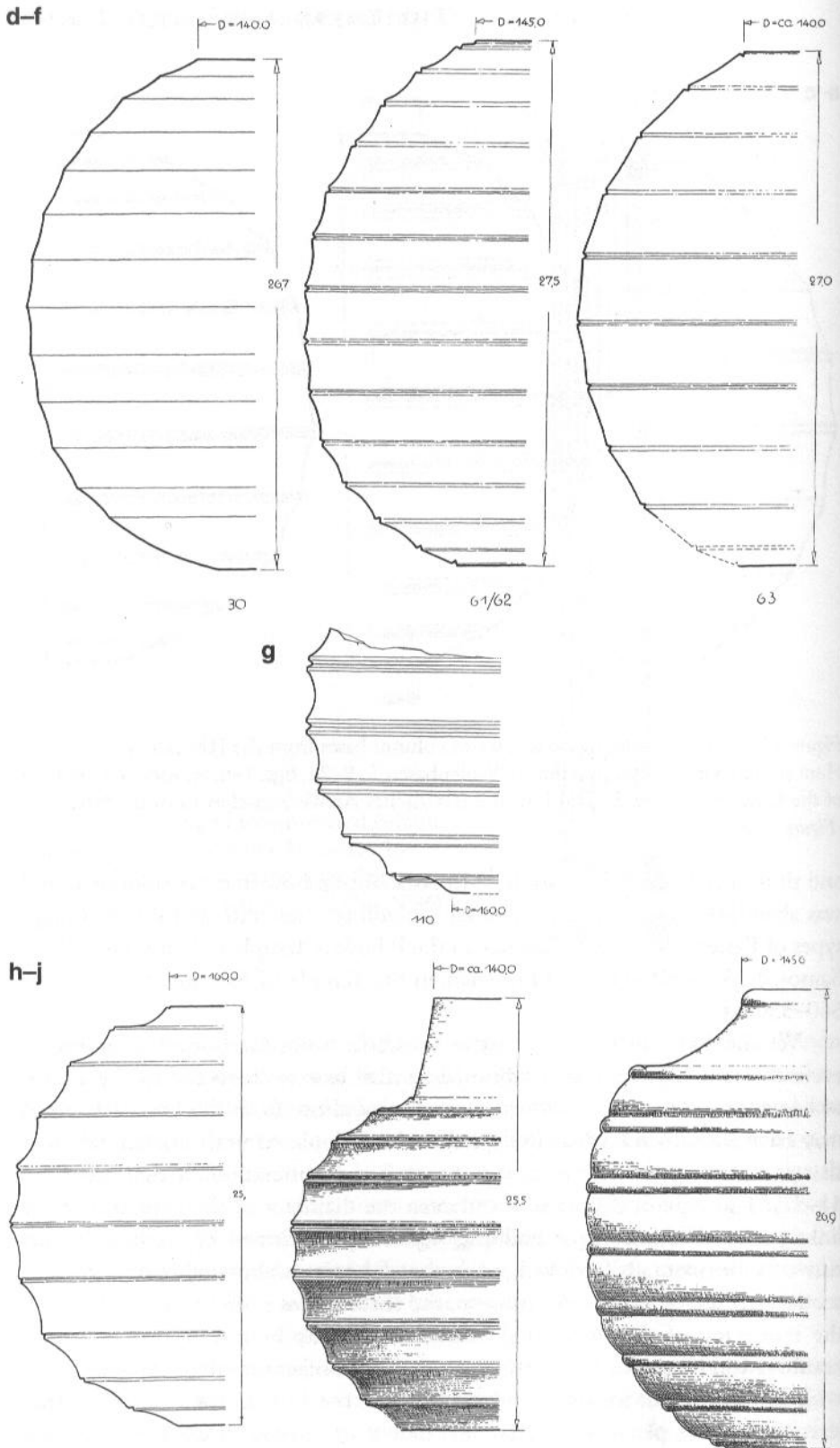
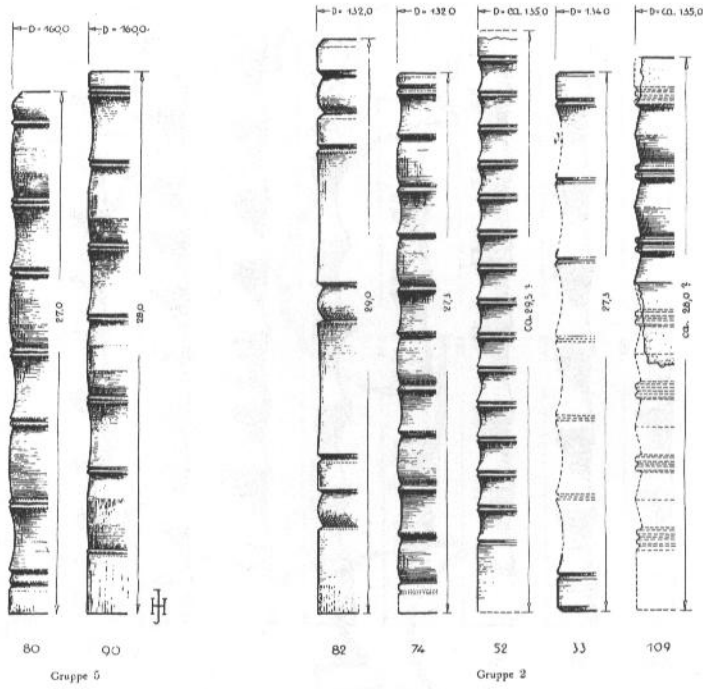


Figure 51 Continued.

a-b



c

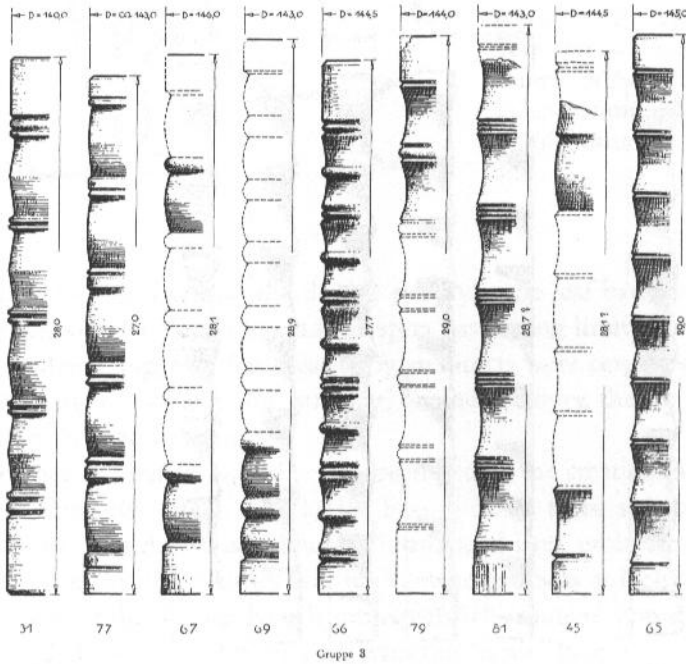


Figure 52. Profiles of spirals of column bases from the Rhoikos Temple of Hera (III) at Samos, from Johannes, "Säulenbasen," pls. 18–21: (a) Group 5, (b) Group 2, (c) Group 3, (d) Group 4, (e) Group 8, (f) Group 10, reproduced courtesy of the German Archaeological Institute (Deutsches Archäologisches Institut), Athens. (Figure continues)

THE ORIGINS OF THE GREEK ARCHITECTURAL ORDERS

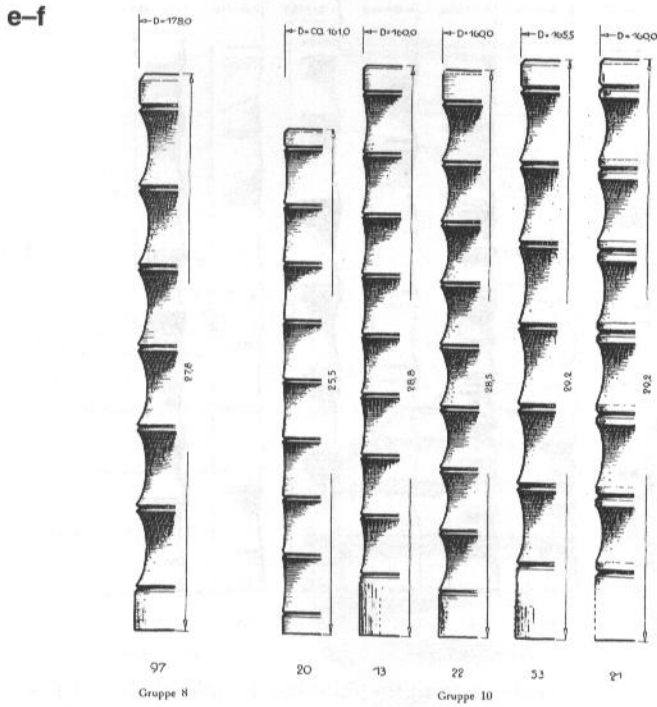
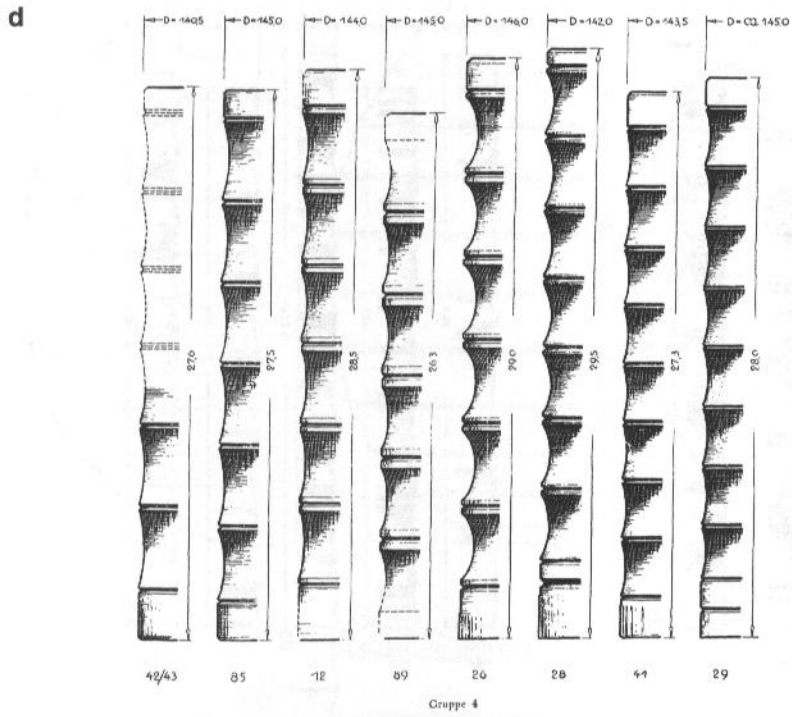


Figure 52 (Continued)

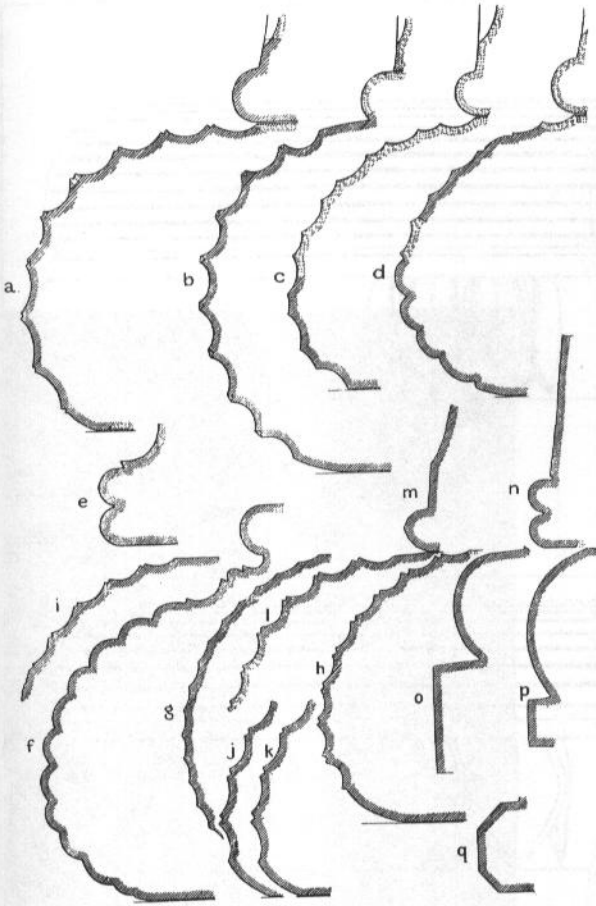


Figure 53. Profiles of toruses from column bases of the Temple of Artemis at Ephesos, from Hogarth, *British Museum Excavations*, pl. 5.

terms of their locations within the double peristyle, the leaf base appearing in both inner and outer colonnades and the spira base being limited to the inner one. Such evidence suggests that these early architects were certainly not striving for the formation of a canon, but that, on the contrary, they intentionally sought variety in their buildings.

The absence of a canon is further demonstrated by the creation elsewhere of variations of these two types. The Chian base, with its three scotias, seems to draw from both. The Attic base, although introduced later, probably during the second quarter of the fifth century B.C. in the Athenian Stoa at Delphi (Fig. 55), may be a variant of the Samian type. It subsequently became so popular that Vitruvius (III, 5, 2-3) considered it on a par with the "Ionic" base.¹⁷

A similar pattern of development is attested by the column shaft. It is typically provided with an astragal at top and bottom, but the earliest examples show no consistency in this regard. Since the shafts of the Oikos of the Naxians (first quarter of the sixth century B.C.) were executed in stone, one can clearly deter-

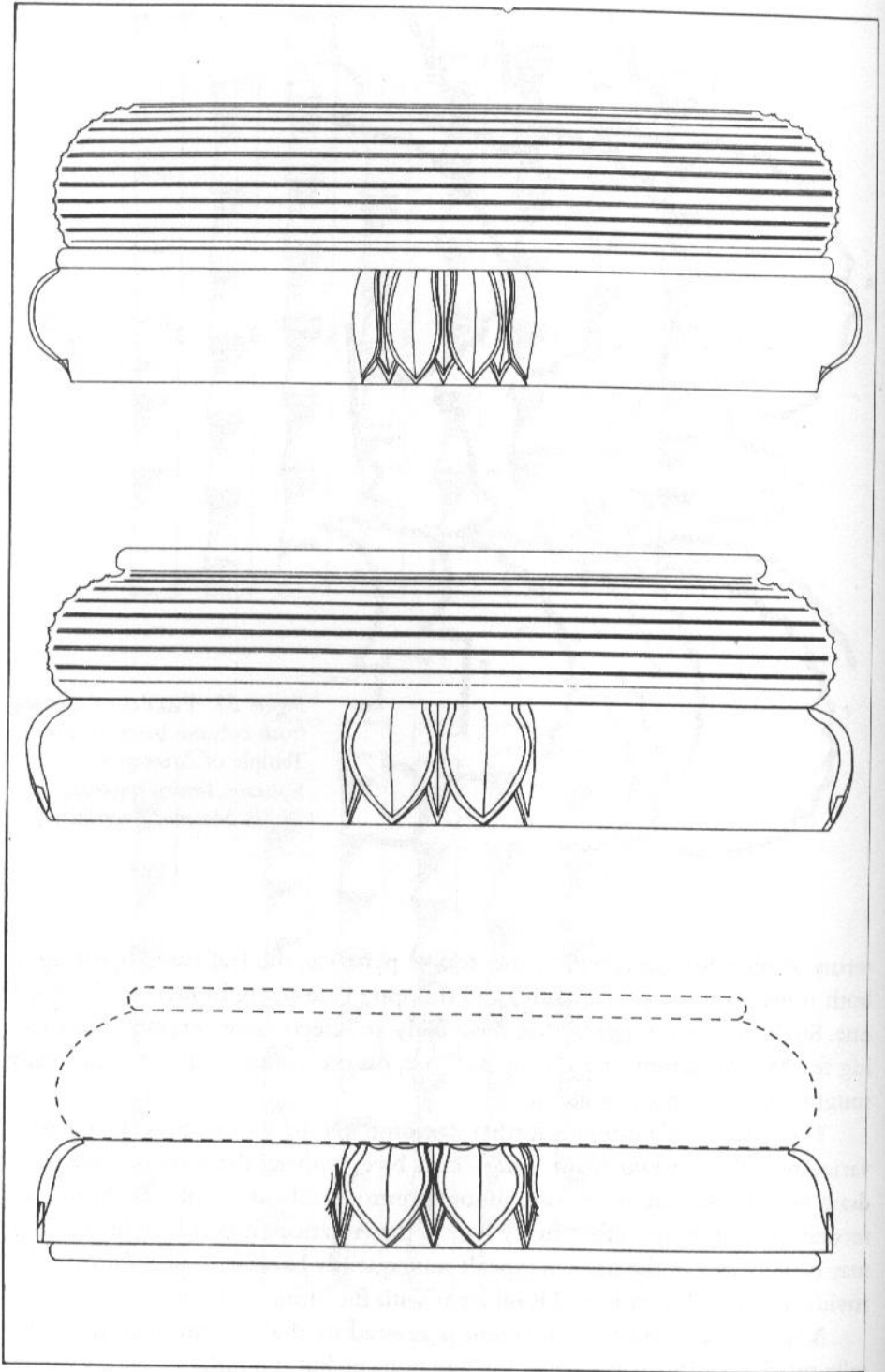


Figure 54. Reconstructed column bases with leaf drums, Temple of Artemis at Ephesos, according to Wesenberg, *Kapitelle*, fig. 278, reproduced by permission of B. Wesenberg.

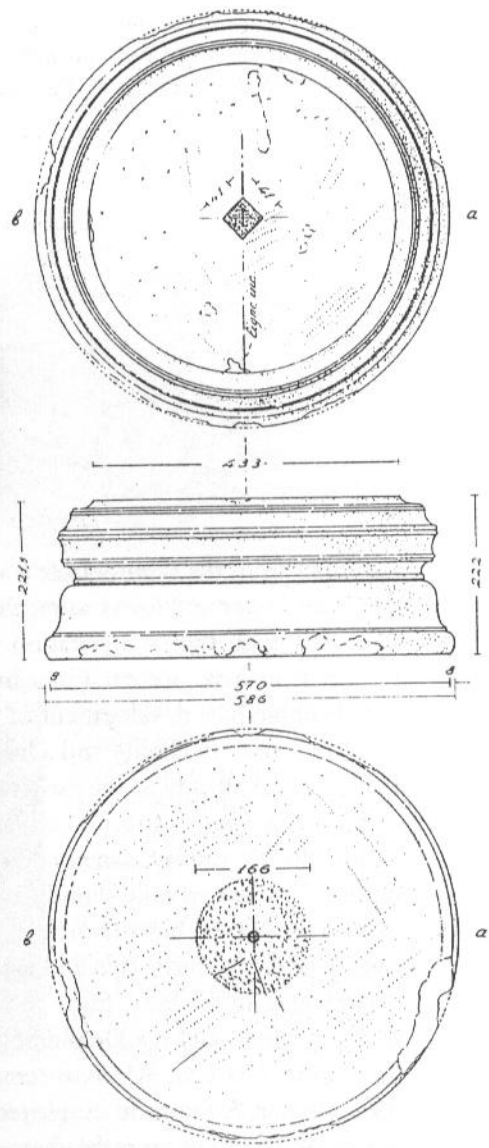
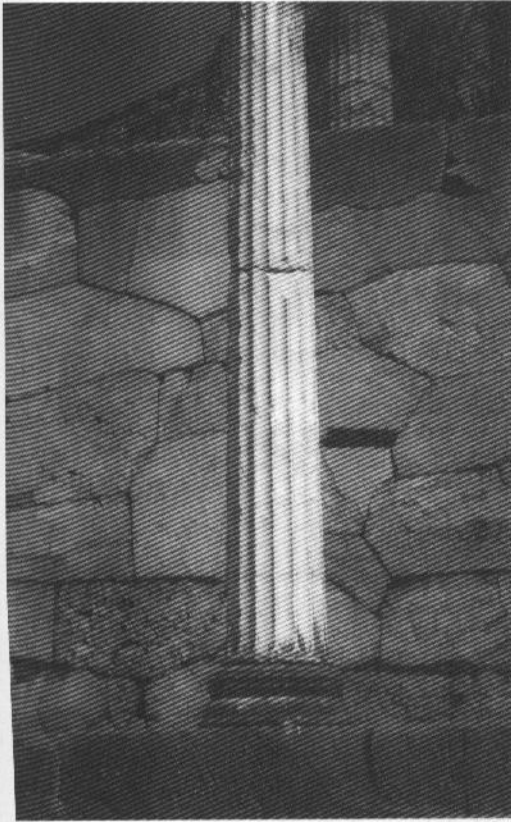
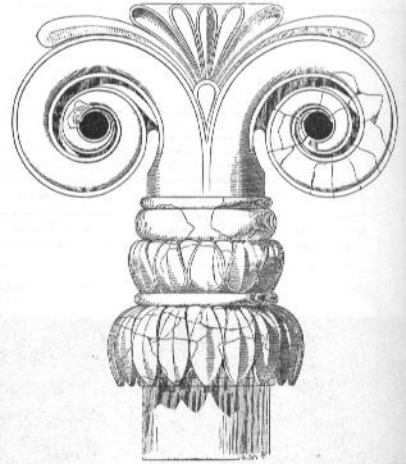


Figure 55. (a) Column base and shaft of the Athenian Stoa at Delphi (photo: author); (b) Column base, from P. Amandry, *FdD II: Topographie et Architecture, 5: La Colonne des Naxiens et le Portique des Athéniens* (Paris: de Boccard, 1953), pl. 24, reproduced by permission of the French School in Athens (École Française d'Athènes).

mine that astragals were lacking. They may also not have existed in the porch columns of the fourth Temple of Dionysos at Yria (ca. 580–570 B.C.): there was definitely no lower astragal, but too little evidence remains to be certain about the upper. On the other hand, both astragals are tentatively identified in a monument attributed to the same period, the Aigina Sphinx Column, and are certainly present by ca. 570 B.C. on the Naxian Sphinx Column at Delphi.¹⁸

Figure 56. Reconstruction of Aeolic column capital with leaf drums from Neandria, from R. Koldewey, *Neandria* (Berlin: G. Reimer, 1891) fig. 62.



Columns from the slightly later (ca. 560 B.C.) Temple of Artemis at Ephesos possess both upper and lower astragals, but the latter is executed more often on the base. Although the incorporation of astragals at the ends of the shaft thus does not seem to have occurred in a linear manner, it nevertheless generally follows the chronological development of the base.

Even more flexibility and a longer development exist for the column fluting. Flutes appear already in the earliest preserved shafts, but their number varies. One of the oldest series of stone columns, from the interior of the Naxian Oikos on Delos, already displays twenty-four flutes, as will become canonical. This same number is repeated only slightly later in the porch columns of the fourth temple at Yria on Naxos, but the interior shafts show differing numbers of flutes, from twenty-eight to thirty-two and even thirty-six.¹⁹ Other examples from the same period may differ even from these, such as the Aigina Sphinx Column with thirty-six flutes and the Delphi Sphinx Column, another product of Naxos, with forty-four. The later Rhoikos temple (Hera III) at Samos used forty flutes, and the Ephesian Artemision employed forty, forty-four, and forty-eight. Limestone pieces attributed to an early phase of the Temple of Apollo at Didyma show the unusual numbers of twenty-seven and thirty.²⁰ As in the decoration and size of their bases, it appears that these early buildings did not adhere to a "canon" in the number of flutes per shaft, nor even strive for uniformity within a single structure. Moreover, the flutes on early Ionic columns rose in points or arrises, as with their Doric counterparts. It was not until construction of the fourth, or Polykratean, Temple of Hera at Samos, begun ca. 530 B.C., that the sharp arris was replaced by the flattened fillet of "canonical" Ionic shafts.²¹

The Ionic capital likewise shows considerable variety and complexity in its development. Its form, with horizontally connected volutes over an ovolo echinus, was early on assumed to derive from the vertically rising volutes of the Aeolic capital (Fig. 56).²² As explained by J. Boardman, the need for a sturdy horizontal

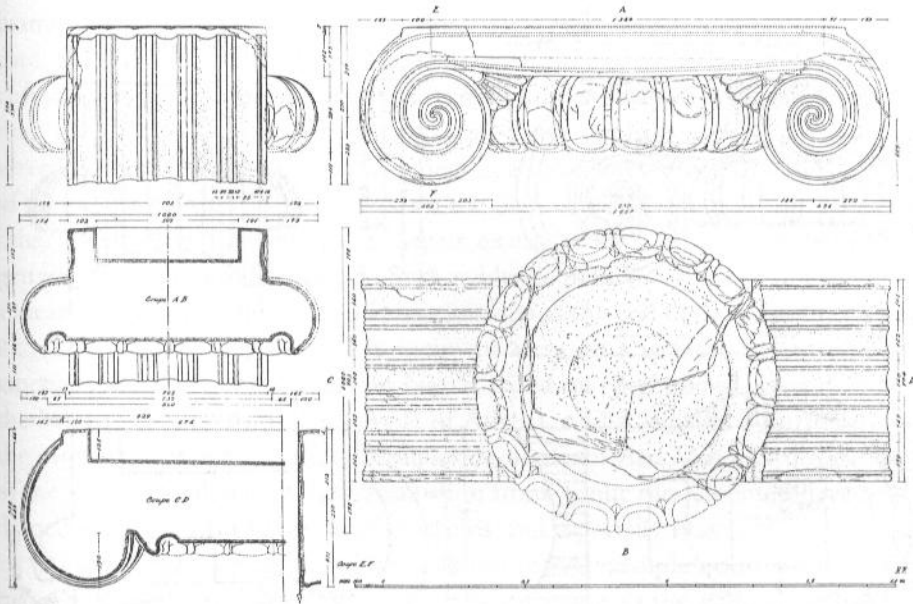


Figure 57. Capital of the Naxian Sphinx Column, Delphi: (a) reconstruction, from P. Amandry, *FdD II: Topographie et Architecture, 5: La Colonne des Naxiens et la Portique des Athéniens* (Paris: de Boccard, 1953) pl. XI, reproduced by permission of the French School in Athens (École Française d'Athènes); (b) detail (photo: author).

resting surface may have led Ionic architects to raise the center of the Aeolic design upward, thus spreading the volutes horizontally. Support for such a derivation is adduced from one of the earliest known examples of the Ionic capital, crowning the Naxian Sphinx Column at Delphi (Fig. 57). Although the crucial central area of this capital is not preserved, Boardman argues that its loss resulted from the fact that "there was something [in that area] to break away." There is, indeed, another sphinx capital, likewise perhaps a Naxian dedication but found on Delos, that has the central portion of the volute member interrupted by a floral element (Fig. 58).²³ The effect created by the horizontal termination of the canalis, however, is that the volutes appear to descend from the upper surface rather than to rise toward it in the Aeolic manner. More important, this feature does not appear on the earliest known Ionic capitals. Instead, the Sphinx Columns

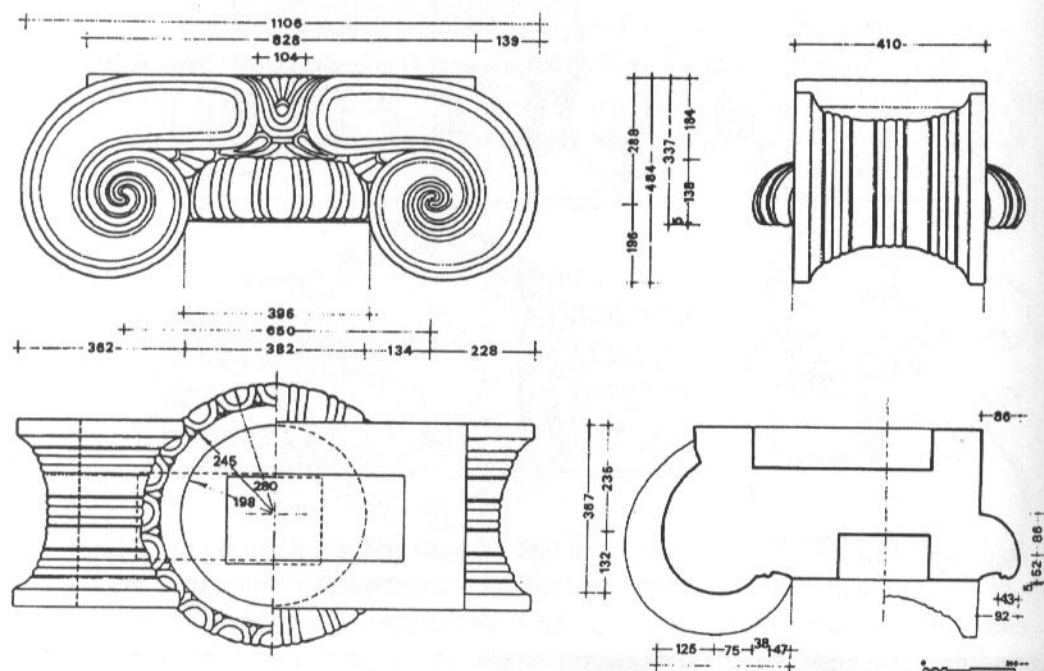


Figure 58. Capital of the Delian Sphinx Column, A583, from R. Martin, *BCH Suppl. I* (1973) 388, fig. 17, reproduced by permission of the French School in Athens (École Française d'Athènes).

at Delphi and Delos are usually dated ca. 570 and ca. 560 B.C., respectively, which is considerably after the initial appearance of the horizontal volute form. Finally, the interrupted canalis is also found on other Ionic capitals from the same period and geographical area (Naxos and Paros), but with a smooth surface (perhaps once painted) instead of a floral element. Such evidence suggests that the treatment of the canalis on the Delos, and perhaps also Delphi, Sphinx Column capitals represents a regional interpretation rather than an evolutionary stage.²⁴

Nevertheless, Ionic capitals do bear a similarity to Aeolic examples in that each seems to be composed of two distinct elements, a leaf torus that represents the termination of the cylindrical column shaft, and a rectilinear member, decorated with volutes, that serves as a transition to the beam above.²⁵ In Ionic capitals, those two elements are usually combined into a single piece, whereas in Aeolic, they are clearly separate. Because of this arrangement, considerable debate has focused on the precise reconstruction of the Aeolic capital, and in particular whether the two elements were actually used together. R. Martin has provided strong evidence, however, that at least in some cases the volute member rested above a leaf drum, while the latter could also appear separately as a second type of capital. In Ionic architecture, as well, there existed a separate leaf capital.

Although these two styles of capital thus reflect similar solutions, their relative chronologies speak against the derivation of one from the other. Because

many of the earliest Ionic capitals served a votive function, they are difficult to date. Scholars must rely primarily on proportions and style, but as already discussed for Doric examples, such evidence is often unreliable and even contradictory for this early period.²⁶ Particular problems apply to votive capitals that served as supports, since they must reflect in at least some way the shape and size of the object above.²⁷ Nevertheless, on the basis of stylistic factors and especially other architectural evidence, the earliest examples have been assembled into a general chronological framework. Such evidence points to a nearly simultaneous appearance of Ionic and Aeolic capitals in stone at the end of the seventh century B.C. The former is represented in incipient form on a votive column from the sanctuary of Demeter at Sangri on Naxos, dated on epigraphical grounds,²⁸ and the latter in capitals from the Temple of Athena at Old Smyrna.²⁹ Furthermore, the proveniences of the earliest examples do not favor Asia Minor as the initiator of the Ionic capital, where the transmission from Aeolic models could have readily occurred, but instead the Aegean islands, and especially Naxos.³⁰

Among Ionic capitals, in addition to the votive example noted from Naxos, two Cycladic capitals from Delos are argued to date to the end of the seventh century. An unfinished pillar capital found on the same island, but of uncertain attribution, may also belong before 600 B.C.³¹ By the first quarter of the sixth century, the Ionic capital appears in architecture, crowning the interior columns of the Oikos of the Naxians, again on Delos (Fig. 59). Despite attempts to date this capital later, in the second quarter of the sixth century, its generally accepted association with the Oikos and the date for that building derived on other grounds ensure its early assignment.³² The capital of the Sphinx Column on Aigina may belong to the same period (Fig. 60). Although this piece displays several unusual characteristics, especially the shape of its echinus, it nevertheless bears similarities to Cycladic examples in its concave volutes (although here very flat), the raised borders of their grooves, and the absence of an abacus.³³ Next within the evolution of the Ionic capital would fall those from the fourth Temple of Dionysos at Yria on Naxos, ca. 580–570 B.C., and in the following decade, the Naxian (Fig. 57) and Delian (Fig. 58) Sphinx capitals and their counterparts, discussed previously.

With the exception of the Aigina Sphinx capital, the origins of which are uncertain, all the earliest Ionic capitals are Cycladic. In addition, by far the majority are votive. The question then follows whether the Ionic capital originated for votive use. This is the conclusion of W. Kirchhoff who, in noting the overwhelming votive associations of early monumental capitals, traced their background in small-scale supports, such as the late seventh-century column from Sangri, which he derived in turn from the placement of a rectangular plinth above the torus-crowned cauldron stand.³⁴ Other scholars favor an architectural origin, including G. Gruben and A. Ohnesorg, who have reconstructed the evolution of the capital from a simple transverse beam crowning a column or post.³⁵ They explain the priority of votive over architectural columns as resulting from

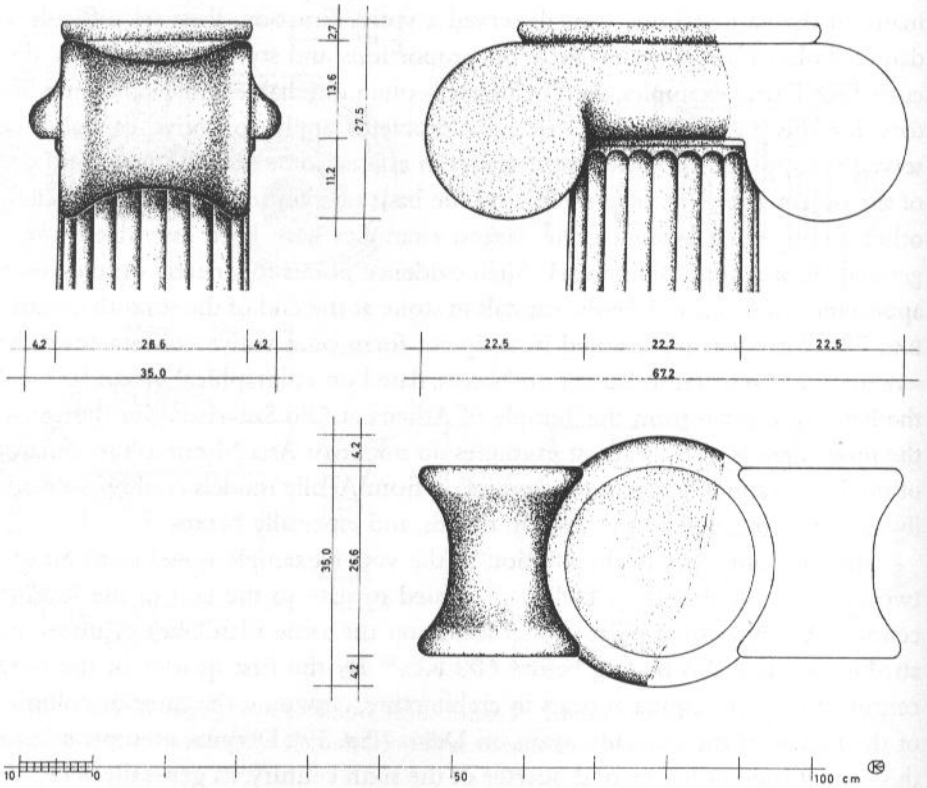


Figure 59. Reconstructed interior column capital of the Oikos of the Naxians on Delos (by G. Kaster), from A. Ohnesorg, "Votiv- oder Architektursäulen," in E.-L. Schwandner, ed., *Säule und Gebälk* (Mainz am Rhein: P. von Zabern, 1996) 40, fig. 1, reproduced by permission of A. Ohnesorg.

the development of stone sculpture in the seventh century and its elevation on votive supports. To carry the heavy load, it became necessary to "petrify" the column as well. Meanwhile, supports serving an architectural function continued to be constructed in wood and therefore do not appear as early in the archaeological record.

The question of a wooden origin for the components of the Ionic, as well as Doric, orders will be explored later. Here it is appropriate to consider the debate of votive versus architectural functions as the motivation behind the creation of the capital. As both sides admit, clearly the archaeological evidence favors the priority of votive capitals. One must therefore ask whether it is likely that already existing forms were "translated" into stone as supports for votive objects. This theory supposes a "petrification" from the top down, but would not the placement of a stone capital on a wooden shaft raise the same difficulties as that of a stone votive on a fully wooden column? Thus, if the introduction of stone sculp-

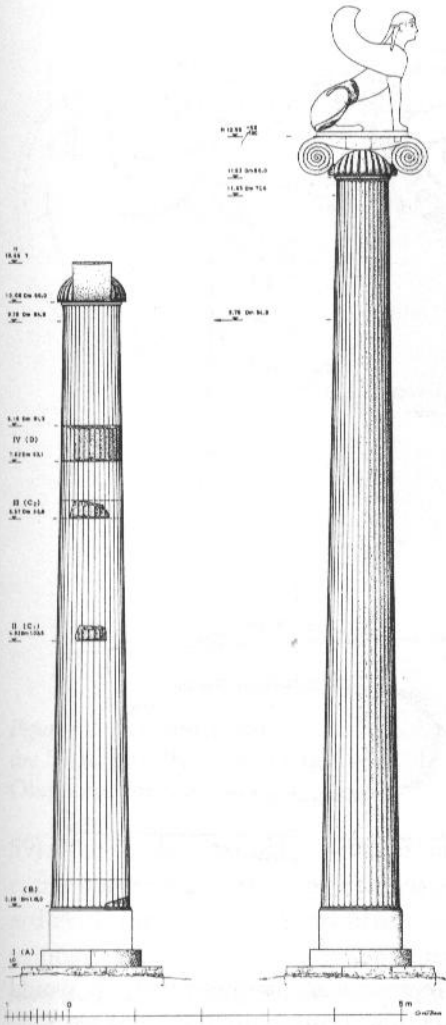


Figure 60. Reconstruction of the Sphinx Column on Aigina, from G. Gruben, "Die Sphinx-Säule von Aigina," *AM* 80 (1965) pl. 3, reproduced by permission of G. Gruben.

ture did indeed precipitate the petrification of the column, we should expect it to have done so completely.

Early votive columns, such as that of the late seventh century from Sangri (Fig. 61), may be of particular importance for this issue. Caution should be exercised in extrapolating evidence from votive capitals to architectural ones, as well as in moving from small-scale examples such as this to monumental ones. Yet, as Gruben argues, this piece may provide testimony of an early stage in the evolution of the Ionic capital. It differs from typical examples in the echinus, which appears as a continuation of the smooth shaft that expands in diameter to form a torus. Gruben explains this thickening of the shaft as an attempt to provide additional support for the transverse beam. At this point the "echinus" is undecorated, but the "beam" is rendered by incision as a volute member and the juncture between these two components is marked by a single petal.

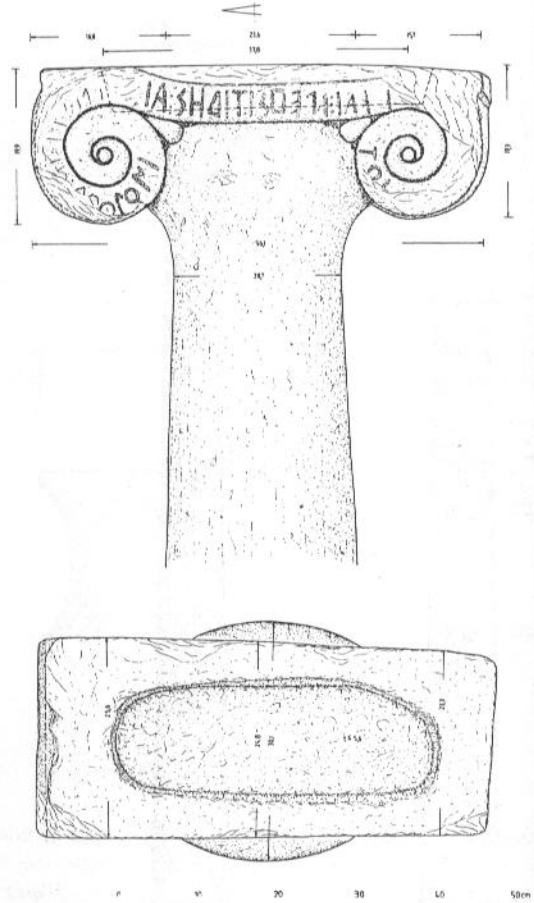


Figure 61. Votive column from Sangri, from G. Gruben, "Das älteste marmorne Volutenkapitell," *IstMitt* 39 (1989) 162, fig. 1, reproduced by permission of G. Gruben.

If this unusual echinus does, indeed, represent an incipient form, it would suggest that even in the late seventh century, the Ionic capital was not yet fully developed. In favor of that view is the diverse representation of the echinus in other early capitals. Thus, in the Aigina Sphinx Column the echinus takes the profile of a quarter round, as opposed to the slightly later hawksbeak or "typical" ovolo (Fig. 60). More important, since it is only slightly wider than the diameter of the column, it appears to merge directly into the shaft, rather than resting on it. Here the echinus is positioned so low in relation to the bolster that the lowest point of each is in the same plane. The result is that the echinus becomes a semi-spherical termination for the shaft, on which is applied a visually and formally distinct volute member. This effect is enhanced by the depiction of leaves or eggs in low relief on the echinus that, while wider than the flutes, mimic their vertical lines. As in the Sangri capital, this example would point to the emergence of the echinus as a continuation of the shaft.

A different approach, however, is represented by the earliest architectural capital, from the interior colonnade of the Oikos of the Naxians on Delos (Fig.

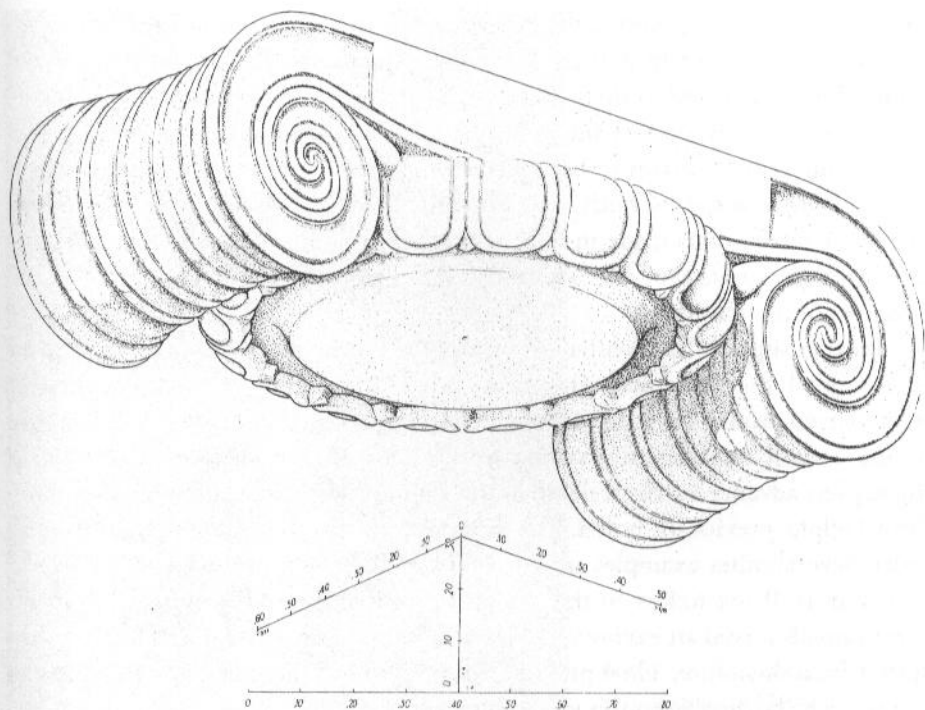


Figure 62. Reconstructed column capital, porch of the fourth Temple of Dionysos at Yria (by M. Korres), from Ohnesorg, "Votiv," 43, fig. 3, reproduced by permission of A. Ohnesorg.

59). The single remaining specimen of this series is poorly preserved, missing an entire bolster and part of the echinus as well as much of its original surface. Nevertheless, the face shows no plastic articulation and was likely only incised or painted. According to the reconstruction published by Ohnesorg, the echinus now acquires a more pendulous profile, with its greatest diameter just above the shaft. This fact, along with the fluting of the shaft below, emphasizes its distinction from that member. At the same time, the paucity of surface treatment makes it appear to merge into the canalis above.³⁶

This diversity in the relationship and treatment of the echinus in the earliest extant capitals suggests that the form had not yet crystallized. That event seems to occur with the adoption of the strongly projecting and undercut leaf ring on capitals from the fourth Temple of Dionysos at Yria on Naxos (Fig. 62) and those from the succeeding Naxian (Fig. 57) and Delian (Fig. 58) Sphinx Columns, thus between 580 and 560 B.C. Even after this date, variations occur, notably in the unusual double tier arrangement on the echinus of the Cyrene Sphinx Column from the mid-sixth century.³⁷

The fact that the echinus was still in the process of formation during the late seventh and early sixth centuries may suggest that we are witnessing the experimentation that accompanies the development of a new form. This would argue against a history for the Ionic capital in wood and suggest instead that the exam-

ples cited are probably among the earliest in any material. Furthermore, although our evidence is severely limited, it would seem that the forms of these initial echini differ according to their function. That is, in the votive capitals, the echinus is more closely tied to the columnar support, while in the example cited from architecture, it seems to be linked to the member above. Only later does it assume a single shape for both uses. Thus, the Ionic capital may owe its development to contributions made in both contexts, although the chronological priority of votive capitals in the archaeological record would favor them as the initiators of the tradition.

Further support for a votive origin may be found in the second, rarer type of Ionic capital, the leaf crown. It consists of an abacus above a rounded member with convex profile, the latter decorated with carved or painted leaves. What may be the earliest representative comes from Delos. Its leaf element is considered slightly less advanced stylistically than the echinus of the Naxian Sphinx Column from Delphi previously noted.³⁸ A date around 575 B.C. may therefore be in order. Several other examples are known from elsewhere in the Cyclades, two of which, from Paros, follow in the second quarter of the sixth century.³⁹ Initially, these capitals served an exclusively votive function; only around 530 B.C. do they appear in architecture. They provide clear testimony, then, of the willingness of architects to borrow from the votive sphere.

At the same time, the absence of a distinct form for the echinus in its earliest appearances undermines Kirchhoff's theory that the Ionic capital derived from already established supports. Having served as a capital in its own right, the echinus would surely have been transferred to the new, composite creation. Artists may have drawn inspiration from votive supports in both small and large scale, but the evidence speaks against the imitation of any established model. Rather, as outlined here, the capital probably arose from the structural necessities of providing support to a sculpture and, perhaps only slightly later, to the upper members of a building.

Current evidence places the origin of the Ionic capital in the Cycladic Islands. Its adoption in east Greece seems to occur somewhat later. The first monumental temple in this region is the Rhoikos Heraion at Samos, dated ca. 570 B.C. Although it clearly possessed stone column bases and shafts, no capitals are preserved. These, as well as the entablature, are generally assumed to have been of wood. Thus, even by the beginning of the second quarter of the sixth century, the Ionic capital may still not have been common in stone.⁴⁰

The appearance of the capitals from the Rhoikos Heraion is debated.⁴¹ Most reconstructions favor the canonical arrangement of a volute element over an echinus, at least for some of the columns. Such a combination was known in Samos by this time, to judge from the relief representation of columns on a stone sarcophagus from the island (Fig. 63).⁴³ While the volute member is assumed to have been executed in wood, several scholars, beginning with Gruben, have suggested that the echinus was of stone and can be identified in some of the extant toruses. This

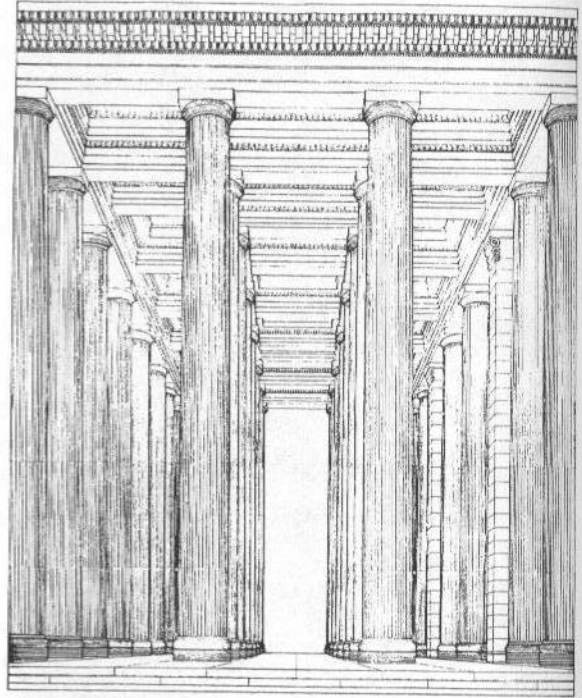


Figure 63. Sarcophagus from Samos (photo: Deutsches Archäologisches Institut-Athen, neg. no. Samos 5251).

would account for the large number of such elements, considered too numerous to have served in all cases as part of the base, as well as the variations in their profiles, with some closer to the ovolo of the Ionic echinus.⁴³ Gruben has further hypothesized the existence of two different types of capitals: those consisting of a torus with square abacus above would have crowned columns inside the temple and within the inner row of the peristyle, while toruses bearing volutes would have appeared in the outer line of the peristyle. H. Walter has entirely eliminated the volute element, reconstructing the torus and crowning abacus throughout the temple (Fig. 64). As noted previously, the toruses were given a variety of treatments, but all consisted of horizontal bands. If these served in capitals, they would be far different in shape and decoration from the undercut leaf or egg motif on contemporary Cycladic, as well as "canonical," echinuses. They would not, however, be without parallel, as demonstrated by two recently discovered volute capitals from Didyma.⁴⁴

The first confirmed architectural use of the volute capital within an east Greek context can be placed slightly later. Two temples, each dated in the decade 560 to 550 B.C., apparently employed the volute form, but in different ways. The Temple of Artemis at Ephesos, traditionally assigned to this period because of its association with Kroisos, is often assumed to have had two variations of the capital, with the volute in one case terminating in a spiral and in the other overlain

Figure 64. Reconstruction of the Rhoikos Temple of Hera (III) at Samos with torus capitals, according to H. Walter, *Das griechische Heiligtum, dargestellt am Heraion von Samos* (Stuttgart: Urachhaus, 1990) fig. 140, reproduced courtesy of H. Walter.



Hera-Tempel, Rekonstruktion. 560 v. Chr. Höhe der Säulen etwa 10,3 m

with a rosette.⁴⁵ Another early example of the volute member may appear at Naukratis, in the Temple of Apollo, dated ca. 566 or to the mid-sixth century.⁴⁶ Although Herodotos (II, 178) notes that the Milesians were responsible for this temple, its artistic connections with Samos are much stronger.

Very little is preserved of the temple at Naukratis. Only two fragments of the capitals were ever recovered, a portion of the echinus with leaf decoration and part of a volute (Fig. 50). The latter was destroyed immediately, but W.M.F. Petrie offered a conjectural drawing of it with its own echinus placed above the fragmentary leaf member. The uppermost drum of the shaft, with a bead and reel crown, appears below. In addition to these elements, Petrie also found fragments of a lotus necking that he suggested must belong to "another column." Whether Petrie was referring to another column of identical form but with floral necking instead of a bead and reel is unclear, but it is possible that there are actually two types of columns represented by these remains, one with a floral necking and volute crown and another terminated by the leaf echinus above a smaller bead and reel.⁴⁷ Each type might then correspond to a separate base, either the conical drum or the torus and disc.

Two different types of Ionic capitals were likewise executed for the Polykratean or fourth Temple of Hera on Samos, begun around 530 B.C. (Fig. 65).⁴⁸ Those within the building and the inner row of the peristyle are identified by Gruben as being of the leaf crown type, which could be viewed equally from all sides, while those of the outer peristyle possessed the characteristic two-sided volute

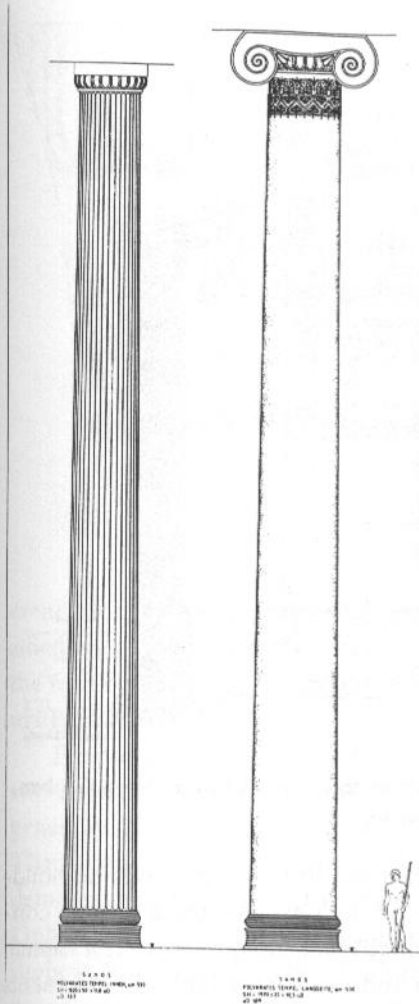


Figure 65. Reconstructed interior and exterior columns of the Polykratean Temple of Hera (IV) at Samos, from Gruben, "Un-Ordnung," fig. 17, reproduced by permission of G. Gruben.

member above the echinus. Because the building was constructed in phases over a long period of time, only Gruben's leaf capitals would seem to date to the Archaic period. Volute members may have been executed during this initial phase, as also later, but perhaps never put in place.⁴⁹

Around 530 B.C., the rounded leaf capital appears in Cycladic architecture. It is certainly attested in the Temple of Demeter and Kore at Sangri and perhaps in that of Apollo near the harbor, both on the island of Naxos.⁵⁰ At Sangri, these capitals bore painted rather than carved decoration, in accord with Island-Ionic traditions. Yet they were used in a location comparable to that of the Samian examples, that is, in the front porch and interior of the building (Fig. 66). In the Apollo temple, Gruben reconstructs leaf capitals above the in-antis porch columns and volute capitals in the peristyle, thus following an arrangement similar to that at Samos.

We have already noted that the leaf type capital seems to have originated for use in votive columns. This likely occurred in the Cyclades, to judge from its ini-

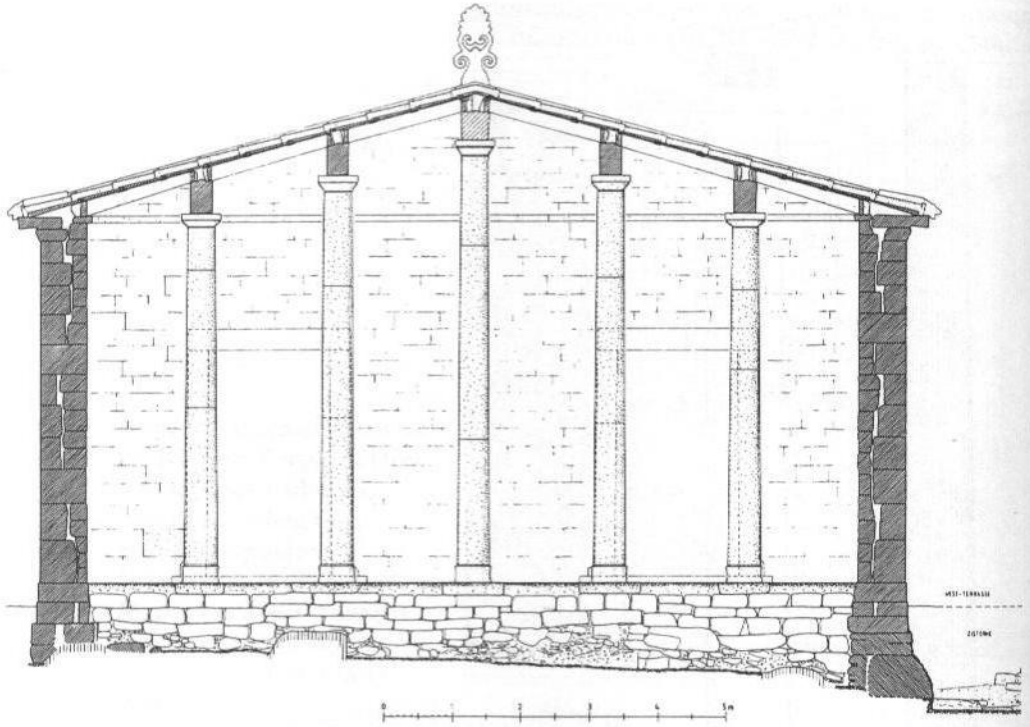


Figure 66. Section through interior room of Temple of Demeter and Kore at Sangri, from Gruben, "Un-Ordnung," 71, fig. 12, reproduced by permission of G. Gruben.

tial distribution. Less clear is when and where it was first incorporated into buildings, since the earliest architectural examples of the type are approximately contemporary in date. If the fragment from Naukratis indeed represents a leaf capital, this event may have occurred in Asia Minor and, as suggested by other elements of the temple, specifically in Samos. In fact, both Martin and Gruben have noted a parallel between the Ionic leaf capital and the leaf drum of Aeolic architecture.⁵¹ Perhaps the presence of leaf supports elsewhere in Asia Minor, combined with the desire for a rounded interior capital, as hypothesized already for the Rhoikos Heraion, led to this adaptation. In that case, each of the two regions of the Ionic world would be responsible for the introduction in architecture of a particular capital, the volute type in the Cycladic Islands, and the leaf or egg crown in Asia Minor. Even so, the leaf type would have appeared too late and in the wrong location to have served as the basis of Vitruvius's claim of east Greek priority in the development of the Ionic order.

As with the column base, the capital continued to evolve along regional lines. By the late sixth century B.C., a type appears in western Greece that, by its unique combination of traits, may be a local invention. In any case, it continues to be used in the West and becomes characteristic of this region.⁵² During the same period, Athens begins to produce its own form of capital, which is fully developed by the mid-fifth century. It differs from canonical examples in its pref-

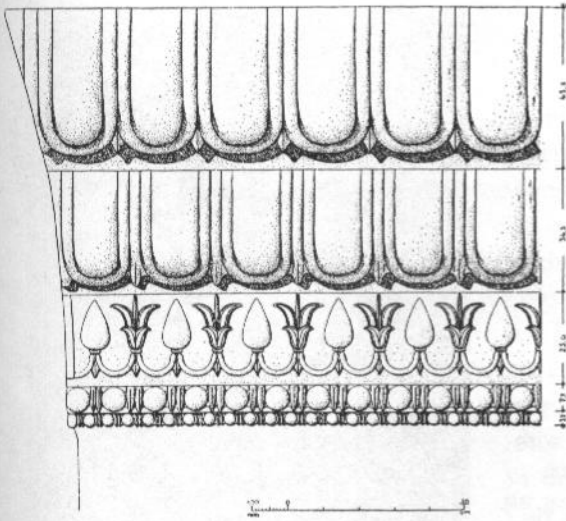


Figure 67. Crown of northwest anta wall, Rhoikos Altar, Samos, from H. Schleif, "Der grosse Altar der Hera von Samos," *AM* 58 (1933) 188, fig. 11, reproduced courtesy of the German Archaeological Institute (Deutsches Archäologisches Institut), Athens.

erence for paint over relief and its two-tiered echinus. So closely was this type allied with constructions in Attica and with Athenian buildings elsewhere during the fifth century B.C. that E. P. McGowan believes it had become by then a hallmark of Athenian style.⁵³

Regional distinctions exist as well for the Ionic anta capital, which assumed two different forms. In contrast to Doric temples, in Ionic buildings the anta was generally not wider than the wall. The term refers, then, simply to the wall-end. That it was considered a part of the wall, and not an independent element, is demonstrated by the continuation of the wall base moulding around its foot. Only the crowning capital distinguished it from the wall and defined its role as a support for the entablature.⁵⁴ Typically, that capital consists of three superimposed rolls on its face and a cavetto profile for the sides. The rolls may be left smooth and painted, or carved with decoration. A series of volutes, each corresponding to a roll, appears on the lateral faces. This two-sided decoration is consistent with the oblong plan of the capital.

The same form may be used for the crowning of the side-walls of altars. In fact, capitals of buildings and altars are so similar in appearance that, when found out of context, their attributions are often difficult to determine. In his examination of Archaic anta capitals, W. Hahland even speculated that the type may have originated for an altar, specifically Altar VII at the Samian Heraion, built around 600 B.C.⁵⁵ That suggestion has now found support in H. J. Kienast's reidentification of a fragment from the sanctuary as part of an anta capital, which on the basis of size is assigned to a pre-Rhoikos phase of the altar.⁵⁶ The type is further recognized, but not always with certainty, in a series of structures on Samos dated to the second quarter of the sixth century B.C., beginning with a fragment attributed to the Rhoikos Heraion, and followed by the original capitals from the Rhoikos Altar (VIII) (Fig. 67) and a complete piece perhaps from Temple A (Fig. 68).⁵⁷ It may be



Figure 68. Anta capital associated with Temple A, Samos (photo: Deutsches Archäologisches Institut-Athen, neg. no. Samos 2195).

adopted next in the Temple of Artemis at Ephesos, although some question has been raised here as well.⁵⁸ Because of the uncertainty of these identifications and associations, the original context of the Ionic anta capital cannot be firmly established. Yet the evidence previously cited would seem to favor an origin in altars and a transmission to temples perhaps through the Rhoikos Heraion, since it and its altar were presumably designed by the same architect and at least planned, although not executed, simultaneously.

A.D. Brockmann derives the anta capital from the cavetto form, to which are applied the kymatia or rolls at the front. These rolls initially take the form of a leaf overfall, perhaps inspired by metal examples. The lateral volutes are considered secondary, since in early capitals, as from the Rhoikos Altar, they may be undercut at the base as a continuation of the front profiles.⁵⁹ The fragmentary state of the earliest capitals, and the problematic identification or attribution of several, make it difficult to assess these claims. As already noted, Kienast places a newly discovered piece at the beginning of the series. It bears an unusual decoration consisting of a scale pattern. What may be the next example is preserved only in part of a volute. Its date is based on its assignment to the Rhoikos Heraion, which in turn rests on its large size and concave rendering. The Ephesian capital is likewise fragmentary, although two faces have been identified, one with a volute and the other with an "egg-and-tongue" moulding. The Rhoikos Altar antae are better known, but largely through Roman reconstructions, which cannot be relied on for details. Nevertheless, they may suggest the continued use of ornament on the rolls, egg-and-dart on the upper two and an anthemion decoration below, while the volutes on the sides are clearly undercut. Only the anta capital assigned to Temple A (Fig. 68) provides good testimony for these early

forms, assuming that its association and thus date are correct. Its rolls are smooth and fully round, with no undercutting at their bases or on the corresponding volutes.

The Rhoikos Altar capital therefore provides the strongest evidence for Brockmann's derivation of the face from superimposed leaf mouldings. One might then account for the decoration of the Ionic anta capital largely as a counterpart to that of the column capital, with one or more leaf toruses and volutes on each. This association is reinforced by the similar evolution of the kymation, or roll, and the echinus, both of which move over time from an undercut round to an ovolo profile and correspondingly from a leaf- or tongue-and-dart to the more tapered egg-and-dart motif. Yet the undercut profile may have a particular function in the Rhoikos Altar. A recent reconstruction of that monument places a hawksbeak crowning with its leaf-and-dart face directly above the anta capitals and explains the undercutting of the rolls on the capital as a reflection of the moulding above. As Kienast points out, such an arrangement leads to a gradual increase in the amount of undercutting in each moulding from bottom to top.⁶⁰ A further suggestion that the Heraion altar capital may not be representative arises from the example assigned to Temple A. Despite its presumed early date, it provides no indication of a background in leaf mouldings in either its shape or decoration. Thus, as attractive as Brockmann's hypothesis may be, it cannot be proven on the basis of extant evidence.

At one point, Martin suggested that the earliest Ionic anta capitals bore a smooth face, while the later ones adopted carved ornaments.⁶¹ From the pieces just discussed, the opposite would seem to be true: among the initial examples, only that attributed to Temple A displays smooth rolls. An explanation may lie in its relatively small size, only slightly over 0.50 m in height. Smooth rolls appear as well in a series of small altar crowns from Didyma, whereas capitals from a large altar at the same site exhibit rolls decorated with relief. The presence or absence of ornament in the Ionic anta capital may therefore be more a factor of size than date.

Our evidence thus suggests that the "canonical" Ionic anta capital is a product of southern Asia Minor, with likely origins in Samos, and that its basic form, if not also decoration, was established by the middle of the sixth century B.C. A further refinement occurs at the end of the century, with the addition of a crowning fascia and the transference of the anthemion band to the central roll, in the large altar capital from Didyma. This form becomes the model for later buildings.⁶² It is also diffused to northern Asia Minor, where it is adopted only slightly later but with variations. A pilaster capital from Larisa, dated ca. 500 B.C., shows a similar form with two rolls, while an anta capital from Chios, of the second quarter of the fifth century, has only one. In both, the abacus is articulated in two fascias.⁶³

Another, less well known, type of Ionic anta capital also emerged in the Archaic period, specifically in the second half of the sixth century. It resembles

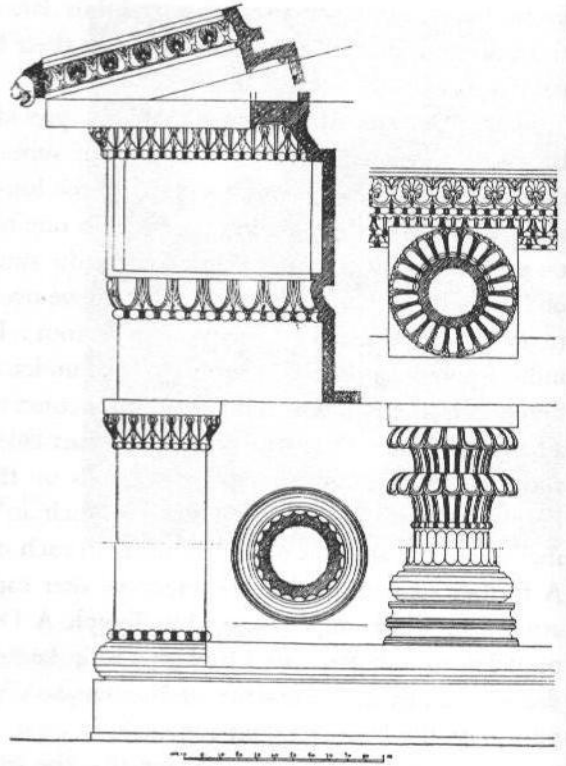


Figure 69. Reconstructed elevation, Treasury of Massalia at Delphi, from D.S. Robertson, *Greek and Roman Architecture* (London: Cambridge University Press, 1974) 102, fig. 46, reprinted with the permission of Cambridge University Press.

the Doric capital in bearing the same decoration on all three sides, a moulded profile crowned with an abacus. Yet here the moulding takes a rounded form, rather than the Doric hawksbeak, and the capital is symmetrical in plan, as a reflection of the unenlarged anta. The profile is generally a cyma reversa, decorated by a Lesbian leaf motif. Four buildings are known to have had this type of capital: the Delphic Treasuries of Massalia (Fig. 69) and Siphnos, dated ca. 540 and 525 B.C., respectively, a temple at Koressia on Keos, placed generally in the second half of the sixth century, and that of Demeter and Kore at Sangri on Naxos, ca. 530 B.C.⁶⁴ A variant of this type also appears in two capitals of western Greece, one from a small building at Gela in Sicily (end sixth century) (Fig. 70) and another of unknown use at Metapontion in southern Italy (undated), where the moulding is an ovolo carved with egg-and-dart.⁶⁵

The similarities noted between these capitals and their Doric counterparts led to the initial assumption that they were developed under Doric influence, and, on the basis of geographical distribution, perhaps in Delphi itself.⁶⁶ Yet Gruben argued for a Cycladic origin, as in other characteristics of the Delphic treasuries.⁶⁷ His hypothesis has subsequently found support through the discovery of examples in Cycladic territory. Although these are unlikely to be earlier than the Delphic capitals, the weight of evidence points to a Cycladic origin.

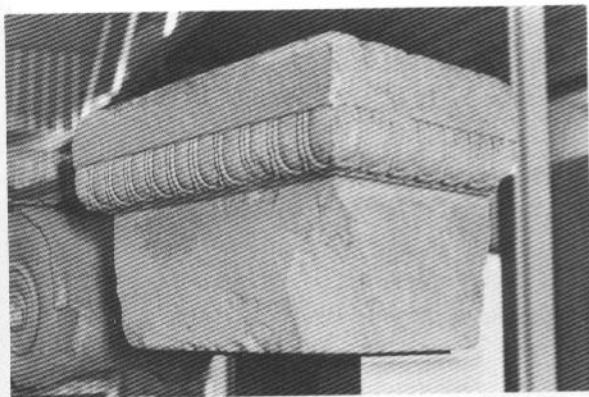


Figure 70. Ionic anta capital from Gela (photo: author).

The Cyclades, especially the island of Keos, were located close to mainland Greece and during the second half of the sixth century exhibited an increasing "Doricization" of their architecture.⁶⁸ This new type of anta capital was probably part of that development, which, in its transmission to the West, represents a true "exchange" of ideas.

Both column and anta capitals were crowned by the architrave or epistyle. In its canonical Ionic form, this member is articulated by a series of smooth fascias, or horizontal bands, in a stepped arrangement. The earliest extant Ionic architrave is already of this type and comes from the eastern porch of the Naxian Oikos on Delos, dated ca. 560 B.C. In this case there are only two fascias, in contrast to the three bands of Eastern-Ionic architecture. Also unusual are the disparate heights of these bands, with the upper, projecting member less than one-half the height of the lower.⁶⁹ The overall effect of this arrangement is thus of a smooth architrave with a crowning fillet.

East Greek buildings of this same period are lacking any remains of the architrave. In the case of the Rhoikos or third Temple of Hera on Samos, this member is assumed to have been of wood, while the Temple of Artemis at Ephesos is thought to have used marble for the epistyle, but it is no longer preserved.⁷⁰ An architrave is known from the Knidian treasury at Delphi, datable as early as ca. 560–550 B.C.;⁷¹ however, the relationship of this building to east Greek architecture is problematic. Although dedicated by Knidos, a city on the coast of Asia Minor, its close resemblance to the other (later) Ionic treasuries at Delphi may place it in a special category. As in those buildings, its architrave is smooth.

It is thus only with the Temple of Apollo at Didyma, begun around 540 B.C., that we have certain evidence of an Eastern-Ionic architrave (Fig. 71).⁷² Here the remains seem to represent two different types: an entirely smooth band on the south and east sides, and a triple-fascia architrave on the north and west. Based on the renderings of the gorgons decorating the respective corners, Gruben has proposed an earlier date for the smooth (SE) epistyle than for its companion. The

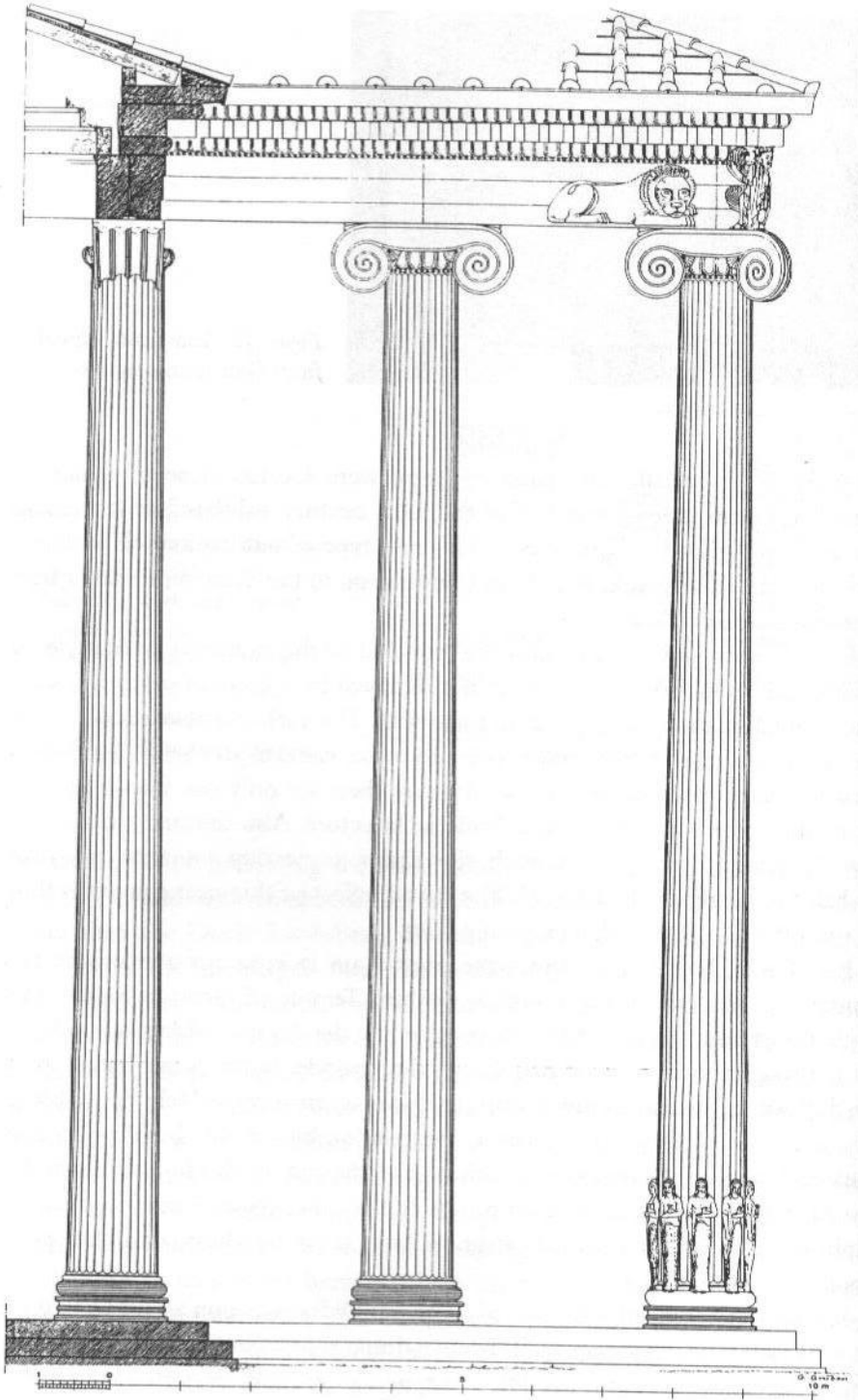


Figure 71. Reconstructed elevation of the archaic Temple of Apollo at Didyma, from G. Gruben, "Das archaische Didymaion," *JdI* 78 (1963) fig. 39, reproduced by permission of G. Gruben.

fascias would then represent a later development. An alternative reconstruction, recently proposed by T. G. Schattner, would place the block with smooth background in a frieze course, leaving the three-fascia architrave throughout.⁷³ This arrangement is apparently motivated primarily by a slight difference in height between the two blocks, with that assigned by Schattner to the frieze being 1.5 cm taller. Yet such a difference seems insignificant in a member over 90 cm high, especially when the corner gorgon of the smaller block continued into the next course. Moreover, such a frieze would be unparalleled in both its overall size and its subject matter.⁷⁴ On present evidence, Gruben's reconstruction appears more likely.

Nevertheless, his interpretation contrasts with the once-accepted explanation of the Ionic banded architrave as a translation into stone of horizontal wooden beams.⁷⁵ Rather, it raises the possibility of another explanation, perhaps related to size. In buildings of smaller scale, such as the Delphic treasuries, a smooth treatment seems to be preferred. With larger buildings, and thus epistyles, the architect may have felt the need to enliven the surface. In addition to the gorgons, flanking lions appeared on the two diagonally opposed corners of the Didymaion architrave. The only other extant epistyle from an Archaic east Greek temple, the Doric Temple of Athena at Assos (ca. 530–520 B.C.), bears a continuous frieze. These examples have led Gruben to hypothesize that relief sculpture may have been a characteristic of this member.⁷⁶ Fascias might then be another example of such decoration.

The geographical separation between Island- and Eastern-Ionic already noted in several components of the order extends especially to the area above the architrave. In the former style, that position is typically occupied by a frieze course. A distinction must be made here in the meanings of the word "frieze." When applied to the course, it refers to the member placed within the entablature in a comparable location to the Doric frieze. The term may also designate a continuous band of sculpture, which in Ionic architecture can appear in a number of locations: on walls, around columns, on the architrave, on the frieze course, and even on the roof. The sculptured frieze tends to be more characteristic of the Eastern-, than the Island-, Ionic tradition.

The frieze course is identified already in one of the initial examples of Ionic architecture, the early sixth-century Oikos of the Naxians on Delos (Fig. 43).⁷⁷ Its purpose is assumed by Gruben to be essentially functional, that is, to mask the ceiling beams on the exterior of this fully stone building. Additionally, it acts as a leveling course for the roof. The Oikos was constructed on sloping ground. To compensate for this, the lower edge of the frieze rises toward one (east) end, while its upper edge remains horizontal. The course is constructed of a series of undecorated plaques of differing sizes placed on end. Below them, Gruben reconstructs a line of marble blocks that extend farther into the wall and thereby form a termination for the granite wall and a support for the frieze. These blocks appear on the exterior as a fillet, which serves as a functional predecessor of the

later kymation. Perhaps because of their functional origin and use, subsequent Cycladic entablature friezes tend also to be undecorated.

This member is next recognized by an extant moulding that presumably crowned it in the fourth Temple of Dionysos at Yria, ca. 580–570 B.C. (Fig. 47).⁷⁸ The course is certainly present in the porch added to the east front of the Oikos of the Naxians on Delos ca. 560 B.C.⁷⁹ Around this same time, the entablature frieze may have been transmitted to Asia Minor and embellished with relief, if the assumed position of the single sculptured slab from Iasos is correct.⁸⁰ Sculpture may also have decorated the frieze course of the Knidian treasury at Delphi, as those of the subsequent Treasuries of Massalia, Siphnos, and Klazomenai. Although these buildings are dedicated by cities in disparate parts of the Greek world, they are united by several characteristics that are associated by Gruben with the Cycladic architectural tradition. Their use of sculpture, on the other hand, may be a factor of their relatively small size, the ornamental proclivity of this type of building, their geographical location in a truly pan-Hellenic sanctuary, or even influence from the highly decorated temples of east Greece.⁸¹ In the Islands, the plain frieze course is further identified in the Temple of Demeter and Kore at Sangri on Naxos and in Temple A on Paros, both dated ca. 530 B.C.⁸² Not only in its origins but also in its subsequent use, the entablature frieze is thus very much a product of the Cyclades.

Although the sculptured frieze found no “canonical” location in Eastern-Ionic architecture, it was a distinctive component of this tradition, so much so that it appeared in all the major stone temples built in Asia Minor during the Archaic period.⁸³ In addition, structures in perishable materials, particularly those of small scale, may be enlivened by terracotta relief friezes.⁸⁴ A short survey of examples is thus warranted. Perhaps the earliest appearance of the frieze occurs around 675 B.C. in the Hekatompedon (II) at Samos, if the poorly executed design on a wall block is accepted as the remains of such.⁸⁵ The block preserves only the heads and spear points of three warriors; their bodies, and any companions, would have been completed on other courses. The location of this frieze on the temple is uncertain. E. Buschor placed it within the hypothetical pronaos, which would correspond to the presumed location of two later Samian friezes, that associated with the Temple of Aphrodite and Hermes (ca. 530–525 B.C.) and the small frieze from the fourth (Polykratean) Temple of Hera (ca. 510–500 B.C.). These, as well as the big frieze from the Hera temple, were executed in courses, which thus seems to be a Samian characteristic.⁸⁶

Slightly before the middle of the sixth century, the carved frieze appears on the mainland of Asia Minor, but in various sites and locations on buildings.⁸⁷ The Temple of Artemis at Ephesos, ca. 560–550 B.C., is now known to have had carved pedestals, with figures executed in different courses, as was the case in its fourth-century successor.⁸⁸ Friezes also decorated its column drums,⁸⁹ a prac-

tice continued slightly later in the Temple of Apollo at Didyma (Fig. 71) and an unknown building at Kyzikos.⁹⁰ Fragments of a frieze at Myus may have originally been located on all four exterior cella walls of the Temple of Dionysos, dated in the third quarter of the sixth century.⁹¹ We have already noted the application of sculpture to architraves and perhaps entablature friezes in other temples from this area. At still higher locations, friezes in terracotta embellished cornices and simas probably beginning before the mid-sixth century and figural relief was carved on the marble parapet sima of the Ephesian Artemision at the end of the Archaic period.⁹² Additional friezes existed in Asia Minor at Karaköy (ca. 540–530 B.C.) and Kyzikos (ca. 520), but their functions remain uncertain. The popularity of this type of decoration clearly attests to the local interest in ornament. Its varied locations on these buildings also suggest the lack of a single "standard" for the appearance of east Greek temples, a point reinforced by the irregular spacing, size, and treatment of columns in some of these same structures.

In place of the frieze course of the Island-Ionic entablature, Eastern-Ionic architecture typically inserts dentils. These "teeth," formed of alternately projecting and receding rectangles, become so distinctive of later buildings that this is the only entablature illustrated in many handbooks for the Ionic order. Yet even in Asia Minor, the dentil course is rarely attested in Archaic architecture. This situation is often ascribed to the relatively late petrification of the east Greek entablature and the poor preservation of some of its most important temples. Scholars thus reconstruct dentils even when no actual evidence exists, as in the giant dipteroi at both Ephesos and Didyma (Fig. 71).⁹³ There are good grounds for doing so, since building models from Samos suggest the use of dentils by the early sixth or even late seventh century B.C.⁹⁴

Debate exists, however, whether the dentil was an east Greek or Cycladic innovation. Schattner argues for the latter, partly on the grounds that only two Archaic examples have been discovered in east Greece, an unpublished piece from Samos and a second from an unknown building at Larisa.⁹⁵ By contrast, Schattner cites a much larger, and in some cases earlier, group from the Cyclades. Of these, however, one comes from a representation, rather than an actual structure, and several are post-Archaic in date. Only two have been assigned to Archaic architecture, in both cases by R. Vallois to the Hexagonal Monument at Delos, dated in the later sixth century B.C. A more recent publication by M. C. Hellmann and P. Fraisse disputes the attribution, but not the date.⁹⁶ Thus, while Schattner's evidence points to the occasional presence of the dentil course in Archaic Cycladic architecture, his theory of origin is far from proven.

Instead, if one follows Gruben, the dentil course and entablature frieze are but two representations of the same architectural component. Dentils reflect the visible ends of the ceiling beams while the frieze derives from their covering. The near identity of these two members would thus explain their rare

appearance in a single entablature. The two are attested together for the first time only at the end of the Archaic period (ca. 480–475 B.C.), in Temple D at Metapontion in southern Italy (Fig. 72), and not again until the later fourth century B.C.⁹⁷

Because of the much earlier “petrification” of the Ionic entablature in the Cyclades, it should not be surprising to find the earliest known geison or cornice also in this area. It appears in the same building as one of the first volute capitals, the Oikos of the Naxians on Delos.⁹⁸ This early cornice takes on a very rudimentary form, consisting of a low slab, about 10 cm high, placed on top of the wall and projecting beyond it with a slightly thickened end (Fig. 43). It thus serves the dual function of shedding rainwater and supporting the eaves tiles above, but the overhang, with its rectangular section and flat underside, is rather simple.⁹⁹ On the other hand, the raking cornice on the pedimental west end already shows the hollowed underside that will become typical of the Ionic geison.¹⁰⁰ This feature is attested slightly later in fragments of the horizontal or lateral cornice from the fourth Temple of Dionysos at Yria, ca. 580–570 B.C. (Fig. 47).¹⁰¹ With the addition of the east porch to the Naxian Oikos, ca. 560 B.C., the cornices, both horizontal and raking, assume the characteristic Ionic form with a concave underside, here separated from the bearing surface by an astragal.¹⁰² A similarly concave soffit, but without the astragal, is adopted as well in Asia Minor for the limestone phase of the Temple of Apollo at Didyma, datable within the second quarter of the sixth century, and subsequently for the Temple of Artemis at Ephesos, which although begun ca. 560 B.C., took some years to reach this level.¹⁰³ Although the early evidence is rather meager, it would seem that we are witnessing the evolution of the Ionic cornice within the first, or first two, quarters of the sixth century B.C. This presents an interesting parallel with Doric architecture, which evolved its characteristic geison within the same period and in the process experimented with a comparable form.¹⁰⁴

PLAN

The relatively small number of Ionic temples known for the early periods makes it difficult to trace the development of their plans. An even more significant factor is the obvious geographical division between Island- and Eastern-Ionic, which has been noted as well in several components of the elevation. Most striking is the difference in the size of respective buildings and their use of columns. Cycladic temples tend to be of small dimensions and to lack a peristyle.¹⁰⁵ They nevertheless typically have a front porch, which in several cases assumes a prostyle arrangement, perhaps as an abbreviation of the peristyle used elsewhere. A prostyle porch is found already in both the third and fourth Temples of Dionysos at Yria, dated ca. 680 and ca. 580–570 B.C., respectively (Fig.

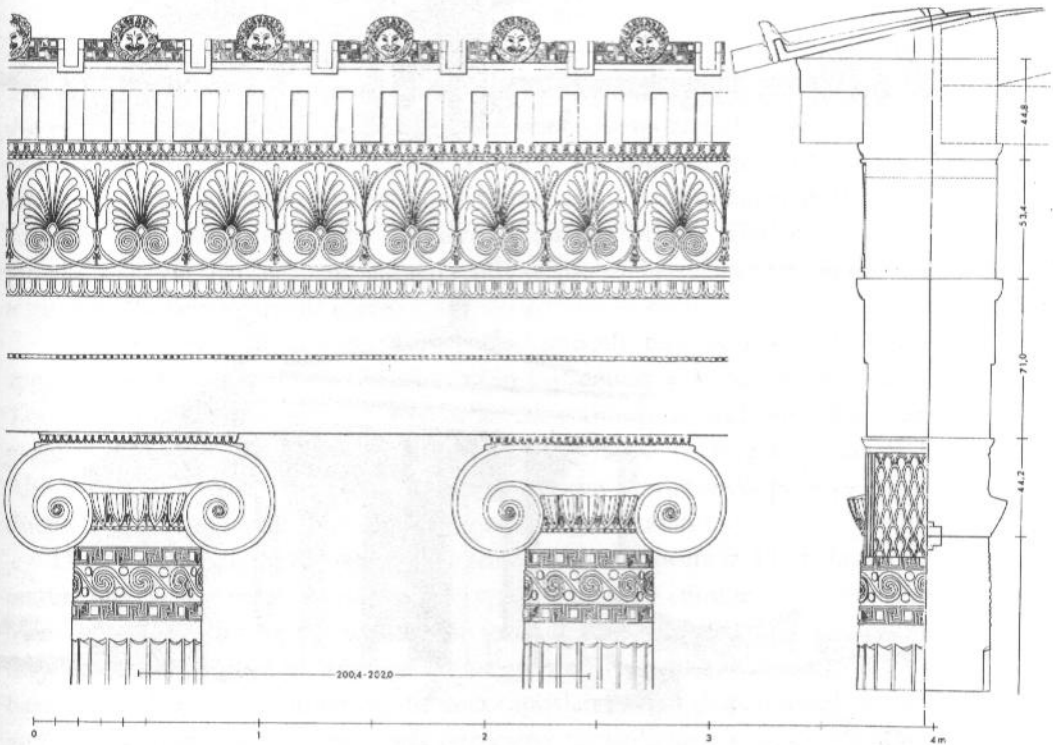


Figure 72. Entablature of the Ionic temple (D) at Metapontion, from D. Mertens, "Der ionische Tempel in Metapont," *Architectura* 7, 2 (1977) 157, fig. 9, reproduced by permission of D. Mertens.

73), and is added to the Oikos of the Naxians on Delos around 560 B.C.¹⁰⁶ Columns usually appear in the interior of these buildings to assist in supporting the roof. In one phase (II) of the Yria temple, around the middle of the eighth century B.C., there were as many as three rows.¹⁰⁷

By contrast, East Greek architects created some of the largest temples of the Greek world at Samos, Ephesos, and Didyma, and encircled the cella building with a "forest" of columns. At least two colonnades extended around four sides of the building, with a third row on the facades of some. These dipteroi are equally early, beginning with the Rhoikos Temple of Hera, ca. 570 B.C. (Fig. 74), and continuing through its replacement, the Polykratean temple, begun ca. 530 B.C. Two of these temples had cellas that were hypaethral, or open to the sky – those of Artemis at Ephesos and of Apollo at Didyma; the same arrangement is found in their fourth-century successors.

As with Doric architecture, the emergence of specific characteristics of the Ionic order in the elevation of temples is accompanied by the development of "canonical" plans. Yet here the plan takes precedence, since the prostyle porch and double peristyle appear prior to the full panoply of Ionic forms. In addition, Ionic plans separate even more strongly than elevations into two distinct styles.

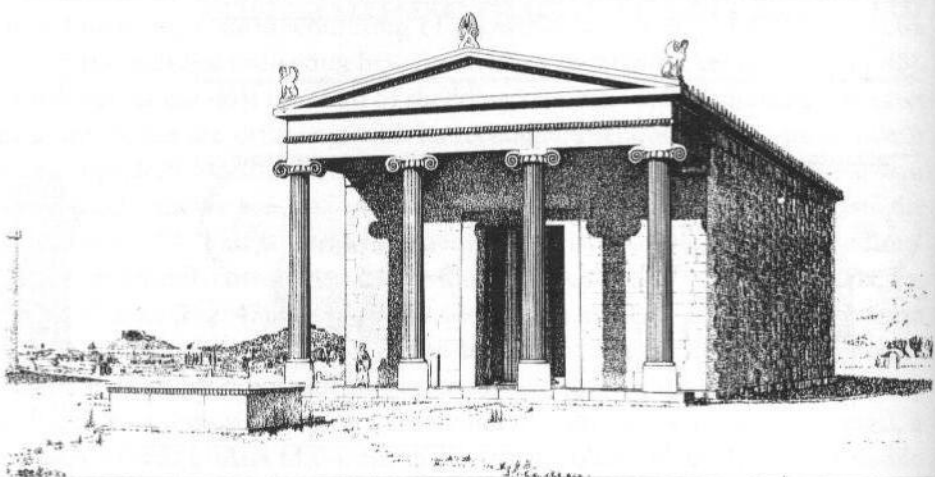
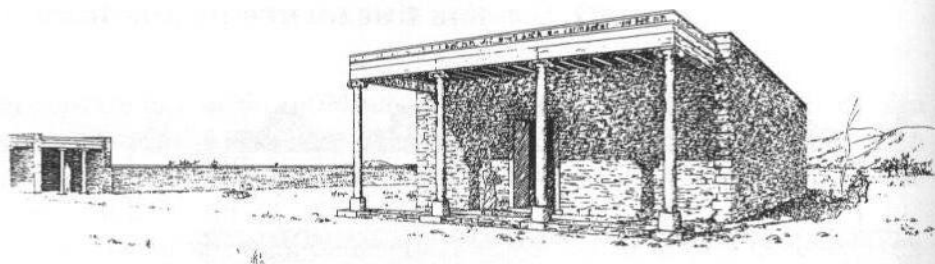


Figure 73. Reconstructed elevations of the third (top) and fourth (bottom) Temples of Dionysos at Yria on Naxos, with prostyle facades, from Gruben, "Naxos und Delos," 265, fig. 2b, reproduced by permission of G. Gruben.

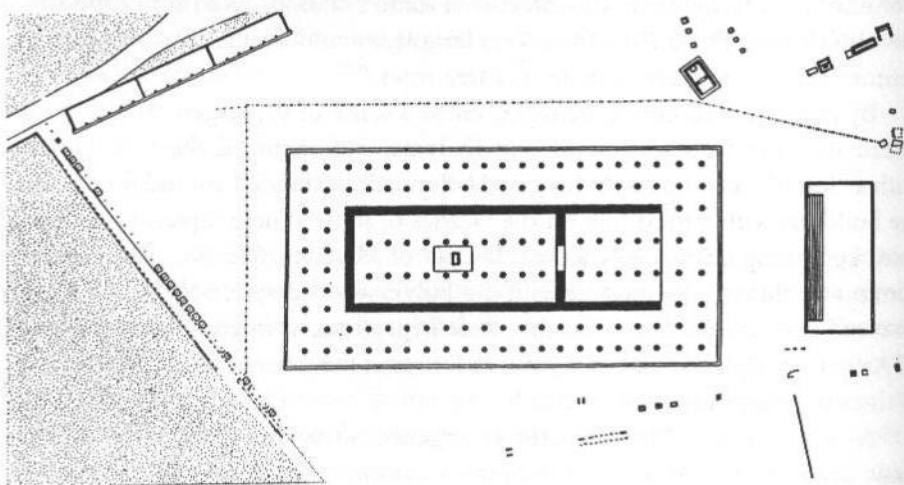


Figure 74. Plan of Rhoikos Temple of Hera (III) and altar at Samos, from G. Gruben, *Die Tempel der Griechen*, 3rd ed. (Munich: Hirmer Verlag, 1980) 331, fig. 278, reproduced by permission of G. Gruben.

CONCLUSIONS

The somewhat later evolution of Ionic than Doric components, combined with the early adoption of stone by Cycladic architects, allows us to follow the emergence of the Ionic "order" during the course of the late seventh and sixth centuries. Although east Greece continued to use wood for the upper portions of columns and entablatures into the second quarter of the sixth century, the remains of lower members and, subsequently of the architrave, provide important testimony for developments there.

Such evidence suggests that only the smooth base and volute capital appeared during the seventh century and in forms that were not yet canonical. Thus, the base may be either a disc or an incipient torus, and the echinus, to judge from the votive column at Sangri, may have been poorly defined. Although not identified in the architectural remains, dentils were perhaps introduced by the late seventh century, as suggested from models.

During the early sixth century, the frieze course appears in Cycladic architecture. Within the same region, the two types of base are combined to create the form that will become canonical. By the second quarter of the sixth century the majority of elements of the Ionic order are attested, including the torus and spira base, capital with leaf echinus, Asiatic anta capital, regularly shaped frieze course, and concave-soffit cornice. Purely decorative features, such as plastically articulated entablature mouldings and the characteristic Cycladic wall socle, seem to be introduced in this same period, as demonstrated by their presence in the fourth temple at Yria, ca. 580-570 B.C.¹⁰⁸ East Greek sculptured friezes also begin in large numbers.

Other characteristic components appear somewhat later. Especially significant is the triple-fascia architrave, whose date of introduction seems to be attested at Didyma. The Cycladic anta capital and leaf column capitals may likewise have been initiated in the second half of the sixth century. Refinements of some forms, such as the substitution of characteristic fillets for the earlier arrises on the Ionic column shaft and the development of a "canon" for the Asiatic anta capital, await the end of the century. The creation of the Ionic order can thus be fairly closely traced over much of the sixth century B.C. As with Doric architecture, this relatively slow development cannot be attributed to the vagaries of preservation and excavation alone; rather, the evolution of canonical forms from their pre-canonical counterparts demonstrates that we are witnessing the emergence of the "order."

The fame of later Asia Minor temples may have given rise to the claims of Vitruvius and Pliny that the Ionic order developed there. Yet our evidence clearly favors the Cyclades as the originator of the base, the fluted shaft, and the volute capital, as well as the entablature frieze.

Regional variations are even more evident than with Doric. One need only note the treatment of the base, smooth in the Cyclades and with different com-

binations of mouldings in Samos, Ephesos, Chios, and Attica. Local interpretations also exist in details of the capitals,¹⁰⁹ and in the presence, location, and type of sculptural friezes. When other components are included, these regional distinctions are sufficient to speak of two separate systems within the Ionic "order," Island- and Eastern-Ionic. They can be defined not only through their bases, but also in the preferred type of anta capital, and most significantly in the components of the entablature and in temple plans.

We have already discussed for Doric architecture how a coherent style emerged over a broad area as the result of developments in different regions that were progressively incorporated into a shared repertoire. This is likewise true of the Ionic order, as attested particularly by its column. Comparable factors, such as the movement of architects and the corresponding diffusion of ideas, must have been at work in this process. Indeed, literary sources confirm the participation of the same architect, Theodoros, in the construction of two of the earliest Ionic temples, of Hera at Samos (III) and of Artemis at Ephesos.¹¹⁰ This close connection would surely have aided the transmission of Ionic architectural forms as well as the dipteral plan. At the same time, regional styles are especially strong in Ionic architecture. The two temples discussed here offer excellent examples of that. Despite their geographical and chronological proximity and the involvement of the same architect, they differ in many of their details. We have attributed regional diversity in Doric architecture to local pride and civic identity. Those factors likely account for such stylistic and formal differences, as well as the increasing size and column count in successive east Greek dipteroi. By contrast, custom would ensure the continuation of more established forms, such as smooth surfaces for column bases in the Cyclades. Certainly the requirements of individual cults would have played a role in the presence of certain features, such as the western orientation and hypaethral cella of the Ephesos temple. These likely explain as well the diversity of plans between Island- and Eastern-Ionic. Indeed, in some cases we can trace the emergence of those plans already in the eighth century B.C.

Even within a single temple, Ionic architects show little propensity toward uniformity. Particularly those of east Greece seem to seek variety in the spacing, fluting, and decoration of columns as well as in the placement of carved friezes. In the Cyclades, this flexibility has been discerned also in column proportions. Scholars generally assume a progression over time in the relationship of column diameter to its height. Instead, the builders of the Temple of Demeter and Kore at Sangri (ca. 530 B.C.) retained the same diameter for columns throughout, but varied their heights to fit the location. As a result, those of the facade were much squatter than in the interior, and the slenderer interior supports showed a range of heights that could differ by over 1 m.¹¹¹ Such evidence suggests that early Ionic architects were not striving for a fixed canon. Indeed, it is only in the fourth century that the Ionic order developed a canonical plan and proportional system, in the Temple of Athena Polias at Priene, which not surprisingly had a considerable impact on Vitruvius.¹¹²

THE ORIGINS OF THE ORDERS: REALITY AND THEORY

AS DISCUSSED IN CHAPTER 1, modern views on the origins of the orders are strongly influenced by those of ancient authors. Certainly these individuals had the advantage of chronological proximity to the events in question. More important, their work was available from the beginning of modern inquiry, long before the advent of scientific archaeological research. Reliance on these sources has led to an understanding of the orders as arising first in perishable materials, especially wood, and motivated by structural needs. Only later were they translated into stone. The idea of wooden predecessors also accords with the evolutionary view of development, which has held considerable popularity among both ancient and modern scholars.

The archaeological evidence, assessed in subsequent chapters, paints a somewhat different picture.¹ It supports the early use of wood as well as its continuation throughout the history of Greek architecture as the primary material for ceilings and especially roofs.² There is no doubt that the Greeks were familiar with the use of wood. Yet whether the orders originated in wood, and/or are necessitated by structural forms in that material, are issues that continue to generate considerable debate. The evidence, and the debate, will be examined here.

WOOD AS AN EARLY MATERIAL

Wood was certainly an integral part of early architecture in Greece. It was incorporated into the fabric of the wall in wattle-and-daub construction and was used to reinforce it in many mud-brick buildings. Freestanding supports, in the form of both rectangular posts and cylindrical columns, were likewise of wood, even when stone was used elsewhere. This is true also of initial constructions in ashlar masonry, such as the Temple of Poseidon at Isthmia of the second quarter of the seventh century B.C., which probably possessed wooden supports in the interior, if not in a peristyle. Because of the perishable nature of wood, its identification within the crowning of such temples is problematic. Yet one can assume from its later use in ceilings and roofs that wood was employed in at least these areas of early buildings as well.

With the introduction of characteristics of the architectural orders in the later seventh and early sixth centuries, wood continues to be an important material. It must have been used to frame and secure the terracotta panels in the Temple of Apollo at Thermon (ca. 630–620 B.C.) as well as the stone reliefs in the temple at Mykenai (ca. 600 B.C.) and thereby perhaps offered inspiration for subsequent Doric components. Although we cannot be sure of their form, the columns of the Thermon temple, including those of its presumed peristyle, were probably wooden.³ This material was used extensively in the somewhat later (ca. 600–590 B.C.) Temple of Hera at Olympia. We have already noted the sheathing of its wall-ends with boards, thus creating the enlarged anta. Its original columns were likewise of wood. Pausanias (V, 16, 1) records that in his own time, the second century A.D., an oak support was still standing in the opisthodomos. Moreover, the diverse proportions of the preserved stone columns point to their installation over a long period, as gradual replacements of their predecessors. Nothing remains of the entablature of this temple, but it was presumably also of wood, as suitable above columns of the same material and walls of mud-brick on a stone orthostate.⁴

Although stone becomes increasingly popular for temples during the first half of the sixth century, parts or even entire buildings could still be constructed in wood. This material seems to have been used, perhaps ca. 570 B.C., for the entablature of the Temple of Athena Pronaia at Delphi, despite the use of stone for the columns below.⁵ W. B. Dinsmoor proposed a combination of wood and stone to account for the unusual L-shaped sections of epistyle blocks in two buildings of comparable date (ca. 570–560 B.C.), the Temple of Apollo at Syracuse and the Monopteros at Delphi. These reconstructions are, however, open to doubt. Recently D. Mertens has restated the argument for stone backers for the Syracusan epistyle, as supported by anathyrosis on its horizontal interior surface. Nevertheless, the motivation for this treatment remains the same: to lighten the weight in an unfamiliar material. The Monopteros architrave was probably completed with more closely fitting blocks. H. Pomtow reconstructs a similarly shaped, but inverted block at the rear, and D. Laroche and M.-D. Nenna suggest stacked and clamped stone backers⁶. At Kalapodi, wooden columns were used alongside those of stone in the peristyle of the Archaic South Temple, the construction of which is dated stratigraphically to 570–560 B.C. Columns of the contemporary North Temple are likewise assumed to have been in some cases of wood.⁷ In east Greece, the volute member, if not the entire capital, as well as the epistyle of the Rhoikos Heraion on Samos (also ca. 570–560 B.C.) were presumably of wood. It is thus clear that wood played an important role not only in the initial phases of Greek architecture but even into the monumental constructions of the early sixth century.⁸

What is not so clear, however, is the relationship of these wooden members to the canonical forms of the architectural orders. Scholars who accept the Thermon plaques as metopes assume that they were accompanied by triglyphs

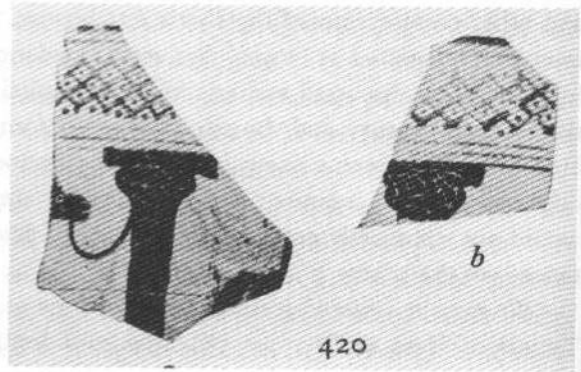
and other components of the Doric entablature. Similarly, the columns of the temple are depicted as Doric.⁹ Yet actual evidence for these members is lacking. Indeed, as discussed earlier, the Doric capital is first attested at the end of the seventh century and the triglyph is not found in a datable context until even later. If, as seems likely, individual components of the order emerged at different times, an incipient form of one element, such as the metopal plaque, would not necessarily entail the same stage of development – or even the existence – of the others.

We may be somewhat more assured of the existence of Doric forms in the Temple of Hera at Olympia, but here, too, doubts remain. Because the stone replacement columns are Doric, one might logically assume that the originals were as well. W. Dörpfeld suggested comparable proportions, with the lower diameter of the wooden examples equal to that of at least the thinnest stone ones, and suited to the width of the stylobate.¹⁰ Yet such columns, measuring 1.00 m or slightly larger at the base, are perhaps more in keeping with a stone, than a wooden, tradition. One must also consider the independence shown in the replacement columns, which by their diversity can only reflect shapes and proportions of their own times. Such evidence speaks against a reconstruction of the original wooden columns on the basis of their successors.

Problems exist as well in regard to the entablature. Although no longer extant, it is identified as "Doric" from the closer column spacing at the corners. This adjustment, referred to as corner contraction, resulted from the requirement of the Doric frieze that the corner triglyph rest beyond the axis of the last column.¹¹ Thus, at some point the temple may have possessed a canonical frieze. Even so, we cannot be certain that angle contraction existed here originally, since it is not attested again in Greek architecture until the mid-sixth century. Instead, its presence, if dictated by the frieze, may have been a later addition. Renovations were continually conducted for the installation of the stone columns, which would have allowed opportunities for such a change.¹² We must also consider the possibility that the closer spacing of the Heraion columns was motivated by other concerns. One could be the desire to give greater stability to the corners of the peristyle,¹³ which is demonstrated later by the practice of enlarging diameters in corner columns.

Even if the columns and frieze of the Hera temple were originally executed in Doric style, they would provide little evidence for the origin of the order. By its early sixth-century construction date, Doric columns had already appeared elsewhere and metopes were probably in the course of development. Their presence here, in the first monumental temple of this Panhellenic sanctuary, might in fact be expected.¹⁴ The real importance of these members, then, would be in demonstrating the use of wood for canonical elements. The existence of wooden, alongside stone, columns in the temples at Kalapodi and of wood in the capitals of the Rhoikos Temple of Hera (III) on Samos might further support this point.

Figure 75. Sherds from a Proto-Corinthian skyphos, Perachora, from T. J. Dunbabin, in *Perachora II* (Oxford: Clarendon Press, 1962) pl. 22, no. 420, reproduced by permission of Oxford University Press.



EVIDENCE FOR A PRECEDING WOODEN TRADITION

The suggestion that canonical architectural elements may have been – at least occasionally – executed in wood raises the possibility of an earlier history for the architectural orders in that material. Such a view agrees with an evolutionary progression, as discussed earlier, and places the emergence of the orders in a period when temples were largely constructed of perishable materials, as we know to have been the case in early times. It might even account for the heaviness of later Doric architecture versus the lightness of Ionic as a factor of the relative availability of wood in different parts of the Greek world.¹⁵ Furthermore, a long history allows for the possibility of experimentation in the creation of the “correct” forms, a process that is not generally recognized in the archaeological remains.

This theory is perhaps most strongly argued by B. Wesenberg for the Doric capital.¹⁶ He cites two pottery sherds from Perachora as evidence of a pre-monumental form of capital (Fig. 75). The sherds, which preserve parts of two columns below three horizontal lines, were published by T. J. Dunbabin as questionably Late Proto-Corinthian.¹⁷ Wesenberg accepts a date for them in the third quarter of the seventh century, thus significantly earlier than the next appearance of a Doric capital, on a krater from Vari attributed to the Nessos Painter and dated ca. 600 B.C. The shape of both Perachora capitals differs from “canonical” Doric in the relatively thin abacus and torus-like echinus. Additionally, the left example shows a continuous, concave necking, in contrast to the more abrupt transition demonstrable on early Doric capitals. Because nothing comparable seems to exist in the stone remains, Wesenberg attributes these capitals to a pre-monumental wooden tradition that, on the basis of shape, is more closely linked with earlier Mycenaean than subsequent Doric examples. He suggests that capitals such as these may have appeared in the Temple of Hera at Argos, an area not only familiar with Mycenaean building forms but, according to Vitruvius, also producing the earliest “pre-monumental” Doric temple.¹⁸ The sherds would thus provide evidence of this earlier stage in the development of

the Doric capital, as well as an explanation for its shape, as an imitation of Bronze Age models still extant in stone in the seventh century B.C.

As attractive as this theory might be in providing a "missing link," it is nevertheless problematic. It rests on the remains of a single vase of uncertain attribution, which seems to precede significantly in date other vase depictions of the Doric column. On the other hand, a Late Proto-Corinthian designation for the sherds would allow for a date as late as ca. 630 B.C.,¹⁹ thus not far removed in time from the initial appearance of the stone capital. It should also be noted that the capitals on these two sherds show slightly different renderings: the right has a higher shoulder and thicker abacus, traits that are more in accord with "Doric" forms.

Furthermore, the reliability of vase painting for accurate representations of architecture must be questioned. A study by L. Eckhart²⁰ has found several illustrations of Doric columns on vases ranging in date throughout the sixth century B.C., none of which is truly canonical. Most lack fluting, perhaps as an abbreviation on the part of the painter, but they also typically show a longer abacus than echinus and several are equipped with bases. The torus-shaped echinus of the Perachora sherds is paralleled on some of these pieces, including a dinos fragment by Sophilos, whose work is generally placed ca. 580–570 B.C., and two Chalcidian vases of the third quarter of the sixth century. Perhaps the Sophilos piece and certainly one Chalcidian vase also display a low abacus. These features therefore may not necessarily indicate a pre-monumental form or even an early date. Variations from canonical Doric might be expected in depictions of wooden buildings, but it is also likely that the artist did not aim to portray a faithful copy of the original. Without additional evidence to support the existence of a pre-monumental capital, this tradition must be considered hypothetical.

Other scholars have found in the earliest stone remains themselves evidence for the prior emergence of canonical traits in wood. R. Demangel, for example, attributes the generally shallow fluting of early Doric shafts to wooden construction techniques.²¹ The slender proportions of certain early columns, such as those of the Old Tholos (ca. 580 B.C.) or the Temple of Athena Pronaia (perhaps ca. 570 B.C.), both at Delphi, may be adopted from wooden supports.²² A tradition of wooden construction may also be responsible for the execution of monolithic columns in some of the earliest stone buildings, including the Delphic Tholos (ca. 580 B.C.), Temples E 1 (ca. 580), Y (ca. 560) and even parts of C (for which the date ranges around the mid-sixth century) at Selinous, and those of Apollo and Zeus at Syracuse (ca. 570–550 B.C.).²³ In addition, the epistyles of both the Old Tholos (ca. 580 B.C.) and the Monopteros (ca. 570–560 B.C.) at Delphi consist of only a single thickness, as was also presumably the case with wooden examples.²⁴

Such characteristics, however, do not necessitate the prior existence of Doric forms in wood. More likely, they reflect the continuation of wooden practices in stone construction, which would be expected with the transition to a new material. In the Temple of Athena Pronaia, where the entablature remained in wood,

the familiar slender proportions must have been considered sufficient for the columns. The use of slender forms throughout the Tholos may result both from this background and from the small scale of the building.

The gradual adoption, over the course of the late seventh and especially early sixth centuries, of forms and techniques better suited to the use of stone accords well with our reconstruction of the architectural orders, which are likewise first attested during this period. It may be no accident that the adoption of stone and the creation of a monumental architectural style go hand-in-hand. Moreover, since our evidence suggests that some experimentation continued to exist with stone members, the development may as likely have occurred in this material as in wood.

VITRUVIUS AND THE THEORY OF STRUCTURAL ORIGINS

The view that the architectural orders had a prior history in wood is extended further by some, who derive the distinctive components from wooden structural forms. This theory is, of course, based on the statements of Vitruvius, for whom the "ornaments" of the orders are attributed to elements of the roof. Yet whereas Vitruvius referred only to the Doric frieze and mutules and to the Ionic dentils, others have suggested wooden antecedents for the banded Ionic architrave as well as the combination of echinus and abacus in both types of capitals. Indeed, already in 1870, J.-I. Hittorff offered reconstructions of the two orders that accounted for nearly every component in terms of wooden structural antecedents.²⁵

This theory has particular appeal, not only because it rests on the authority of Vitruvius, but also because its emphasis on function imbues it with a certain rationality. Moreover, it seems to offer explanations for forms, especially those of the entablature, that are difficult to construct in stone and make little sense in that material. A structural origin may further account for the relative immutability of these components throughout Greek history. Modern scholars have therefore largely accepted this line of reasoning, at least in general terms.²⁶ Their arguments and criticisms are generally focused on a single order, each of which is treated individually below.

DORIC

The combination of two differently shaped elements in the Doric capital has been explained in several ways. The abacus is generally derived from a transverse beam placed above the vertical member to assist in carrying the weight of the horizontal entablature. The echinus is more problematic. Hittorff found its projecting shape difficult to explain in wood and suggested an early transition of the Doric capital to stone.²⁷ A. Wotschitzky likewise noted problems in the exe-

cution and durability of a wooden echinus and therefore proposed one of stone. His candidate, a flat disc pierced with a hole in the center, could instead be, by his own admission, a millstone.²⁸ An even more remote possibility is offered by H. Schleif, who derived the echinus from a protective wrapping of the juncture between shaft and abacus.²⁹ All these theories suffer from the lack of evidence for a two-part construction of the Doric capital. Furthermore, the earliest known examples in stone exhibit an echinus that reaches its greatest diameter just below the abacus, thus giving no hint of an origin in a separately executed member.

Certainly the most debated component of the Doric order is its frieze. Whereas to Vitruvius the triglyphs represented decorative boards fastened to beam ends, for modern scholars they may have other origins (Fig. 76). Some suggest that they reflect the beams themselves, while others, taking their cue from the option rejected by Vitruvius, argue for the barred space between beams or barred wooden windows. Still another line of thought sees them as a decorative version of a second level of columns or pilasters, as evidence of a wooden mezzanine, or as roof supports derived from Bronze Age parapets.³⁰ Metopes may be the beam ends or the spaces between, which in the latter case were perhaps filled by inserted panels or a continuation of the wall surface.³¹ Scholars also often dispute Vitruvius's equation of the projecting mutules on the underside of the eaves with the ends of rafters, since such beams would have been quite large. Instead, some suggest that the mutules are the petrification of flat boards placed above or at the ends of rafters. Spaces between these boards are reflected in later *viae*, while the dowels or nails securing them to members above are the predecessors of *guttae*.³²

Even if, as these scholars assume, equivalents can be found in perishable materials for the various components of the Doric entablature, problems arise in equating them with structural elements of the roof. Among the most important are that ceiling beams (as frieze) should appear at different levels on the front and sides of the temple and would not naturally terminate at the corners in two adjacent faces. Moreover, in Vitruvius's reconstruction they would rest on the epistyle, in contrast to the usual practice of inserting ceiling beams into the cornice, above the frieze backers.³³ Proportions are also an issue, since the size of triglyphs would equate to unnecessarily large beams. In two of the earliest stone temples, of Artemis at Korkyra and Aphaia at Aigina, both dated to the years around 580 to 570 B.C., triglyphs measure about 0.61 and 0.48 m in width, respectively.³⁴ We may expect even greater relative dimensions for earlier temples, because the interaxial distance tends to be greater.³⁵ Applying the ratio of triglyph:metope width found in these early stone buildings to Vitruvius's first Doric temple, that of Hera at Argos, would yield triglyphs (beam ends) of ca. 0.70 m on columns whose lower diameters were only somewhat larger (ca. 0.80 m). With alternate beams placed, as triglyphs, at the centers of the intervening spaces, such enormous timbers would rest on an architrave that extended

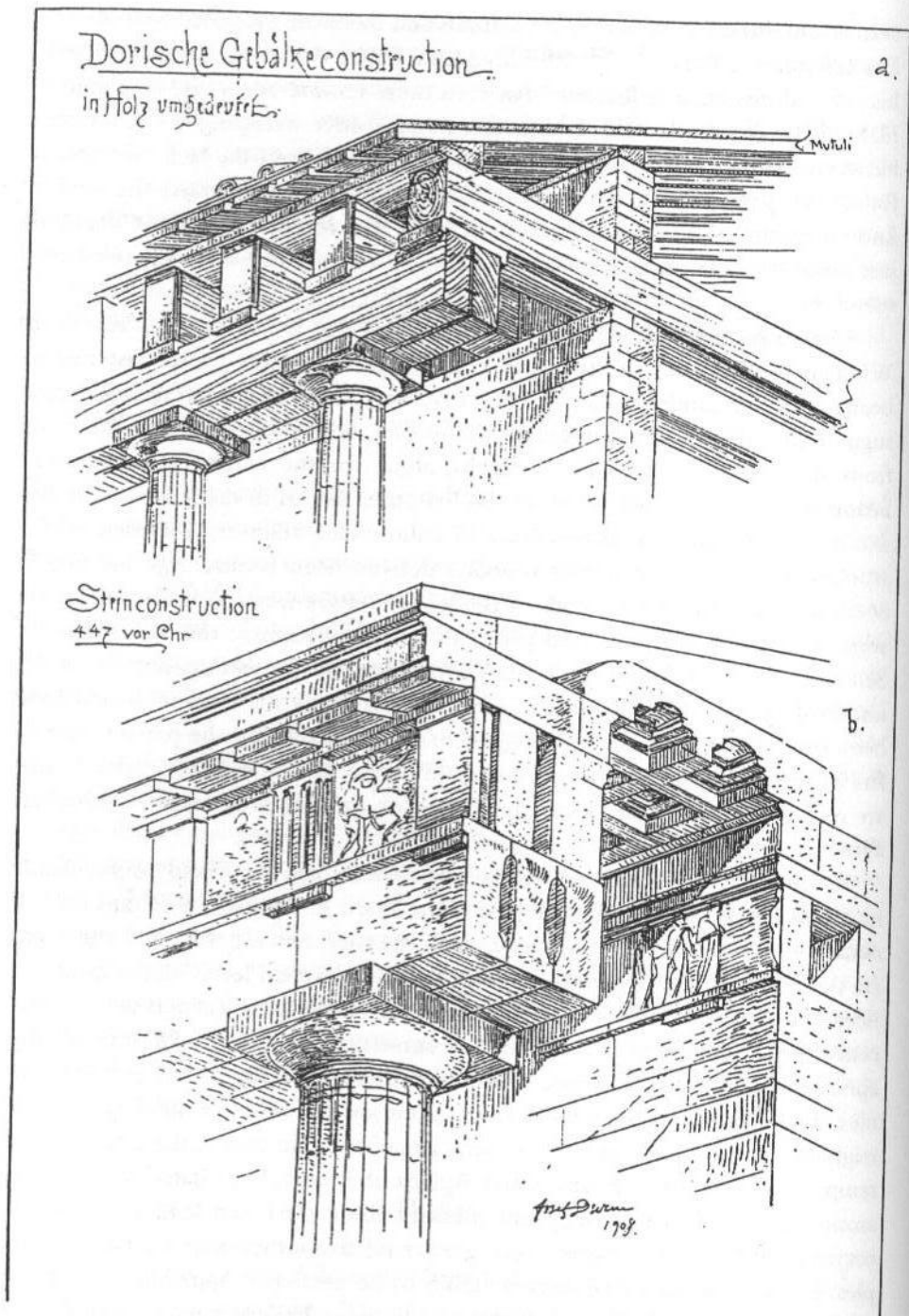


Figure 76. Doric entablature in wood and in stone, from J. Durm, *Handbuch der Architektur II: Die Baukunst der Griechen* (Leipzig: A. Kröner, Verlag, 1910) 262, fig. 233.

unsupported for 2.7 m.³⁶ Not only are beams of this size unnecessary for the ceiling, but their use would compromise the structural integrity of the building.

The identification of the frieze course with windows suffers from some of the same problems, since, at least in the peristyle, the usual placement of the ceiling above the frieze means that light would enter the porticoes rather than the cella building. A second level of columns or a mezzanine, although possible, is not attested by the extant architecture and the presumed vestiges of these forms can be explained in other ways.³⁷

Not only may we question the structural basis for the entablature, but also its proposed translation from wood. The shapes used, such as vertical panels with beveled edges for the triglyphs, narrow strips for the taenia and regulae, and the cylindrical form of the guttae, would necessitate rather sophisticated woodworking techniques and equipment.³⁸ More important, the resulting arrangement is needlessly complex and is not a solution that would naturally occur to an architect. Indeed, modern attempts to reproduce the entablature focus merely on representing canonical forms in wood and/or mud-brick, but provide no convincing justification for them. L. B. Holland has even challenged the structural wisdom of inserting a taenia and regula between the presumed ceiling beams and their horizontal support.³⁹ One must conclude, as did L. von Klenze over 150 years ago, that the Doric temple can be explained no more readily as a product of wooden, than of stone, construction.⁴⁰

IONIC

By comparison, the Ionic order is more easily accounted for in terms of structural elements in wood. This is especially true of its capital, which has long been recognized as being composed of two distinct members.⁴¹ The upper, volute portion, is generally derived from a transverse beam.⁴² It may still have been executed in wood with the construction of the Rhoikos temple at Samos. The echinus would represent a transitional member, which expands the bearing surface below. It may have evolved from a separate torus-shaped element,⁴³ to which was later applied a leaf motif,⁴⁴ or from a widening of the vertical support.

This second explanation is offered by G. Gruben.⁴⁵ He argues that the thickening of the upper portion of the column arose as the simplest solution to the problem of forming a transition between the rectangular transverse beam and the cylindrical shaft. A stage in this development would be represented by the late seventh-century votive support from Sangri (Figs. 77–78). In that piece, the echinus is created by an expansion of the shaft into an unarticulated torus. Other characteristics of this votive column likewise suggest an early level of development and, according to Gruben, a background in wood. These are the appearance of the volute member as if it were separately applied, its execution in flat surfaces with incised lines, and the single corner petal.⁴⁶ The evidence of votive

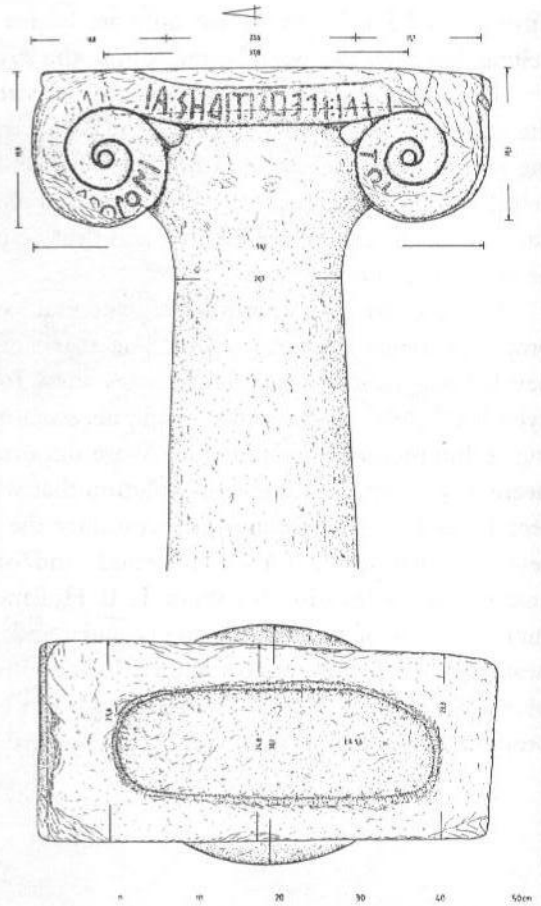


Figure 77. Votive column from Sangri, from G. Gruben, "Das älteste marmorne Volutenkapitell," *IstMitt* 39 (1989) 162, fig. 1, reproduced by permission of G. Gruben.

capitals must be used with caution, however, since they often differ from architectural ones. Moreover, irregularities noted in the execution of the Sangri example may suggest a rather casual approach to its form as well. Since it provides the only documentation for the evolution of the echinus from an enlargement of the shaft, this argument, however logical, must remain hypothetical.

Other capitals from this same period are cited by Gruben and A. Ohnesorg⁴⁷ as further evidence of the origin of this Ionic member in wood. Two examples from Delos assigned to the end of the seventh century, as well as a questionable piece from Didyma of ca. 600 B.C., all display flat surfaces into which the volute pattern is simply incised. An unfinished capital from Delos, perhaps before 600 B.C., also preserves a blocklike form. These last two pieces may have crowned pillars rather than columns, another shape known early in wood. Such characteristics are believed by these scholars to reflect the rectilinear beams and engraving technique associated with woodworking.

Although rectangular posts are certainly attested in early Greek architecture, their shape is no more suitable for execution in wood than that of the cylindrical

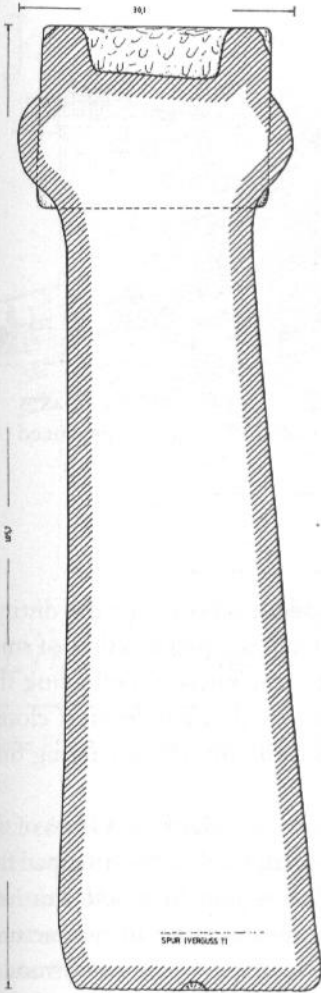


Figure 78. Section of votive column from Sangri, from Gruben, "Volutenkapitell," 163, fig. 2, reproduced by permission of G. Gruben.

column. Thus, nothing requires that the supports of these last capitals were of wood. Moreover, the placement of a stone capital on a wooden member is problematic. In these same articles, the two scholars argue for the earlier petrification of votive, than architectural, columns as a result of the adoption of stone for sculpture. Why, then, would the same needs not extend to a stone capital? With such a member, one may assume that the shaft, whether of columnar or pillar form, was also of stone. The intermediate role ascribed to these particular capitals, at least in regard to their materials, cannot therefore be supported. We must also consider that in the earliest marble sculptures, particularly in the Cyclades, details were generally limited and often created by incision. Thus, while these capitals likely reflect the beginning of a stone tradition, and perhaps even the transference of woodworking techniques to that material, they do not confirm the prior existence of those forms in wood.

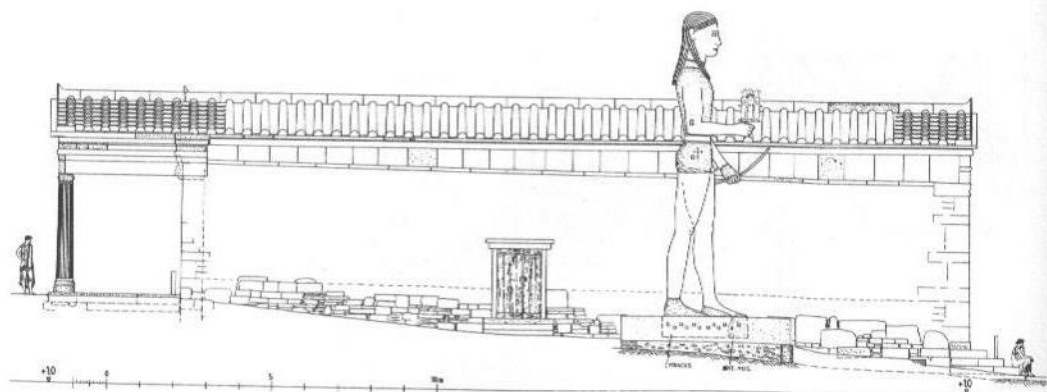


Figure 79. Reconstruction of exterior, Oikos of the Naxians on Delos, from G. Gruben, "Naxos und Delos. Studien zur archaischen Architektur der Kykladen," *JdI* 112 (1997) fig. 3, reproduced by permission of G. Gruben.

A wooden origin has also been assumed by modern scholars for the distinctive Ionic architrave. Its three bands or fascias are seen as a petrification of small wooden beams that were superimposed for greater thickness.⁴⁸ Following this interpretation, one would expect the earliest examples to resemble most closely their presumed prototypes, with any variations from the models occurring only at a later time. Yet the opposite is actually the case.

Perhaps the first extant Ionic epistyle, from the east porch of the Oikos of the Naxians on Delos, dated ca. 560 B.C. (Fig. 79),⁴⁹ is composed of two unequal fascias, which would reflect an uneven distribution of weight in wood. Furthermore, the upper fascia is so narrow that it seems more decorative than structural. The next two preserved architraves give even less evidence for origins in wooden boards, since both that of the Knidian treasury at Delphi, ca. 560–550 B.C., and what Gruben identifies as the earlier example from the Temple of Apollo at Didyma, begun ca. 540 B.C., are smooth.⁵⁰ Only on the north and west sides of the Didymaion do the "characteristic" three fascias appear. Yet as noted already, this portion seems to be later than its companion. Such evidence suggests that the fascias of the Eastern-Ionic architrave represent not a translation of wooden forms but rather a decorative elaboration, perhaps as Gruben suggests, motivated by a desire to articulate this load-bearing member. A similar situation is found with Ionic doors, which adopt a series of enclosing fascias only at a later stage of development, likewise around the middle of the sixth century B.C.⁵¹

Whereas the claims of wooden models for the Ionic capital and epistyle arise from modern scholarly theory, Vitruvius suggests such an origin only for dentils. According to his passages (IV, 2, 1 and 5), they imitate the projections of common rafters, that is, the beams immediately below the roof tiles. In that case, they should appear above the other timbers, rather than below the cornice. On a

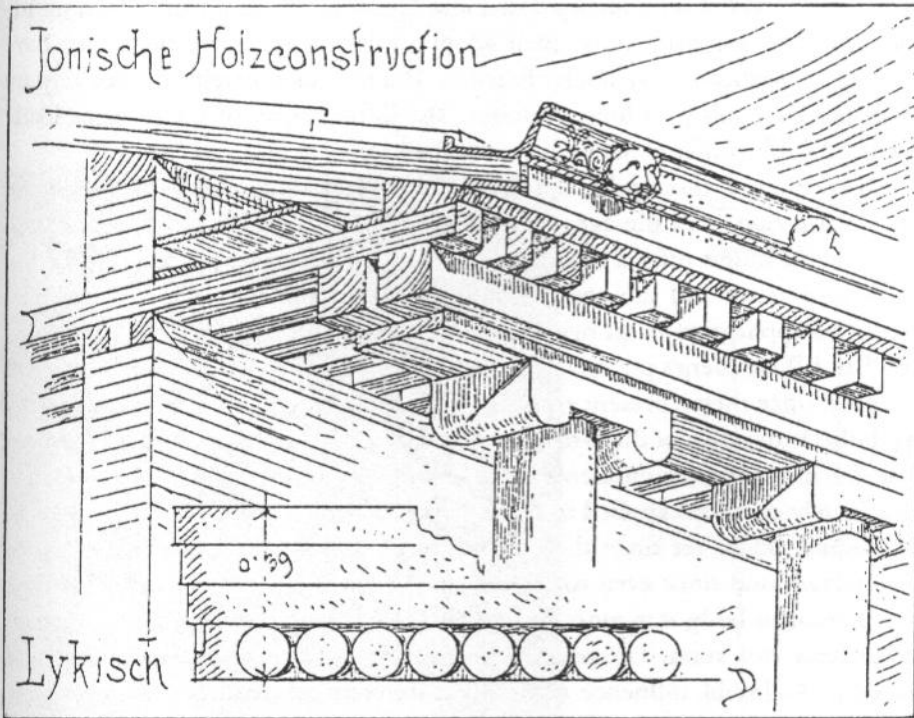


Figure 80. Ionic order in wood, from Durm, *Handbuch*, 329, fig. 315.

pitched roof, which is common in Ionic architecture, the rafters slant downward, in contrast to the horizontal dentils. Their spacing must also have been wider than that of the closely packed dentils. In addition, as with the Doric frieze, these elements would be reflected on only two sides of the building, or at different levels on fronts and sides.

Some of these problems are solved if, as suggested by A. von Gerkan and others, dentils represent ceiling, rather than rafter, beams. They may have emerged on flat-roofed buildings when the ceiling and roof were one and the same, or on sloped roofs where they were allowed to extend beyond the wall face to support the cornice above (Fig. 80).⁵² The original form may thus have had a structural origin, although differing from Vitruvius's account. The extension of the dentil course to all four sides of the building, and likely also its size and spacing, are better explained from artistic motives.⁵³

ORNAMENTAL-SYMBOLIC INTERPRETATIONS

Attempts to derive the components of the orders from wooden structural elements offer at most only a partial explanation for their distinctive traits. We must therefore consider the alternative, that the forms did not arise as an imitation of

earlier materials but were incorporated into Greek buildings for their own significance. Either originally or on their adoption into architecture, they must have fulfilled an aesthetic or symbolic function. Because such origins do not rely on particular materials or a long evolution, the introduction of these forms likely occurred fairly contemporaneously with their initial appearance.

Nevertheless, those who opt for this interpretation often seek models in the Bronze Age or in the age-old traditions of Egypt and the Near East. Such connections might offer a sanctity or at least legitimacy that accounts for the ready acceptance and subsequent longevity of these forms in Greek art. The presumed application of an originally Mycenaean leaf motif to the Ionic echinus⁵⁴ and Wesenberg's pre-monumental Doric capital would both fall into this category, since they represent revivals of Mycenaean types. G. Hersey suggests a symbolic association of the Greek temple with the Bronze Age in his argument that the individual components represent images of sacrifice.⁵⁵ His evidence rests largely on terms applied to these elements, which are the same as those of the human body. Yet since these terms, as he admits, are known from much later writers and since even today we use the same names for parts of vases as for the human body, it is more likely that the building parts inspired the terms rather than vice versa. The relationship with Egypt is even more complex. As traced by G. Hölbl, influence occurred at different and widely separated periods and was effected by various intermediaries: the Doric capital and perhaps fluted shaft were adopted initially for Minoan-Mycenaean columns and transmitted later to the Greeks, while other characteristics, both technical and formal, were borrowed more directly in the Orientalizing period.⁵⁶

DORIC

Although the "pre-monumental" capital remains unverified, similarities between the Doric form and its Bronze Age predecessors (Fig. 81) have long been noted.⁵⁷ Both are composed of a rectilinear abacus crowning a rounded member. The Doric echinus is more spreading in profile, but the nearly horizontal underside of its early representatives resembles that of the Mycenaean torus. Even more convincing is the decoration of certain Doric capitals. One from Kalapodi, dated 580–560 B.C., bears a spiral pattern of flutes in its necking that R.C.S. Felsch believes originates in Mycenaean capitals.⁵⁸ Wesenberg argues for a similar background for the plastic leaf necking of an entire series of capitals. Additionally, necking rings may take the half-round shape typical of Bronze Age examples.

These last two traits occur especially in early capitals, which seems to reinforce the connection.⁵⁹ They are found on several Korkyrean examples, beginning with that of the Xenvares funerary column of the first quarter of the sixth century (Fig. 82), and continuing into capitals assigned to the Temple of Artemis

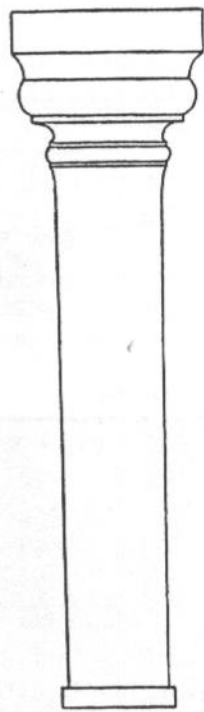


Figure 81. Lion Gate, Mykenai: (a) photo: author; (b) drawing of central column, from M. Meurer, "Form und Herkunft der mykenischen Säule," *JdI* 29 (1914) 7, fig. 4d.

(ca. 580–570 B.C.) as well as other, unattributed pieces. Around the middle of the sixth century, the foliated necking makes its introduction in western Greece, in the "Basilica" at Poseidonia (Paestum), and is repeated in numerous examples during the second half of that century. This feature does appear, often in combination with a half-round necking, on Peloponnesian capitals as well, but these are all datable after the mid-sixth century. One exception may be provided by a separately executed leaf ring in bronze found in the Heraion at Olympia (Fig. 83).⁶⁰ It was attributed by R. Hampe to the necking of a column in the Hera temple, since its restored diameter is approximately equivalent. Such an association has suggested an early date. Yet there is no independent evidence for dating this piece and even its attribution to the temple is uncertain. More recently, a second example was recovered in the same sanctuary and tentatively assigned to a votive base in the form of a column. A similar use should also be considered for the first ring.⁶¹

Despite the generally early date of these necking treatments, they have not been identified on the oldest known capitals. Moreover, the distribution of at least the distinctive leaf ring shows a much more westerly orientation. Its

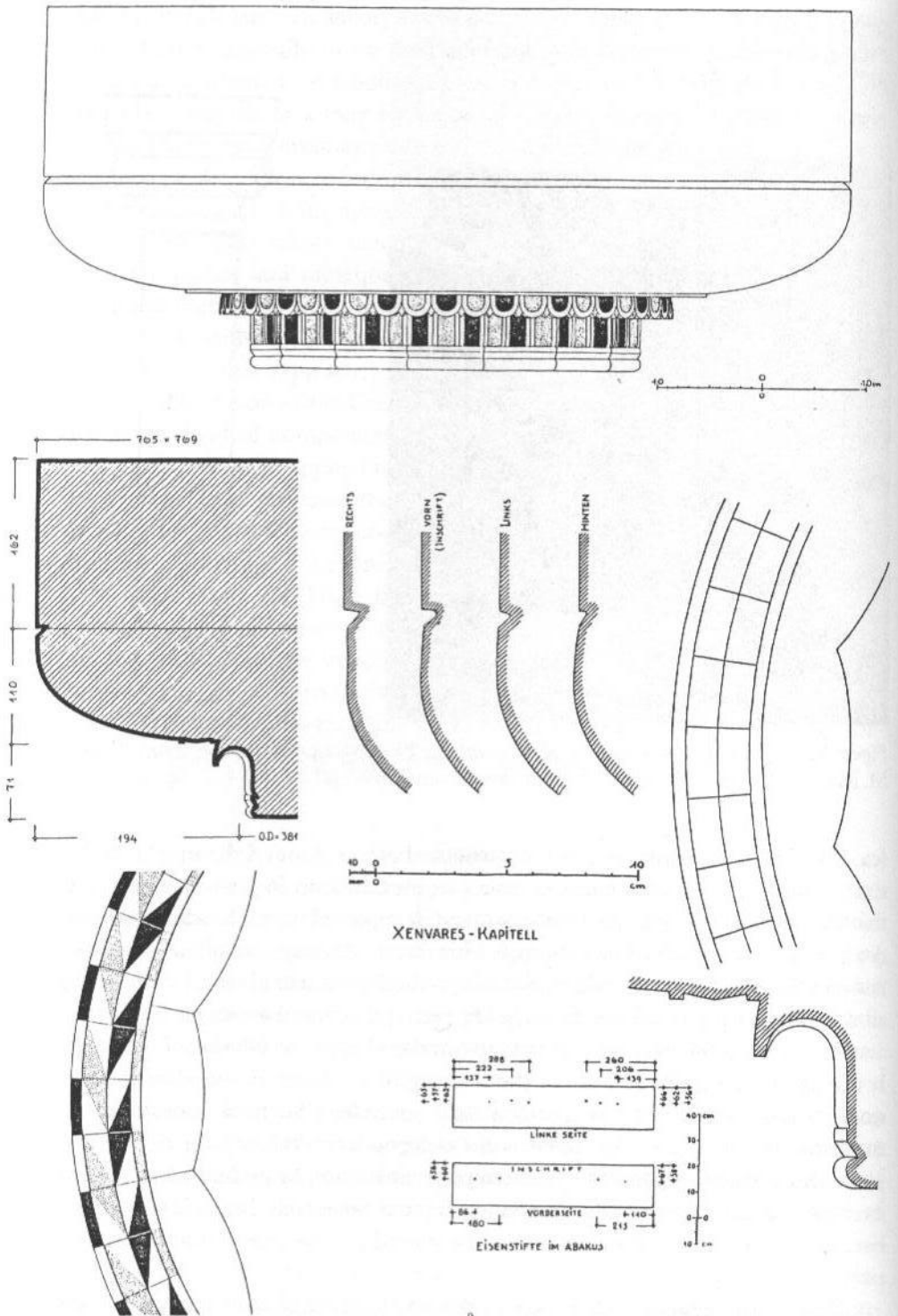
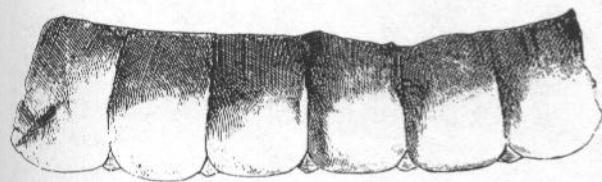


Figure 82. Xenvares capital, Korkyra, from H. Schleif, in G. Rodenwaldt, et al., *Korkyra I: Der Artemistempel* (Berlin: Gebr. Mann, 1940) 77, fig. 60, reproduced by permission of Gebr. Mann Verlag.



Figure 83. Bronze leaves from Olympia, from R. Hampe, "Ein bronzenes Beschlagblech aus Olympia," *AA* (1938) 364, figs. 4-5, reproduced by permission of the German Archaeological Institute (Deutsches Archäologisches Institut), Berlin.



appearance in the Peloponnesos, where Mycenaean models were preserved in stone, is fairly late. Current evidence thus suggests that it represents instead a regional variation that parallels Mycenaean treatments in its desire for plastic elaboration. This is supported by its increasingly ornamental rendering in later examples.⁶²

In discussing the Doric order, we have already noted the similarity with Egypt in the early use of sixteen flutes for the column shaft. Both J. J. Coulton and Hölbl cite the upward taper of Doric shafts as an additional indication of Egyptian inspiration. Coulton also proposes Egypt as a source for the narrow taenia crowning the smooth Doric architrave, although the band there is part of the cornice. Such connections are attested by historical evidence as well as the adoption in Greece of technical innovations ascribed to Egypt.⁶³

The Doric triglyph-metope frieze is likewise derived by some scholars from Bronze Age models. Especially noted are motifs such as alternate groupings of vertical and horizontal grooves (Fig. 84) or the half-rosette frieze with vertically striped dividers.⁶⁴ Since these motifs were in some cases executed in stone, they have survived even into our own times. It is difficult to explain, however, their transmission into Greek architecture. M.L. Bowen argued for continuity, citing as evidence variations of the Bronze Age megaron in the plans of historical-period temples. Yet as we have noted, the simplicity of plans in early architecture argues for a less than direct connection. Additionally, unlike column capitals, these Bronze Age panels seem to have served a different function originally. Rather than in the crowning of a building, as with the Doric frieze, they were placed at a low level, as on the face of a bench or the socle of a wall.⁶⁵ Bowen accordingly reconstructs transmission from benches to triglyph altars through missing Bronze Age remains. Even more problematic is her explanation for the elevation of the motif to the entablature, since she must argue not only for Bronze Age antecedents but also for continuity through the early Iron Age, for which no evidence is preserved. The link with the Doric frieze thus seems

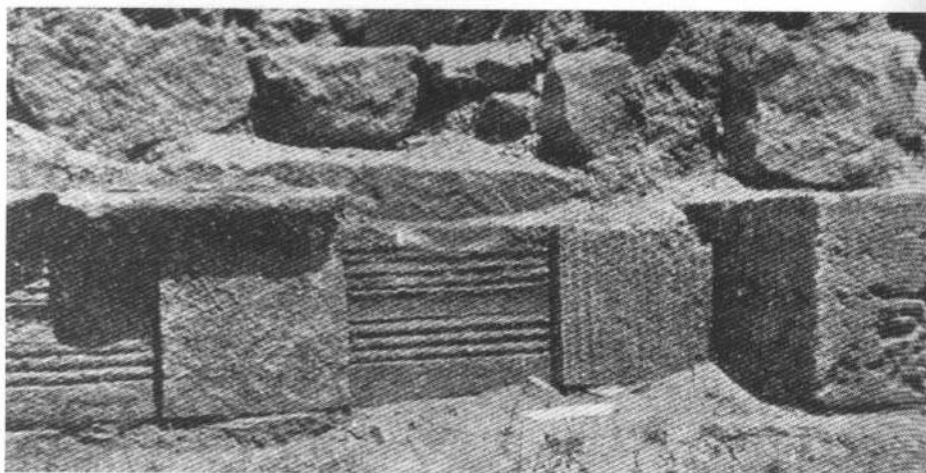


Figure 84. Minoan stone bench at Phaistos, from L. Pernier, *MA* 12 (1902) 48, fig. 13.

to rest primarily on visual similarities, which are not sufficiently close to make the argument convincing.

A new theory has recently been proposed that derives the triglyph from the representation of a tripod.⁶⁶ This has the advantage of coincidence in time and place, since tripods, like temples, served as early and very visible dedications to the gods in sanctuaries. Another view is that they represent images of windows, as symbols of a house (*oikos*) inhabited by the deity.⁶⁷ More plausible, but equally unverifiable, is the suggestion that the frieze originated in more ordinary decorative elements, such as the panels or "metopes" of Geometric vases.⁶⁸ This recalls G. Semper's attempt to trace the antecedents of architecture in the industrial arts.⁶⁹ Certainly the basic approach to the design is comparable, but whether the motif was transferred from one medium to another, or whether both arise from the same tectonic interest, cannot be determined.

IONIC

An ornamental and/or symbolic interpretation has also been applied to components of the Ionic order, specifically its capital. As already noted, the echinus is seen by some as reflecting the Mycenaean leaf torus and by others as derived from a Near Eastern leaf drum. Volutes are likewise associated with Near Eastern art and architecture. Although it has been argued that no close parallels exist in the Near East,⁷⁰ R. Martin makes a strong case for general inspiration.⁷¹

Symbolic interpretations have also been proposed, as by W. Andrae, who derives volutes from the symbol for the eastern fertility goddess Inanna and suggests that they come to represent the female being.⁷² This gender link has its basis in Vitruvius's own understanding of the Ionic column (IV, 1, 7). He likens

its "delicacy, adornment, and proportions" to the female body, with the base representing shoes and the volute, ringlets, while kymatia and fruits replaced hair, and the fluted shaft imitated female robes. In the same discussion (IV, 1, 6 and 8), he compares the Doric column to the "proportions, strength, and beauty" of a male body and Corinthian to the "slenderness of a maiden," but does not equate their components with human features. This has allowed for a more symbolic interpretation of Ionic.

Yet this interpretation does not seem to have been held by the Greeks. J. Onians attributes it to the tendency of Dorians to worship male deities and of Ionians to emphasize females, especially those associated with fertility, as well as to a late fifth-century view of Dorians as strong and Ionians as weak.⁷³ This view seems to result from the increasing distinction and categorization of the ethnic groups especially within the context of the Peloponnesian War, as discussed in the first chapter. Wesenberg points out the association of (female) karyatids with Ionic buildings and (male) atlantids with Doric.⁷⁴ Because Atlas figures as supports are first attested only at the end of the Archaic period, in the Temple of Zeus Olympios at Akragas, this concept would likewise reflect a later development. If such associations existed, they must have occurred considerably after the evolution of the individual column types and therefore cannot be ascribed to original intent.

THE ORDERS AS "ORNAMENTS"

Both approaches previously outlined have points to commend them, but neither is entirely satisfactory on its own. A more accurate understanding of the origins of the orders may therefore be possible by interweaving the tectonic and ornamental-symbolic interpretations. This explanation draws on the inherent logic of inspiration from structural forms. Yet since attempts to reconstruct original "counterparts" in wood or other perishable materials from elements in stone have proven unsuccessful, it is clear that the components are not simply translations. Instead, as with Greek artists generally, architects have interpreted their sources, whether they be wooden structural members or models drawn from art. This explanation is consistent with Vitruvius's own designation of the Doric frieze and mutules and the Ionic dentils as "ornaments" that imitate the arrangement of members in wood. Moreover, it accords with the evolutionary view of both ancient and modern theorists, in that it allows for the development of forms as a series of inventions, by unknown architects but often in determined locations.

Evidence for this interpretation is perhaps best adduced from the column. Architects of the Geometric period frequently raised wooden shafts above the ground on bases in order to provide a firm support and insulation from the earth. Over time, plinths and continuous stylobate blocks were introduced, which

served the same purpose. Yet in the Ionic order, the base was retained. It played a structural role in creating a wider supporting surface for the shaft and in providing an additional joint to absorb lateral movement. That value must have been rather minimal, however, since the base was abandoned in Doric buildings. Thus, the choice to continue employing it should be understood as primarily aesthetic. Its composition and surface treatment arise likewise from artistic concerns.

Similar considerations apply to the capital. Wooden crownings of the veranda posts, perhaps consisting simply of rectangular cross-pieces, may be detected already in the Heroön at Lefkandi, in the first half of the tenth century B.C.⁷⁵ For cylindrical columns, the expanded echinus served as a transitional member and, with the abacus above, offered a larger bearing surface and greater resistance to lateral movement. Thus, in both orders, the basic form of the capital likely arose in response to structural needs. Its individual articulation, with an ascending profile of the echinus and square plan for the abacus in the Doric style or with an undercut leaf echinus and narrow, volute member in Ionic, would reflect local refinements of this form. Artistic influences from other periods or regions help to explain these differences. Thus, Mycenaean capitals preserved in stone probably influenced the shape of the Doric echinus. On a more general level, the Bronze Age spiral and Near Eastern volute, as well as perhaps the Mycenaean and more likely the eastern leaf, are clear sources for the decoration of the Ionic capital.

The exact process by which artistic models were incorporated cannot now be reconstructed. It is assumed that horizontally connected volutes were applied to the elongated rectangular face of the "abacus," or transverse beam, and its ends rounded off to fit the spiralling curves. The echinus is more problematic. As just discussed, it likely originated from a desire to widen the upper end of the shaft for structural purposes. Along with its Doric counterpart, this area in the Ionic capital took a torus-like shape. Yet the undercutting of the echinus in the second generation of capitals, between 580 and 560 B.C., probably results from an interest in consistency between shape and decoration. That is, the initial application to the echinus of a motif borrowed from Mycenaean or Near Eastern leaf crowns subsequently led to its representation also in the profile.

The merging of shape and decoration suggests that this member, at least by the second generation, was patterned after an established element with an already determined form, most likely the Near Eastern leaf crown. The wide diffusion of that crown in both geography and medium presents difficulties, as Martin points out, in determining a specific source of inspiration. Furthermore, its derivation may not have been direct, but rather transmitted through other objects, including W. Kirchhoff's vessel stands as well as furniture and portable artworks.⁷⁶ In any case, this motif achieved considerable popularity in east Greek architecture, serving independently as a palm or leaf capital, or combined with volutes. In the latter configuration, the Aeolic vertical volutes resting on a separate leaf drum or attached torus would parallel the Ionic horizontal volutes on the leaf-, or later egg-, echinus.⁷⁷

If we assume Near Eastern sources for the motif, and certainly by a second phase for the shape, of the Ionic echinus, its evolution is unlikely to predate the Orientalizing period of the seventh century B.C. The lack of articulation of the "echinus" in the Sangri votive column, dated to the late seventh century, may place this event even later, during the early sixth century. The development of the capital would thus parallel that of the Ionic base, which received its refinement and characteristic components only during this same period.

It is more difficult to set a date for the emergence of the Doric capital, since both Mycenaean models and structural requirements existed throughout the Early Iron Age. Yet it is not until the second half of the eighth century that we begin to see an interest among the Greeks in their Bronze Age past.⁷⁸ This interest is displayed in a variety of ways and seems to be generated by different factors. The emulation of heroic burials and the depiction of heroic subjects on vases can be attributed to the dissemination of epic stories and poetry, especially the *Iliad* and *Odyssey*. Offerings left at tombs, on the other hand, must have been provoked by the rediscovery of actual physical remains. The possible eighth-century installation of a cult building within the megaron at Tiryns, as discussed in Chapter 2, would likewise suggest a familiarity with archaeological remains. More important for our investigation, the Lion Gate at Mycenae, which incorporates a column in relief between the two felines, must have been known in this period since it was still visible in the second century A.D. according to Pausanias (II, 16, 5).

Yet while models and an interest in them may have existed from the second half of the eighth century onward, it is not clear that they inspired architectural forms so early. One telling indication of this point is provided by a construction deposit on the Cycladic island of Delos, dating from the end of the eighth or the seventh century B.C., that contained Mycenaean miniature column models.⁷⁹ Although the locals must have been aware of the forms and showed respect for the objects, they made no attempt to emulate the columns. Even with the subsequent rise of monumental architecture, Delos was part of the Ionic, rather than the Doric, tradition. If, then, Mycenaean capitals served as models for their Doric counterpart, a catalyst was needed beyond mere familiarity. That catalyst was probably the move toward monumentality in the second half of the seventh century.

The interpretation espoused here, of an ornamental elaboration of structural forms, is particularly appropriate for the entablatures of the respective orders, the very area to which it was applied by Vitruvius. Accepting a fundamental accuracy in his explanation, we should look for inspiration both for the Doric frieze and mutules and for Ionic dentils in elements of the roof. In the case of dentils, an origin in ceiling beams has already been noted. Yet the dentil is not merely a "petrification" of structural antecedents in wood. Rather, while the practice of exposing the rectangular projections immediately below the roof line may be borrowed from earlier construction methods, their spacing and placement in a single course must arise from aesthetic interests. The introduction of the dentil as

a decorative motif can be dated on the basis of building models to the late seventh or early sixth century B.C.

Antecedents for the Doric entablature are much more obscure. As E.-L. Schwandner suggests, these forms may have become ornamental at such an early stage that construction details are now irrevocably lost.⁸⁰ Certainly attempts to equate triglyphs with ceiling beams have failed because of both the level at which they would appear and their overwhelming size. The first problem can be resolved if the frieze evolved not above the peristyle, where the ceiling typically appears in a higher course, but above a porch and/or solid walls.⁸¹ With the reclassification of many of our earliest temples as non-peripteral, such a reconstruction becomes more likely.

Three buildings emerge as potential candidates in this development. Both the Temple of Poseidon at Isthmia and the Temple of Apollo at Thermon have recently been identified as non-peripteral, while new research has confirmed that designation for the temple at Mykenai. According to the reconstruction proposed in Chapter 2 for the Isthmia temple, the course of blocks immediately below the geison may have supported ceiling beams that extended through the entire width of the blocks. Beam ends would thus be visible on the exterior, as irregularly spaced wooden rectangles within otherwise stone walls. Depending on the extent of their projection, these beam ends may have given rise to the concept of mutules or to the articulation of the wall surface in the form of triglyphs. In either case, the correspondence would be only very general. Although R. F. Rhodes discounts the origin of triglyphs in the Corinthia, he nevertheless views timbers in this building as possible sources for Doric forms, including the taenia and regulae of the later architrave.⁸²

Another motivation for the frieze may exist in the decorated wall panels of these temples. Ornamentation of the walls of important buildings is attested early in extant architecture as well as in models. Already during the tenth century B.C., the walls of the Heroön at Lefkandi may have displayed patterns of differently colored mud-bricks.⁸³ Courses of bricks in alternating colors certainly appear in the early seventh-century South Temple at Kalapodi.⁸⁴ If the painted sides of Geometric models imitated the practice in large-scale architecture, those buildings would presumably have been decorated with motifs derived from contemporary painting. Such a tradition is attested in the wall panels of the seventh-century Temples of Apollo at Corinth and Poseidon at Isthmia (Fig. 85).⁸⁵ The depictions cannot be reconstructed at either site, but the evidence from Isthmia clearly demonstrates their arrangement in panels enclosed both horizontally and vertically. It is perhaps only a small step from the walls to the entablature.⁸⁶

That step may have been taken in the painted terracotta plaques at Thermon. From the preserved representations, H. Payne has determined that some subjects were completed on additional panels.⁸⁷ This horizontal linkage is inconsistent with individual plaques and points to the origin of such decoration in a

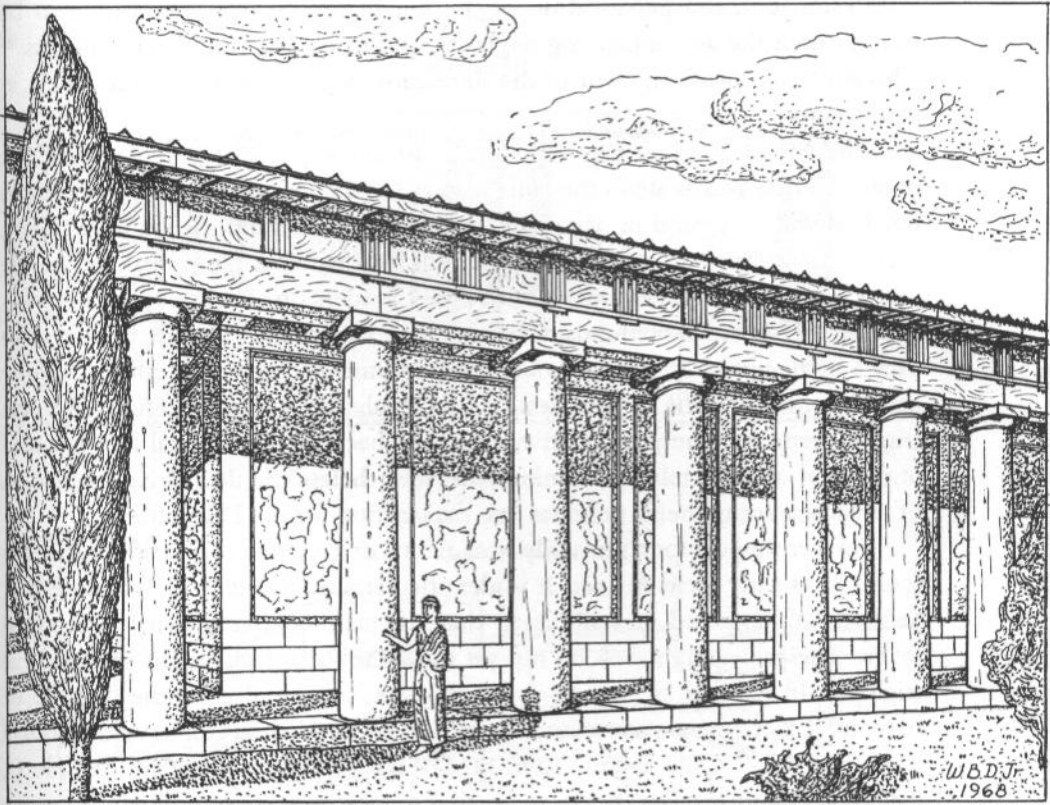


Figure 85. Restoration of archaic Temple of Poseidon at Isthmia, at southwest corner, from O. Broneer, *Isthmia I: Temple of Poseidon* (Princeton, NJ: American School of Classical Studies at Athens, 1971) 41, fig. 54, reproduced by permission of the American School of Classical Studies at Athens.

larger or more continuous medium. We have already noted how the method of insertion of these panels and their shallow depth, which required backers, point to a primarily decorative purpose. Wooden panels may have secured their edges, overlapping them somewhat in the manner of later triglyphs and forming a taenia-like border at the base.⁸⁸ Although the Thermon plaques cannot be considered true metopes, they may have formed a functional, and to some extent also formal, link between the somewhat earlier wall panels in the Corinthia and canonical metopes.

Because the Thermon panels are of a fairly consistent size, it is possible that their location corresponded in some way with the structure of the building. It is tempting to suggest that they even filled the spaces between ceiling beams. As noted previously, however, their height would considerably exceed that of the beams. An analogy may be suggested with the Ionic entablature frieze that, according to Gruben, originated as a covering for the ends of ceiling beams. In its earliest appearance, in the *Oikos* of the Naxians on Delos, the frieze course is taller than the beams it masks.⁸⁹ The same may be true at Thermon. More-

over, even with the petrification of the entablature, metopes continue to be thinner than the accompanying triglyphs, and thus to require backer blocks.⁹⁰ This situation speaks in favor of the derivation of metopes from thin panels, as at Thermon.

The Mykenai reliefs may represent a further step in the emergence of the frieze.⁹¹ These panels are in the same material as the wall (stone) and executed in relief, as will be typical of decorated metopes in later times. As we have noted, they were probably secured within the wall by a wooden framework. Since the reliefs were themselves equipped with raised borders on all sides, such an enclosure would be visually redundant. For instance, two plaques set side by side with only a single upright between would result in three verticals. The effect is similar to that created by the triple fillets of later triglyphs. Any connection with the triglyph remains purely speculative, especially because the original location and disposition of these reliefs are unknown. Nevertheless, the decorative adaptation of structural components provides one explanation for the Doric frieze.

Further support for a primarily ornamental or symbolic origin of the frieze is found in its early form and use. It is identified around 580 B.C. in Temple E 1 at Selinous as composed of wall blocks that articulate complementary trapezoidal forms. The projecting panels do not yet show the surface treatment of canonical triglyphs. In another of its earliest appearances, on the altar of the Temple of Artemis at Korkyra, presumed to date ca. 580–570 B.C., it is employed at ground level (Fig. 86).⁹² Only slightly later, ca. 570 B.C., the non-peripteral Temple of Aphaia at Aigina displays the frieze on all four faces of the exterior, mainly above solid walls, as well as around three sides within its porch. Even those who argue for structural origins admit that the placement of the frieze in the same level on all four sides can only derive from artistic considerations. More important, the back-to-back placement of triglyphs must surely negate any structural significance.

This point is demonstrated even more clearly in the terracotta covering of a wooden geison from Kroton in south Italy, dated to the first half of the sixth century B.C. (Fig. 87). This geison revetment displays an abbreviated entablature consisting of "tetraglyphs" above a taenia, from which hang independently spaced regulae with guttae. Mutules may be indicated at the bases of antefixes by pendant guttae.⁹³ It is hard to imagine that such a free interpretation of the Doric entablature would be possible in a system based on structural elements.

Additionally, in some of the earliest extant peristyle friezes, such as those of the Old Tholos at Delphi (ca. 580 B.C.) and the Temple of Apollo at Syracuse (ca. 570–60 B.C.), there is no alignment between the triglyphs and columns. If triglyphs originally served a structural function, one would expect them to rest directly above their supports, at least initially. Instead, this coordination becomes more characteristic in later buildings. A step in that direction is represented by the contemporary (ca. 570–60 B.C.) Sikyonian Monopteros, which places triglyphs above columns but not above the intervening spaces.⁹⁴ It may thus have been in the transference of the frieze from the walls of a non-

ALTAR
NORDSEITE

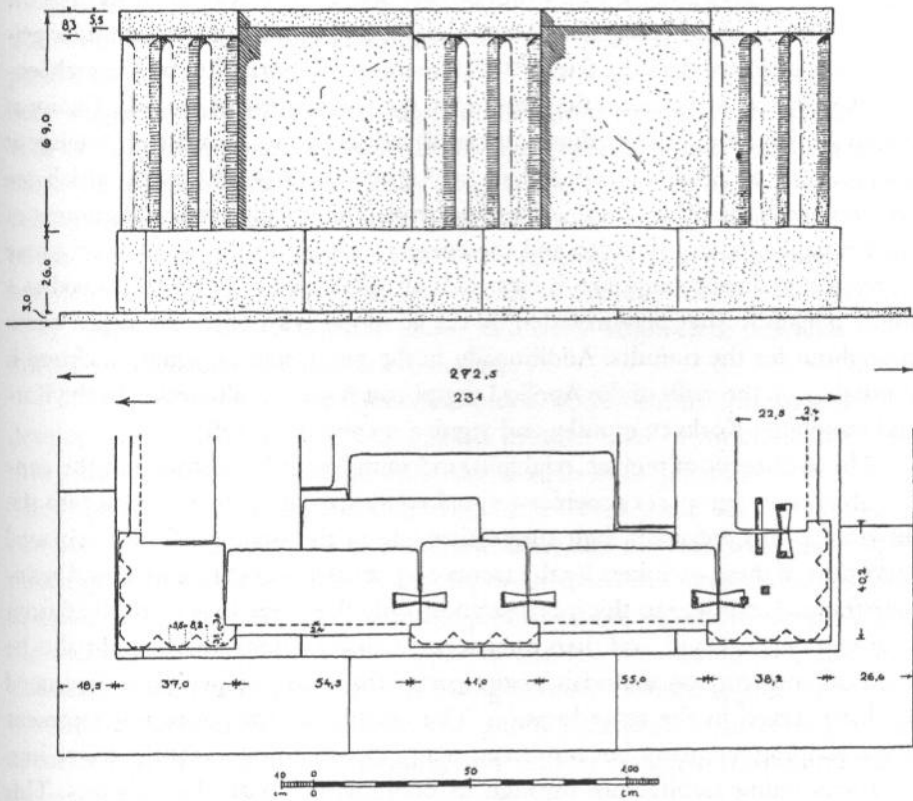


Figure 86. Altar of the Temple of Artemis, Korkyra, from Schleif, *Korkyra* I, 65, fig. 49, reproduced by permission of Gebr. Mann Verlag.

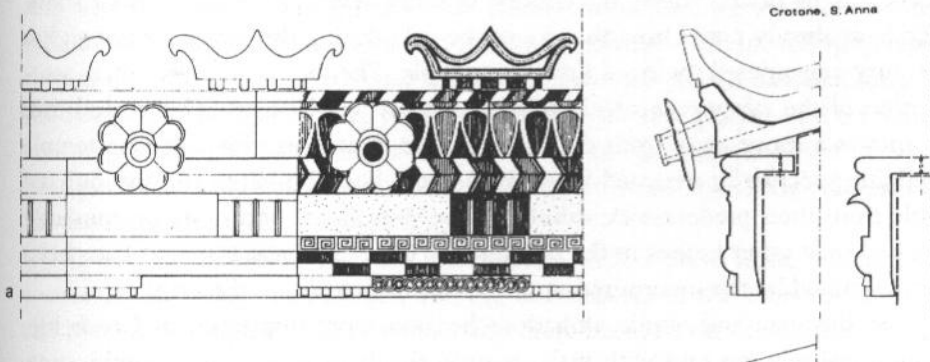


Figure 87. Terracotta covering of wooden geison, Kroton, from D. Mertens, in *Atti Taranto* 23 (1983) 212, fig. 5a, reproduced by permission of D. Mertens.

peripteral building to a peristyle that a more "structural" arrangement was adopted.⁹⁵

This secondary emphasis on structure may also account for the creation of the other members of the entablature. Vitruvius (IV, 2, 3) implies that the mutular geison originated later than the frieze.⁹⁶ This seems to be borne out by the archaeological evidence. Mutules are first attested in the entablatures of the Old Tholos at Delphi (ca. 580 B.C.), but without guttae, as well as in the Temples of Artemis at Korcyra and of Apollo I and Aphaia at Aigina (ca. 580–570 B.C.), which are equipped with the other canonical components. The usually vertical alignment of regulae, triglyphs, and mutules, and the correspondence in the number of guttae on regulae and mutules, make it clear that all these elements are conceived as a unit.⁹⁷ This is further demonstrated by the adoption with time of a single width throughout for the mutules. Additionally, in the rare instances when the frieze is omitted, as on the walls of the Apollo I temple on Aigina or altogether in the Kardaki temple on Korcyra, mutules and regulae are absent as well.

The alignment of regulae, triglyphs, and mutules with columns and the centers of intervening spaces provides a visual continuation of the columns into the entablature and enhances their supportive role in the building. The horizontal separation of these members by the taenia and cornice serves to define and articulate them. According to this interpretation, only the frieze may be derived from a component in wood, and then only very generally. Other forms could also be based on construction materials, as the guttae from nails or pegs, but they need not have served in the same location. The entablature thus does not represent actual building members, but instead an artistic device to integrate the frieze into the surrounding architecture through its coordination with the columns. This interest in tectonics is demonstrated in vase-painting already in the Proto-Geometric period and seems to grow with time. Vitruvius's reference to the components of the entablature as "ornaments" may therefore stem from an accurate understanding of their basic nature.

The emergence of the architectural orders from the elaboration of structural forms can be placed within the context of other developments in Greek society. We have already noted how the rise of the *polis* during the course of the eighth century engendered the need for a city temple. The looser, and less urban, association of the *ethnos* seems to have had a similar requirement. This period thus witnesses a move away from the ruler's house as a center for cult to a temple building specifically designed to serve the god. Such buildings initially differed little from their predecessors, although they were larger and more prominently located than other houses in the community. Cult structures may also have been distinguished by the incorporation of decoration into or on their walls.

As the state and ethnic affiliations became more important in Greek life, communal religion, and with it the temple, also took on increased significance. Growing prosperity and technology allowed for a greater monumentalization of the temple building. This would be expressed not only in increased size but also

in the use of more durable materials, such as cut-stone blocks and tile roofs, both of which are introduced for temples in the first half of the seventh century. These materials must have served also to distinguish sacred from secular. This distinction would apply especially in mainland Greece, where throughout the Archaic period tile roofs were generally limited to religious structures.⁹⁸ Likewise, it has been suggested that the peristyle assumes a religious association in the early seventh century. Its appearance before this time in generally secular buildings undermines the proposal first broached by Semper and expanded by H. Drerup of its derivation from the baldacchino as a symbol of authority.⁹⁹ Nevertheless, that resemblance must have carried some meaning. On its own, the peristyle would have lent the temple increased stature – an effect already noted by Vitruvius (III, 3, 9) – and, as the two became more intimately connected, provided for its immediate recognition as a sacred structure.

The emergence of the architectural orders occurs within this same series of developments. That is, the orders offered another level of monumentality and thus another means of distinguishing the temple from surrounding structures. They thus stood as recognizable symbols of a sacred place. So, too, individual components of the orders were employed, especially early on, to support votive offerings or to adorn altars. Even in later times when the orders were extended to other building types, their use in temples was more rigorously defined. Since the orders do not represent translations of construction techniques, but rather elaborations of structural forms, it is fitting that they should appear secondarily. Roofing terracottas likewise move from purely functional to increasingly more decorative, with the process beginning only slightly earlier, in the second half of the seventh century B.C.¹⁰⁰

The motivation for these changes probably arose, at least in part, from a growing familiarity with other cultures. Both the Near East and, to a greater extent, Egypt had a tradition of monumental stone buildings that must have offered inspiration to the Greeks. In fact, it is likely that the techniques for carving first soft, then hard, stones were borrowed from the Near East and Egypt, respectively.¹⁰¹ We have suggested Near Eastern inspiration for the Ionic capital. Additionally, certain characteristics of the Doric column shaft, including its taper toward the top, its early preference for sixteen flutes, and the initially flat form of the flutes, may be based on Egyptian models. By the last quarter of the seventh century, Greeks had established a trading colony at Naukratis in Egypt.¹⁰² That time period would coincide with our earliest evidence for the Doric column and for the beginnings of the orders in general.

It is clear, however, that the architectural orders drew from a variety of sources, both foreign and local. Thus, the resemblance of the Doric echinus to the Mycenaean capital makes a connection there likely. At the same time, adaptations of the archetype often prevent certainty. It appears that architects treated external models in the same way as structural predecessors – that is, they used them for general inspiration rather than imitation.

As also with innovations in materials, which are adopted in separate locations at different times rather than appearing simultaneously in all Greek temples, a comparable situation existed with the introduction of architectural forms. Yet certain factors led to the eventual prevalence of stone buildings with tile roofs and of two fairly uniform traditions, or "orders." As discussed in Chapter 3, one must have been the transmission of ideas and innovations from site to site by architects. Since the temple is often referred to as a communal votive offering, we can certainly assume a local pride and competitive spirit on the part of the patrons.¹⁰³ C. Höcker points out the role that the temple must have played in proclaiming Greek identity in the western colonies and suggests a similar function in the emerging *polis*.¹⁰⁴ Such factors would have stimulated an interest in developments elsewhere as well as a desire to imitate and even surpass them. Because the orders satisfied the shared quest for monumentality and architectural distinction, it is no wonder that they found ready acceptance in this period.

CONCLUSIONS

Any reconstruction of the origins of the orders must necessarily remain somewhat speculative. It is clear, however, that a direct translation of forms originally fashioned in another material, such as wood, cannot be supported by the archaeological evidence. For Vitruvius (IV, 2, 2), aesthetics played a part in the final result. Models from other arts must have contributed as well. The process was thus a complex one and, it would seem, impossible to reconstruct.

Yet with the elimination of a prior evolution in wood, the basis for assuming an early date and long development for the orders is removed. There is no longer any reason to expect an origin significantly earlier than our initial evidence in stone. Vitruvius explained the steps in the emergence of canonical forms as a series of inventions by unnamed architects. We have traced that process of experimentation in the archaeological remains of the Doric and Ionic orders. Invention and innovation are attested perhaps even more clearly for the third order, Corinthian, since it was created in the Classical period, a time of better documentation.¹⁰⁵ Thus, neither the literary nor the archaeological evidence requires an origin for the Doric and Ionic orders before the late seventh century, and, in fact, both speak against it.

CONCLUSIONS: INTERPRETATION AND IMPLICATIONS

MODERN VIEWS ON THE origins of the orders are largely based on the ancient sources and subsequent interpretations of them. These views were established long before the beginning of archaeological research. A more critical approach to these sources, along with the recovery of empirical evidence, has supplemented or refined our understanding. Yet archaeological remains are still frequently interpreted according to the accepted theories. As N. Weickenmeier has demonstrated in regard to the Doric frieze, a wide gap exists between theory and reality.¹

An attempt has been made here to bridge that gap by accounting for Vitruvius's explanation of the origins of the orders as both structural and ornamental. Rather than representing direct translations of structural components, extant elements may be ornamental elaborations and loose interpretations of them. This explains the inability of scholars to recreate original forms from those preserved to us.

Such an approach also eliminates the necessity of an early date for the origins of the orders. The materials used in the Early Iron Age do not seem capable of the refinement needed to execute precise forms. Nor are such forms attested in one of the few pieces of evidence we possess for elevations: building models. Similarly, there is little indication of a desire to distinguish individual buildings architecturally, as for example by a peristyle. Indeed, it is assumed that the temple as a separate structure only arose during the eighth century B.C.

We can trace an increasing expertise in stone construction during the eighth and especially seventh centuries. This allows the opportunity for the execution of specific architectural forms. Yet even in the most sophisticated temples of this period, such as those of the first half of the seventh century at Corinth and Isthmia or the Samian Heraion, there is as yet no indication of the distinctive members of either order. According to recent arguments, even the peristyle may be lacking in these structures and only occasionally used elsewhere. The move toward more permanent and precisely worked materials surely demonstrates an interest in monumentality. The introduction of architectural orders must represent a second step in that development.

Individual components of the orders seem to appear piecemeal over the course of the late seventh and early sixth centuries. It is not until the beginning of the second quarter of the sixth century that we find the combination of developed elements that characterize each "order." In Doric architecture, and subsequently in Ionic, the peristyle also becomes more common. Nevertheless, temples in Asia Minor are still in the process of "petrification." Components in both orders will continue to evolve throughout most of the sixth century B.C.

This relatively late date for the emergence of the orders coincides with the development of another monumental art, sculpture. It is also not inconsistent with the statements of Vitruvius. One may account for his implied early date as the result of association: that is, the correspondence between the name of the order and the eponymous leader of each tribe led to the identification of that leader as the founder. On the other hand, Vitruvius designates the first Doric temple as that of Hera at Argos and the first Ionic one as the Temple of Artemis at Ephesos. The dates for these buildings, perhaps the third quarter of the seventh century and ca. 560–550 B.C., respectively, are not far from the period suggested here for the origins of the orders.

The earliest remains still betray a period of experimentation. Inventions of new forms or significant innovations in their rendering are attested in the Doric frieze and especially in its geison, as well as in the Ionic column base, echinus, triple-fascia architrave, and geison. Once the "correct" forms are reached, the Doric order evolves toward greater uniformity in its members and a proportional relationship of parts. This is demonstrated by the alignment of triglyphs and columns, the coordination in size between the triglyph and anta return, and the adoption of a single width for all of the mutules. By contrast, Ionic remains more flexible, as in the type and form of decorative components, the employment of a frieze versus dentils, and in the spacing and even proportions of columns. A canon is thus not attested in the early material. It seems to emerge in regard to the elements only by the late sixth century B.C., and still later for proportions.

From the beginning, each order is a product of a distinct part of the Greek world, but is created by contributions from different sites or regions. Attempts to isolate a single location for the origin of an order, as the northeast Peloponnesos or more specifically the city of Corinth for Doric, are unsupported. At the same time, current evidence suggests that individual areas could play a leading role, as in the case of Naxos for the Ionic order. Innovations made in one region may become part of the broader tradition, or may remain localized. Thus, the Doric anta capital existed in two different forms, only one of which eventually became "canonical." The Ionic order shows sufficient variation that two separate systems can be recognized, Island-Ionic in the Cyclades and Eastern-Ionic in Asia Minor. Even within a single system, diversity exists, as demonstrated perhaps most clearly in the types and locations of architectural sculpture in Asia Minor temples. Interaction between areas may also account for the evolution of "hybrid" forms. The sofa-type anta capital may be an example of a Doric component created under

Ionic influence. The Island-Ionic anta capital and the smooth version of the leaf column capital both bear similarities with Doric elements.

These conclusions have implications for our understanding of Greek architecture as a whole. Scholars have often failed to appreciate the contributions of individual regions. The Cycladic Islands, for example, have remained largely unknown and therefore unrecognized. Their impact on the formation of Ionic architecture and the intermediate role they played between East and West are now becoming clear. Western Greece is another area that has been poorly understood. It generally adopted the Doric order, which developed for the most part in mainland Greece. Yet separate components of that order evolved in different parts of the Mainland, and elements such as the sofa-type capital may even have originated in the West. Thus, western Greece should be seen as an active participant in this process, on a more equal level with the other contributors to the Doric order.

Conversely, Attica has perhaps received excessive credit for innovation and fine workmanship. This situation probably arises from the initial literary bias of the discipline, which placed special emphasis on Athenian historical and cultural accomplishments, and from the early exploration and publication of its remains. Moreover, Athens produced a number of significant buildings within the relatively short span of the High Classical period. Yet as the Cycladic tradition becomes better known, its enormous contribution to the Attic-Ionic style is increasingly recognized. So, too, investigations of Classical architecture in the Peloponnesos are unveiling equally impressive achievements in the refinement and execution of buildings there.²

The flexibility and experimentation that led to the formation of the orders continued into much later times. This accounts for the willingness of architects throughout Greece to incorporate elements of "other" styles. From their earliest constructions, western Greeks employ Ionic forms or concepts in their Doric buildings and even, from the end of the sixth century, build in the Ionic order. At the same time, the Cyclades become more canonical in their approach to Doric elements and after the end of the Archaic period abandon their "native" tradition altogether. Perhaps the most obvious example is Athens, which during its great Akropolis building program drew increasingly on Ionic traditions with each new construction. This development has been labeled a "gesture of racial solidarity," that is, an attempt by Mainland Athens, an ethnically Ionian city, to integrate Dorians and Ionians through architectural style.³ In view of the evidence presented here, however, one might interpret it instead as reflecting a continuing openness to new ideas and influences in the use of the orders as a result of expanding interactions. Certainly Athens had political reasons to advertise that openness, but neither political nor racial motivations can account for the incorporation of Ionic and even Corinthian interiors in Peloponnesian Doric temples of the late fifth and fourth centuries B.C. Once popularized by the Akropolis buildings, the use of different orders and otherwise separate components in the

same structure becomes increasingly characteristic of subsequent Greek architecture.⁴ It is indeed doubtful whether in any period the orders were so strictly defined or mutually exclusive as we have come to believe.

Such evidence suggests that the evolutionary model has only limited validity for the architectural orders. Each order reached a point of "perfection" in regard to proportions during the Classical period, but neither experienced the expected decline. Both continued in use throughout the history of Greek architecture, and both remained vital through constant innovation. The orders were not at any stage the frozen, rigid systems that Vitruvius, or his interpreters, imply. For the Greeks, they remained always capable of change and thus a living, rather than an academic, tradition.

NOTES

Abbreviations follow the format prescribed in *AJA* 104 (2000) 10–24. Where no abbreviation is listed there or where greater clarity is desired, the full title is given. Greek names and spellings are used for Greek sites (e.g., Aigina, Selinous) except where the Roman name (e.g., Paestum) or Anglicized form is much better known.

CHAPTER 1

1. J. J. Pollitt, *The Ancient View of Greek Art: Criticism, History, and Terminology* (New Haven and London: Yale University Press, 1974) 66–70 discusses Vitruvius in his chapter on “Roman Variants,” since he considers Rome during the first centuries B.C. and A.D. to be an “extension of late Hellenistic culture.” Similar points are made by I. D. Rowland and T. N. Howe, eds., *Vitruvius: Ten Books on Architecture* (Cambridge: Cambridge University Press, 1999) 1–20. For Vitruvian architectural theory and its legacy, see also T. N. Howe, “The Invention of the Doric Order” (Diss. Harvard University, 1985), esp. 14–78.
2. J. Onians, *Bearers of Meaning. The Classical Orders in Antiquity, the Middle Ages, and the Renaissance* (Princeton, NJ: Princeton University Press, 1988) 247–48; I. D. Rowland, “Raphael, Angelo Colocci, and the Genesis of the Architectural Orders,” *Art Bulletin* 76 (1994) 81–104, esp. 97–103.
3. M. Vitruvius Pollio, *The Ten Books on Architecture*, trans. M. H. Morgan (New York: Dover Publications, Inc., 1960). This is the primary translation used here. See now Rowland and Howe, eds., *Vitruvius*.
4. This genealogy is known already in the Hesiodic *Catalogue of Women* (*Katalogos*): N.G.L. Hammond and H. H. Scullard, eds., *The Oxford Classical Dictionary*, 2nd ed. (Oxford: Clarendon Press, 1970) 495 s.v. Hellen; M. L. West, *The Hesiodic Catalogue of Women* (Oxford: Clarendon Press, 1985) 57–60, 125–37, 143–44. West dates the composition of the *Catalogue* to the sixth century B.C. but traces the genealogy of Hellen and his sons to at least the eighth century B.C.
5. Opinions on this issue vary. Recent scholarship includes: E. Will, *Doriens et Ioniens* (Paris: Les Belles Lettres, 1956); J. Alty, “Dorians and Ionians,” *JHS* 102 (1982) 1–14; J. M. Hall, *Ethnic Identity in Greek Antiquity* (Cambridge: Cambridge University Press, 1997).
6. Anakreon: D. A. Campbell, *Greek Lyric II* (Cambridge, MA: Harvard University Press, 1988) 83 no. 399; M. Dillon and L. Garland, *Ancient Greece: Social and Historical Documents from Archaic Times to the Death of Socrates (ca. 800–399 B.C.)* (London and New York: Routledge, 1994) 382. Herodotos: Herodotus, *The Histories*, translated by A. de Sélincourt (Harmondsworth, Middlesex: Penguin Books Ltd., 1972) 372. E. B. Harrison, “Notes on Daedalic Dress,” *JWalt* 36 (1977) 37–48, esp. 47–48.
7. J. Miller, *Pauly-Wissowa*, s.v. Dores; S. Hornblower, *A Commentary on Thucydides*, I (Oxford: Clarendon Press 1991) 142 and II (Oxford: Clarendon Press 1996) 225, with previous bibliography.

8. Hall, *Ethnic Identity* 50 sees evidence for an increasingly "aggregative identity" in the archaeological record of Naukratis. Sanctuaries are initially created for individual cities, but in geographical proximity to those of other members of the wider ethnic group, while somewhat later there appears a Hellenion for all descendants of Hellen.
9. P. Gros, "La Ligue ionienne et les origines de l'ordre dorique, selon Vitruve, IV, 1, 3-6," in J. des Courtils and J.-C. Moretti, *Les grands ateliers d'architecture dans le monde égéen du VIe siècle av. J.-C.* (Paris: de Boccard, 1993) 59-67, esp. 63-67.
10. J. C. Wright, "The Old Temple Terrace at the Argive Heraeum and the Early Cult of Hera in the Argolid," *JHS* 102 (1982) 186-201. I. Strøm, "The Early Sanctuary of the Argive Heraion and its External Relations (8th-early 6th c. B.C.)," *Acta Arch* 59 (1988) 173-203, esp. 174-76, notes the presence of some Proto-Geometric material and suggests that the sanctuary may have been in existence already in that period. C. M. Antonaccio, "Temples, Tombs, and the Early Argive Heraion," *Hesperia* 61 (1992) 85-105, esp. 90-98, 100-101, for the date of the foundation of the sanctuary and the construction of both the terrace and the Old Temple. She also raises the possibility of a predecessor to the Old Temple not on this terrace but on one nearby.
11. Some have wanted to identify the building represented in a terracotta model from this sanctuary with its earliest temple. That model is usually dated at the end of the eighth century, but S. Ferri, trans., *Vitruvio: Architettura (dai libri I-VII)* (Rome: Elli Palombi, 1960) 139 suggests an even earlier date for the first temple, in the ninth or eighth century B.C., and believes that Vitruvius is referring to this temple in his passage. Yet the model has also been identified as a house, and without further evidence the existence of a temple in the sanctuary prior to the seventh century B.C. remains speculative.
12. A. Bammer, "A *Peripteros* of the Geometric Period in the Artemision of Ephesus," *AnatSt* 40 (1990) 137-60.
13. Indeed, W. B. Dinsmoor, *The Architecture of Ancient Greece* (New York: W. W. Norton and Co., Inc., 1975) 130 accepts this proportion of the temple columns, although G. Gruben, *Die Tempel der Griechen* 3rd ed. (Munich: Hirmer Verlag, 1980) 351 reconstructs them with a height of ca. twelve lower diameters.
14. For this style, see P. P. Betancourt, *The Aeolic Style in Architecture* (Princeton, NJ: Princeton University Press, 1977).
15. P. Gros, "Vitruve: l'architecture et sa théorie, à la lumière des études récentes," *Aufstieg und Niedergang der Römischen Welt* II, 30, 1 (1982) 659-95, esp. 684-86.
16. Indeed, P. Gros, "Nombres irrationnels et nombres parfaits chez Vitruve," *MÉFRA* 88 (1976) 669-704, esp. 702-704, suggests that Vitruvius's choice of the Attic and Ionic (Ephesian) bases for discussion had even more mundane motives: that their profiles allowed for an arithmetic definition. These examples were thus preferable to the Samian type, which evolved around the same time as the Ephesian but is not mentioned, and to the composite type, which had replaced the Ephesian base by Vitruvius's time. H. Knell, *Vitruvs Architekturtheorie* (Darmstadt: Wissenschaftliche Buchgesellschaft, 1985) 101-107, makes a similar point in regard to both the bases and the two different types of entablature. He attributes Vitruvius's choices and proportions for those members to a desire for a single principle of design using a shared module, thus emphasizing theory over history.
17. F. E. Brown, "Vitruvius and the Liberal Art of Architecture," *Bucknell Review* 11 (1962-63) 99-107.
18. P. Kidson, "Architecture and City Planning," in M. I. Finley, ed., *The Legacy of Greece: A New Appraisal* (Oxford: Clarendon Press and New York: Oxford University Press, 1981) 376-400, esp. 386, takes a more cynical view of Vitruvius's aims: "his book was dedicated to the Emperor in the transparent hope of landing one of the plum commissions for himself. But it is clear that the best jobs were going to Greeks. So, in order to show that Roman architects were in no way inferior to

- Greek, he went in for an impressive display of Greek name-dropping."
19. As discussed by A. von Gerkan, "Betrachtungen zum ionischen Gebälk," *JdI* 61/62 (1946/47) 17–29 and H. Kähler, *Das griechische Metopenbild* (Munich: Münchener verlag, 1949) 25.
 20. Especially J.-I. Hittorff, in J.-I. Hittorff and L. Zanth, *Recueil des Monuments de Ségeste et de Sélinonte* (Paris: Donnaud, 1870) 330–57. See Chapter 5 for a more complete discussion of wooden origins.
 21. The unity of construction is noted by Knell, *Vitruvs Architekturtheorie*, 53. In his fig. 11 he shows the secondary rafters as inclined, which they would be, according to Vitruvius's reconstruction.
 22. See Gros, *Aufstieg und Niedergang*, 679–80, for concerns of theoreticians and the need for a logical system.
 23. Pollitt, *Ancient View*, 32–34.
 24. For these passages and a more thorough discussion of this issue, see A. A. Donohue, "Xoana" and the Origins of Greek Sculpture (Atlanta, GA: Scholars Press, 1988), esp. 133–50, 208–18. It should be noted that in the passage cited Pausanias does not actually refer to the statue as being of wood, but simply calls it a "xoanon." Nevertheless, as Donohue has argued convincingly, Pausanias uses that term to describe a wooden image of a deity.
 25. Donohue, "Xoana," passim.
 26. Donohue, "Xoana," 197–98, for discussion and references; Pollitt, *Ancient View*, 74–76, in regard to Pliny and his sources. For Skamon, see F. Jacoby, *Pauly-Wissowa*, s.v. Skamon.
 27. Brown, "Vitruvius and the Liberal Art," 103–107.
 28. Gros, *Aufstieg und Niedergang*, 669–70.
 29. Pollitt, *Ancient View*, esp. 14–22, and J. J. Pollitt, "The Canon of Polykleitos and Other Canons," in W. G. Moon, ed., *Polykleitos, the Doryphoros, and Tradition* (Madison: The University of Wisconsin Press, 1995) 19–24. In the latter work, Pollitt argues for the debt of Polykleitos to the ideas not only of Pythagoras but also of architects. Other authors in this volume, esp. J. M. Hurwit and I. S. Mark, 11–12 and 28, respectively, likewise discuss the relationship of Polykleitos and Pythagoras. See also W. Hoepfner, who connects Pythagoras with the first great period of building theory, and F. Preisshofen, who argues that only in the end of the sixth century did the structure of the Greek language begin to allow for theoretical discussions: in *Bauplanung und Bautheorie der Antike, Diskussionen zur archäologischen Bauforschung* 4 (Berlin: Wasmuth, 1983) 15 and 26–30, respectively.
 30. Pollitt, *Ancient View*, 18–20, suggests an exchange of ideas between Polykleitos and the Pythagoreans; J. E. Raven, "Polyclitus and Pythagoreanism," *CQ* 45 (1951) 147–52, assumes that Polykleitos' theory of proportions appeared first, in his book, *The Canon*. See also J. Rykwert, *The Dancing Column: On Order in Architecture* (Cambridge, MA and London: MIT Press, 1996), esp. 97–110.
 31. Pollitt, *Ancient View*, 12; B. Wesenberg, "Die Entstehung der griechischen Säulen- und Gebälkformen in der literarischen Überlieferung der Antike," in E.-L. Schwandner, ed., *Säule und Gebälk* (Mainz am Rhein: P. von Zabern, 1996) 5; B. Wesenberg, "Zu den Schriften der griechischen Architekten," in *Bauplanung und Bautheorie der Antike, Diskussionen zur archäologischen Bauforschung* 4 (Berlin: Wasmuth, 1983) 39–48.
 32. Silenus appears to be otherwise unknown, but F. W. Schlicker, *Hellenistische Vorstellungen von der Schönheit des Bauwerks nach Vitruv* (Würzburg-Aumühle: Konrad Triltsch, 1940) 11 n. 29 raises the possibility that Vitruvius meant the fourth century architect Satyros. Arcesius is dated tentatively in the third century B.C. by R. A. Tomlinson, "The Doric Order: Hellenistic Critics and Criticism," *JHS* 82 (1963) 133–45, esp. 137, while Ferri, *Vitruvio*, 143, suggests the fourth century. Ferri, 252, also places Philo in the fourth century, specifically its second half.
 33. G. Hersey, *The Lost Meaning of Classical Architecture* (Cambridge, MA: MIT Press, 1988) 3, says that all the sixty-odd treatises that Vitruvius mentions are lost.

34. P. Gros, "Structures et limites de la compilation vitruvienne dans les livres III et IV du *De architectura*," *Latomus* 34 (1975) 986-1009, esp. 998-1002. See also R. Martin, *Encyclopedia of World Art*, vol. xiv (New York: McGraw-Hill, 1967) 806-11, esp. 807-808, s.v. "Vitruvius."
35. For a discussion of the impact of these sources on Vitruvius, and consequently on our own thinking, see Tomlinson, "Doric Order." The dating of Hermogenes' career is still unresolved. Possibilities range from the last quarter of the third century through the third quarter of the second century B.C. See M. Kreeb, "Hermogenes—Quellen- und Datierungsprobleme," and N. C. Stampolidis, "Hermogenes, sein Werk und seine Schule vom Ende des 3. bis zum Ende des 1. Jhs. v. Chr.," in W. Hoepfner and E.-L. Schwandner, eds., *Hermogenes und die hochhellenistische Architektur* (Mainz am Rhein: P. von Zabern, 1990) 103-13 and 115-21, respectively, both of whom prefer the end of the third and beginning of the second centuries B.C.
36. R. Carpenter, "Vitruvius and the Ionic Order," *AJA* 30 (1926) 259-69. In attributing certain proportions of Vitruvius' elevation to Pytheos, Carpenter assumes that he was the architect of the Mausoleion, which is uncertain, and that the Temple of Athena Polias at Priene possessed a frieze course, which is not generally accepted. Gros, "Structures" 995-98 also notes two different systems in the calculation of epistyle height for Ionic temples.
37. Schlicker, *Hellenistische Vorstellungen*, 1-33.
38. As pointed out by G. L. Hersey, "The Classical Orders of Architecture as Totems in Vitruvian Myth," in P. Brezzi and M. de Panizza Lorch, eds., *Atti del convegno su "Umanesimo a Roma nel Quattrocento"* (Rome: Istituto di studi romani; New York: Barnard College, Columbia University, 1984) 213-21, esp. 218, this story represents an extension of Vitruvius's scheme of equating the architectural orders with humans. Along with the masculine Doric and feminine Ionic, he now has a "daughter-like" Corinthian. See also B. Wesenberg, "Virginis peculia. Zu Vitruvius Aitiologie des korinthischen Kapitells," *AA* (1999) 313-15.
39. The combination of a frieze course and dentils is first attested in Greek architecture in Temple D at Metapontion, in southern Italy, dated ca. 480 B.C.: D. Mertens, "Der ionische Tempel von Metapont. Ein Zwischenbericht," *RM* 86 (1979) 103-37.
40. For the problems of his sources and the use of secondhand information, see esp. Gros, *Aufstieg und Niedergang*, 673-75, and Ferri, *Vitruvio*, 4-7 and various notes, who questions Vitruvius's expertise in the Greek language.
41. It has often been stated that the text was rediscovered in St. Gall in 1414, but manuscripts are known from the ninth century onward. On this point, see esp. F. Pellati, "Vitruvio nel Medio Evo e nel Rinascimento," *Bollettino del Reale Istituto di Archeologia e Storia dell'Arte* 5 (1932) 111-32 and P. Frankl, *The Gothic* (Princeton, NJ: Princeton University Press, 1960) 86-89. For discussions of the impact of Vitruvius on the Renaissance, see P. Fontana, "Osservazioni intorno ai rapporti di Vitruvio colla teorica dell'Architettura del Rinascimento," in *Miscellanea di Storia dell'Arte in onore di I. B. Supino* (Florence: L. S. Olschki, 1933) 305-22; R. Wittkower, *Architectural Principles in the Age of Humanism* (London: A. Tiranti, 1962); P. O. Long, "The Vitruvian Commentary Tradition and Rational Architecture in the Sixteenth Century: A Study in the History of Ideas" (Diss. University of Maryland, 1979); Onians, *Bearers*.
42. See the comments of T. Buddensieg, in R. R. Bolgar, ed., *Classical Influences on European Culture AD 1500-1700* (Cambridge: Cambridge University Press, 1976) 342-43.
43. Pellati, "Vitruvio," 120.
44. The use of various ancient sources is confirmed for the sixteenth-century writer Giorgio Vasari by his own statements. In the preface to part 2, Vasari specifically mentions his reliance on "Pliny and other authors." As discussed earlier, both the progressive view of history and the

- emphasis on inventions and innovations appear in Pliny's *Natural History*.
45. Onians, *Bearers*, 148.
 46. Wittkower, *Principles*, 27–29; Long, “Commentary Tradition,” 19–31.
 47. Onians, *Bearers*, 242–43, 247, 258–60, fig. 150.
 48. Long, “Commentary Tradition,” 178–209.
 49. Giorgio Vasari, *The Lives of the Artists*, trans. by G. Bull (Harmondsworth, Middlesex: Penguin Books Ltd., 1965), from which the cited page numbers are taken. The concept of birth to death is expressed on p. 46, and that of rebirth, following perfection and ruin, appears on p. 32. Some discussion of Greek art appears in the first preface, but it is mainly used in the next two prefaces as a parallel for the development of art closer to Vasari's own time in three stages, from beginnings to perfection.
 50. On the association of architecture with mathematics and music, see Wittkower, *Principles*, 101–21.
 51. Onians, *Bearers*, 153.
 52. Long, “Commentary Tradition,” 155–74; Onians, *Bearers*, esp. 266–71, 308.
 53. Onians, *Bearers*, 149–50 on Alberti; 264–65 on Serlio.
 54. Scholars generally give the date of publication as 1764, but A. A. Donohue, “Winckelmann's History of Art and Polykleitos,” in W. G. Moon, ed., *Polykleitos, the Doryphoros, and Tradition* (Madison: The University of Wisconsin Press, 1995) 327–53, esp. 328 and n. 8, claims that the first edition actually appeared in December 1763.
 55. Both Donohue, “*Xoana*,” 189–91, and A. Potts, *Flesh and the Ideal* (New Haven and London: Yale University Press, 1994) 52 and n. 13, mention the existence of cyclical ideas in other eighteenth-century writers, particularly G. Vico, although Donohue finds no link between the two. A. Potts, “Winckelmann's Construction of History,” *Art History* 5 (1982) 377–407, esp. 380–83, argues that Winckelmann was the first to include a period of decline in his historical progression. Yet this notion had already been raised by the comte de Caylus, who traced art from Egypt to Etruria and then Greece and noted its decline in Rome: J. Babelon, *Choix de Bronzes de la Collection Caylus* (Paris and Bruxelles: G. van Oest, 1928) 18–22, esp. 21. M.-A. Laugier, *An Essay on Architecture*, trans. by W. and A. Herrmann (Los Angeles: Hennessey and Ingalls, Inc., 1977) 8–9, 39–40 finds perfection in Greek art, with a decline from the Roman period until the Renaissance. It is expressed even earlier by Vasari. As Potts correctly notes, Vasari's reconstruction of Greek art, like that of his own time, ended with the period of greatest perfection. The decline is applied only to late Roman art. To be sure, these developments are discussed in different parts of the book – the reconstruction of Greek art in the preface to part 2 and the decline of Roman in the preface to part 1. Thus, Vasari did not apply his cyclical view specifically to Greek art. Yet he saw classical antiquity as a continuum. Moreover, he did express a general development of rise and decline in the first preface, in order to set the background for the early artists, who marked the rebirth. Donohue, “Winckelmann's History,” 332–34, argues that G. P. Bellori likewise provided a model for the idea of artistic decline, which followed the end of both Antiquity and the Renaissance. The concept thus clearly predates Winckelmann.
 56. Donohue, “*Xoana*,” 186–91, discusses Winckelmann's reliance on Vasari, and through him on Cicero, as well as his use of ancient sources. Indeed, Vasari's (trans. Bull), 85–86, evolution of both sculpture, which reaches its perfection with Polykleitos, and painting, culminating in the works of “Erione, Nicomachus, Protogenes, and Apelles,” is clearly based on Cicero's. Potts, “Construction,” 381–82, adds Pliny and Quintilian to the list of Vasari's sources. See now Donohue, “Winckelmann's History,” for a fuller discussion of Winckelmann and his sources.
 57. H. E. Butler, trans., *Istituto Oratoria of Quintilian* (London: W. Heinemann Ltd. and Cambridge, MA: Harvard University Press, 1961).
 58. Pollitt, *Ancient View*, 81–84, suggests that Quintilian treats only sculpture as a cyclical development, apparently because only sculpture is seen to decline. Pollitt interprets Quintilian's remarks about realism as

- alluding to the beginning of a decline that climaxes with Demetrius, who carried "realism too far."
59. For a discussion of Pliny's sources, see Pollitt, *Ancient View*, 73–84, and Donohue, "Winckelmann's History," 341.
 60. G. Henry Lodge, trans., *The History of Ancient Art, Translated from the German of John Winckelmann* (Boston: J. R. Osgood and Company, 1880), vol. I, 134–38, 143–48; vol. II, 51, 116–17.
 61. Laugier, *Essay*, 11–13.
 62. Lodge, *History II*, 130–36.
 63. Lodge, *History II*, 133–40.
 64. Potts, *Flesh*, 73–74; Lodge, *History II*, 153.
 65. H. Berve and G. Gruben, *Greek Temples, Theatres and Shrines* (New York: H. N. Abrams, 1962) 314–15, 319–23; 475–80, respectively.
 66. Lodge, *History I*, esp. 310, 375–76.
 67. See, e.g., D. S. Robertson, *Greek and Roman Architecture* (London: Cambridge University Press, 1974) figs. 17–19, illustrated here as Figs. 1–2.
 68. Lodge, *History I*, 163, 286–93; Lodge, *History II*, 175–98. Potts, "Construction," 385–86; Donohue, "Winckelmann's History," 332–33.
 69. For these points, particularly the impact of Dionysius' views on Winckelmann, see Donohue, "Winckelmann's History," 335–38, 342–43.
 70. Tomlinson, "Doric Order," 133–45, discusses this point and offers evidence to refute it.
 71. Potts, *Flesh*, 24 and n. 24, 33–37.
 72. Donohue, "Winckelmann's History," esp. 334–35, 344.
 73. J. Rykwert, "Lodoli on function and representation," *The Architectural Review* 160 (1976) 21–26.
 74. H. Hübsch, *Über griechische Architecture*, 2nd ed. (Heidelberg: Akademische Buchhandlung von J. C. B. Mohr, 1824).
 75. M. Viollet-le-Duc, *Entretiens sur l'architecture I* (Paris: Q. Morel et cie, 1863) 34–51.
 76. F. Milizia, *The Lives of Celebrated Architects, Ancient and Modern I*, trans. by Mrs. E. Cresy (London: J. Taylor, 1826) viii–xxxv.
 77. J.-I. Hittorff, in Hittorff and Zanth, *Recueil*, 317–66.
 78. A. Choisy, *Histoire de l'Architecture I* (Paris: E. Rouveyre [1908]).
 79. J. Durm, *Handbuch der Architektur II, 1: Die Baukunst der Griechen* (Leipzig: A. Kröner Verlag, 1910) 5–18, 257–329.
 80. G. Semper, *Der Stil in den technischen und tektonischen Künsten oder praktische Aesthetik I* (Munich: Friedr. Bruckmann's Verlag, 1878), esp. 398–438; II (Munich: Friedr. Bruckmann's Verlag, 1879), esp. 199–204, 396–444; W. Herrmann, *Gottfried Semper: In Search of Architecture* (Cambridge, MA: MIT Press, 1984), esp. 139–52, 165–73.
 81. See, e.g., Dinsmoor, *Architecture*, 66–68, who notes also the rendering of such elements in Lycian stone sarcophagi.
 82. As J. Summerson, *The Classical Language of Architecture* (Cambridge, MA: MIT Press, 1963), esp. 12; A. Bruschi, *Encyclopedia of World Art*, xiii (New York: McGraw-Hill, 1967) 533–38, s.v. "The Orders."
 83. As with Caylus and others: Babelon, *Collection Caylus*; N. Pevsner and S. Lang, "Apollo or Baboon?" *The Architectural Review* 104 (1948) 271–79, esp. 276.
 84. The letter, from Antonio Paoli to Carlo Fea, is published in J. J. Winckelmann, *Storia delle arti e del disegno presso gli antichi*, vol. 3, trans. by C. Fea (Rome: della stamperia Pagliarini, 1784) 141, 145, 177–78. See also J. Rykwert, *On Adam's House in Paradise* (New York: Museum of Modern Art, 1972) 50–51.
 85. J. F. Champollion Le Jeune, *Lettres écrites d'Égypte et de Nubie en 1828 et 1829*, new ed. (Paris: Didier et Ce, 1868) 58, 61, 63, 93, 112, 118–19.
 86. J. Fergusson, *The Illustrated Handbook of Architecture: The Different Styles of Architecture Prevailing in All Ages and Countries* (London: J. Murray, 1855), esp. 265, expanded and later published as *A History of Architecture in All Countries I* (London: J. Murray, 1893) 251–55.
 87. R. Wittkower, "Piranesi's 'Parere su L'Architettura,'" *Journal of the Warburg Institute* 2 (1938–39) 147–58. G. B. Piranesi, *Della Magnificenza e d' Architettura de' Romani* (Rome 1761) passim; *Osservazioni di G. B. Piranesi sopra la Lettre de M. Mariette aux Auteurs de la Gazette Littéraire de l'Europe* (Rome: Generoso Salomoni, 1765). See also H. Focillon, *Giovanni-Battista Piranesi* (Paris: Librairie Renouard, 1928) 83–88; N. Penny, *Piranesi* (London:

- Oresko Books, 1978) 15–18. For an overview of these issues, see D. Mertens, "The Paestum Temples and the Evolution of the Historiography of Architecture," in J. Raspi Serra, ed., *Paestum and the Doric Revival 1750–1830* (Florence: Centro Di, 1986) 63–68.
88. Laugier, *Essay*, esp. 11–38, 56–57, 152–53; Milizia, *Lives*, xix.
 89. L. Lawrence, "Stuart and Revett: their Literary and Architectural Careers," *Journal of the Warburg Institute* 2 (1938–39) 128–46; O. J. Brendel, *Prolegomena to the Study of Roman Art* (New Haven and London: Yale University Press, 1979). See also N. Zanni, M. McCarthy, M. Mosser and M.-R. Paupe, J. Raspi Serra, A. M. Vogt, T. I. Gejedor and Z. V. Zolotnickaja, D. Wiebenson, and D. C. Lipfert on the influence of Doric architecture and Paestum in various countries, discussed in Raspi Serra, ed., *Paestum*, 158–84.
 90. Pevsner and Lang, "Apollo," discuss issues regarding the Doric column as well as the more general debate over styles.
 91. This view of Athens appears already in W. J. Anderson and R. P. Spiers, *The Architecture of Greece and Rome* (London: B. T. Batsford, 1902) 52 and is continued with Dinsmoor, *Architecture*, 147. A. W. Lawrence, *Greek Architecture*, 5th ed. rev. by R. A. Tomlinson (New Haven and London: Yale University Press, 1996) 125, refers to the Acropolis buildings as coming "very near perfection."
 92. S. Lang, "The Early Publication of the Temples at Paestum," *Journal of the Warburg and Courtauld Institutes* 13 (1950) 48–64. Penny, *Piranesi*, esp. 18.
 93. For discussions of these points, see esp. Will, *Doriens*, and Hall, *Ethnic Identity*. Will discusses the application of such views to art and argues against this practice, but he does not discuss architecture.
 94. Alty, "Dorians." Hall, *Ethnic Identity*, esp. 111–42.
- CHAPTER 2
1. Three synthetic studies have appeared for this period: H. Drerup, *Griechische Baukunst in geometrischer Zeit*, *ArchHom*, II, O (Göttingen: Vandenhoeck and Ruprecht, 1969); K. Fagerström, *Greek Iron Age Architecture: Developments through Changing Times* (Göteborg: Paul Åströms förlag. Studies in Mediterranean Archaeology, vol. 81, 1988); A. Mazarakis Ainian, *From Rulers' Dwellings to Temples: Architecture, Religion and Society in Early Iron Age Greece (c. 1100–700 B.C.)* (Jonsared: Paul Åströms förlag. Studies in Mediterranean Archaeology, vol. 121, 1997). See also for Crete, L. Renard, "Notes d'architecture proto-géométrique et géométrique en Crète," *AntCl* 36 (1967) 566–95.
 2. For discussions of the purpose and function of the Greek temple, see W. Burkert, "The Meaning and Function of the Temple in Classical Greece," in M. V. Fox, ed., *Temple in Society* (Winona Lake: Eisenbrauns, 1988) 27–47 and "Greek Temple-builders: Who, Where and Why?" in R. Hägg, ed., *The Role of Religion in the Early Greek Polis. Proceedings of the Third International Seminar on Ancient Greek Cult, 1992* (Stockholm: Svenska institutet i Athen, 1996) 21–29. In the latter publication, Burkert focuses on the early temple, defining its characteristics and function, including the not always attested association with divine statues, esp. 23–25.
 3. Mazarakis Ainian, *Rulers' Dwellings*, 270–396, provides a particularly detailed discussion of these issues. He also sets them out succinctly in "Geometric Eretria," *AntK* 30 (1987) 3–24, esp. 20–21.
 4. W. Martini, "Vom Herdhaus zum Peripteros," *Jdl* 101 (1986) 23–36, esp. 31–32, in discussing reasons for the emergence of the peripteral temple focuses particularly on the early seventh-century rise of hoplite warfare and of a more diversified economy, which contributed to a broader economic and social base.
 5. Much has been written about the rise of the polis, but less has appeared on the *ethnos*. I cite here a few of the important sources for each: V. Ehrenberg, "When did the Polis Rise?" *JHS* 57 (1937) 147–59; A. Snodgrass, *Archaic Greece: The Age of Experiment* (Berkeley and Los Angeles: University of California Press, 1980); A. M. Snodgrass, "Archaeology and the Study of the Greek City," in J. Rich and A. Wallace-Hadrill, eds., *City and Country*

- in the *Ancient World* (London: Routledge, 1991) 1–20; F. de Polignac, *Cults, Territory, and the Origins of the Greek City-State* (Chicago: University of Chicago Press, 1995); Burkert, “Meaning and Function,” esp. 39–45; C. Morgan, “The Archaeology of Sanctuaries in the Early Iron Age and Archaic Ethne: A Preliminary View,” in L. G. Mitchell and P. J. Rhodes, eds., *The Development of the Polis in Archaic Greece* (London and New York: Routledge, 1997) 168–98.
6. V. Ehrenberg, *The Greek State*, 2nd ed. (London: Methuen, 1969) 15. Morgan, “Archaeology of Sanctuaries,” suggests a different relationship of the deity to the *ethnos*, although the importance of cult is likewise demonstrated by temples and dedications.
 7. Mazarakis Ainian, *Rulers’ Dwellings*, 340–49.
 8. I. B. Romano, “Early Greek Cult Images” (Diss. University of Pennsylvania, 1980) esp. 4–5, finds a link between the development of the temple and that of the cult statue. More recent scholarship has been critical of this presumed function of the temple. J. G. Miller, “Temple and Image: Did All Greek Temples House Cult Images?” *AJA* 101 (1997) 345 (abstract) suggests that not every temple contained a cult image and that considerable regional differences existed in such displays. A. A. Donohue, “The Greek Images of the Gods: Considerations on Terminology and Methodology,” *Hephaistos* 15 (1997) 31–45 argues for a rethinking of modern views of “cult images.”
 9. See M. B. Hollinshead, “‘Adyton,’ ‘Opisthodomos,’ and the Inner Room of the Greek Temple,” *Hesperia* 68 (1999) 189–218, whose discussion of inner rooms emphasizes the use of the temple as a repository of valuable offerings and, in several cases, of state funds. Her evidence is drawn from temples dated as early as the seventh century but primarily the sixth to fourth centuries B.C. (her Table 1).
 10. Drerup, *Baukunst*, 79–80, 106, who attributes the lack of early remains to the transient nature of this type of construction.
 11. Fagerström, *Iron Age Architecture*, 23–24, for the discussion of the building, Asine 2, Apsidal Structure 70L/74L, and Mazarakis Ainian, *Rulers’ Dwellings*, 68–69, for the compression of this and a parallel apsidal structure into a single building having mudbrick walls perhaps reinforced by posts.
 12. W. A. McDonald, W.D.E. Coulson, and J. Rosser, *Excavations at Nichoria in Southwest Greece III* (Minneapolis: University of Minnesota Press, 1983) 19–42.
 13. See Fagerström, *Iron Age Architecture*, 34–35; Mazarakis Ainian, *Rulers’ Dwellings*, 74–79.
 14. P. Auberson, “La reconstitution du Daphnéphorion d’Érétrie,” *Antike Kunst* 17 (1974) 60–68.
 15. Fagerström, *Iron Age Architecture*, 55–56; and Mazarakis Ainian, *Rulers’ Dwellings*, 58–61, and “Geometric Eretria,” 10–11, 17, both of whom express doubts about the identification of the building as a temple. Mud-brick walls are placed on the stone socle also by H. Drerup, “Das sogenannte Daphnephoreion in Eretria,” in K. Braun and A. Furtwängler, eds., *Studien zur Klassischen Archäologie, Festschrift zum 60. Geburtstag von F. Hiller* (Saarbrücken: SDV Saarbrücker Druckerei und Verlag, 1986) 3–21 and by J. J. Coulton, “Post Holes and Post Bases in Early Greek Architecture,” *Mediterranean Archaeology* 1 (1988) 58–65, esp. 59–62. Coulton states that wattle and daub is not certainly attested in Early Iron Age Greece and he specifically cites structures at Nichoria and Asine as unlikely to have used it because of the stone footings of their walls.
 16. E. Østby, “Recent Excavations in the Sanctuary of Athena Alea at Tegea (1990–93),” in K. A. Sheedy, ed., *Archaeology in the Peloponnese* (Oxford: Oxbow, 1994) 39–63 reports two cult buildings at Tegea with walls of wattle and daub, or according to Mazarakis Ainian, *Rulers’ Dwellings*, 80–82, either wattle and daub or pisé walls. E. French, *AR* (1991/92) 18 reports that at least one of these structures had wooden posts set on clay bases. Such an arrangement would pose the same problems as cited by Fagerström for the “Bay Hut” at Eretria – that is, insufficient support for the wattling. Østby’s identifi-

cation of "coupled vertical wooden posts" (i.e., a post on either wall face) would also seem at variance with this technique. Both buildings are dated to the eighth century, the earlier in the second half of the century.

17. Fagerström, *Iron Age Architecture*, 107–109, labels the former technique in regard to apsidal houses "wall construction method 2," and suggests that it ends earlier than the fully mudbrick wall, "method 4." The Heroön at Lefkandi is placed in a separate category, "method 3." No such analysis is made in relation to rectangular buildings, however, where reinforced mud-brick construction appears into the seventh century in such temples as that of Apollo at Halieis, of Artemis Orthia at Sparta, and A and B at Kalapodi. It should also be noted that J. Coulton, "The Toumba Building: its architecture," in M. R. Popham, P. G. Calligas, and L. H. Sackett, eds., *Lefkandi II, The Protogeometric Building at Toumba, pt. 2, The Excavation, Architecture and Finds* (Athens: British School of Archaeology, 1993) 33–70, esp. 47, suggests that the Heroön wall-posts functioned to provide stability not for its walls, but rather for the corresponding posts in its veranda and the wall-plates that seated the rafters. According to this interpretation, the timbers would have formed the structural framework for the building.
 18. Mazarakis Ainian, *Rulers' Dwellings*, 218–21, 224–26, discusses these sites, with bibliography. He further notes similarities in plan among the two structures cited here and Building 138–140 at Karphi, and relates these constructions to traditions of the end of the Bronze Age, rather than those of the Proto-Geometric period: 233. For Bronze Age construction of stone walls in Crete, see J. W. Graham, *The Palaces of Crete*, rev. ed. (Princeton, NJ: Princeton University Press, 1987), esp. 151–53, and for those of the Early Iron Age, see Drerup, *Baukunst*, 107, and Renard, "Crète," 580, 593.
 19. J. N. Coldstream, *Geometric Greece* (New York: St. Martin's Press, 1977) 304–305. See also Fagerström, *Iron Age Architecture*, 124, for a mention of the "almost total lack of PG structures" in the Cyclades, and both Fagerström and Mazarakis Ainian, *Rulers' Dwellings*, passim, for stone walls in general. In the temples at Yria on Naxos, mud-brick is used for the early eighth-century construction of Building I while stone is employed at the end of the century for Building II: G. Gruben, "Naxos und Delos. Studien zur archaischen Architektur der Kykladen," *JdI* 112 (1997) 261–416, esp. 314.
 20. R. V. Nicholls, *BSA* 53–54 (1958–59) 68–71, 122–23, and pl. 17c, and "Early Monumental Religious Architecture at Old Smyrna," in D. Buitron-Oliver, ed., *New Perspectives in Early Greek Art* (Hanover and London: National Gallery of Art, 1991) 150–71, esp. 151: City Wall 1, tower at Northeast Gate. A specific date for this tower of ca. 820 B.C. is offered in the recent publication of the British excavations by J. M. Cook and R. V. Nicholls, *Old Smyrna Excavations: The Temples of Athena* (London: The British School at Athens, 1998) 36, 44–45.
 21. M. Waelkins, P. DePaepe, and L. Moens, "The Quarrying Techniques of the Greek World," in *Marble: Art Historical and Scientific Perspectives on Ancient Sculpture* (Malibu, CA: J. Paul Getty Museum, 1990) 47–72, esp. 54.
 22. For Geometric stoneworking at Corinth, see A. C. Brookes, "Stoneworking in the Geometric Period at Corinth," *Hesperia* 50 (1981) 285–90. Brookes dates the earliest appearance of stoneworking at Corinth to the Middle Geometric period, with its application to architecture in Late Geometric times. For the seventh-century temples at Corinth and Isthmia, see below. R. Rhodes, "Early Corinthian Architecture and the Origins of the Doric Order," *AJA* 91 (1987) 477–80 also discusses early stoneworking in this area and argues that the ashlar used in these early temples recalls rubble construction in many of its characteristics.
- Early polygonal fortification and terrace walls are known from Old Smyrna and Miletos, respectively, and the technique is used in "house" walls at Antissa, Lesbos, in the later Apsidal Building IV: see esp. Coldstream, *Geometric Greece*,

- 260–63, 304, who attributes the move toward monumental construction to the East Greeks, and W. Lamb, "Antissa," *BSA* 32 (1931–32) 41–67, esp. 45–48. The ashlar masonry of Hekatompedon II at Samos was constructed in the two-skin technique, which resulted in regularity and tight joints only on the visible surfaces: J. J. Coulton, *Ancient Greek Architects at Work* (Ithaca, NY: Cornell University Press, 1977) 32; H. Kyrieleis, *Führer durch das Heraion von Samos* (Athens: Krene Verlag, 1981) 79. For a recent survey of ashlar masonry in the eastern Mediterranean, although with particular emphasis on drafted margins, see J. Boardman, *Persia and the West* (London: Thames and Hudson, 2000) 20–35.
23. E. Østby, "The Archaic Temple of Athena Alea at Tegea," *OpAth* 16 (1986) 75–102, esp. 98–99, notes the use of different building materials in the Peloponnesos, even into the sixth century, and ascribes it to two separate traditions, one Corinthian and the other Argive. He elaborates on this point in "Delphi and Archaic Doric Architecture in the Peloponnese," *BCH Suppl.* vol. 36, 239–62 (in press). I thank Dr. Østby for sending me a copy of this manuscript before publication.
24. E. R. Gebhard and F. P. Hemans, "University of Chicago Excavations at Isthmia, 1989: I," *Hesperia* 61 (1992) 1–77, esp. 28–30, interpret a series of regularly spaced pits along the outer face of one wall as originally containing piers. This is assumed to explain the vertical bands noted by the original excavator, O. Broneer, of protected surface on the wall blocks. The report does not suggest a material for these piers, but they do not seem to have been of stone, since no suitable blocks are known and the piers showed no bonding with the wall. Rhodes, "Early Corinthian," 478, suggests that they were of wood, but in that case one would expect more, not less, fire damage on the wall in their locations. It is difficult to explain why relatively narrow (ca. 0.32 m) and unbonded piers were considered necessary with stone walls, except as a decorative frame for the exterior paintings. Moreover, since the pits vary in depth and in their shapes at the base, the elements that they contained may not have been regular in form. If such elements served a structural function, one wonders whether it might have been in connection with the erection of the wall, as perhaps for scaffolding, of which the underpinning were not removed until the temple was finally dismantled.
25. See the comments on apsidal, oval, and circular forms by Mazarakis Ainian, *Rulers' Dwellings*, 82 and 84; 86; 114 and 123–24; respectively, and on apsidal vs. rectangular by Fagerström, *Iron Age Architecture*, 111. Renard, "Crète," 578, 591, discusses rectilinear shapes in Crete. Although oval and circular plans did enjoy a following in east Greece, they seem not to have been popular for public or sacred buildings.
26. Fagerström, *Iron Age Architecture*, 106, suggests that an apsidal house "presupposes a hipped roof of thatch," while Coldstream, *Geometric Greece*, 304, notes that such buildings were "almost always" covered with a thatched roof at a steep angle, which thus offers protection for the walls.
27. Fagerström, *Iron Age Architecture*, 111, suggests that the construction of the roof leads to the material of the wall, and ultimately the plan. Thus, a flat roof would result in a rectangular building. Certainly all these factors are related, but it is difficult to designate one as the most important.
28. A. Mazarakis-Ainian, "Late Bronze Age Apsidal and Oval Buildings in Greece and Adjacent Areas," *BSA* 84 (1989) 269–88. Coldstream, *Geometric Greece*, 304, notes the shift to rectangular structures already in the LG period, which according to his time chart (p. 385) generally begins about 750 B.C.
29. Mazarakis Ainian, "Geometric Eretria," 16–17, with bibliography.
30. Mazarakis-Ainian, "Late Bronze Age," 287.
31. Mazarakis Ainian, *Rulers' Dwellings*, 112–13, with examples. One of these is the peripteral temple at Ano Mazaraki, built around 700 B.C., with an apse at both front and back: 72–73.
32. See Mazarakis Ainian, *Rulers' Dwellings*, 259–69, with tables I–VIII.

33. K. Kilian, "Ausgrabungen in Tiryns 1978, 1979," *AA* (1981), esp. 159–60; J. C. Wright, "The Old Temple Terrace at the Argive Heraeum and the Early Cult of Hera in the Argolid," *JHS* 102 (1982) 186–201, esp. 195–97, 201, offers a summary and critique of the evidence. For the results of recent excavations, which provide additional support for a LH III C construction date, see J. Maran, "Das Megaron im Megaron. Zur Datierung und Funktion des Antenbaus im mykenischen Palast von Tiryns," *AA* (2000) 1–16. Mazarakis Ainian, *Rulers' Dwellings* 159–62, argues for its conversion to a temple, his T2, around the middle of the eighth century B.C.
34. Mazarakis Ainian, *Rulers' Dwellings*, 283.
35. Fagerström, *Iron Age Architecture*, 162–63; Mazarakis Ainian, *Rulers' Dwellings*, 276–86.
36. For a description of the building and its architectural significance, see Coulton "Toumba," esp. 56–59. Its function and date are discussed in more detail by M. R. Popham, "The Sequence of Events, Interpretation and Date," in Popham, Calligas and Sackett, eds., *Lefkandi II*, 2, 97–101.
37. Mazarakis Ainian, *Rulers' Dwellings*, 278–79, 389–90, who seems to see both a structural and a symbolic role for the Heroön peristyle.
38. For these theories, see A. Mallwitz, "Kritisches zur Architektur Griechenlands im 8. und 7. Jahrhundert," *AA* (1981) 599–642, esp. 601–604, 621–24; B. Wesenberg, "Thermos B 1," *AA* (1982) 149–57, esp. 154–57; and G. Kuhn, "Bau B und Tempel C in Thermos," *AM* 108 (1993) 29–47, esp. 40–47, respectively. Mazarakis Ainian, *Rulers' Dwellings*, 125–35, offers a summary of the various views and excavations, and a reconstruction that revives the attribution of the bases to a peristyle.
39. For the excavations and the dating of the bases later than Megaron B, see J. Papapostolou, *Praktika* 1992, esp. 125–26; *Ergon* 1993, 44–56, esp. 52; 1994, 45–49, esp. 49; 1995, 36–42, esp. 39 and 42.
40. Mallwitz, "Kritisches," 624–33.
41. H. Kienast, "Die rechteckigen Peristasenstützen am samischen Hekatompedos," in E.-L. Schwandner, ed., *Säule und Gebälk* (Mainz am Rhein: P. von Zabern, 1996) 16–24, esp. 17–18.
42. A. Bammer, "A *Peripteros* of the Geometric Period in the Artemision of Ephesus," *Anatolian Studies* 40 (1990) 137–60, esp. 138, 142, and pl. 17 b; A. Bammer, "Les sanctuaires des VIIIe et VIIe siècles à l'Artémision d'Éphèse," *RA* (1991) 63–84, esp. 73 and fig. 20, who notes that the diameters of the bases are not uniform.
43. A. Bammer, "Fouilles à l'Artémision d'Éphèse (Périodes géométrique et archaïque): Nouvelles données," *RA* (1993) 187–99, esp. 187, sees this squat plan as a harbinger of large dipteral and peripteral temples of the sixth century B.C.
44. This temple is discussed by Mazarakis Ainian, *Rulers' Dwellings*, 72–73, and by its excavator, M. Petropoulos, "New Elements from the Excavation of the Geometric Temple at Ano Mazaráki (Rakita)," *Peloponnesiaka, Journal of the Society of Peloponnesian Studies*, Suppl. 22: Acts of the Fifth International Congress of Peloponnesian Studies, II (1996–97) 165–92, esp. 166–72. We await the final publication of this unusual building. Separate blocks are used as well for the interior columns of the Temple of Artemis Orthia at Sparta. Østby, "Archaic Temple," 84, 97, suggests that the deeper foundation only below columns of the interior stylobates in the late seventh-century Temple of Athena Alea at Tegea may arise from this practice. See also R. Martin, *Manuel d'architecture grecque*, I (Paris: Picard, 1965) esp. 310–12.
45. The original excavations are reported by L. Tilton, "The Architecture of the Argive Heraeum," in C. Waldstein, *The Argive Heraeum I* (Boston and New York: Houghton Mifflin, 1902). Subsequent studies of the temple and/or its terrace include P. Amandry, "Observations sur les monuments de l'Héraion d'Argos," *Hesperia* (1952) 222–74; A. E. Kalpaxis, *Früharchaische Baukunst in Griechenland und Kleinasien* (Athens: P. Athanassiou, 1976), esp. 42–47; Wright, "Old Temple Terrace;" I. Strøm, "The Early Sanctuary of the Argive Heraion and its External Relations (8th–early 6th c. B.C.)," *ActaArch*

- 59 (1988) 173–203, esp. 178–91; C. Pfaff, “Three-Peaked Antefixes from the Argive Heraion,” *Hesperia* 59 (1990) 149–56; C. M. Antonaccio, “Terraces, Tombs, and the Early Argive Heraion,” *Hesperia* 61 (1992) 85–105; M.-F. Billot, “Propositions pour une restitution du temple archaïque,” in *Héra: Images, espaces, cultes* (Naples: Centre Jean Bérard, 1997) 57–81.
46. Amandry, “Observations,” 223–25 and n. 14; Wright, “Old Temple Terrace,” 191, attributes to the temple a stone column drum that could not have supported wood, thus implying a fully stone column; Strøm, “Early Sanctuary,” 184–86, argues instead for the interpretation of such pieces as stone socles for wooden columns.
47. Thus, Kalpaxis, *Früharchaische Baukunst*, 44, considers it early seventh century; both Amandry, “Observations,” 225, and Strøm, “Early Sanctuary,” 191, place it in the first half of the seventh century; Antonaccio, “Terraces,” 98, following Wright, “Old Temple Terrace,” 190–91, accepts the third quarter of the seventh century; Pfaff, “Antefixes,” 154, lowers it to the last quarter of that century, which allows the attribution of a three-peaked antefix to its roof. In 1990, M.-F. Billot, “Terres cuites architecturales d’Argos et d’Épidaure. Notes de typologie et d’histoire,” *Hesperia* 59 (1990) 95–139, esp. 98–102, suggested that the building could date as late as the first third of the sixth century B.C., but her recent publication, “Propositions pour une restitution,” 70, places it in the first half of the seventh century on technical grounds.
48. For a discussion of this issue and of the temple, see R. A. Tomlinson, *Argos and the Argolid* (Ithaca, NY: Cornell University Press, 1972) 230–35.
49. Antonaccio, “Terraces.”
50. Mallwitz, “Kritisches;” Billot, “Terres cuites,” 97–99.
51. A. Plassart *Délos 11: Les sanctuaires et les cultes du mont Cynthe*, (Paris: de Boccard, 1928) 149–74; P. Bruneau and J. Ducat, *Guide de Délos*, 3rd ed. (Paris: de Boccard, 1983) 230–31, no. 101; Drerup, *Baukunst*, 23–24. The temple has been dated just after 700 B.C. on the basis of offerings found inside. A more recent investigation associates some of those offerings with an earlier structure, thus allowing for a later date for the temple: J. Ducat, *BCH* 89 (1965) 996–99. Bruneau and Ducat suggest that its construction may be more in accord with the date of the latest sima, which is placed around the middle of the sixth century B.C.
52. Fagerström, *Iron Age Architecture*, 69, in criticizing this suggestion, notes that the differing sizes of the bases suggest that they had differing functions or locations within a building. V. Lambrinoudakis and G. Gruben, “Das neuentdeckte Heiligtum von Iria auf Naxos,” *AA* (1987) 569–621, esp. 602 n. 36, offer a partial solution in explaining the varying heights of the bases by their immersion in the ground.
53. Mallwitz, “Kritisches,” 624–33 and n. 149, where Mallwitz raised, but dismissed, the possibility of eliminating the peristyle in Hekatompedon II; Kienast, “Peristasenstützen,” 16–24. See also Mazarakis Ainian, *Rulers’ Dwellings*, 199–202. Because Mallwitz argued that only his first phase of the Hekatompedon possessed an axial interior colonnade, and Kienast’s reassessment seems to follow on the comments of Mallwitz, it would appear that the reassigned column base still belongs to the initial construction.
54. P. Auberson, *Eretria I: Temple d’Apollon Daphnéphoros*, *Architecture* (Bern: A. Francke AG Verlag, 1968) 11–15, esp. 13, for the foundations; Mallwitz, “Kritisches,” 633–34.
55. The temple was initially excavated and published by O. Broneer, *Isthmia I: Temple of Poseidon* (Princeton, NJ: American School of Classical Studies at Athens, 1971) 3–56. Criticisms of Broneer’s reconstruction have been leveled especially by W. Koenigs, *Gnomon* 47 (1975) 403–404; Mallwitz, “Kritisches,” 635–41; and R. Rhodes, “The Beginnings of Monumental Architecture in the Corinthia” (Diss. University of North Carolina, Chapel Hill, 1984) and “Early Corinthian,” 477–80. These criticisms have led to additional excavation by E. R. Gebhard and F. P. Hemans, “University of Chicago Excavations at Isthmia, 1989: I,” *Hesperia* 61 (1992) 1–77.
56. The results of the excavations were initially disseminated by F. P. Hemans in a

- paper entitled "New Discoveries in the Archaic Temple of Poseidon at Isthmia" delivered at the 92nd Annual Meeting of the Archaeological Institute of America (*AJA* 95, 1991, 301–302) and in an article for the *ALA Newsletter* 7, 3 (February 1992) 1–3. They are now published by Gebhard and Hemans, "Excavations at Isthmia, 1989: I." During the campaign of 1989, a robbing trench was uncovered at the west end of the building that links up with previously known trenches on the north and east sides; these three trenches are assumed to have contained stylobate blocks for the peristyle. In addition, pits found against the south cella wall, which the excavators believe once held buttresses, offer evidence for the spacing of peristyle columns. In order to support roof beams, the buttresses and columns are presumed to have had identical spacing. This allows for the reconstruction of a peristyle of 7 × 18 columns enclosing a cella building with a single interior colonnade. Construction of the temple is placed between 690 and 650 B.C. on the basis of pottery found beneath the earliest floor.
57. Broneer, *Isthmia I*, 10.
 58. Broneer, *Isthmia I*, 9–11, proposed for the peristyle an axial distance of ca. 2.20 m with 7 × 19 columns of ca. 0.70 m lower diameter; he conjectured a slightly larger spacing for the interior columns, generally 2.278 m. Gebhard and Hemans, "Excavations at Isthmia, 1989: I," suggest an interaxial of 2.26 m for the peristyle, which matches the spacing of their piers and reflects the interaxial spacing assigned by them to the interior columns, of ca. 4.52 m. They assume that the central line of holes in the interior of the cella was used for columns rather than scaffolding, as proposed by Broneer. It should be noted, however, that the interior columns, as reconstructed by these latest excavators, are not aligned with those of the exterior, but rather fall at the midpoint of alternate pairs.
 59. The evidence for column spacing in this period is, admittedly, meager, but calculations are offered in several sources, including Østby, "Archaic Temple," 100, and Kalpaxis, *Früharchaische Baukunst*, 99, who cites a different ratio for the Isthmia temple.
 60. The fact that this arrangement has no structural advantage, but actually serves to weaken the building, is pointed out by Rhodes "Monumental Architecture," 83.
 61. This distortion is noted by Koenigs, *Gnomon*, 403, who calculates a width of ca. 75 cm for each via and only 35 cm for the mutule.
 62. Rhodes, "Monumental Architecture," discusses these two other buildings as well.
 63. Recent criticism has come particularly from B. Schmaltz, "Bemerkungen zu Thermos B," *AA* (1980) 318–36, esp. 331. General discussions of the building appear in Kalpaxis, *Früharchaische Baukunst*, 47–50, and W. B. Dinsmoor, *The Architecture of Ancient Greece* (New York, W. W. Norton and Co., Inc., 1975) 51–52, who accept the Hellenistic plan as a reflection of the late seventh-century construction. The temple is discussed further in the next chapter.
 64. Opinions have varied as to the type of reworking carried out on this panel, whether it was repainted or perhaps refashioned from preserved fragments. More recently, R. A. Stucky, "Die Tonmetope mit den drei sitzenden Frauen von Thermos: Ein Dokument hellenistischer Denkmalpflege," *AntK* 31 (1988) 71–78 (with previous bibliography) has argued for a Hellenistic creation of ca. 200 B.C. Kuhn, "Bau B und Tempel C," 34–35, cites evidence to contradict the presumed re-use of some metopes and antefixes.
 65. Kuhn, "Bau B und Tempel C," esp. 41–47.
 66. Mazarakis Ainian, *Rulers' Dwellings*, 134–35, with bibliography.
 67. Østby, "Archaic Temple," esp. 79, 94.
 68. The temple was initially published by R. Demangel, "Le Temple du VIIIe Siècle," *FdD II: Topographie et Architecture*, 3: *Le Sanctuaire d'Athènes Pronaia*, 1 (Paris: de Boccard, 1923) 26–41, and dated to the seventh century. Its columns were discussed and reconstructed differently by P. de la Coste-Messelière, "Chapiteaux doriques du haut archaïsme," *BCH* 87 (1963) 639–52. The seventh-century dating has been challenged by E.-L.

- Schwandner, "Der ältere Aphaiatempel auf Aegina," in U. Jantzen, ed., *Neue Forschungen in griechischen Heiligtümern* (Tübingen: E. Wasmuth, 1976) 103–20, esp. 117–19.
69. A discussion of those on Crete dating from the Late Minoan to the Orientalizing period is provided by R. Mersereau, "Cretan Cylindrical Models," *AJA* 97 (1993) 1–47, who derives their shape not from architecture but from pottery. Examples from the Geometric and/or Archaic periods are discussed by Drerup, *Baukunst*, 69–76; Fagerström, *Iron Age Architecture*, 155–57; S. D. Markman, "Building Models and the Architecture of the Geometric Period," in *Studies Presented to D. M. Robinson I* (St. Louis: Washington University, 1951) 259–71; and T. G. Schattner, *Griechische Hausmodelle: Untersuchungen zur frühgriechischen Architektur* (Berlin: Gebr. Mann, 1990). For the Perachora and Argive Heraion models, respectively, see H. Payne, *Perachora I* (Oxford: Clarendon Press, 1940) 34–42; K. Müller, "Gebäudemodelle spätgeometrischer Zeit," *AM* 48 (1923) 52–68.
 70. The strongest argument against the identification of models as temples is made by Fagerström, *Iron Age Architecture*, 155–57. See also the comments by Schattner, *Hausmodelle*, 204–12, regarding the Samian pieces and the likelihood that some models, especially those with architectural decoration, represent temples.
 71. These cautionary remarks are made by Schattner, *Hausmodelle*, 98, and Markman, "Building Models," 265, respectively. Mersereau, "Cretan Cylindrical Models," places her material entirely within a coroplastic tradition.
 72. Although Müller, *Gebäudemodelle*, 52, identified cylindrical supports on the Argive Heraion model, others have opted for rectangular posts, on the basis of preserved markings. Kienast, "Peristasenstützen," 24, cites instances in which rectangular supports are used, as inside buildings, in stoas, or when bordered by walls. None of these conditions apply to the model.
 73. For windows, see Drerup, *Baukunst*, 111. A triangular opening in a wall at Zagora is identified as a window by A. Cambitoglou, *Praktika* (1972) 263–64 and pl. 234 a.
 74. For the Perachora model, see A. D. Brockmann, *Die griechische Ante* (Marburg: Görlich & Weiershäuser, 1968) 21, and Drerup, *Baukunst*, 72–73. For Argos, Drerup, *Baukunst*, 71, and A. von Gerkan, "Die Herkunft des dorischen Gebälks," *JdI* 63/64 (1948/49) 1–13, esp. 6.
 75. R. W. V. Catling, "A Fragment of an Archaic Temple Model from Artemis Orthia, Sparta," *BSA* 89 (1994) 269–75. For the chronology of the Artemis Orthia sanctuary, see J. Boardman, "Artemis Orthia and chronology," *BSA* 58 (1963) 1–7.
 76. The timber framework in the walls of the Temple of Artemis Orthia is assumed to have reinforced mud-brick. Catling instead proposes walls of clay and some binding material. The lack of alignment of the "triglyphs" and wall timbers is attributed to a decorative role for the frieze, which masked the structural support of the wall timbers at the top.
 77. See, most recently, Schattner, *Hausmodelle*, 92–94 no. 50 and 176–77. Schattner provides a *terminus ante quem* for the model of 570/560 B.C., the construction date of the second temple. R. M. Dawkins, in R. M. Dawkins, ed., *The Sanctuary of Artemis Orthia at Sparta* (London: Macmillan, 1929) 22 and 194 no. 60 and *BSA* 16 (1909/10) 34 n. 2, dated it to the same period as two triangular reliefs that he believed to be copies of or, more tentatively, models for the pedimental sculpture of the second temple. One was found in the layer of sand laid down during construction of this temple, while the other was discovered in a deposit dating slightly after its construction. Dawkins thus seems to suggest a date for the building model around, rather than before, 570/560 B.C.
 78. Schattner, *Hausmodelle*, 167–73, for a discussion of raftered ceilings and flat roofs. He identifies dentils on three models, of which no. 32 is assumed to date before the end of the seventh century, while the others are placed in the early sixth century (no. 19) and before the mid-sixth century (no. 26). Raftered ceilings are

- noted on the front of three models, of which no. 21 is also tentatively dated before the end of the seventh century, while no. 22 is placed "probably 7th/6th centuries."
79. Schattner, *Hausmodelle*, 143–44 and no. 25 (probably before the mid-sixth century), for the anta capital; 159–61 and nos. 44 (last quarter of the sixth century), 45 (third quarter of the sixth century), for two models from Sardis with Ionic columns and capitals. The columns in both of these models stand on smooth torus bases.
80. Coulton, "Toumba," 41. The columns, or circular posts, were ca. 0.18–0.25 m in diameter.
81. Coulton, "Post Holes," 62–63.
82. As is the case with the column bases in the front porch of the Megaron Hall at Emporio, Chios, which is dated to the seventh, or perhaps even eighth, century B.C.: J. Boardman, *Excavations in Chios 1952–1955, Greek Emporio* (Athens: British School of Archaeology, 1967) 31–34. A similar arrangement is now concluded for the interior columns of the seventh century Hekatompedon at Samos: Kienast, "Peristasenstützen," 20–21.
83. Drerup, *Baukunst*, 114. See, e.g., Chios, the Lower Megaron and House I: Boardman, *Excavations in Chios*, 42, 47–48; Old Smyrna, perhaps from stoas and certainly from houses: Nicholls, "Early Monumental," 156, 159, and fig. 10; and Dreros, the Temple of Apollo: Drerup, *Baukunst*, 6.
84. V. Lambrinouidakis, "The Sanctuary of Iria on Naxos and the Birth of Monumental Greek Architecture," in D. Buitron-Oliver, ed., *New Perspectives in Early Greek Art* (Hanover and London: National Gallery of Art, 1991) 173–88, esp. 175; G. Gruben, "Die inselionische Ordnung," in J. des Courtils and J.-C. Moretti, *Les grands ateliers d'architecture dans le monde égéen du VI^e siècle av. J.-C.* (Paris: de Boccard, 1993) 97–109, esp. 102 and fig. 3, pl. XVI, 1–2. This temple is dated to the beginning of the seventh century. It is preceded by the second temple, built during the eighth century, with roughly worked marble bases in its interior.
85. Kienast, "Peristasenstützen," 20, suggests an association with the Cycladic spira, but since cylindrical bases were known elsewhere in Greek architecture, the connection may not be direct.
86. Brockmann, *Ante*, 21, 23–24. Brockmann identifies three buildings at Emporio with wooden antae, the Upper and Lower Megara and House I. Megaron B at Thermon, which has now been dated earlier than the eighth century, may have adopted the practice of terminating the wall in wood from nearby Megaron A, constructed during the Bronze Age. Building III at Antissa, originally placed in the tenth or ninth century, is now considered later. For the Thermon and Antissa structures, see Mazarakis Ainian, *Rulers' Dwellings*, 125–35 and 84–85, respectively.
87. The emergence of an architectural order in response to the creation of monumental architecture is argued especially by R. M. Cook, *BSA* (1951) 50–52 and *BSA* (1970) 17–19. Monumental architecture may be defined as construction in permanent materials, such as cut stone for walls and other bearing members and terracotta tiles for the roofs. For a discussion of the beginnings of this tradition in the Corinthia, see Rhodes, "Monumental Architecture."
88. M. C. Roebuck, "Excavations at Corinth: 1954," *Hesperia* 24 (1955) 147–57; H. S. Robinson, "Excavations at Corinth: Temple Hill, 1968–1972," *Hesperia* 45 (1976) 203–39, esp. 224–35; H. S. Robinson, "Temple Hill, Corinth," in U. Jantzen, ed., *Neue Forschungen in griechischen Heiligtümern* (Tübingen: E. Wasmuth, 1976) 239–60, esp. 244–50; H. S. Robinson, "Roof tiles of the Early Seventh Century B. C.," *AM* 99 (1984) 55–66, esp. 57 and n. 5; Rhodes, "Monumental Architecture," 98–102, 104–108.
89. There is some debate whether the mud-brick found within this context should be attributed to the temple. Roebuck, "Excavations at Corinth: 1954," assumed a stone socle with mud-brick walls. Robinson, "Excavations at Corinth: Temple Hill," 227, believed that the mud-brick came from the nearby roadway and that the temple was constructed fully with stone walls. A more recent study by

- Rhodes, "Monumental Architecture," 102, has again raised the possibility of combination stone and mud-brick walls. Although column fragments were also recovered in some of the same trenches, they are not associated with the temple. Roebuck suggested that the temple perhaps had a porch and colonnade; Robinson opts for probably "no more than a cella."
90. Roebuck, "Excavations at Corinth: 1954," 155-56, assumes mud-brick walls, while Robinson, "Excavations at Corinth: Temple Hill," 227, argues for stone. Nevertheless, Robinson accepts cuttings in one type of block (equivalent to Isthmia group 6) as providing anchors for "wooden ties designed to strengthen the masonry."
 91. Rhodes, "Early Corinthian," 478-79, describes the seventh-century temples at Corinth and Isthmia, as well as the early sixth-century example at Nemea, as "closely related members of the same tradition of early monumental construction," especially on the basis of their roofing systems.
 92. Broneer, *Isthmia I*; Rhodes, "Monumental Architecture," 43-98, 104-108.
 93. Rhodes, "Monumental Architecture," 105-106, explains that the Isthmia blocks show a development over those from Corinth in their occasional use of anathyrosis and the appearance of true geison blocks (Broneer's Group 10). In addition, the pan tiles along the eaves bear a decoration not present at Corinth and the combination tiles have a more advanced shape. On the other hand, Broneer notes that the temple should be placed before the introduction of decorated architectural terracottas, which according to C. K. Williams, II, first appear on Corinthian roofs around the middle of the seventh century: "Demaratus and Early Corinthian Roofs," in *Stele* (Athens: To Somateion ton philon tou Nikolaou Kontoleontos, 1980) 345-50, esp. 347. Still another *terminus ante quem* cited by Broneer is a marble perirrhantion that he dates stylistically to the mid-seventh century. The extensive study of this piece by M. C. Sturgeon, *Isthmia IV, Sculpture I: 1952-1967* (Princeton, N. J.: American School of Classical Studies at Athens, 1987) 14-61, supports its assignment to the decade 660-650 B.C.
 94. Broneer, *Isthmia I*, 34-38.
 95. To judge from the restoration: Broneer, *Isthmia I*, fig. 54, reproduced here.
 96. Broneer, *Isthmia I*, 30-31 (catalogue of Group 10 blocks); 36-37 (restoration). Although Broneer notes that the face of the geison blocks lacked stucco, he does not claim this for the underside. Rhodes, "Monumental Architecture," 143, likewise suggests that the lower surface of the geison blocks was visible, since they have a smoother surface in this area than on the resting surface.
 97. According to Rhodes' reconstruction ("Monumental Architecture," esp. fig. 24), each Group 10 geison block would alternate with three Group 6 wall crown blocks. Although Rhodes suggests that the stone geison blocks could have supported heavier rafters than those carried by the wooden beams inserted in the wall crown blocks, the structural advantage of this arrangement is not so obvious. The Group 10 blocks bear no cuttings for the rafters; instead, the rafter end would have been attached to a horizontal wall plate, which in turn rested in a slight sinking at the back edge of the geison block. The eaves would thus be composed of a series of horizontal pieces of wood alternating with sloping stone geison blocks, an unlikely combination. Rhodes's theory also fails to account for the two different sizes of Group 6 blocks, which must have crowned walls of different thicknesses. Such diversity is more appropriate for transverse (cross or end) than lateral walls, in which case the beams carried by these blocks would have run longitudinally, at least for some extent. This, along with their flat, shallow cuttings, may suggest that they supported ceiling beams. The Group 10 blocks may then have rested above the Group 6 blocks, at least on the outer walls.
 98. Rhodes, "Monumental Architecture," 85-91.
 99. N. L. Klein, "The Origin of the Doric Order on the Mainland of Greece: Form and Function of the Geison in the

- Archaic Period" (Diss. Bryn Mawr College, 1991) 151–59.
100. Rhodes, "Monumental Architecture," 141, 144, and "Early Corinthian," 479, argues that the cornice was the first element in the Corinthian roof to "petrify." In this building and perhaps in that at Corinth, however, the cornice seems to have rested on the top of fully stone walls.
101. H.G.G. Payne, "On the Thermon Metopes," *BSA* 27 (1926) 124–32, discusses the themes of the metopes and suggests that some must have been completed on other panels. This seems to be confirmed for the Perseus metope and a fragment that may show one of the gorgons pursuing him.
102. See esp. B. S. Ridgway, *The Archaic Style in Greek Sculpture*, 2nd ed. (Chicago: Ares Publishers, Inc., 1993) 380, 390. This piece will be discussed further, with additional bibliography, in Chapter 4.

CHAPTER 3

1. The most recent general treatments of the early Doric capital are those of P. de La Coste-Messelière, "Chapiteaux doriques du haut archaïsme," *BCH* 87 (1963) 639–52 and B. Wesenberg, *Kapitelle und Basen* (Düsseldorf: Rheinland-Verlag, 1971) 50–54. La Coste-Messelière attempts to order the pieces in time, beginning rather early in the seventh century. He thus provisionally places the Heraion C capital at the start of the series, with a date between 675 and 630 B.C., although he considers the example from Aigina as possibly earlier. The Tiryns and Delphi capitals would follow and be very close in date. There is no real evidence, however, for such a high chronology. In fact, several of his examples are now placed much later, including those from the Older Temple of Aphaia on Aigina, recently dated ca. 570 B.C., and a decorated capital attributed to the Temple of Artemis Knakeatis at Tegea, which has subsequently been assigned to the second half of the sixth century B.C. by its most recent excavator, K. A. Rhomaios. In accord with current views, Wesenberg has lowered the date for the first Doric capital, which in turn has repercussions for the assignment of these particular examples. He argues that no capital can be placed with certainty before ca. 580 B.C., his date for the Temple of Artemis at Korkyra as determined by its pedimental sculpture, and therefore he assigns the introduction of stone capitals to the last quarter of the seventh century B.C. or, more recently, to no later than ca. 600 B.C.: B. Wesenberg, "Die Entstehung der griechischen Säulen- und Gebälkformen in der literarischen Überlieferung der Antike," in E.-L. Schwandner, ed., *Säule und Gebälk* (Mainz am Rhein: P. von Zabern, 1996) 6.
- Heraion, Capital C: P. Amandry, "Observations sur les monuments de l'Héraion d'Argos," *Hesperia* (1952) 222–74, esp. 229–33. Other capitals accepted by Amandry as seventh century are B, H, M, and N, which no longer exist. H is similar to C in its unfluted neck and base diameter.
- Aigina, early votive capital (Mus. Inv. 2375): H. Schleif, in G. Rodenwaldt, et al., *Korkyra I: Der Artemistempel* (Berlin: Gebr. Mann, 1940) 90–91, fig. 70; G. Welter, *AA* (1938) 16–19.
- Tiryns: H. Sulze, "Das dorische Kapitell der Burg von Tiryns," *AA* (1936) 14–36; A. Frickenhaus, *Tiryns I, 1* (Athens: Eleutheroudakis & Barth, 1912) 7–9; W. Dörpfeld, in H. Schliemann, *Tiryns* (London: J. Murray, 1886) 293–94, fig. 122; E.-L. Schwandner, *Der ältere Porostempel der Aphaia auf Aegina* (Berlin: W. de Gruyter, 1985) 115–16.
- Delphi: R. Demangel, *FdD II: Topographie et Architecture, 3: Le Sanctuaire d'Athènes Pronaia 1* (Paris: De Boccard, 1923) 26–41. Demangel, 40, places the temple prior to the sixth century on the basis of column proportions, fluting, capitals, and lifting channels. A. W. Lawrence, *Greek Architecture*, rev. 4th ed. (Harmondsworth, Middlesex: Penguin Books Ltd, 1983) 129, fig. 89, and rev. 5th ed. (New Haven and London: Yale University Press, 1996) 68–70, fig. 90, calls these capitals "probably late seventh century."
- Aigina, Older Temple of Aphaia: Schwandner, *Porostempel*, esp. 29–33, 67–72.

- Tegea: K. A. Rhomaios, "Tegeatikon hieron Artemidos Knakeatidos," *ArchEph* (1952) 1–25.
2. Capital C: J. J. Coulton, *The Architectural Development of the Greek Stoa* (Oxford: Clarendon Press, 1976) 28–29 accepts the attribution of capital C (among others) to the North Stoa, which he dates ca. 600 B.C. More recently, C. A. Pfaff, "Three-peaked Antefixes from the Argive Heraion," *Hesperia* 59 (1990) 155 n. 14 has suggested that capital C does not belong to the stoa in its original phase and is not even Archaic. For Hoffelner, see below.
- Aigina votive capital: K. Hoffelner, et al., *Alt-Agina II, 4: Die Sphinxsäule* (Mainz am Rhein: P. von Zabern, 1996) 16–19 discusses several early Doric capitals, including another votive capital from Aigina that he dates somewhat earlier, 600–590 B.C.
- Tiryns capital: E.-L. Schwandner, "Archaische Spolien aus Tiryns. Ausgrabungen in Tiryns 1982/83," *AA* (1988) 269–84.
- Delphi, capitals from the Temple of Athena Pronaia: E.-L. Schwandner, "Der ältere Aphaiatempel auf Aegina," in U. Jantzen, ed., *Neue Forschungen in griechischen Heiligtümern* (Tübingen: E. Wasmuth, 1976) 103–20, esp. 116–19. Schwandner discusses these capitals also in his book on the Aphaia temple (*Porostempel*, 117 n. 165), where he places them around the middle of the sixth century B.C.
- M.-F. Billot, *Hesperia* 59 (1990) 95–139, esp. 99–100, discusses the capitals noted here, along with other early examples, and argues as well for a lower date. Recent mentions of the Aigina capital have maintained its seventh-century assignment: A. Ohnesorg, "Votiv- oder Architektursäulen?" in E.-L. Schwandner ed., *Säule und Gebälk* (Mainz am Rhein: P. von Zabern, 1996) 45; R. Felsch, *AA* (1980) 74. Yet that may be largely due to its squat shape, which in turn may be a factor of its votive function.
3. G. Dontas, "Denkmäler und Geschichte eines kerkyräischen Heiligtums," in U. Jantzen, ed., *Neue Forschungen in griechischen Heiligtümern* (Tübingen: E. Wasmuth, 1976) 121–33, esp. 126–129, who distinguishes three building phases on the basis of the terracottas. A. E. Kalpaxis, *Früharchaisches Baukunst in Griechenland und Kleinasien* (Athens: P. Athanassiou, 1976) 58 discusses the temple and suggests a date for it ca. 600 B.C. For the architectural terracottas, see N. A. Winter, *Greek Architectural Terracottas* (Oxford: Clarendon Press, 1993) 115. I. Strøm, "The Early Sanctuary of the Argive Heraion and its External Relations (8th–early 6th c. B.C.)," *ActaArch* 59 (1988) 173–203, esp. 188–89, places the earliest terracottas and the Doric columns ca. 630 B.C. or slightly later.
 4. Korcyra: Schleif, *Korcyra I*, 31–33. The date given is that generally accepted for the temple, although Schleif (p. 89) originally suggested 600–585 B.C. An even later placement, ca. 560 B.C., has recently been offered by W. Alzinger, "Akragas und Kerkyra, Fixpunkte der früharchaischen Chronologie?," in *APARXAI. Nuove ricerche e studi sulla Magna Grecia e la Sicilia antica in onore di Paolo Enrico Arias I* (Pisa: Giardini, 1982) 113–20.
- Old Tholos, Delphi: H. Pomtow, "Die alte Tholos und das Schatzhaus der Sikyonier zu Delphi," *Zeitschrift für Geschichte der Architektur* 3 (1910) 97–143, 153–192; H. Pomtow, "Die beiden Tholoi zu Delphi," *Zeitschrift für Geschichte der Architektur* 4 (1911) 171–214; F. Seiler, *Die griechischen Tholos* (Mainz am Rhein: P. von Zabern, 1986) 40–55.
- Selinous: G. Gullini, "Il tempio E I e l'architettura protoarcaica di Selinunte," in G. Rizzo ed., *Insedimenti coloniali greci in Sicilia nell'VIII e VII secolo a. C., Cronache di Archeologia* 17 (Catania: Università di Catania, Istituto di Archeologia, 1978) 52–61, where the temple is dated to the last quarter of the 7th c. by the excavator, but a date ca. 580–570 B.C. is proposed by M. Torelli. G. Gullini, "Origini dell'architettura greca in Occidente," *ASAtene* 59 n.s. 43 (1981) 97–125, esp. 104–12. G. Gullini, "L'architettura," in G. Pugliese Car-

ratelli, ed., *Sikanie* (Milan: Istituto Veneto di Arti Grafiche, 1985), esp. 422–33. I. Romeo, *Xenia* 17 (1989) 43 reports a conversation with Gullini in which he proposed a lower date for Temple E I, of 600–580 B.C.

Apollo I temple, Aigina: K. Hoffelner, *Alt-Aigina I, 3: Das Apollon-Heiligtum* (Mainz am Rhein: P. von Zabern, 1999) 15–45 cites the uncanonical components of this building, including its sofa-type anta capitals and the rendering and narrow proportions of its triglyphs, as evidence for an early date. Yet his comparisons are with buildings that are usually dated between 580 and 565 B.C. It would seem that he employs a higher chronology in general, as shown by his list of Doric capitals in *Sphinxsäule*, 18, where earlier dates are offered for the Temple of Artemis at Korkyra (590–580 B.C.) and the Old Aphaia temple on Aigina (580–570 B.C.) than those accepted here, although a later one is suggested for the Old Tholos at Delphi (570–560 B.C.). See also my discussion throughout this chapter of individual components from the Temple of Apollo I.

Note also that C. K. Williams, II, “Doric Architecture and Early Capitals in Corinth,” *AM* 99 (1984) 67–75, esp. 71, suggests that stone capitals from the Heraion at Olympia may have been installed not long after its construction ca. 600/590 B.C. Its two earliest extant examples would then date 600–570 B.C., and the earliest capital that he notes from Corinth would be only slightly later.

5. J. J. Coulton, “Doric Capitals: A Proportional Analysis,” *BSA* 74 (1979) 81–153 presents the results of a detailed analysis of proportions. On p. 103 he concludes that proportions “did not develop continuously or uniformly with time,” but instead in stages. His Group 1/3, of Archaic date, shows “significantly different proportions,” and apparently does not lend itself to division into more clearly defined subgroups.
6. For the capital, see Wesenberg, *Kapitelle*, 51, 54 no. 27, fig. 110; P. Griffo, *Il Museo archeologico regionale di Agrigento* (Rome: L. Nardini and Co., 1987) 84–86, fig. 71.

The official foundation date of Akragas is ca. 581 B.C., but it should be noted that material of an earlier period has been found in the area, suggesting contact or even a settlement before the official foundation. This may be implied as well by the decision of Megara Hyblaia to establish its subcolony of Selinous so much farther west (over 200 km from Gela) already around 650 or 628 B.C.: P. Griffo and L. von Matt, *Gela* (Greenwich, CT: New York Graphic Society Ltd., 1968) 83. The possibility should also be considered that the apparently early form of the capital results not from its date but from its use as the crown of a votive column.

7. M. Schuller, “Die dorische Architektur der Kykladen in späarchaischer Zeit,” *Jdl* 100 (1985) 319–98. Although Schuller does not specifically list this trait among his attributes, he mentions it in regard to several examples.
8. J. J. Coulton, *Ancient Greek Architects at Work* (Ithaca, NY: Cornell University Press, 1977) 104; Williams, “Early Capitals,” 69–70, in regard to capitals from Corinth. See also Schuller, “Architektur der Kykladen,” who notes the lack of annulets, or their modification, in several Cycladic Doric capitals from the second half of the sixth century to the end of the Archaic period.
9. K. Herrmann, “Zum Dekor dorischer Kapitelle,” *Architectura* (1983) 1–12. The Aigina capital has been discussed previously. For the Xenares capital, see Schleif, *Korkyra I*, 76–78, where it is placed at the beginning of the series from Korkyra. With the date of the Artemis temple generally accepted as ca. 580–570 B.C., the Xenares capital would presumably fall in the first quarter of the sixth century. It should be noted, however, that L. H. Jeffery, *The Local Scripts of Archaic Greece*, rev. ed. (Oxford: Clarendon Press, 1990) 233, no. 13, dates the inscription on this piece ca. 575–550 B.C. and attributes the discrepancy to a stylistic lag in the development of votive capitals.
10. Old Tholos, Delphi: Pomtow, “alte Tholos,” esp. 104–105, 156–159; Pomtow, “beiden Tholoi,” esp. 82–86; Seiler, *Tholos*, esp. 44–45.

- Temple of Apollo I, Aigina: Hoffelner, *Apollon-Heiligtum*, 16–18, 38, 43, who attributes a chronological significance to the shape of annulets and suggests that a canonical form was reached ca. 570–560 B.C.
- The capitals from the Temple of Aphaia at Aigina have been discussed previously. The architectural capitals from Korkyra are attributed to the Artemis temple: Schleif, *Korkyra I*, 31–33, 79–87. The example from Kalapodi is tentatively associated with an Archaic temple built ca. 570–560 B.C.: R.C.S. Felsch, et al., "Apollon und Artemis oder Artemis und Apollon? Bericht von den Grabungen im neu entdeckten Heiligtum bei Kalapodi," *AA* (1980) 38–118, esp. 73–76, figs. 51, 53.
11. For a discussion of this feature and of its continuation in later sixth-century capitals around the Ionian Sea, see B. A. Barletta, "An 'Ionian Sea' Style in Archaic Doric Architecture," *AJA* 94 (1990) 45–72 esp. 45–52.
 12. Schleif, *Korkyra I*, 87–88, nos. 11–16.
 13. Schwandner, *Porostempel*, 113–15 n. 155; Hoffelner, *Apollon-Heiligtum*, 18, 38, 43.
 14. Wesenberg, *Kapitelle*, 52 nos. 1 and 2. For no. 1, see E. Curtius and F. Adler, eds., *Olympia: die Ergebnisse der von dem Deutschen Reich veranstalteten Ausgrabung IV* (Berlin: A. Asher and Co., 1890) 149, nos. 939 and 939a, pl. 53; R. Hampe, "Ein bronzenes Beschlagblech aus Olympia," *AA* (1938), 359–69, figs. 3–5, assigned by Hampe to the Heraion. For no. 2, see *BCH* 89 (1965) 746 and fig. 3, perhaps from a votive base.
 15. See the list given by Schwandner, *Porostempel*, 113–115 n. 155.
 16. Schuller, "Architektur der Kykladen," 395–97 states that fluting is omitted almost without exception in late Archaic Cycladic Doric columns and attributes this to their slender proportions. With the increased influence of mainland Doric around 500 B.C., "canonical" Doric traits, such as fluted columns, appear.
- Regional preferences may seem to offer an unlikely explanation for the smooth necking of the capital in the Temple of Apollo I on Aigina, since those from the geographically (and chronologically) proximate Temple of Aphaia display a fluted necking. Yet the two buildings exhibit considerable differences in other ways as well, such as the types of anta capitals used and the respective geisa, in the former case with uniform mutules, but only on the front, and in the latter with mutules of alternating widths that continue on all sides.
17. D. S. Robertson, *Greek and Roman Architecture* (London: Cambridge University Press, 1974) 41 and n. 5. Some variations exist in the treatment of the shaft, especially faceting. Hoffelner, *Sphinxsäule*, 14 cites examples of faceted shafts as evidence that this treatment appears earlier than fluting, already in the Late Geometric period, and continues through the sixth century.
 18. Aigina: Schwandner, *Porostempel*, 26–29, 67–72. Corinth: Williams, "Early Capitals," 70.
 19. Schleif, *Korkyra I*, 87. These capitals also show differing treatments of the band at the base of the echinus.
 20. Coulton, *Greek Architects*, 39; T. N. Howe, "The Invention of the Doric Order" (Diss. Harvard University, 1985) 308–34.
 21. For a study of Doric, as well as Ionic, antae, see A. D. Brockmann, *Die griechische Ante* (Marburg: Görich & Weierhäuser, 1968); R. Martin, *Manuel d'architecture grecque I* (Paris: Picard, 1965) 470–85 also discusses this member.
 22. Brockmann, *Ante*, 24 and 149–50. See fig. 3–12, from G. Soteriades, *ArchEph* (1900) between pp. 174 and 175.
 23. For the anta of this building and the changes that it exemplifies, see Brockmann, *Ante*, 27–30. The form of the anta is discussed by W. Dörpfeld, *Alt-Olympia I* (Berlin: E. S. Mittler & Sohn, 1935) 172–73 and fig. 42, and in E. Curtius and F. Adler, eds., *Olympia: die Ergebnisse der von dem Deutschen Reich veranstalteten Ausgrabung II, Die Baudenkmäler* (Berlin: A. Asher & Co., 1896) 32 and pl. 23, 3; Martin, *Manuel*, 15 and pl. III, 1, who also notes the continuation of this practice even later and in fully stone walls at Selinous, including in Temple C (ca. 550 B.C.). It is explained there by the relatively fragile nature of the stone.

24. Brockmann, *Ante*, 28, 34–35.
25. Schleif, *Korkeyra I*, 47 and figs. 37–38; Schwandner, *Porostempel*, 22–25, respectively. One of the building models discussed earlier from Samos, with a Doric frieze, also displays an anta capital, in which T. G. Schattner, *Griechische Hausmodelle: Untersuchungen zur frühgriechischen Architektur* (Berlin: Gebr. Mann, 1990) 145 identifies a hawk's beak. The model dates before 570/560 B.C., and thus serves as early testimony of the Doric anta capital. Its very rough workmanship prohibits, however, any observations concerning the exact form of the capital.
26. It should be noted that Schwandner, *Porostempel*, 102–11, argues for a prostyle, rather than in antis, arrangement for the porch of the Aphaia temple, which means that the plan of the anta capital would, in this case, be symmetrical.
27. Brockmann, *Ante*, 88–89.
28. An important exception to the two-sided form of capital appears in the antae of the "Basilica" at Paestum. All four faces of these capitals take the form of a cavetto, although pendant cylinders appear only on the sides. In this case, the columns stand between antae (in antis) rather than in front (prostyle), which probably explains the need for a more uniform capital.
29. For stelai, see G.M.A. Richter, *The Archaic Gravestones of Attica* (London: Phaidon Press, 1961) esp. 2, 9–26, where the earliest examples are dated ca. 610/600 B.C.
30. W. B. Dinsmoor, *The Architecture of Ancient Greece* (New York: W. W. Norton and Co., Inc., 1975) 86, 144 is one scholar who notes an Ionic connection. See also Barletta, "Ionian Sea," 52–55 for a discussion of distribution and dates for the sofa-type anta capital.
31. E.-L. Schwandner, "Archaische Spolien aus Tiryns. Ausgrabungen in Tiryns 1982/83," *AA* (1988) 269–84. Hoffelner, *Apollon-Heiligtum*, 38–39, likewise assumes a Peloponnesian origin and places the Tiryns capital at the beginning of the series, but dates it even earlier, ca. 620–600 B.C.
32. Thermon plaques: G. Soteriades, "Anaskaphai en Thermo," *ArchEph* (1900) 161–212; G. Kawerau and G. Soteriades, "Der Apollotempel zu Thermo," *Antike Denkmäler II*, 5 (Berlin: G. Reimer Verlag, 1902–1908) 1–8; H. Koch, "Zu den Metopen von Thermo," *AM* 39 (1914) 237–55; H. Payne, *BSA* 27 (1925–26) 124–32. Kalpaxis, *Früharchaische Baukunst*, 49 not only accepts these panels as metopes, but also argues from them for the existence of an early peristyle, since he finds a correspondence in width between the "metopes" and reconstructed triglyphs, on the one hand, and the interior column spacing and Hellenistic peristyle, on the other. For arguments against the peristyle, see below.
- Terracotta metopes, but without painted decoration, have been recovered at Gonnoi, in Thessaly, where they are assigned to the Temple of Athena: M. L. Bowen, "Some Observations on the Origin of Triglyphs," *BSA* (1950) 117, who dates the temple to the seventh century. E. D. Van Buren, *Greek Fictile Revetments in the Archaic Period* (London: J. Murray, 1926) 38–39, however, associates with the metopes revetments of the seventh to the sixth centuries: no. 88, pp. 80 (34) and 100 (4); figs. 99–101. Two of these pieces are mentioned by Winter, *Architectural Terracottas*, 196, 201 as belonging to types of ca. 500–490 B.C., which may point to a later date for the metopes as well.
33. See N. Bookidis, "A Study of the Use and Geographical Distribution of Architectural Sculpture in the Archaic Period" (Diss. Bryn Mawr College, 1967) 150–56, who notes that the plaques display "a kind of primitive anathyrosis" and in some cases a partial beveling on the edges, as found also in some later, undisputed metopes from Kalydon. She further cites the placement of decoration in the center of each plaque, enclosed laterally by borders of painted rosettes, the considerable size and width of the plaques, and their findspots as proof of their metopal function. Although the plaques differ in width, their heights vary by only 1–2 cm, which would suit a placement in a horizontal frieze.
34. See the discussion in the previous chapter.
35. The material of the wall is disputed. Its lower part was rubble, but the upper is

- suggested to be wood, mudbrick in a wooden framework, or even stone. See Kalpaxis, *Früharchaische Baukunst*, 47–48.
36. As claimed by H. Payne, *Necrocorinthia* (Oxford: Clarendon Press, 1931) 254, who suggested that the actual work was carried out at Thermon using local clay and imported Corinthian slip.
37. Jeffery, *Local Scripts*, 225–26.
38. For the distinctive roofing system of northwest Greece, see Winter, *Architectural Terracottas*, 110–33.
39. Bookidis, "Study," 157–65 discusses all of these metopes and their attributions, and observes that the continued use of terracotta is not necessarily linked to "primitive" constructions. She does not offer a date for the latest series from Thermon, which includes a terracotta triglyph, except to say that it is possibly later than the others. Dates offered here are taken from Winter, *Architectural Terracottas*, 119–21, 125–30. For the Thermon plaques, see also Kawerau and Soteriades, *ArchEph*, 6–7, pls. 49–52a and H. Koch, *RM* 30 (1915) 69. For the Kalydon pieces, see E. Dyggve, *Das Laphrion. Der Tempelbezirk von Kalydon* (Copenhagen: I Kommission hos Ejnar Munksgaard, 1948) 149–64, 236–39.
- Note also the presence in this period of a painted terracotta metope from Sicilian Naxos (beginning of the sixth century) on display in the Naxos museum and of two series of terracotta relief metopes, one from Sparta (ca. 570–560 B.C.): G. Steinhauer, *ASAtene* 60 n.s. 44 (1982) 329–41 and another from Temple B at Himera (mid-sixth century): A. Adriani, et al., *Himera I. Campagne di scavo 1963–1965* (Rome: "L'Erma" di Bretschneider, 1970) 169–73. A terracotta relief, probably from a metope and dated to the last quarter of the sixth century, is reported from Sicilian Naxos as well: P. Pelagatti, *NSc* 1984–85, 264–65 n. 18.
40. Bookidis, "Study," 448–50.
41. A.J.B. Wace, *Mycenae, An Archaeological History and Guide* (Princeton, NJ: Princeton University Press, 1949) 84–86 considered these sculptured reliefs, which were recovered south of the foundations for the sixth-century temple, to be from an altar. Bookidis, "Study," 166–76, while dividing the reliefs into two groups on the basis of the criteria noted as well as their restored dimensions, assigned one of the groups to the temple metopes. According to Ridgway, *Archaic Style*, 333–35, 357–58 n. 8.5, such differences can be reconciled; she thus accepts that the reliefs belonged to one group, datable around 600 B.C. N. L. Klein, "Excavation of the Greek temples at Mycenae by the British School at Athens," *BSA* 92 (1997) 247–322, who has recently restudied the early remains of the temple, attributes all of the panels to that building and offers a date for it in the last quarter of the seventh century B.C.
42. The terracotta triglyphs found at Thermon, Olympia, and Elis are assumed, because of their material and the simplicity of their accompanying decoration, to be of seventh to sixth century date: Van Buren, *Greek Fictile Revetments*, 35–36. Precise chronology for these examples cannot, however, be determined, since their original context is not clear. The triglyph from Elis is particularly problematic. Other revetments found with it are assumed by Van Buren to belong to a subsequent renovation because of their presumably later date, at the end of the sixth century. On the other hand, the triglyph itself may represent a holdover from earlier times. The Thermon piece preserves both the triglyph and metope in one slab. The metopes, in turn, bear decoration of "quite archaic style," according to Van Buren. She associates them (p. 70) with the Temple of Artemis, which she in turn dates to the beginning of the sixth century B.C.
- At Himera, a possible variant of the triglyph, in terracotta, was used along with terracotta metopes in the decoration of Temple B, ca. 550 B.C.: A. Adriani, et al., *Himera I*, 165, and n. 94.
43. Ström, "Early Sanctuary," 187–89, fig. 10 attributes the stone triglyph from Mon Repos to the earliest phase of the Temple of Hera. This triglyph was already reported by Schief, *Korkyra I*, 75, fig. 59, but ascribed to an unknown building. As noted

by the recent excavator, Dontas, "Denkmäler und Geschichte," there seem to be three phases of the temple, ranging from before the mid-seventh century to the beginning of the sixth century, as well as other buildings in the sanctuary. Until more detailed publications of this material appear, we cannot therefore assign a specific context, and thus date, to it. See Hoffelner, *Apollon-Heiligtum*, 20–24, 27, 32–35, 39–40, 43, for the Apollo temple triglyphs.

Bowen, "Some Observations," 114 cited the Temple of Apollo at Cyrene as yielding the earliest known triglyphs in stone, dated ca. 600 B.C. The chronology of that building has since been revised, however. The initial construction of the naos is now assigned to the mid-sixth century B.C., while the addition of its peristyle and crowning Doric frieze is placed in the last quarter of the sixth century B.C.: S. Stucchi, "Le fasi costruttive dell'Apollonion di Cirene," *Quaderni di Archeologia della Libia* 4 (1961) 55–81, esp. 61–62.

44. Gullini, "L'architettura."
45. The usual arrangement is black or dark blue for projecting triglyphs and red for metopes: Lawrence, *Architecture*, 4th ed., 137; 5th ed., 75. It should be noted, however, that in the Temple of Apollo I on Aigina, for which a date of ca. 580–570 B.C. is accepted here, the triglyphs seem to be painted alternately black and red: Hoffelner, *Apollon-Heiligtum*, esp. 42.
46. P. Zancani Montuoro and U. Zanotti-Bianco, *Heraion alla Foce del Sele* II (Rome: Libreria dello Stato, 1954); F. D. Van Keuren, *The Frieze from the Hera I Temple at Foce del Sele* (Rome: G. Bretschneider, 1989); K. Junker, *Der ältere Tempel im Heraion am Sele* (Cologne: Böhlau Verlag, 1993); M. C. Conti, *Il più antico fregio dallo Heraion del Sele* (Florence: Casa Editrice Le Lettere, 1994).
47. Delphi: Seiler, *Tholos*, 45–46; Aigina, Apollo Temple: Hoffelner, *Apollon-Heiligtum*, 20–24, 27, 30–35, 39–40; Korkyra: Schleif, *Korkyra I*, 34–35, 63–66; Aigina, Aphaia sanctuary: Schwandner, *Porostempel*, 36–42, 60, 62–67.
48. As discussed by Barletta, "Ionian Sea," esp. 62–69 and by D. Mertens, *Der alte Hera-tempel in Paestum* (Mainz am Rhein: P. von Zabern, 1993) passim.
49. Lokroi: G. Gullini, *La cultura architettonica di Locri Epizefirii* (Taranto: Istituto per la storia e l'archeologia della Magna Grecia, 1980) 5–10; E. Østby, "The Temple of Casa Marafioti at Lokroi and Some Related Buildings," *Acta Institutum Romanum Norvegiae* 8 (1978) 25–47, esp. 31–32, 45–47.
- Selinous: R. Koldewey and O. Puchstein, *Die griechischen Tempel in Unteritalien und Sicilien* (Berlin: A. Asher & Co., 1899) 129 and fig. 111. The tetraglyphs were accompanied by seven or eight guttae on the regulae below.
50. Tholos: See most recently, Seiler, *Tholos*, 40–55. Temple of Apollo: G. Cultrera, "L'Apollonion-Artemision di Ortigia in Siracusa," *MonAnt* 41 (1951) 822–24 and fig. 93. For both the Tholos and the Monopteros: F. Courby, "La Tholos du Trésor de Sicyone à Delphes," *BCH* 35 (1911) 132–48. J.-F. Bommelaer and D. Laroche, *Guide de Delphes: Le Site* (Paris: de Boccard, 1991) 120–23; D. Laroche and M.-D. Nenna, "Le Trésor di Sicyone et ses foundations," *BCH* 114 (1990) 241–84, esp. 263–66, discuss recent investigations of the Sikyonian Treasury and the earlier buildings it contains. See now E. Østby, "Delphi and Archaic Doric Architecture in the Peloponnese," *BCH Suppl.* vol. 36, 239–62 (in press).
51. W. B. Dinsmoor, Jr., "The Kardaki Temple Re-Examined," *AM* 88 (1973) 165–74.
52. Broneer, *Isthmia I*, 30–31, 36–37.
53. N. L. Klein, "The Origin of the Doric Order on the Mainland of Greece: Form and Function of the Geison in the Archaic Period" (Diss. Bryn Mawr College, 1991) 151–59 attributes the two different types of crowning blocks to separate positions on this temple and divides the functions of the geison between them. Group 6 blocks are thought to secure the rafters, while those discussed here, which are labelled Group 10, would deflect the water, but on only one side, perhaps the entrance end. This leads her to suggest that the two functions were combined at a later stage. Yet other reconstructions of the building, especially

the extensive study by R. F. Rhodes, "The Beginnings of Monumental Architecture in the Corinthia" (Diss. University of North Carolina, Chapel Hill, 1984) esp. 83–85, see the Group 10 blocks as already serving both functions.

54. These early geison-tiles are noted, with bibliography, by Schwandner, *Porostempel*, 118 and n. 169, who discusses their association with wooden temples and their relationship to both the Ionic geison and the Doric raking geison in stone.

For a discussion of the various roofing systems, including that of northwest Greece, that employ the geison tile, see Winter, *Architectural Terracottas*, passim.

Thermon: In addition to the Temple of Apollo (C) in both its first and second roofs, an unknown building of later date (580–570 B.C.) may use this member.

Kalydon: Dyggve's Temple B1

(Dinsmoor's A1) as well as Temple B2, usually dated ca. 575 but assigned by Winter to 550–40 B.C.

An even earlier geison tile has been recovered in the sanctuary of Artemis Orthia at Sparta. Its date, ca. 650–620 B.C., is contemporary with the temple, to which Winter tentatively assigns it. Yet it has an oblique, rather than concave soffit, and is the only example of its type in Laconia, which may suggest an experiment that was not continued. The geison tile is, nevertheless, known later in Laconian-tile roofs found outside of their homeland. The northwest Greek examples would seem to be largely separate from those of Laconian roofs but may have inspired others from Kalapodi, dated ca. 570 B.C. In Athens, the terracotta geison tile continues to the end of the Archaic period. Some possess a soffit that is at least partially concave, as in the early examples from northwest Greece: E. Buschor, *Die Tondächer der Akropolis II* (Berlin and Leipzig: W. de Gruyter & Co., 1933) 3–25.

55. A. Trevor Hodge, *The Woodwork of Greek Roofs* (Cambridge: Cambridge University Press, 1960) 76–91, in his discussion of cornice blocks, traces their development from such flat terracotta slabs at Thermon

and Kalydon to the more square members of later times. He associates the thicker geison blocks with ashlar construction, noting the similarity in shape to wall blocks. The subsequent publication of thick stone geison blocks from the seventh-century Temple of Poseidon at Isthmia would seem to confirm the association of this geison type with ashlar walls. But the early date of the Isthmia temple points to a parallel, rather than evolutionary, development of the two types. It should be noted that neither of these early traditions yet provides evidence of the mutules or guttae characteristic of Doric architecture.

56. Klein, "Origin of the Doric Order," 1 and n. 2, 174 and n. 14, following N. Winter, *Hesperia* 59 (1990) 8, 18, who defines a geison tile as an eaves tile with a drip. Schwandner, *Porostempel*, 118 argues, however, that the term "geison" is in fact appropriate for the eaves tile and notes the survival of the form in stone geisa.

57. The terracotta geisa from the Temple of Apollo at Thermon, for example, have a somewhat trapezoidal section, with flattened upper surface, slanting face, and concave underside. They are also relatively thin, measuring 19.5 cm at the front face and only 8 cm in thickness toward the back.

58. J. Reimers, *Zur Entwicklung des dorischen Tempels* (Berlin: Weidmannsche Buchhandlung, 1884) 36 suggested early on that the duplication of raking and horizontal geisa on the facade must arise from the addition of the pediment to a hipped roof.

59. Winter, *Architectural Terracottas*, 112–17, 119–21 for the northwest Greek roofs, where a geison tile from Kalydon may belong to the pediment of Temple B1, and 201 for the North and South Temples at Kalapodi.

60. A.J.B. Wace, *Mycenae, An Archaeological History and Guide* (Princeton, NJ: Princeton University Press, 1949) 84–86 assigns the cornice blocks to a temple, but raises the possibility that they may instead have crowned an altar. P. Amandry, *Hesperia* 21 (1952) 254 and fig. 16 discusses both of these possibilities and suggests that the

- blocks must have come from a small structure. Klein, "Origin of the Doric Order," 138–44 believes that the blocks belonged to an early sixth-century temple and represent both the lateral and horizontal geisa of that building. See now Klein, "Excavation of the Greek temples," esp. 282–93, for the geison blocks and discussion of the Archaic temple.
61. Note also the execution of a concave soffit for the lateral geisa of an early sixth-century building at Olympia. In this case the mutular geison was also used, but apparently only on the front: Klein, "Origin of the Doric Order," 60–62, and K. Herrmann, "Beobachtungen zur Schatzhaus-Architektur Olympias," in U. Jantzen, ed., *Neue Forschungen in griechischen Heiligtümern* (Tübingen: E. Wasmuth, 1976) 323–25, perhaps belonging to the Older Sikyonian Treasury. Different forms of geisa on sides (smooth) and front (with mutules) are also now attested for the Temple of Apollo I on Aigina: Hoffelner, *Apollon-Heiligtum*, 24–25, 34, 40–41. Klein accounts for the use of a concave soffit in less visible areas (the flanks) of the Olympia building and the later Megarian Treasury at the same site as an economy measure. It nevertheless suggests some flexibility in the form of the geison.
 62. Dyggve, *Das Laphrion*, 110–15, 216–19, 223–25 and pl. 12. These geison slabs have a maximum thickness of 13.5 cm. In a review of Dyggve's book, W. B. Dinsmoor, *AJA* 54 (1950) 278 rejects the attribution of this poros geison to Temple A.
 63. K. Rhomaios, "Die Ausgrabungen in Thermos und Kalydon," in *Archäologisches Institut des deutschen Reiches, Bericht über die Hundertjahrfeier* (Berlin: W. de Gruyter, 1930) 254–58.
 64. Klein, "Origin of the Doric Order," 103–104.
 65. Even in this temple, terracotta was retained for some of the metopes, although the rest of the entablature was of stone. Rhomaios, "Ausgrabungen," 257 states that the poros stone used was so light that the geison would have weighed less than its terracotta counterpart from Thermon. This may suggest a concern with weight. The cassettes appear on both lateral and horizontal geisa, but not on the raking geison blocks assigned to the temple. Klein, "Origin of the Doric Order," 99, has expressed doubts, however, about the association of the latter series with Temple A, since their projection from the tympanum (25 cm) is less than the overhang created by the cassette geisa (32 cm): see Dyggve, *Das Laphrion*, 218–19. Dyggve, 108, 218, also reports the remains of red and black paint on the soffit of some geison fragments, which raises the possibility of a decorative treatment of this area.
 66. Rhodes, "Monumental Architecture," 104.
 67. Seiler, *Tholos*, 46, who attributes the lack of guttae on mutules and regulae to their small size.
 68. Korkyra: Schleif, *Korkyra I*, 35–38. Apollo I, Aigina: Hoffelner, *Apollon-Heiligtum*, 23–26, 34, 40–41. Aigina: Schwandner, *Porostempel*, 42–54.
 69. For the Artemis temple geisa, see Schleif, *Korkyra I*, 35, 38, and figs. 19–21, and Schwandner, *Porostempel*, 124–26. For the earlier use of the overhanging geison revetment in Western Greece: C. Wikander, "The Artemision Sima and its Possible Antecedents," *Hesperia* 59 (1990) 275–83.
 70. A mutule fragment belonging to the Artemis temple was discovered by Schwandner, *Porostempel*, 124–26 and fig. 76. It preserves only two guttae in each row, but the reconstruction of four guttae is derived from the dimensions of the corresponding triglyphs and regulae. The mutular geison of the Apollo I temple clearly shows this number of guttae, although it is unusual for its early date in possessing mutules of equal size.
 71. Dinsmoor, *Architecture*, 72; Klein, "Origin of the Doric Order," 7–16. A geison block attributed by Cultrera to the contemporary Temple of Apollo at Syracuse arranges its guttae in three or six rows of four each, but this block has now been dissociated by Mertens. See Cultrera, "L'Apollonion-Artemision," 764, 825–27 and fig. 26; D. Mertens, "Die Entstehung des Steintempels in Sizilien," in E.-L.

- Schwandner, ed., *Säule und Gebälk* (Mainz am Rhein: P. von Zabern, 1996) 25–38, esp. 28.
72. Schwandner, *Porostempel*, 126.
 73. In the conclusions to her study of the Doric geison, Klein, "Origin of the Doric Order," 163–81 stresses that its development was not linear, in contrast to general assumptions, and was subject to regional variations from the beginning.
 74. There are quite a few examples of guttaless mutules. For examples of the two other traits, see Klein, "Origin of the Doric Order," 114 and 117–18: Temples of Artemis Knakeatis at Tegea and of Athena Soteira and Poseidon at Vigla, both located in Arcadia and both dated to the second half of the sixth century. Klein attributes these divergences from "canonical" Doric to a particular independence in that region and stresses the role of regional variations in the form of the Doric geison. Seiler, *Tholos*, 46 n. 161 generally associates such variations with smaller temples as well as those in peripheral locations.
 75. "Basilica" or Temple of Hera I, Poseidonia: Mertens, *Heratempel*, esp. 132. Temple of Athena: H. Berve and G. Gruben, *Greek Temples, Theatres and Shrines* (New York: H. N. Abrams, 1962) 410–413, esp. 412. Temple of Hera (II), Foce del Sele: F. Krauss, in P. Zancani Montuoro and U. Zanotti-Bianco, *Heraion alla Foce del Sele I* (Rome: Libreria dello Stato, 1951).
 76. M. B. Hollinshead, "'Adyton,' 'Opisthodomos,' and the Inner Room of the Greek Temple," *Hesperia* 68 (1999) 189–218 concludes that the conventional terms used for the rear rooms of Greek temples are erroneous. She argues that "adyton" refers not to an architectural form but to a function and that "opisthodomos" is the appropriate name for both rooms, whether entered from the cella or outside. Because the conventional terms are recognized in the modern literature and convenient for distinguishing the separate architectural forms, they will still be used here.
 77. Dinsmoor, *Architecture*, 51 says that the opisthodomos appears "almost for the first time" in this temple, but cites no earlier examples. Coulton, *Greek Architects*, 36 points to the opisthodomos as the "chief development from earlier temples."
 78. See the study of A. Mallwitz, "Das Heraion von Olympia und seine Vorgänger," *JdI* 81 (1966) 310–76, esp. 374–75, who concludes that the opisthodomos was part of the original construction.
 79. Schleif, *Korkyra I*, 19–20 notes the difficulties of identifying the rear room, but in his description and illustration of the plan (48–50 and fig. 39), he emphasizes the adyton over the opisthodomos. Hollinshead, "Adyton," 195 implies that there are no regional emphases in the use of the inner room (here called an adyton), but her Table 1 clearly demonstrates a greater number of temples with this feature in Greek Italy (Magna Graecia and Sicily) than in any other region.
 80. A two-tier arrangement is suggested for the Temple of Hera by W. Hoepfner, "Zum Problem griechischer Holz- und Kassettendecken," in A. Hoffmann et al., eds., *Bautechnik der Antike* (Mainz am Rhein: P. von Zabern, 1991) 90–98, esp. 90, and fig. 2. Remains of smaller versions of capitals and architrave elements may indicate two tiers of columns in the Temple of Artemis at Korkyra: Schleif, *Korkyra I*, 45–47.
 81. See Martin, *Manuel*, 336–46, for a list of temples with one to four steps in the platform (krepis).
 82. Both Schleif, *Korkyra I*, 52, and G. Rodenwaldt, *Korkyra II: Die Bildwerke des Artemistempels* (Berlin: Gebr. Mann, 1939) 174–75 recognize this as an early, if not the first, Doric pseudodipteros.
 83. Vitruvius III, 3, 8 attributes the invention of the pseudo-dipteros with eight-column facade to the Hellenistic architect Hermogenes, but it clearly existed earlier. See W. Alzinger, "Hermogenes. Bauglieder und Bauelemente," in A. Hoffmann, et al., eds., *Bautechnik der Antike* (Mainz am Rhein: P. von Zabern, 1991) 1–3.
 84. Selinous, E 1: Gullini, "L'architettura," 431–32 and pls. II, 2–4; III. This temple is known only in its eastern portions, but is assumed to have had an adyton from its apparent correspondence with the Early Classical Temple E (now E 3), beneath which it was found.

- Aigina: Schwandner, *Porostempel*, 102–11 offers two different plans for the temple, both with three rooms and a double line of columns in the cella, in this case arranged in two tiers. The plans differ in the placement of columns in the front porch, either prostyle or in antis.
85. Coulton, *Greek Architects*, 39. R. M. Cook, "The Archetypal Doric Temple," *BSA* (1970) 17–19, esp. 19.
 86. An early reading by M. Guarducci, "L'iscrizione dell'Apollonion di Siracusa," *ArchCl* 1 (1949) 4–10 has since been revised. For a summary of those revisions and of recent opinions, see Ridgway, *Archaic Style*, 442–43, note 10.35. Jeffrey, *Local Scripts*, 265 criticizes the Knidian connection.
 87. R. Martin, "Aspects financiers et sociaux des programmes de construction dans les villes grecques de Grande Grèce et de Sicile," in *Economia e società nella Magna Grecia*, *Atti Taranto* 12 (1973) 185–205, esp. 197.
 88. A. Schachter, "Policy, Cult, and the Placing of Greek Sanctuaries," in A. Schachter, ed., *Le Sanctuaire grec* (Geneva: Fondation Hardt, 1990) 1–57, esp. 56.
 89. Martin, "Aspects financiers," 199–200 attributes the perpetuation of local traits, at least in western Greek cities, to a stable labor force. This was possible in centers that possessed the financial resources to generate ongoing commissions. Although he is speaking of a somewhat later period, from the sixth to fifth centuries B.C., when considerable construction took place in these cities, similar factors must apply.
 90. J. N. Coldstream, "The Meaning of the Regional Styles in the Eighth Century B.C.," in R. Hägg, ed., *The Greek Renaissance of the Eighth Century B.C.: Tradition and Innovation* (Stockholm: Svenska institutet i Athen; Lund: Distributor, P. Aström, 1983) 17–25.
 91. See C. Pfaff, "Archaic Corinthian Architecture, Ca. 600–480 B.C.," in *Corinth XX* (in press).
 92. Ridgway, *Archaic Style*, 80–81.
 93. Schuller, "Architektur der Kykladen," 395–98 discusses the adoption of canonical Doric forms after the beginning of the fifth century. G. Gruben, "Die inselionische Ordnung," in J. des Courtils and J. C. Moretti, eds., *Les grands ateliers d'architecture dans le monde égéen du VI^e siècle av. J.-C.* (Paris: de Boccard, 1993) 109 notes the abandonment of Ionic.
 94. See Seiler, *Tholos*, 52–54, who discusses the dating for the Monopteros as well, and W. B. Dinsmoor, "The Hekatompedon on the Athenian Acropolis," *AJA* 51 (1947) 109–51, respectively.
 95. R.C.S. Felsch, *AA* (1987) 19, 24.

CHAPTER 4

1. As noted and criticized by B. Wesenberg, "Die Entstehung der griechischen Säulen- und Gebälkformen in der literarischen Überlieferung der Antike," in E.-L. Schwandner, ed., *Säule und Gebälk* (Mainz am Rhein: P. von Zabern, 1996) 1–15, esp. 5–9.
2. Even the torus identified on the upper surface of the interior bases in the early seventh-century (third) temple at Yria on Naxos is described as "crudely" rendered by V. Lambrinoudakis, "The Sanctuary of Iria on Naxos and the Birth of Monumental Greek Architecture," in D. Buitron-Oliver, ed., *New Perspectives in Early Greek Art* (Hanover and London: National Gallery of Art, 1991) 173–88, esp. 175.
3. This same type of base, a smooth, cylindrical drum without taper, was adopted also for the Aeolic style columns of the Temple of Athena at Old Smyrna: E. Akurgal, *Alt-Smyrna I* (Ankara: Türk Tarih Kurumu Basimevi, 1983) 79–80. This last phase of the temple was completed ca. 600–590 B.C. according to Akurgal.
4. Archegeion: G. Daux, *BCH* 87 (1963) 862–65 and figs. 1–2.

Oikos of the Naxians: P. Courbin, *Délos 33: L'Oikos des Naxiens* (Paris: de Boccard, 1980) esp. 43–47. Both buildings are also discussed by P. Bruneau and J. Ducat, *Guide de Délos*, 3rd ed. (Paris: de Boccard, 1983) 122, 200. Courbin dates the Oikos, including the interior colonnade, to the beginning of the second

- quarter of the sixth century, or more specifically about 575 B.C. (pp. 43, 55, 90, 93). As he points out however (p. 55 n. 3), R. Vallois, *L'Architecture Hellénique et Hellénistique à Délos, I* (Paris: de Boccard, 1944) 109 has placed it as early as 600 B.C. The bases from the Naxian Oikos rest on plinths or individual stylobates, which measure approximately 1.0 m in diameter: B. Wesenberg, *Kapitelle und Basen* (Düsseldorf: Rheinland-Verlag, 1971) 127; they also show an upward taper. This taper apparently existed as well in bases of the Archegesion, where a slightly conical member was placed above a cylindrical support, but was not a characteristic of the Naxian Sphinx Column: P. Amandry, *FdD II: Topographie et Architecture, 5: La Colonne des Naxiens et le Portique des Athéniens* (Paris: de Boccard, 1953) 7 specifically states that its base is "perfectly cylindrical." In the slightly later fourth Temple of Dionysos at Yria and the added east porch of the Naxian Oikos, the continuous stylobate is introduced: G. Gruben, "Fundamentierungsprobleme der ersten archaischen Grossbauten," in *Bathron, Beiträge zur Architektur und verwandten Künsten für H. Drenup zu seinem 80. Geburtstag* (Saarbrücken: Saarbrücker Druckerei und Verlag, 1988) 159–72, esp. 166. See also G. Gruben, "Naxos und Delos," *JdI* 112 (1997) 261–416, esp. 301–50, for the Oikos.
5. V. Lambrinoudakis and G. Gruben, "Das neuentdeckte Heiligtum von Iria auf Naxos," *AA* (1987) 569–621, esp. 602, consider the Archegesion cylinders as true bases, since they rose above the ground. Courbin, *L'Oikos*, 47 n. 2, likewise distinguishes early bases as at Dreros and Chios from the later Cycladic Ionic base by the fact that the former examples stood directly on or in the ground and supported wooden columns, thus serving as socles or stylobates.
 6. For the column bases of the east porch of the Oikos, see Courbin, *L'Oikos*, 102–103, and pl. 23. Courbin, 95, dates the addition of this porch slightly before the mid-sixth century. Such an assignment is accepted by Bruneau and Ducat, *Guide*, 3rd ed., 122–28, and by R. Vallois, *L'Architecture Hellénique et Hellénistique à Délos II* (Paris: de Boccard, 1966) 175–77, who places the later set of capitals from the building ca. 560 B.C., the date used here. For additional bibliography and comparative proportions for the column bases, see Wesenberg, *Kapitelle*, 119 no. 15, 125.
 7. Lambrinoudakis, "Sanctuary of Iria," 175 describes the interior bases as "worked crudely in the shape of a torus." G. Gruben, "Die inselionische Ordnung," in J. des Courtils and J. C. Moretti, eds., *Les grands ateliers d'architecture dans le monde égéen du VIe siècle av. J.-C.* (Paris: de Boccard, 1993) 97–109, esp. 102, pl. 16, 1–2, is more specific, noting rounded edges and a marked transition to the pavement, which sets off the bases as "feet" of the supports. This is documented as well in his illustration.
 8. See Lambrinoudakis, "Sanctuary of Iria," 173–88, esp. 175 and figs. 8, 15, 16. Both G. Gruben, "Das älteste marmorne Volutenkapitell," *IstMitt* 39 (1989) 161–72, esp. 166 n. 12, and A. Ohnesorg, "Votive- oder Architektursäulen?" in E.-L. Schwandner, ed., *Säule und Gebälk* (Mainz am Rhein: P. von Zabern, 1996) 39–47, esp. 42, interpret the circular plinth of the interior columns at Yria as an incipient spira. Certainly the protrusion of the plinth above ground level might give the appearance of a cylindrical support. Yet the earlier existence of spiras as elements distinct from the stones or plinths that support them suggests that these cylinders should be considered plinths.
 9. Lambrinoudakis and Gruben, "Heiligtum," 596 and figs. 7, 40. Only fragments are preserved of the porch bases and that of the torus represents a repair. Nevertheless, both members are attested.
 10. Courbin, *L'Oikos*, 102–103 and pls. 71–72.
 11. Rhoikos Heraion: For the column bases, which correspond to several different forms, see H. Johannes, "Die Säulenbasen vom Heratempel des Rhoikos," *AM* 62 (1937) 13–37. Note, however, objections to Johannes' proposed reconstructions for these bases by Wesenberg, *Kapitelle*, 121. Ephesian Artemision: see esp. D. G. Hogarth, *British Museum Excavations at Eph-*

esus, *The Archaic Artemisia* (London: British Museum, 1908) 260, 264–67, 273–76 and Atlas pls. 3–5. These bases rested on square plinths. Additionally, although the spira remained consistent, considerable variety exists in the shape and decoration of the crowning torus. See also Wesenberg, *Kapitelle*, 116–29, 135–37.

Temple of Apollo, Naukratis: W. M. Flinders Petrie, *Naukratis I* (London: Trübner and Co., 1886) 11–13; F. N. Pryce, *Catalogue of Sculpture in the Department of Greek and Roman Antiquities of the British Museum I, 1* (London: Trustees of the British Museum, 1928) 171–74. A composite form of base has been reconstructed for this temple, with the profiled spira and fluted torus similar to the Samian bases, but with a tapered cylindrical element above. Several scholars have objected to this arrangement, however, including J. Boardman, “Chian and Early Ionic Architecture,” *Antj* 39 (1959) 170–218, esp. 203, who considers the drum “suspect.” For arguments in favor of its association, see Wesenberg, *Kapitelle*, 122, who cites similarities with Samian bases. The temple has been dated ca. 566 B.C. (W. B. Dinsmoor, *The Architecture of Ancient Greece* [New York: W. W. Norton and Co., Inc., 1975] 125–26) or to the mid-sixth century (Boardman, above and *The Greeks Overseas*, new ed. [London: Thames and Hudson 1980] 120).

Two types of column bases seem to be represented in the Temple of Apollo, although combined in Petrie’s reconstruction. The lower, of Samian type, includes a spira carved with a series of horizontal bands, apparently alternately convex and concave and separated by astragals, as found in examples from the Samian Heraion. The second element, a smooth, conical drum placed above the torus and divided into three fascias, is unparalleled in combination with the more usual Ionic base, but would seem to derive from the early Samian and Cycladic bases of cylindrical shape. As

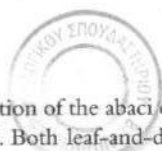
will be discussed subsequently, two types and sizes of necking are also preserved. One may question, then, whether the base as reconstructed may not instead represent two separate members, which presumably would have been used in different parts of the temple.

12. Wesenberg, *Kapitelle*, 129. As Wesenberg notes, the astragal appears occasionally as a torus crown in bases from the Archaic Temple of Artemis at Ephesos (ca. 560 B.C.), but the norm in Greek architecture is to attach the astragal to the shaft.
13. Note that neither the torus nor astragal is represented on an early stone sarcophagus from Samos decorated with Ionic columns. This sarcophagus is dated to the period of the Rhoikos Heraion, thus ca. 570–60 B.C., by I. Kleemann, “Der archaische Sarkophag mit Säulendekoration in Samos,” in N. Himmelmann-Wildschütz and H. Biesantz, eds., *Festschrift für Friedrich Matz* (Mainz am Rhein: P. von Zabern, 1962) 44–55, but toward the mid-sixth century by Wesenberg, *Kapitelle*, 128, and in the middle third of that century by I. Hitzl, *Die griechischen Sarkophage der archaischen Zeit* (Jonsered: Paul Åströms förlag. Studies in Mediterranean Archaeology, Pocket Book vol. 104, 1991) 30–32, 209 no. 43. The sarcophagus is also discussed by B. Freyer-Schauenburg, *Samos XI* (Bonn: Habelt, 1974) 183–84 no. 102, pl. 76.
14. Wesenberg, “Entstehung,” 8.
15. Temple at Sangri: N. M. Kontoleon, *Praktika* (1954) 333 and fig. 5. Wesenberg, *Kapitelle*, 126, for the designation of the smooth base as Island-Ionic. Wesenberg notes this treatment of the base also in the Temple of Athena at Paestum: F. Krauss, *Die Tempel von Paestum I: Der Athenatempel* (Berlin: W. de Gruyter, 1959) 43–44. Here one may attribute it to Cycladic influence.
16. Wesenberg, *Kapitelle*, 135–37, and fig. 278.
17. For the Chian base, see Boardman, “Chian and Early Ionic,” esp. 171–76, 181–83. Wesenberg, *Kapitelle*, 130–41 offers a discussion of the possible derivation of the Attic base from members tra-

- ditionally assigned to the capitals (leaf crowns) of Aeolic columns and the bases of Ionic. This type is generally assumed to have been initiated with the bell-shaped base used in the Stoa of the Athenians at Delphi, traditionally dated ca. 478 B.C. This building has recently been redated to the 450s B.C.: J. Walsh, "The Date of the Athenian Stoa at Delphi," *AJA* 90 (1986) 319–36. A similarly shaped disc appears perhaps even earlier in the Ionic Temple (D) at Metapontion, placed on stratigraphical grounds ca. 480–475 B.C.: D. Mertens, "Der ionische Tempel von Metapont, Ein Zwischenbericht," *RM* 86 (1979) 103–37.
18. Aigina Sphinx Column: E. R. Fiechter, in A. Furtwängler, *Aegina und Heiligtum der Aphaia* (Munich: Verlag der K. B. Akademie der Wissenschaften in Kommission des G. Franz'schen Verlags, 1906) 156–57 and pl. 64 notes no base astragal – that is, between the shaft and spira of the Sphinx Column. Wesenberg, *Kapitelle*, 129 n. 669 agrees. G. Gruben, "Die Sphinx-Säule von Aigina," *AM* 80 (1965) 170–208, esp. 176–78, 183, 187–90, however, accepts astragals at both top and bottom of the shaft. Gruben dates this column to the beginning of the sixth century; H. L. Mace, "The Archaic Ionic Capital: Studies in Formal and Stylistic Development" (Diss. University of North Carolina, Chapel Hill, 1978) 80 argues for a later date, ca. 550 B.C.; W. Kirchhoff, *Die Entwicklung des ionischen Volutenkapitells im 6. und 5. Jhd. und seine Entstehung* (Bonn: Rudolf Habelt, 1988) 20–21, places it even later, 550–540 B.C.
- Naxian Sphinx Column: Amandry, *La Colonne*, 7–10. The astragal is here not a separate member but rather is carved on the base of the column shaft. This monument is dated ca. 570 B.C. on both architectural and sculptural grounds (pp. 15–32). The presence of these astragals is noted also by Ohnesorg, "Votive," 43.
19. G. Gruben, "Anfänge des Monumentalbau auf Naxos," in A. Hoffmann, et al., eds., *Bautechnik der Antike* (Mainz am Rhein: P. von Zabern, 1991) 63–71, esp. 69.
20. P. Schneider, "Neue Funde vom archaischen Apollotempel in Didyma," in E.-L. Schwandner, ed., *Säule und Gebälk* (Mainz am Rhein: P. von Zabern, 1996) 78–83, esp. 79 and n. 6. Schneider suggests that such limestone members date earlier than their marble counterparts. Gruben, "Naxos und Delos," n. 228 raises the possibility of attribution to a votive column instead.
21. The introduction of fillets was long assumed to occur in the Polykratean (fourth) Temple of Hera on Samos: Dinsmoor, *Architecture*, 135; E. Buschor, *AM* 58 (1933) 35–36. For a discussion of the temple, see also O. Reuther, *Der Heratempel von Samos* (Berlin: Gebr. Mann, 1957). With its first phase of construction now placed between 530 and 500 B.C. (E. French, *JHS-AR* 1989–90, 68), our earliest evidence might instead come from the Ionic porch columns of the Temple of Athena at Paestum, usually dated ca. 510 B.C., although it is hard to imagine the origin of this treatment in an otherwise Doric building. For that temple, see Krauss, *Athenatempel*, 44.
22. The first association of the two types was made by O. Puchstein, *Die ionische Säule als klassisches Bauglied orientalischer Herkunft* (Leipzig: J. C. Hinrichs, 1907) 40–42. This view has been followed by Dinsmoor, *Architecture*, 58–63; E. Akurgal, "Vom äolischen zum ionischen Kapitell," *Anatolia* 5 (1960) 1–7; Gruben, "Sphinx-Säule," 208; J. Boardman, "Architecture," in J. Boardman, et al., *Greek Art and Architecture* (New York: Henry N. Abrams, Inc., 1967) 17. See also the discussion of this problem in P. P. Betancourt, *The Aeolic Style in Architecture* (Princeton, NJ: Princeton University Press, 1977) 122–33, who notes similarities also in other characteristics of the two styles and suggests for them a fairly contemporary origin from Near Eastern "capitals with paired volutes," and in Mace, "Ionic Capital," 143–47.
23. Delos capital: R. Martin, "Compléments à l'étude des chapiteaux ioniques de Délos," *BCH Suppl. I* (1973) 371–98, esp. 387–89; Bruneau and Ducat, *Guide*, 3rd ed., 64 and n. 1, fig. 8, where the decora-

- tion of the canalis is considered Parian; Vallois, *L'Architecture II*, 170–75, who dates the capital ca. 560 B.C. or slightly later. In this case, the beginning of each volute is actually above the coiled portion, which is the reverse of Aeolic volutes. This capital, as well as a fragmentary but very similar example, is also discussed by Amandry, *La Colonne*, 19–21, pls. 15, 3; 16. It should also be noted that the extant porch capital of the fourth Temple of Dionysos at Yria, dated about the same time, has an unarticulated area in the center of the canalis: Gruben, "Volutenkapitell," 172 and n. 32. Gruben suggests that the missing portion of the Naxian Sphinx Capital was probably rendered in the same way. He does not, however, argue for a floral element here, in correspondence with Aeolic capitals, but instead relates this treatment to the structural origin of the Ionic volute member in a transverse beam.
24. N. M. Kontoleon, "Paria ionika kionokrana," *AAA* 1 (1968) 178–81, attributes this type of capital with divided canalis to Paros. Mace, "Ionic Capital," 72–76, argues for a local tradition also on the basis of other similarities among several Island capitals, including those mentioned here with a divided canalis. For these various capitals, see Mace 211–14, nos. 52, 53; G. Daux, *BCH* 87 (1963) 824 and figs. 18–19; 86 (1962) 858, fig. 10; A. Ohnesorg, "Parische Kapitelle," in J. des Courtils and J. C. Moretti, eds., *Les grands ateliers d'architecture dans le monde égéen du VIIe siècle av. J.-C.* (Paris: de Boccard, 1993) 111–18, esp. 113–15, who suggests that at least some Parian capitals bore a painted motif (e.g., lotus flower) in this location. The earliest example on Paros of the capital with divided canalis is generally dated to the second quarter of the sixth century B.C., that is, slightly later than the Naxian capital from the porch colonnade of the fourth Temple of Dionysos at Yria, dated ca. 580–570 B.C., which likewise bears a smooth central area. Current evidence would thus favor Naxos as the originator of this feature.
 25. This similarity, and a historical reconstruction, are explored by R. Martin, "Problème des origines des ordres à volutes," *Études d'archéologie classique* 1 (1955–56) 119–32.
 26. See especially Kirchhoff, *Entwicklung*, 10–12, who notes the difficulties of using proportional relationships for dating. He nevertheless uses them in his own work, in this case based on overall length:volute interval. This leads to dates for individual capitals that may differ significantly from those generally accepted and, in the case of architectural pieces, from those assigned to other components of the same building. Although proportional relationships provide general guides to chronology, they should not be followed too strictly, as Gruben, "Volutenkapitell," 168 n. 15, makes clear in regard to Kirchhoff's results.
 27. As noted by Amandry, *La Colonne*, 18. Mace, "Ionic Capital," in his discussion of the Archaic Ionic capital, offers separate proportional tables for architectural and votive capitals.
 28. Gruben, "Volutenkapitell," 161–72. Of the two works discussed, Column A (Naxos Mus. 8) is earlier, dated to the end of the seventh century on the basis of an inscription on one side. E. P. McGowan, "Votive Columns of the Aegean Islands and the Athenian Acropolis in the Archaic Period" (Diss. Institute of Fine Arts, New York University, 1993) 21–24, 207–11, however, cites arguments for an early sixth century dating of the inscription and places the capital 590–570 B.C. (?). She views the simple treatment of this and other small scale votive capitals as a factor of size rather than early date.
 29. J. M. Cook and R. V. Nicholls, *Old Smyrna Excavations: The Temples of Athena* (London: British School at Athens, 1998) 134–58, dated ca. 600 B.C.; Akurgal, *Alt-Smyrna*, 88–97; 127, who dates the columns and capitals to 610–590 B.C.; Betancourt, *Aeolic Style*, 58–63.
 30. A Naxian origin is also suggested by Boardman, "Architecture," 17, and by H. Drerup, in a lost manuscript cited by W. Darsow, in T. Dohrn, ed., *Festschrift A. Rumpf* (Krefeld: Scherpe Verlag, 1952) 58 and n. 98.
 31. For the first two Delian capitals, see Ohnesorg, "Votive," 39–40 and n. 9, who

- tentatively places them at the end of the seventh century, and Martin, "Compléments," 382–91, nos. 5 and 6 (the latter votive). Martin dates these, along with the rest of the Cycladic series, in the second quarter of the sixth century, but since the series includes the capital from the Oikos of the Naxians, a slightly earlier date is perhaps in order. Another capital from Delos, found below the base of the Naxian Kolossos and therefore datable before ca. 580 B.C., is discussed by G. Gruben, "Griechische Un-Ordnung," in E.-L. Schwandner, ed., *Säule und Gebälk* (Mainz am Rhein: P. von Zabern, 1996) 61–77, esp. 64 and fig. 4, who seems to place the Kolossos somewhat earlier, around 600 B.C. This piece is unfinished, but is assumed to have been placed on a pillar; its original function is uncertain, although Gruben suggests that it might have been intended for the pronaos of the Artemision, and thus an architectural context.
32. Courbin, *L'Oikos*, 43 n. 1 and 55 nn. 3, 4, discusses the various dates given to the building and its capital. He settles on an assignment of 575 B.C. for his "new building" or Oikos. Vallois, *L'Architecture II*, 175, dates both interior and eastern porch capitals ca. 575–560 B.C. As shown in the recent discussion of the building by Courbin, however, the porch columns and entablature are much more sophisticated than those of the interior. Martin, "Compléments," 390–91, no. 10 and fig. 18, places the Oikos capital within an entire series between 580/70 and 550 B.C. The only publication expressing doubt about the attribution is P. Bruneau and J. Ducat, *Guide de Délos* (Paris: de Boccard, 1965) 79 n. 1; however, in the third edition of this publication, the authors make no mention of any such concerns.
 33. The upper surface of the volute member is reconstructed with a projecting edge, but this cannot be seen as an incipient abacus. It is present also in the capitals of the Naxian Sphinx Columns from Delphi and Delos: Amandry, *La Colonne*, pls. 13–15. Note that Ohnesorg, "Votive," 40–41, sees significant differences in other ways between this and Cycladic capitals.
 34. Kirchhoff, *Entwicklung*, 135–90.
 35. Gruben, "Sphinx-Säule," 207–208, and "Un-Ordnung;" Ohnesorg, "Votive."
 36. For the capital, see Courbin, *L'Oikos*, 51–55 and pl. 49, and Ohnesorg, "Votive," 41 and fig. 1, which reproduces the drawing of G. Kaster and includes a profile view. While admitting that the lack of sculptural treatment may result from the use of this capital inside a building, Courbin believes other characteristics, including the shape of the echinus and the absence of grooves on its baluster, are indicative of an early date.
 37. D. White, "The Cyrene Sphinx, its Capital and its Column," *AJA* 75 (1971) 47–55, esp. 51–52. The rendering of the echinus could also be affected by function (as an independent and possibly more decorative monument) and/or provenience outside the Aegean.
 38. Martin, "Compléments," 378–82, Delos Museum Inv. 222. Martin dates this capital to the first half of the sixth century and, by the form of its leaves, in the first rather than second quarter of that century. Yet he also considers it slightly earlier than the Naxian Sphinx capital, usually dated around 570 B.C., which would suggest an assignment around or not much before 575 B.C.
 39. Ohnesorg, "Kapitelle," 111–12, for the Delian and Parian carved capitals; McGowan, "Votive Columns," 38–44 discusses these three capitals as well as a fourth example of similar type and workmanship (her cat. no. 25, pp. 253–55) that she assigns to a Parian mason, although found at Delphi. She dates the series considerably later, beginning perhaps around 540 B.C. McGowan also discusses the type with a smooth echinus and thus painted leaves (pp. 44–47), which she sees as a development from the carved examples and places even later, beginning in the last quarter of the sixth century B.C. It should be noted, however, that her chronology tends to be low.
 40. Another, even later, temple at Samos may also have had wooden capitals. The so-called South Building was begun around the mid-sixth century but work was halted and its elevation was not completed until



- the late sixth century. Although it has stone cylindrical bases and fluted columns, nothing is known of its capitals and its entablature is assumed to have been of wood. If the capitals were likewise of wood, they would suggest a long tradition in the use of that material on Samos.
41. The temple is discussed in general by G. Gruben, *Die Tempel der Griechen*, 3rd ed. (Munich: Hirmer Verlag, 1980) 333; H. Berve and G. Gruben, *Greek Temples, Theatres and Shrines* (New York: H. N. Abrams, 1962) 451–54; H. Walter, *Das griechische Heiligtum, dargestellt am Heraion von Samos* (Stuttgart: Urachhaus, 1990) 121–29; H. Kyrieleis, *Führer durch das Heraion von Samos* (Athens: Krene Verlag, 1981) 73–78; H. J. Kienast, "Topographische Studien im Heraion von Samos," *AA* (1992) 171–213, esp. 174–80, who observes that despite its short life span, the temple was probably completed. Most of these sources suggest that the capitals were of wood, but Gruben, in the first two publications, assigns the tori to the capitals. Additionally, in his book of 1980, he states that the interior peristyle columns and those inside the cella building were presumably crowned with square abaci in place of volutes. Kyrieleis assumes capitals in wood similar to those of the succeeding Polykratean Heraion.
 42. Kleemann, "archaische Sarkophage;" Freyer-Schauenburg, *Samos XI*; Hitzl, *griechische Sarkophage*. These may be the earliest volute-type Ionic capitals from an East Greek context. The date of the sarcophagus is based on the similarity of its columns to those of actual buildings, although such representations should not necessarily be considered faithful reproductions. Additionally, even if the early date is accepted, it demonstrates only an awareness of the Ionic column at this time and not its actual employment in the architecture of east Greece.
 43. The differing shapes of the tori have recently been cited as additional support for this theory by H. J. Kienast, "Topographische Studien," 176–77.
 44. Ohnesorg, "Votiv," 45 and fig. 5.
 45. Hogarth, *British Museum Excavations*, 268–70, who notes variations in the decoration of the abaci of the preserved capitals. Both leaf-and-dart and egg-and-dart ornaments were used, and within each category variety exists in the actual rendering. Pryce, *Catalogue of Sculpture*, 41–45. Dinsmoor, *Architecture*, 131, and more recently A. W. Lawrence, *Greek Architecture*, 5th ed., rev. by R. A. Tomlinson (New Haven and London: Yale University Press, 1996) 93, accept the rosette capitals, but W. Schaber, *Die archaischen Tempel der Artemis von Ephesos* (Waldsassen-Bayern: Stiftland-verlag, 1982) 103 n. 1, 145 n. 345, does not.
 46. Petrie, *Naukratis I*, 13 and pl. 3. Although Dinsmoor, *Architecture*, 125 places the temple already ca. 566 B.C., Boardman, "Chian and Early Ionic," 203 argues for a date around the middle of the sixth century on the basis of disc proportions in the column bases, the lotus neckings on the column shaft, and mouldings. Similarities are cited with Samos in some of these features, such as the style of mouldings and the existence of column neckings. As we have noted, at least one type of column base also shows Samian connections. It should likewise be mentioned that the Temple of Artemis at Ephesos may have had necking decoration, as suggested by Dinsmoor, *Architecture*, 131, and supported by P. Pedersen, "Zwei ornamentierte Säulenhäule aus Halikarnassos," *JdI* 98 (1983) 87–121, esp. 102–103.
 47. Also in favor of two different types of capitals are the differing diameters exemplified by the pieces recovered: 0.49 m for the shaft decorated with the lotus chain and only 0.42 m for that crowned by the bead and reel. Boardman, "Chian and Early Ionic," 203 n. 3, raises the possibility that the capital may have been of the Aeolic type. Indeed, Aeolic volute capitals are traditionally associated with leaf drums similar in form to the leaf echinus found here, but the lack of any other Aeolic features and the appearance of lotus necking make such a possibility unlikely.
 48. The main publication of this temple is by Reuther, *Henatempel*, reviewed in detail by F. E. Winter, *AJA* 64 (1960) 89–95. See

- also G. Gruben, *Die Kapitelle des Heratempels auf Samos* (Abstract of Diss. Munich 1960) and Gruben, *Die Tempel*, 3rd ed., 335–40.
49. The following sequence of events is suggested by Berve and Gruben, *Greek Temples*, 455: construction of the cella and its columns at the time of Polykrates (ca. 530 B.C.); the two inner rows of facade columns during the last decades of the sixth century, and the outer row at the beginning of the fifth century. Other scholars opt for a slightly later dating, with the cella building and interior peristyle columns completed by 480 B.C. and the exterior peristyle begun (on Archaic foundations) in the Hellenistic period. See Winter, *AJA*, 89–95, and Reuther, *Heratempel*, 52–53, 62–63, who doubts that the volutes were ever set in place. Recent excavations have confirmed that only the cella foundations were begun at the time of Polykrates but that its floor slabs were not laid until ca. 500 B.C. Because the foundations of the interior peristyle use different material from those of the cella and pronaos, the new excavations confirm that the building was constructed from the interior outwards, but push the relative dates later: E. French, *JHS-AR* (1989–90) 68; (1990–91) 64; and Kienast, “Topographische Studien,” 184–87.
 50. Gruben, *Die Tempel*, 3rd ed., 342–43 (Sangri) and 344–46 (Apollo temple). See also G. Gruben, “Naxos und Paros,” *AA* (1972) 319–79, esp. 333–53.
 51. Martin, “Problème,” 127; Gruben, *Die Tempel*, 3rd ed., 337. Even earlier, K. Schefold, “Das Äolische Kapitell,” *ÖJh* 31 (1938) 42–52 argued for leaf drums as capitals in Aeolic architecture, which would likewise have been used independently of the volute member.
 52. See most recently B. A. Barletta, “Ionic Influence in Western Greek Architecture: Towards a Definition and Explanation,” in F. Krinzing, ed., *Die Ägäis und das westliche Mittelmeer, Beziehungen und Wechselwirkungen 8. bis 5. Jh. v. Chr.*, *Archäologische Forschungen*, 4 (Vienna: Verlag der Österreichischen Akademie der Wissenschaften, 2000) 203–16, esp. 208–209.
 53. E. P. McGowan, “The Origins of the Athenian Ionic Capital,” *Hesperia* 66 (1997) 209–33.
 54. For a discussion of the Ionic anta, see A. D. Brockmann, *Die griechische Ante* (Marburg: Görlich & Weiershäuser, 1968) 56–70 and Martin, *Manuel*, 470–71. Brockmann notes two early exceptions to the unenlarged anta: one in the initial plan of the Temple of Hera IV at Samos, although the anta as executed was not thickened, and the other in the Harbor temple at Emporio on Chios, of the second quarter of the fifth century. Because the anta capital in the latter case is also unusual, this form at Chios may be assigned to a mixture of Doric and Ionic approaches.
 55. W. Hahland, “Didyma im 5. Jahrhundert v. Chr.,” *JdI* 79 (1964) 142–240, esp. 169–70.
 56. H. J. Kienast, “Ein verkanntes Antenkapitell aus dem Heraion von Samos,” *Ist Mitt* 39 (1989) 257–63.
 57. As noted by Brockmann, *Ante*, 160–61, the association of this type of anta capital with the Rhoikos Heraion, as well as its Polykratean successor, and Temple A is not certain. For a fragment assigned to the Rhoikos temple, see E. Buschor, *AM* 72 (1957) 4–5, Beil. 3,1. Note that the assignment has been criticized by Kienast, “Antenkapitell,” n. 29, since the fragment shows a concave volute, in contrast to the convex form presumed to have existed in the Rhoikos Altar capitals. He (n. 19) accepts as Archaic only the original capitals from the Rhoikos Altar, the fragment from the Ephesian Artemision, and two fragments from Samos, Inv. Nos. A1386, A1387. For the complete member found in the area of Temple A and attributed to that building, see E. Buschor, *AM* 72 (1957) 4, Beil. 3/2, 100–101, pl. 12, and Walter, *Samos*, fig. 148. The altar is discussed by H. Schleif, “Der grosse Altar der Hera von Samos,” *AM* 58 (1933) 174–208. Recent excavations have recovered more pieces of the antae of the Archaic altar, but do not contribute to its reconstruction. A new arrangement has, however, been suggested for the upper portion of the Rhoikos Altar by Kienast, “Topographische Studien,” 180–82.

58. The identification of this capital was made by W. R. Lethaby, *JHS* 37 (1917) 11, fig. 11, who illustrates the volute side and cites Hogarth, *British Museum Excavations*, pl. 9, bottom, for what Lethaby labels as the "egg and tongue" face. J. Boardman, *Excavations in Chios, 1952-1955. Greek Emporio* (Athens: British School of Archaeology, 1967) 74, n. 5, however, casts doubt on Lethaby's identification, stating that the volute is not "otherwise recorded."
59. Brockmann, *Ante*, 64-65.
60. Kienast, "Topographische Studien," 181.
61. R. Martin, *Manuel d'architecture grecque* (Paris: Picard, 1965) 485.
62. As noted by L. T. Shoe, *Profiles of Greek Mouldings* (Cambridge, MA: Harvard University Press, 1936) 19-20 and Brockmann, *Ante*, 66-68.
63. Larisa capital: J. Boehlau and K. Schefold, eds., *Larisa am Hermos I* (Berlin: W. de Gruyter, 1940) 125, 144, fig. 21. Chios: Boardman, *Chios*, 74, figs. 40, 42.
64. All the capitals are discussed, with bibliographical citations, by S. Altekamp, *Zu griechischer Architekturornamentik im sechsten und fünften Jahrhundert v. Chr.* (Frankfurt am Main: Verlag Peter Lang, 1991) 89-90 and 92-93 for the Delphic treasuries, 125-26 (Koressia), 141-42 (Sangri). Two additional cyma reversa fragments, decorated with Lesbian leaf, were recovered in Paros and tentatively attributed by G. Gruben to an anta capital: "Naxos und Paros. Vierter vorläufiger Bericht über die Forschungskampagnen 1972-1980, I. Archaische Bauten," *AA* (1982) 159-95, esp. 190-92, figs. 31 a-b, dated in the last quarter of the sixth century B.C.
65. Geloan capital: B. A. Barletta, "An Ionic Porch at Gela," *RM* 92 (1985) 9-17, with previous bibliography. Metapontion capital: D. Adamesteanu, et al., "Metaponto, Santuario di Apollo—Tempio D (tempio ionico): Rapporto preliminare," *BdA* 60 (1975) 26-49, esp. 37 and fig. 1.
66. At the time of writing, Brockmann, *Ante*, 69, knew only of the Delphic examples, which she separated typologically from those of Asia Minor as well as the Islands. She notes their dependence on Doric forms and ascribes the initial recognition of this association to C. Weickert, *Typen der archaischen Architektur in Griechenland und Kleinasien* (Augsburg: B. Filser verlag, 1929) 136.
67. G. Gruben, "Kykladische Architektur," *Műj* 23 (1972) 7-36, esp. 18.
68. M. Schuller, "Die dorische Architektur der Kykladen in spätarchaischer Zeit," *JdI* 100 (1985) 319-98. The Aeolic variant of the southern Ionian anta capital, with only one or two rolls, may also represent the blending of Ionic and Doric forms, as suggested especially by the use of an enlarged anta in one of the buildings, the harbor temple at Emporio.
69. In discussing the fragmentary corner epistyle, Courbin, *L'Oikos*, 105-107, gives the average dimensions for the lower and upper bands as 0.376 m and 0.165 m, respectively, and the projection of the upper fascia as 0.011 m on the front and 0.014 m on the small side. The interior face of this block was likewise divided into two levels, with similar dimensions. T. G. Schattner, *Griechische Hausmodelle: Untersuchungen zur frühgriechischen Architektur* (Berlin: Gebr. Mann, 1990) 166 and no. 5 mentions the existence of fascias in a model from Larisa of the second or third quarter of the sixth century B.C., which, as he notes, would place it in the same period as the earliest examples known in monumental architecture.
70. As noted by Gruben, "Kykladische," n. 86. Hogarth, *British Museum Excavations*, 270-71 tentatively attributes marble egg-and-dart mouldings to the entablature of the Ephesian Artemision, which would make it likely that the missing architrave was in this same material. In addition, there remain one block of a cornice and many fragments of a marble parapet sima, all of which necessitate a stone, rather than a wooden, epistyle. Further evidence of a marble architrave is provided by ancient literary sources, as cited by Schaber, *archaischen Tempel*, 78-79.
71. W. B. Dinsmoor, "Studies of the Delphian treasuries.—II. The four Ionic treasuries," *BCH* 37 (1913) 5-83, esp. 61-64. The Knidian treasury has been assigned various dates, the earliest of which, ca. 565-555 B.C., is given by Dinsmoor,

- Architecture*, 138–39. Others would place it after the mid-sixth century.
72. G. Gruben, "Das archaische Didymaion," *JdI* 78 (1963) 78–182, esp. 142–47, 175–76; K. Tuchelt, *Die archaischen Skulpturen von Didyma* (Berlin: Gebr. Mann, 1970) 104–10. Although only the corner blocks of the architrave are preserved, Gruben postulates that carved animals continued along this entire member, as in the animal frieze of the Rhoikos Altar. Fragments of at least three winged figures preserved from the Temple of Artemis at Ephesos are considered by Pryce, *Catalogue of Sculpture*, 92–93 to be similar to the four-winged gorgons from the architrave of the Temple of Apollo at Didyma, but are assigned by him to the parapet frieze, possibly one at each corner.
 73. T. G. Schattner, "Architrav und Fries des archaischen Apollontempels von Didyma," *JdI* 111 (1996) 1–23.
 74. See N. Bookidis, "A Study of the Use and Geographical Distribution of Architectural Sculpture in the Archaic Period" (Diss. Bryn Mawr College, 1967) 484–87 for dimensions and subject matter of Archaic decorated friezes. Note that the girth (combined height and thickness) of the Didymaion blocks would exceed that of other known examples.
 75. As suggested by A. von Gerkan, "Betrachtungen zum ionischen Gebälk," *JdI* 61/62 (1946/47) 17–29, esp. 17, 21, and H. Kähler, *Das griechische Metopenbild* (Munich: Münchner Verlag, 1949) 25, but challenged more recently by Gruben, "Kykladische," n. 86.
 76. Gruben, "Didymaion," 176.
 77. Gruben, "inselionische Ordnung," 105–106 and fig. 4; Gruben, "Naxos und Delos," 344–45, figs. 3, 41.
 78. Lambrinouidakis and Gruben, "Heiligtum," 569–621, esp. 607; Gruben, "inselionische Ordnung," 102–105.
 79. Courbin, *L'Oikos*, 108–12.
 80. C. Laviosa, "Un rilievo arcaico di Iasos e il problema del fregio nei templi ionici," *ASAtene* 50–51, N.S. 34–35 (1972–73) 397–418 suggested a placement of this slab in the entablature, but that location has been doubted by others, including Ridgway, *Archaic Style*, 2nd ed., 404 n. 9.15.
 81. Gruben, "Kykladische," esp. 16–25. See also I. M. Shear, "Maidens in Greek Architecture: The Origin of the 'Caryatids,'" *BCH* 123 (1999) 65–85, esp. 67–81, who argues that several characteristics of the treasuries, especially their sculptural elaboration, were inspired by the large Ionic temples of east Greece.
 82. Sangri: Gruben, *Die Tempel*, 3rd ed., 343 and fig. 284. Temple A: G. Gruben, "Der Burgtempel A von Paros," *AA* (1982), 197–229, esp. 216–17, 227–28.
 83. For a discussion of the Greek frieze and its appearances, see Ridgway, *Archaic Style*, 2nd ed., 377–415. Her statement regarding the widespread use of the frieze in Asia Minor appears on p. 383.
 84. Bookidis, "Study," 359–80, 475–81, discusses the evidence for terracotta friezes, which generally derive from northern Asia Minor and the north Aegean (Thasos) and served as cornice revetments and simas. See now J. Boardman, *Persia and the West* (London: Thames and Hudson, 2000) 40–41, for problems of their inspiration and dating.
 85. The frieze consists of the remains of three male heads engraved on a single block, which is preserved for its entire length of 0.975 m. It was attributed to Hekatompedon II by E. Buschor, *AM* 58 (1933) 157, who later offered a more specific designation, perhaps in the pronaos before an unidentified doorway: E. Buschor, "Ein frühdädalischer Ringhallentempel," in T. Dohrn, ed., *Festschrift A. Rumpf* (Krefeld: Scherpe Verlag, 1952) 32–37. In this publication, Buschor cites vase-painting and sculptural comparisons in support of an assignment of the frieze to the early second quarter of the seventh century B.C. See also Freyer-Schauenburg, *Samos XI*, 184–85, no. 103, pl. 77.
 86. E. Buschor, "Heraion von Samos: Porosfrieze," *AM* 58 (1933) 7–10, Beil. 3 (so-called South Building or Temple of Hermes and Aphrodite); 10–20, Beil. 4, 2–9 (Heraion). A coursed frieze is also known from the western Greek colony of Sybaris: P. Zancani Montuoro, "Divinità e templi di Sibari e Thurii," *AttiMGrecia* 13–14 (1972–73) 57–68, esp. 62–66. Its appearance at this site ca. 530 B.C. is prob-

- ably to be attributed to Samian influence. For a discussion of these friezes and the technique, see also Ridgway, *Archaic Style*, 2nd ed., 390–92.
87. A frieze of equestrian figures dated to the middle or late seventh century was recovered at Prinias and attributed by the excavator to Temple A: L. Pernier, "New Elements for the Study of the Archaic Temple of Prinias," *AJA* 38 (1934) 171–77, esp. 175–76. Other scholars, however, including Ridgway, *Archaic Style*, 2nd ed., 380–82, have suggested alternative uses for the relief. Even if it does belong to the temple, enough is preserved of the building to show that it corresponded to no later architectural order. Indeed, as Ridgway points out, developments in Crete at this time stood outside those of the rest of the Greek world. For the sculptured frieze, see B. S. Ridgway, "Notes on the Development of the Greek Frieze," *Hesperia* 35 (1966) 188–204.
88. See U. Muss, *Die Bauplastik des archaischen Artemisions von Ephesos* (Vienna: Österreichisches Archäologisches Institut, 1994), esp. 5–22; Carlos A. Picón, "The Sculptures of the Archaic Temple of Artemis at Ephesos," *Praktika tou 12 Diethnous Synedriou Klassikes Archaialogias* 3 (1988) 221–24. The pedestal reliefs would also include the bulls previously assigned to the antae by W. Lethaby, "The Earlier Temple of Artemis at Ephesus," *JHS* 37 (1917) 1–16, esp. 1–2.
89. Hogarth, *British Museum Excavations*, 293–300. Pryce, *Catalogue of Sculpture*, 47–64. While accepting the assignment of the earliest sculptured column drums to the time of Kroisos, ca. 550 B.C., Pryce believes that construction of the carved drums "may have continued into the 5th c. B.C." Tuchelt, *Skulpturen*, 131–36 and L 45–51, 54, 56–57; L 60–61, 64, 71, 75–77, 80–81.
90. Didyma: Tuchelt, *Skulpturen*, 99–103. Kyzikos: Tuchelt, *Skulpturen*, L 79, dated to the third quarter of the sixth century (p. 154).
91. H. Weber, "Myus. Grabung 1964," *IstMitt* 15 (1965) 43–64, esp. 54–64, who dates the temple slightly after the middle of the sixth century (p. 62) or to the third quarter of the sixth century (p. 59).
92. For terracotta friezes, see previously. For the Ephesian Artemision: Hogarth, *British Museum Excavations*, 300–10; Pryce, *Catalogue of Sculpture*, 65–99, who dates the parapet ca. 510–460 B.C.; Tuchelt, *Skulpturen*, L 58–59, 66bis, 72, 81bis, 82–83, 109–10a. Construction on the Temple of Artemis at Ephesos certainly continued over a long period of time. Tuchelt (pp. 133, 155) places the earliest sima reliefs about the time of the Siphnian treasury and the latest in the last quarter of the sixth century. Picón, "Sculptures," esp. 224, concludes from his study a date ca. 510–480 B.C. Muss, *Bauplastik*, 57–78 suggests a similar date, ca. 530/525–470/460 B.C., on the basis of the remaining fragments.
93. Ephesos: see Gruben, *Die Tempel*, 3rd ed., 353. Didyma: Gruben, "Didymaion," 149 and n. 123.
94. Schattner, *Hausmodelle*, 50 no. 19 (early sixth century); 70 no. 32 (probably before the end of the seventh century). Schattner's model no. 19 has also been cited by various other scholars in support of Archaic Ionic dentils.
95. Schattner, *Hausmodelle*, 172–73. The Samian example is also mentioned by Gruben, "Didymaion," 149–50 n. 123, who describes it as an Archaic dentil from a small building. That from Larisa is published by Boehlau and Schefold, *Larisa I*, 128, pls. 24c, 42a no. 1. D. Mertens, "Der ionische Tempel von Metapont, Ein Zwischenbericht," *RM* 86 (1979) 103–37, esp. 134, labels it "late Archaic."
96. Vallois, *L'Architecture II*, 266–67; M. C. Hellmann and P. Fraisse, *Délos 32: Le Monument aux hexagones et le portique des Naxiens* (Paris: de Boccard, 1979) 54, pl. 9, 46, nos. 106 and 113.
97. Metapontion: Mertens, "Metapont," 134–35, who suggests that the fusion of frieze and dentils may have occurred earlier in northwestern Asia Minor. Cycladic connections, through the Parian foundation of Thasos, could lead to the incorporation of a frieze course within the "local" dentillated entablature. Mertens's theory is particularly compelling because of the merging of separate traditions, in this case Doric and Ionic, in the anta of

- the Harbor Temple at Emporio on Chios, of about the same time period. Too little evidence exists, however, to confirm this reconstruction. The dentil and frieze together next appear almost simultaneously in two buildings: the Propylon to the "Temenos," now called the Hall of Choral Dancers, at Samothrake, ca. 340 B.C. and the Philippeion at Olympia, begun in 338 B.C. See P. W. Lehmann and D. Spittle, *Samothrace 5: The Temenos* (Princeton, NJ: Princeton University Press, 1982) esp. 65–67, 113–18, 143–47 and A. Mallwitz, *Olympia und seine Bauten* (Munich: Prestel-Verlag, 1972) 128–33, respectively.
98. Courbin, *L'Oikos*, 77–81, figs. 23, 27. Courbin, 89–90 dates this phase of the Oikos to the end of the first quarter of the sixth century, on the basis of the column capitals from the interior colonnade as well as the gorgoneion antefixes that decorated the roof.
99. A similarly flat underside is found in the early stone geison from the seventh-century Temple of Poseidon at Isthmia (see Chapters 2 and 3). Here, however, the projecting portion of the block is of lower height than the supporting surface, while the Delian block tapers in section from the interior to the exterior of the wall and then increases in height just beyond the wall face.
100. Gruben, "Naxos und Delos," 348–50, fig. 43.
101. Lambrinouidakis, "Sanctuary of Iria," 175 and fig. 13; Lambrinouidakis and Gruben, "Heiligtum," 597.
102. Courbin, *L'Oikos*, 114–17.
103. Didyma: Schneider, "Neue Funde," 82–83.
Ephesos: The cornice is illustrated by Hogarth, *British Museum Excavations*, Atlas pl. 10.
104. See Chapter 3 for the Mykenai geison fragments. Note also the presence of a concave-soffit corner geison, presumably of Archaic date, in the Argive Heraion sanctuary: P. Amandry, "Observations sur les monuments de l'Héraion d'Argos," *Hesperia* (1952) 222–74, esp. 252–54.
105. See the definition of Cycladic architectural traits by Gruben, "Kykladische," 27–28, and *Die Tempel*, 3rd ed., 340–42. Gruben, "Naxos und Delos," 343 and n. 218 adds to these the presence of generally only one step, with three appearing at the end of the sixth century.
106. For the third temple at Yria: V. Lambri-noudakis, "Beobachtungen zur Genese der ionischen Gebälkformen," in E.-L. Schwandner, ed., *Säule und Gebälk* (Mainz am Rhein: P. von Zabern, 1996) 55–60. For the fourth temple: Lambrinouidakis, "Sanctuary of Iria," 173–88. For the Oikos: Courbin, *L'Oikos*.
107. Gruben, "inselionische Ordnung," 102.
108. Gruben, "Anfänge," 71 and 64, respectively.
109. As, for example, the presence or absence of an abacus; a convex or concave rendering of the volute; a spiral, rosette, or eye for the volute; etc.: Barletta, "Ionic Porch," 14–16.
110. Theodoros's participation in both buildings is concluded from the book he wrote on the Samian Heraion, which is noted by Vitruvius, and from a mention by Diodorus Laertius (2, 103) of advice Theodoros provided on construction of the Ephesian Artemision.
111. Gruben, "Un-Ordnung," 70–71.
112. Berve and Gruben, *Greek Temples*, 476–80; Dinsmoor, *Architecture*, 221–23.

CHAPTER 5

1. Indeed, N. Weickenmeier, *Theorienbildung zur Genese des Triglyphen. Versuch einer kritischen Bestandsaufnahme* (Darmstadt: Univ. Diss., 1985) concludes his study of the origins of the triglyph frieze by stressing the lack of agreement between theory and archaeology.
2. See A. Trevor Hodge, *The Wordwork of Greek Roofs* (Cambridge: Cambridge University Press, 1960) for roofs and H. Hoepfner, "Zum Problem griechischer Holz- und Kassettendecken," in A. Hoffmann, et al., eds., *Bautechnik der Antike* (Mainz am Rhein: P. von Zabern, 1991) 90–98 for ceilings.
3. G. Kawerau and G. Soteriades, "Der Apollotempel zu Thermos," *Antike Denkmäler* II, 5 (Berlin: G. Reimer Verlag,

- 1902–1908) 1–8 assumed a Doric entablature for this temple, which would have been executed in wood and mud-brick because not even the smallest piece of a stone member was recovered. As already discussed, no evidence exists for such a reconstruction. Nevertheless, the panels must have been secured in the building, presumably with wood. The geison was of terracotta, as shown by a preserved fragment, illustrated in Kawerau and Soteriades fig. 2. G. Kuhn, "Bau B und Tempel C in Thermos," *AM* 108 (1993) 29–47, esp. 45, has identified the stylobate and extant fluted column drums at the west as original. He therefore argues that wooden columns stood above stone socles in both phases of the stylobate.
4. Both W. Dörpfeld, "Das Heraion," in E. Curtius and F. Adler, eds., *Olympia: die Ergebnisse der von dem Deutschen Reich veranstalteten Ausgrabung II, Die Baudenkmäler* (Berlin: A. Asher & Co., 1896) 28–35, esp. 30, and A. Mallwitz, *Olympia und seine Bauten* (Munich: Prestel-Verlag, 1972) 143 note that nothing was found of the entablature of this temple, which must then have been of wood. Further evidence offered by Dörpfeld, 30, in support of a wooden epistyle is the absence of attachment holes on the tops of the capitals. For this, see also R. Martin, *Manuel d'architecture grecque I* (Paris: Picard, 1965) 16.
 5. R. Demangel, *FdD II: Topographie et Architecture, 3: Le Sanctuaire d'Athéna Pronaia 1* (Paris: de Boccard, 1923) 38. The walls of this temple are also presumed to have been of perishable materials, in this case mud-brick.
 6. W. B. Dinsmoor, *The Architecture of Ancient Greece* (New York: W. W. Norton and Company, Inc., 1975) 77–78, esp. 77 n. 2. G. Gullini, "Sull'origine del fregio dorico," *Memorie dell'Accademia della Scienze di Torino, Classe di Scienze Morali, Storiche e Filologiche*, *Seria* 4a, 31 (1974) 1–73, esp. 62–73, has also proposed wooden interior columns and a mixture of wood and stone in the entablature of the Apollo temple, but without evidence. He assumes a similar mixture of materials in the entablature of Temple E 1 at Selinous, partly on the basis of the Apollonion and partly on the rougher working of some surfaces: G. Gullini, "L'architettura," in G. Pugliese Carratelli, ed., *Sikanie* (Milan 1985) 417–91, esp. 431–32 and pl. 3, 1. Apollonion: D. Mertens, "Die Entstehung des Steintempels in Sizilien," in E.-L. Schwandner, ed., *Säule und Gebälk* (Mainz am Rhein: P. von Zabern, 1996) 25–38, esp. 29, who also argues for an earlier date for the temple than traditionally accepted, that is at least contemporary with the earliest examples of mainland Greece. He places the Temple of Athena Pronaia at Delphi in this group and dates it at the end of the seventh century B.C.
 - Monopteros: W. B. Dinsmoor, *BCH* 36 (1912) 472–73. H. Pomtow, "Die alte Tholos und das Schatzhaus der Sikyonier zu Delphi," *Zeitschrift für Geschichte der Architektur* 3 (1910) 97–143, 153–192, esp. 109–10, 115, and fig. 19, had earlier proposed two interlocking stone blocks to create a square section. More recently, D. Laroche and M.-D. Nenna, "Le trésor de Sicyone et ses fondations," *BCH* 114 (1990) 241–84, esp. 266 and fig. 17 c, place three superimposed backer blocks behind the vertical face of the architrave and the metope above, secured to triglyphs at the sides.
 7. R.C.S. Felsch, et al., "Kalapodi. Bericht über die Grabungen im Heiligtum der Artemis Elaphebolos und des Apollon von Hyampolis 1978–1982," *AA* (1987) 1–99, esp. 21, 23–24. The presence of wooden columns is determined by rectangular or crescent-shaped workings for erecting the columns.
 8. As noted earlier, E. Østby, "Delphi and Archaic Doric Architecture in the Peloponnese," *BCH Suppl.* vol. 36, 239–62 (in press) recognizes two separate developments in early Greek architecture. One, located around Corinth, moved quickly toward the development of stone constructions while the other, focused on the Argolid and continuing at Olympia and even into the second half of the sixth century in Arcadia, preferred wood and mud-brick.

9. See, e.g., the description by Dinsmoor, *Architecture*, 51, and illustrations such as those provided by J. J. Coulton, *Ancient Greek Architects at Work* (Ithaca, NY: Cornell University Press, 1977) 36, fig. 7 and J. G. Pedley, *Greek Art and Archaeology* (London: Prentice-Hall, 1993) 131, fig. 5.14.
10. Dörpfeld, "Heraion," 30. Dörpfeld thus estimates a minimum diameter for wooden columns on the flanks of 1.00 m, since those of stone range between 1.00 and 1.25 m, on a stylobate of 1.34 m. The facade columns would be about 9 cm wider, as was also that stylobate.
11. For a discussion of corner contraction, see Coulton, *Greek Architects*, 60–64.
12. Doubts about the existence of angle contraction are raised by M. L. Bowen, "Some Observations on the Origin of Triglyphs," *BSA* (1950) 113–25, esp. 113, 119, who notes that it does not appear again until the Temple of Apollo at Corinth, dated around 550 B.C. She therefore suggests that it may have been introduced later, presumably with the substitution of stone columns. Even so, the frieze would likely have been of wood, since nothing of it was found and since, as N. L. Klein, "The Origin of the Doric Order on the Mainland of Greece: Form and Function of the Geison in the Archaic Period" (Diss. Bryn Mawr College, 1991) 180 n. 22 states, the walls remained in mud-brick.
13. L. von Klenze, *Aphoristische Bemerkungen gesammelt auf seiner Reise nach Griechenland* (Berlin: J. Reimer, 1838) 65 notes a general rule of strengthening corners of buildings, to which he ascribes the closer spacing of corner columns.
14. Indeed, G. Rodenwaldt, "Zur Entstehung der monumentalen Architektur in Griechenland," *AM* 44 (1919) 175–84, esp. 183–84, assuming that Doric temples already existed in stone by this time, referred to the execution of Doric elements here in wood as representing the reverse process of "petrification." As we have seen, however, the frieze is only now emerging in the archaeological record.
15. A. von Gerkan, "Betrachtungen zum ionischen Gebälk," *JdI* 61/62 (1946/47) 17–29, esp. 21.
16. B. Wesenberg, *Kapitelle und Basen* (Düsseldorf: Rheinland-Verlag, 1971) 59–61.
17. T. J. Dunbabin, in T. J. Dunbabin, ed., *Perachora II* (Oxford: Clarendon Press, 1962) 61–62, no. 420, and pl. 22.
18. B. Wesenberg, "Die Entstehung der griechischen Säulen- und Gebälkformen in der literarischen Überlieferung der Antike," in E.-L. Schwandner, ed., *Säule und Gebälk* (Mainz am Rhein: P. von Zabern, 1996) 1–15, esp. 6–7. Vitruvius (IV, 1, 3) attributes to the sanctuary of Hera at Argos the first Doric temple, but one that did not yet display rules of symmetry.
19. D. A. Amyx, *Corinthian Vase-Painting of the Archaic Period, II* (Berkeley and Los Angeles: University of California Press, 1988) 428–29 dates LPC ca. 650–630 B.C.
20. L. Eckhart, "Bemerkungen zu dorischen Säulen auf archaischen griechischen Vasen," *ÖJh* 40 (1953) 60–73. This article discusses only a few of the depictions of architecture on vases; a full study of the topic was apparently completed by Eckhart for his dissertation, but was never published.
21. Demangel, *Athènes Pronaia*, 40–41. Another possibility, however, for the origin of the shallow, almost faceted, flutes is Egyptian architecture.
22. As suggested, for example, by Martin, *Manuel*, 112–13. Coulton, *Greek Architects*, 167 n. 35 speaks against such a link on the grounds that Ionic columns in stone were typically even slenderer.
23. According to D. Mertens, *Der alte Heratempel in Paestum und die archaische Baukunst in Unteritalien* (Mainz am Rhein: P. von Zabern, 1993) 104, nearly all western Greek column shafts of the first half of the sixth century are monolithic; rather than mimicking wooden techniques this may suggest instead a regional trait. Bibliography for these buildings has been cited previously; see also Mertens, n. 299. To this group we may add the mainland Greek Temple of Apollo at Corinth, also datable around the mid-sixth century.
24. I. Beyer, "Der Triglyphenfries von Thermos C," *AA* 87 (1972) 197–226, esp. 205–206.
25. J.-I. Hittorff, in J.-I. Hittorff and L. Zanth, *Recueil des Monuments de Ségeste et de Sélinonte* (Paris: Donnaud, 1870) 317–66.

26. For a discussion of Vitruvius' views of the Doric order and their elaboration by later scholars, see T. N. Howe, "The Invention of the Doric Order" (Diss. Harvard University, 1985) esp. 14-78.
27. Hittorff, *Recueil*, 340-41.
28. A. Wotschitzky, "Zur Urform des dorischen Kapitells," *ÖJh* 40 (1953) 51-59.
29. H. Schleif, in G. Rodenwaldt, et al., *Korkyra I: Der Artemistempel* (Berlin: Gebr. Mann, 1940) 92.
30. An exhaustive compilation and analysis of the various theories on the origin of the frieze has recently been offered by Weickenmeier, *Theorienbildung*. See also R. M. Cook, "A Note on the Origin of the Triglyph," *BSA* (1951) 50-52 and "The Archetypal Doric Temple," *BSA* (1970) 17-19. Vitruvius's theory regarding the origin of triglyphs in boards applied to beam ends is taken up by A. von Gerkan, "Die Herkunft des dorischen Gebälks," *Jdl* 63-64 (1948-49) 1-13 and by B. Wesenberg, "Vitruvs Vorstellung von der Entstehung des dorischen Triglyphenfrieses," in *Studien zur Klassischen Archäologie. Festschrift für Friedrich Hiller* (Saarbrücken: SDV Saarbrücker Druckerei und Verlag, 1986) 143-57. The equation of triglyphs with vertical bars placed between beam ends was made by O. M. Washburn, "The Origin of the Triglyph Frieze," *AJA* 23 (1919) 33-49; with barred wooden windows by R. Demangel, "Fenestrarum imagines," *BCH* 55 (1931) 117-63; with an upper row of columns or piers by P. Zancani-Montuoro, "La struttura del fregio dorico," *Palladio* 4, 2 (1940) 49-64; with the framework of a wooden mezzanine by I. Beyer, "Der Triglyphenfries von Thermos C," *AA* 87 (1972) 197-226; and with supports for tiled roofs modelled after parapets of Minoan and Mycenaean terrace roofs by F. Ditlefsen, "Gedanken zum Ursprung des dorischen Frieses," *Acta ArtHist* 5 (1985) 1-24.
31. Those scholars who accept the triglyphs as windows must then place the beam ends where later metopes stand. Vitruvius is not clear on precisely what form early metopes took. Wesenberg, "Vitruvs Vorstellung," 145-50, argues that the frieze was first introduced above cella walls, rather than above the peristyle, and that the word "metope" referred originally to the intervening wall surface. Others prefer the idea of a panel that would seal the space and give rise to the concept of an area for decoration. J. J. Winckelmann, *Anmerkungen über die Baukunst der Alten* (Leipzig: Dyck, 1762) 24 suggests, on the basis of a passage in Euripides' play *Iphigeneia in Tauris*, 113, that the space was originally open. Against this proposal, see O. M. Washburn, "Iphigeneia Taurica 113 as a Document in the History of Art," *AJA* 22 (1918) 434-37.
32. Both Gerkan, "Die Herkunft," 1-13 and Gullini, "Sull'origine," 27-33 explain each element of the entablature in terms of wooden components. They differ in their explanations of mutules, the former opting for planks above the rafters and the latter for smaller boards attached to the ends of the rafters and in the intervening spaces.
33. See especially Bowen, "Some Observations," 113-14, for these objections, along with that of proportions. Cook, "A Note," 50 n. 4, counters them by suggesting that once the frieze became accepted as a decorative feature, it was modified to its present form. This would explain the change in alignment of the ceiling with the top, rather than bottom, of the frieze. H. Kähler, *Das griechische Metopenbild* (Munich: Münchner Verlag, 1949) 18 accounts for Vitruvius's error in noting that by the Hellenistic period examples are known where the ceiling beams were placed at the level of the frieze. Vitruvius may thus be drawing on this more "contemporary" development, rather than the Archaic and Classical practice of locating ceiling beams above the frieze. For a discussion of the ceiling as known from architectural remains, see Hodge, *Woodwork*, 35-36.
34. Artemis temple: Schleif, in *Korkyra I*, 34-35. Aphaia temple: E.-L. Schwandner, *Der ältere Porostempel der Aphaia auf Aegina* (Berlin: W. de Gruyter, 1985) 36-42.
35. L. B. Holland, "The Origin of the Doric Entablature," *AJA* 21 (1917) 117-58, esp. 146, for example, calculates the size of triglyphs in the wooden entablature of

- the Temple of Hera at Olympia, generally dated ca. 600–590 B.C., at ca. 0.77 m wide and 0.90–1.00 m high, over an average interaxial of 3.30 m. This would leave, however, only 0.88 m for each metope. Using the proportion of triglyph to metope width in the temples noted above would result in triglyphs about 0.66 m wide and metopes ca. 0.99 m in width. W. Koenigs, *Gnomon* 47 (1975) 403 offers a different solution to avoid excessively wide triglyphs: he proposes a larger number per interaxial than is canonical (3 versus 2) for the Temple of Hera at the Argive Heraion. If this number were chosen for early buildings, however, one wonders why it was not continued later.
36. L. Tilton, "The Architecture of the Argive Heraeum," in C. Waldstein, *The Argive Heraeum I* (Boston and New York: Houghton Mifflin, 1902) 110–11, for these dimensions.
 37. One would expect some evidence for additional columns or a mezzanine level to be preserved in the earliest temples, if indeed such features provided the catalyst for the frieze. Early temples seem to have employed wood for interior columns, which have perished with time, but usually, as in the Temple of Apollo at Thermopylae, the supports were arranged in a single line. This is unlikely to have been divided into two levels or to have been significantly taller than the presumed double-tier exterior columns. By contrast, in the early sixth-century Temples of Artemis at Korkyra and of Aphaia at Aigina, both with two rows of interior columns, their arrangement in two tiers is either tentatively (Artemis) or certainly (Aphaia) supported by the preserved remains: Schleif, *Korkyra I*, 45–47; Schwandner, *Porostempel*, 67–72, 98–101, respectively. This arrangement is also assumed for the double row of wooden interior columns in the earlier Temple of Hera at Olympia: Hoepfner, "Zum Problem," 90 and fig. 2.
 38. Holland, "The Origin," 147 explains the difficulty of creating planks with the "primitive" level of technology that one assumes for early periods. Coulton, *Greek Architects*, 37 expects "primitive builders" to use the saw as little as possible, in contrast to what is demanded by the numerous boards.
 39. See, e.g., the entablatures created by Gerkan, "Die Herkunft," fig. 7, and Gullini, "Sull'origine," fig. 6, in their hypothetical wooden buildings. These require numerous flat boards, especially for the taenia, regulae, and mutules with guttae. Holland, "The Origin," 138 questions the structural soundness of such an arrangement.
 40. Klenze, *Aphoristische Bemerkungen*, 60–71.
 41. This trait was recognized early on by Hitortoff, *Recueil*, 338, who argued for the rationality of such a construction. It is discussed thoroughly by J. Braun-Vogelstein, "Die ionische Säule," *Jdl* 35 (1920) 1–48, esp. 6–38.
 42. A. Bammer, "Beiträge zur ephesischen Architektur," *ÖJh* 49 (1968–71) 1–40, esp. 4, 12, and fig. 8, however, suggests an origin for both Ionic and Aeolic capitals in two superimposed leaf drums, of which the larger, upper, one was cut back along the face of the architrave.
 43. D. Theodorescu, *Le chapiteau ionique grec* (Geneva: Droz, 1980) 95–113.
 44. R. Martin, "Problème des origines des ordres à volutes," *Études d'archéologie classique* 1 (1955–56) 119–32.
 45. G. Gruben, "Griechische Un-Ordnung," in E.-L. Schwandner, ed., *Säule und Gebälk* (Mainz am Rhein: P. von Zabern, 1996) 61–77, esp. 62–65, and fig. 5.
 46. G. Gruben, "Das älteste marmorine Volutenkapitell," *IstMitt* 39 (1989) 161–72.
 47. Gruben, "Un-Ordnung," 63–65; A. Ohnesorg, "Votiv- oder Architektursäulen?" in E.-L. Schwandner, ed., *Säule und Gebälk* (Mainz am Rhein: P. von Zabern, 1996) 39–47, esp. 39–40. These authors provide bibliographical references for the pieces cited; those from Delos are also discussed in our chapter on the Ionic order.
 48. As discussed by Kähler, *Metopenbild*, 25; von Gerkan, "Betrachtungen," 17, but challenged more recently by G. Gruben, "Kykladische Architektur," *MüJb* 23 (1972) n. 86.

49. P. Courbin, *Délos 33: L'Oikos des Naxiens* (Paris: de Boccard, 1980) 105–107.
50. Knidian treasury: W. B. Dinsmoor, "Studies of the Delphian treasuries.—II: The four Ionic treasuries," *BCH* 37 (1913) 5–83, esp. 61–64; J.-F. Bommelaer and D. LaRoche, *Guide de Delphes, Le site* (Paris: de Boccard, 1991) 141–43, fig. 51. Didymaion: G. Gruben, "Das archaische Didymaion," *JdI* 78 (1963) 78–182, esp. 142–47, 175–76; for a different interpretation of this member, see T. G. Schattner, "Architrav und Fries des archaischen Apollontempels von Didyma," *JdI* 111 (1996) 1–23.
51. The association between architraves and doors in the decorative use of fascias is made by Gruben, "Didymaion," 147 n. 119, and "Kykkladische," n. 86, and is developed further by A. Büsing-Kolbe, "Frühe griechische Türen," *JdI* 93 (1978) 66–174, esp. 83–90 and 135–36. As Büsing-Kolbe points out, the earliest Ionic door frames are smooth-sided. See, e.g., the west and east doors of the Naxian Oikos, dated respectively to the first quarter and the mid-sixth century by Gruben, and that of the fourth Temple of Dionysos at Yria, dated ca. 580–570 B.C.: G. Gruben, "Naxos und Delos. Studien zur archaischen Architektur der Kykladen," *JdI* 112 (1997) 261–416, esp. 324–38 and G. Gruben, "Anfänge des Monumentalbaus auf Naxos," in A. Hoffmann et al., eds., *Bautechnik der Antike* (Mainz am Rhein: P. von Zabern, 1991) 63–71, esp. 64 and fig. 6, respectively.
52. Gerkan, "Betrachtungen," 17, 24. See also Gruben, "Didymaion," 150 n. 123, and Dinsmoor, *Architecture*, 64, who propose the two different types of roofs noted here, respectively.
53. A decorative explanation for the presence of dentils in a single level on all sides of certain building models is proposed by both G. Gruben, *AM* 72 (1957) 61 and T. G. Schattner, *Griechische Hausmodelle: Untersuchungen zur frühgriechischen Architektur* (Berlin: Gebr. Mann, 1990) 171–72, who distinguishes dentils from projecting rafters on this basis. Gerkan, "Betrachtungen," 24, sees this as a logical expansion. Wesenberg, "Die Entstehung," 13, raises the possibility that beams were spliced, thus appearing in actual roofs at the same level all around.
54. Gruben, "Un-Ordnung," 65 accepts this as a secondary elaboration of the echinus, and cites H. Drerup, "Architektur und Toreutik in der griechischen Frühzeit," *MdI* 5 (1952) 7–38 for demonstrating the connection through preserved models. See also H. Drerup, *Griechische Baukunst in geometrischer Zeit*, *ArchHom* II, O (Göttingen: Vandenhoeck and Ruprecht, 1969) 115–16.
55. G. Hersey, *The Lost Meaning of Classical Architecture* (Cambridge, MA: MIT Press, 1988).
56. G. Hölbl, "Ägyptischer Einfluss in der griechischen Architektur," *ÖJh* 55 (1984) 1–18. See also E. Østby, "Der Ursprung der griechischen Tempelarchitektur und ihre Beziehungen mit Ägypten," in M. Bietak, ed., *Archaische griechische Tempel und Altägypten* (Vienna: Österreichischen Archäologischen Instituts, in press) 17–33.
57. Wesenberg, *Kapitelle*, 49–62 discusses this relationship and the history of scholarship on the issue. As he states, the initial association of the two traditions was made by J. H. Middleton, "A Suggested Restoration of the Great Hall in the Palace of Tiryns," *JHS* 7 (1886) 161–69, esp. 163–64, and O. Puchstein, *Das ionische Capitell* (Berlin: G. Reimer, BWPr 47, 1887) 51.
58. R.C.S. Felsch, et al., "Apollon und Artemis oder Artemis und Apollon? Bericht von den Grabungen im neu entdeckten Heiligtum bei Kalapodi 1973–1977," *AA* (1980) 38–118, esp. 76–78, fig. 52.
59. F. Krischen, in E. Wasmuth, ed., *Wasmuths Lexikon der Baukunst* II (Berlin: E. Wasmuth, 1930) 226 simply states that the Mycenaean leaf ring still appears in the "earliest Doric architecture." Wesenberg, *Kapitelle*, 54–57 offers more specific examples. See also B. A. Barletta, "An 'Ionian Sea' Style in Archaic Doric Architecture," *AJA* 94 (1990) 45–72, esp. 45–52, for a different interpretation of the capital with leaf necking.
60. Two series of bronze leaves have been recovered. They are both discussed by Wesenberg, *Kapitelle*, 52, nos. 1 and 2. That

- found earlier (no. 1) was published also by E. Curtius and F. Adler, eds., *Olympia: die Ergebnisse der von dem Deutschen Reich veranstalteten Ausgrabung IV* (Berlin: A. Asher and Co., 1890) 149, nos. 939 and 939a, pl. 53 and by R. Hampe, "Ein bronzenes Beschlagblech aus Olympia," *AA* (1938) 359–69, figs. 3–5. The more recent discovery (no. 2), which is perhaps from a votive base, is published in *BCH* 89 (1965) 746 and fig. 3.
61. Schwandner, *Porostempel*, 113–15 n. 155, raises the possibility that additional capitals, which lack carved fluting, may originally have been equipped with a bronze leaf necking. His list includes Capital C from the Argive Heraion, which is considered to be one of the earliest extant Doric capitals. This hypothesis is thus potentially significant for our study, but without further evidence it remains unsubstantiated.
 62. Note, e.g., the necking treatment of capitals from the Temple of Athena at Poseidonia (Paestum) and the Throne of Apollo at Amyklai, as well as of single pieces found near Sparta and at Longá, all of the late sixth century: Barletta, "Ionian Sea," 49–52 and figs. 7, 8.
 63. Coulton, *Greek Architects*, 39–43, and Hölbl, "Ägyptischer Einfluss," 6–9, who note potential Mycenaean sources for the Doric order as well, as in the capital and fluted shaft.
 64. See especially Bowen, "Some Observations," 119–25; Holland, "The Origin," 124–36 offers arguments against this theory.
 65. A half-rossette frieze from the Tiryns megaron is assigned to the wall socle of the porch: U. Jantzen, ed., *Führer durch Tiryns* (Athens: Deutsches Archäologisches Institut, 1975) 30, 123–24.
 66. The theory, by Mark Wilson Jones, is the subject of an article entitled "The Origins and Iconography of the Doric Frieze," and will be further explored in a book, now in preparation. I thank him for discussing his theory with me and for allowing me to read an advance copy of the article.
 67. G. Roux, "La tholos de Sicyone à Delphes et les origines de l'entablement dorique," in J.-F. Bommelaer, ed., *Delphes, Centenaire de la grande fouille réalisée par l'Ecole française d'Athènes, 1892–1903. Actes du Colloque P. Perdrizet, Strasbourg, 6–9 novembre 1991* (Leiden: E. J. Brill, 1992) 151–66.
 68. Coulton, *Greek Architects*, 41 and n. 56.
 69. G. Semper, *Der Stil in den technischen und tektonischen Künsten oder praktische Aesthetik, II: Keramik, Tektonik, Stereotomie, Metallotechnik* (Munich: Friedr. Bruckmann's Verlag, 1879) esp. 200–201.
 70. P. P. Betancourt, *The Aeolic Style in Architecture* (Princeton, NJ: Princeton University Press, 1977) 123.
 71. Martin, "Problème," 119–32.
 72. W. Andrae, "Die griechischen Säulenordnungen," *IstForsch* 17 (1950) 1–9.
 73. J. Onians, *Bearers of Meaning. The Classical Orders in Antiquity, the Middle Ages, and the Renaissance* (Princeton, NJ: Princeton University Press, 1988) 35.
 74. Wesenberg, "Die Entstehung," 2.
 75. J. Coulton, "The Toumba Building: its architecture," in M. R. Popham, P. G. Calligas, and L. H. Sackett, eds., *Lefkandi II, The Protogeometric Building at Toumba, pt. 2, The Excavation, Architecture and Finds* (Athens: British School of Archaeology at Athens, 1993) 33–70, esp. 47.
 76. J. Boardman, *Persia and the West* (London: Thames and Hudson, 2000) 41–42, e.g., cites Near Eastern furniture and small-scale works in ivory and bronze as likely models for the leaves and volutes of Ionic and Aeolic capitals.
 77. For the creation of the Ionic capital from the application of contemporary decorative ornaments to a functional member, and a discussion of possible sources for those ornaments, see Martin, "Problème," 128–31. Variants of the Aeolic capital that comprise vertical volutes rising from an attached echinus are discussed by Betancourt, *Aeolic Style*, 92–93, 106–108; A. Ohnesorg, "Parische Kapitelle," in J. des Courtils and J. C. Moretti, eds., *Les grands ateliers d'architecture dans le monde égéen du VI^e siècle av. J.-C.* (Paris: de Boccard, 1993) 111–18, esp. 115–18; E. P. McGowan, "Votive Columns of the Aegean Islands and the Athenian Acropolis in the Archaic Period" (Diss. Institute of Fine Arts, New York University, 1993) 28–38.
 78. J. N. Coldstream, *Geometric Greece* (New York: St. Martin's Press, 1977) 341–57

- provides a good discussion of these issues and chronology.
79. Both Drerup, *Baukunst*, 115 and Wesenberg, *Kapitelle*, 61–62 use this evidence to support an early acquaintance with the Mycenaean capital.
 80. Schwandner, *Porostempel*, 118.
 81. Wesenberg, "Vitruvs Vorstellung," argues for the creation of the frieze above solid walls and for the later development of the mutular geison. Much earlier, Rodenwaldt, "Entstehung," 181 had raised the issue of corner conflict as an argument against the origin of the frieze on a peripteral building, although this led him to a different solution.
 82. R. F. Rhodes, "Early Corinthian Architecture and the Origins of the Doric Order," *AJA* 91 (1987) 477–80, esp. 480.
 83. Coulton, "Toumba," 38, 55, 57.
 84. G. Touchais, *BCH* 107 (1983) 777, fig. 59. Touchais gives a date for the temple of ca. 700 B.C.
 85. Little is preserved of the decoration on the Corinth temple except for paint on a probable cornice block and an incised pattern on a wall block: H. S. Robinson, "Excavations at Corinth: Temple Hill, 1968–1972," *Hesperia* 45 (1976) 203–39, esp. 230. It should also be noted that while the excavator of the Isthmia temple assigned the painted decoration to the exterior surface of the walls, R. F. Rhodes, "The Beginnings of Monumental Architecture in the Corinthia" (Diss. University of North Carolina, Chapel Hill, 1984) 69–70 attributes it to the interior. This revision rests on Rhodes's association of cuttings at the top of the walls with rafters, which would have been anchored into the cuttings in the opposite direction from that proposed by Broneer.
 86. As suggested by Cook, "Archetypal Doric Temple," 17–18.
 87. H. Payne, "On the Thermon Metopes," *BSA* 27 (1926) 124–32. This continuation of subject seems to be confirmed for the Perseus metope and a fragment that may show one of the gorgons pursuing him.
 88. The use of wood in the entablature of early temples seems to be attested as well by a fragmentary terracotta metope of the early sixth century from Sicilian Naxos (on display in the site museum). It preserves nail holes through its upper area for affixing it to a secure member, which from the weight of the metope was presumably of wood.
 89. The entablature frieze has been recognized in the Oikos of the Naxians on Delos, of the early sixth century, by G. Gruben, "Die inselionische Ordnung," in J. des Courtils and J.-C. Moretti, eds., *Les grands ateliers d'architecture dans le monde égéen du VI^e siècle av. J.-C.* (Paris: de Boccard, 1993) 97–109, esp. 105–106 and fig. 4, and Gruben, "Naxos und Delos," 344–50. Although the ceiling beams are not preserved here, an indication of their size may perhaps be provided by comparison with an extant fragment of a rafter, which measures approximately 13 cm wide and at least 19 cm high. The frieze slabs, by contrast, range in length between 74 and 94 cm or more and in height between 56 and 84 cm: Courbin, *L'Oikos*, 75 n. 5, 77 and n. 8. In his reconstructions, Gruben shows the slabs as equivalent in height to a combination of the ceiling beams and their supporting course in the wall.
 90. Bookidis, "Study," 448–50. Bookidis notes, however, that at Selinous metopes are typically thick, weight-bearing blocks. It is possible that this peculiarity arises from the execution of what is considered to be the earliest Doric frieze at the site, in Temple E 1, in wall courses.
 91. These reliefs and the results of a recent investigation of the temple are discussed, with bibliography, in Chapter 3.
 92. For a discussion of triglyph altars, see C. G. Yavis, *Greek Altars* (St. Louis: St. Louis University Press, 1949) 138–39. In addition, Schwandner, *Porostempel*, 60, 62–67, provides evidence of a probable triglyph altar from Aigina. Similarities between these triglyphs and those from the Aphaia temple would suggest a comparable date. The altar from Korkyra, which is thought to be contemporary with the temple, is the earliest known. That from the Aphaia sanctuary would closely follow. Others from the Archaic period are found at Syracuse and Aigina, while Corinth has produced a frieze in a wall. This has led to suggestions that Corinth had a more

- flexible approach to the Doric frieze (F. P. Johnson, *AJA* 40 [1936] 53) and may have invented the triglyph altar (Yavis).
93. D. Mertens, "I santuari di Capo Colonna e Crimisa: Aspetti dell'architettura crotoniate," in *Crotone, Atti Taranto* 23 (1984) 189–230, esp. 214–21.
 94. W. B. Dinsmoor, "Studies of the Delphian treasuries. – I. The identity of the treasuries," *BCH* 36 (1912) 439–93, esp. 467–73.
 95. It should be noted that an increasing emphasis on structure also occurs in the anta, which in later phases reflects the architrave thickness in the depth of its inner projecting face. Nevertheless, with the construction around 540 B.C. of the Temple of Apollo (A II) at Metapontion, it was still possible for the architect to ignore the Doric alignment of columns and triglyphs. Instead, he constructed an 8-column facade with 14 triglyphs and 13 metopes and created further disunity by placing a large kyma between the frieze and the architrave: D. Mertens, "Metapont. Ein neuer Plan des Stadtzentums," *AA* (1985) 645–71, esp. 658–59.
 96. This is pointed out by Wesenberg, "Vitruvius Vorstellung," 150.
 97. Klein, "Origin of the Doric Order," 180–81.
 98. N. A. Winter, *Greek Architectural Terracottas* (Oxford: Clarendon Press, 1993) 4.
 99. Semper, *Der Stil II*, 390; H. Drerup, "Zur Entstehung der griechischen Tempelringhalle," in N. Himmelmann-Wildschütz and H. Biesantz, eds., *Festschrift für F. Matz* (Mainz: P. von Zabern, 1962) 32–38. The concept of a peristyle as offering protection and authority has been recently elaborated by B. Fehr, "The Greek Temple in the Early Archaic Period: Meaning, Use, and Social Context," *Hephaistos* 14 (1996) 165–91, who sees the protection for the citizens as both actual and symbolic. W. Martini, "Vom Herdhaus zum Peripteros," *JdI* 101 (1986) 23–36, esp. 25–26 and n. 22, prefers the Egyptian columned hall as the source of influence but emphasizes the role of the peristyle in giving prominence to the temple. He also associates the external focus of the peripteral temple with the changed liturgy, moving from cult meals for a small group of people within a hall to a celebration with increased numbers around an external altar.
 100. B. A. Barletta, "The Campanian Tradition in Archaic Architecture," *MAAR* 41 (1996) 1–67, esp. 39.
 101. See M. Waelkens, P. DePaepe, and L. Moens, "The Quarrying Techniques of the Greek World," in *Marble: Art Historical and Scientific Perspectives on Ancient Sculpture* (Malibu, CA: J. Paul Getty Museum, 1990) 47–72, for Near Eastern influence on Greek stone carving, and C. Ratté, "Lydian Contributions to Archaic East Greek Architecture," in J. des Courtiers and J.-C. Moretti, eds., *Les grands ateliers d'architecture dans le monde égéen du VI^e siècle av. J.-C.* (Paris de Boccard, 1993) 1–12, esp. 8–11, for the role of Lydia as a possible intermediary. It is traditionally assumed that at least the idea of carving hard stone was borrowed from Egypt. The recent recognition of the claw chisel on blocks from a mid-seventh-century Egyptian tomb, thus much earlier than its appearance in Greece, increases the likelihood that techniques and tools were adopted from there as well. See O. Palagia and R. S. Bianchi, "Who Invented the Claw Chisel?" *OJA* 13 (1994) 185–97.
 102. R. M. Cook, "Amasis and the Greeks in Egypt," *JHS* 57 (1937) 227–37 and, more recently, J. Boardman, *The Greeks Overseas* (London: Thames and Hudson, 1980) 121.
 103. The temple as votive is discussed by W. Burkert, "The Meaning and Function of the Temple in Classical Greece," in M. V. Fox, ed., *Temple in Society* (Winona Lake: Eisenbrauns, 1988) 27–47 and subsequently by Fehr, "Greek Temple," 175–81. N. Marinatos, "What Were Greek Sanctuaries? A Synthesis," in N. Marinatos and R. Hägg, eds., *Greek Sanctuaries: New Approaches* (London and New York: Routledge, 1993) 228–33, esp. 230–32, stresses the role of sanctuaries as centers of competition. We may assume that the same level of competition existed among cities.
 104. C. Höcker, "Architektur als Metaphor: Überlegungen zum Bedeutung des dorischen Ringhallentempels," *Hephaistos* 14 (1996) 45–79. Höcker seems to imply an early identity linked with each order,

however, which does not find support in the archaeological evidence.

105. See now F. A. Cooper, *The Temple of Apollo Bassitas I and III: The Architecture* (Princeton, NJ: American School of Classical Studies at Athens, 1996) 293–95, 305–24.

CONCLUSIONS

1. N. Weickenmeier, *Theorienbildung zur Genese des Triglyphon. Versuch einer kritischen Bestandsaufnahme* (Darmstadt: University Diss., 1985) esp. 208–10.
2. As concluded by C. A. Pfaff, "Curvature in the Temple of Apollo at Corinth and in the South Stoa and Classical Temple of Hera at the Argive Heraion," in L. Haselberger, ed., *Appearance and Essence: Refinements of Classical Architecture – Curvature* (Philadelphia: The University of Pennsylvania Museum, 1999) 113–125, esp. 124–125.
3. J. Onians, *Art and Thought in the Hellenistic Age* (London: Thames and Hudson, 1979) 72–73. See also J. Onians, *Bearers of Meaning. The Classical Orders in Antiquity, the Middle Ages, and the Renaissance* (Princeton, NJ: Princeton University Press, 1988) 15–18, who speaks of an "ancestral bond," but also (correctly, in my opinion) explains the combination of Doric and Ionic features as an expression of Perikles' "Panhellenic ambitions."
4. Both Ionic and Corinthian columns appear in the interiors of late fifth and fourth century Doric temples at Bassai, Tegea, and Nemea, while dentils and a frieze course are combined in the entablature of the Ionic Temple D at Metapontion (ca. 480–475 B.C.) and more commonly from the later fourth century, beginning with the Propylon to the "Temenos" at Samothrake and the Philippeion at Olympia.

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