THE Earliest Greek Architecture in Corinth AND
The 7th-Century Temple on Temple Hill

As Greece emerges from the Dark Age three hundred years after the collapse of the Mycenaean world, recognizable temple architecture begins to appear in various sanctuaries on the mainland, including the Sanctuary of Hera Akraia at Perachora in the Corinthia, a region of Greece crucial to the early development of monumental architecture. The foundations of an 8th-century temple and associated votives were found at Perachora, as were fragments of terracotta models, almost certainly representing a building very similar to the temple, if not the temple itself. It is a long road from the simple rubble and thatch structures represented at Perachora to the large-scale, solid stone, terracotta-tiled Doric temples of the 6th-century mainland, but it is a direct road.

In the Corinthia that movement toward a monumental conception of architecture begins with a technological advance: in the late 8th century the Corinthians first realized that they were sitting on top of a gold mine of building material, a layer of soft, fine-grained limestone. This poros limestone (porolithos)—petrified from an ancient east–west sand dune—is in many ways the prime determiner of both the physical organization and the look of post–Dark Age Corinth: the “well-watered” character of Corinth is in large measure due to the poros, for it is its consistent position in the geology of the area, combined with the underlying marl, that determines the natural positions of the springs around which the early city grew up, and which made it possible to enlarge the supply of water at those natural points of effluence. It also determined the countenance of the city, for this poros limestone quickly became the primary monumental building material of Corinth (Fig. 6.1).

Both the ancients and modern archaeologists associate the city of Corinth with the beginnings of monumental architecture. It is no coincidence that monumental architecture began on soil that was everywhere underlain by a thick layer of easily cut, fine-grained poros limestone. Nor is it simple coincidence that this early home of monumental stone architecture was also a nation of shipbuilders—master carpenters and inventors in wood. They soon discovered that the poros limestone could be worked with the same tools and techniques as those employed for wood, and that it could even be used for similar purposes in contexts normally reserved for wood. The early repertory of stone-working tools at Corinth was a simple one, consisting of a quarry hammer, broad, flat chisels, and an adze, used—as in carpentry—for the original, rough squaring of architectural members. The adze, like the flat chisels, often created the distinctive deep-grooved, “spatulaed” surface of early Corinthian poros masonry (Fig. 6.2).

It was a technological advance—the discovery of the potential uses of poros limestone—that started Corinthian builders on the road to monumental architecture, and each step along the way was accompa-

1. I would like to begin by thanking Charles K. Williams II for assigning me the responsibility of studying and publishing the Greek stone architecture of the American School excavations at Corinth and for all the help and encouragement he and Nancy Bookidis have given me in my work over the past two decades. I would also like to thank them for the marvelously supportive and fertile atmosphere they have created and maintained at Corinth for students and scholars alike. Finally, I wish to express my deep gratitude to them for organizing the Corinth Centennial Symposium and for inspiring all of us Corinthians—through their own example and through their faith in us—to make our papers worthy of the hundredth anniversary of Corinth.
2. Perachora *1, pl. 96.
3. For a description of this stone and references to other descriptions of poros, see Rhodes 1987a, p. 229, note 2; see also Hayward, p. 32 in this volume. At present, an extensive study of the geological nature of Corinthian limestone is being carried out by Chris Hayward; see his contribution to this volume, including his discussion of the term “poros” (p. 32).
4. For the ancient references to this epithet and ancient accounts of the springs of Corinth, see Corinth I, vi, pp. 1–4. See also the article by Mark Landon in this collection (pp. 43–62).
5. Pindar, OL 13.21–22; Pliny, NH 35.43.151–152; Corinth IV, i, pp. 5–7.
6. For Corinth’s significant role in the early history of Greek shipbuilding, see Jeffery *1976, pp. 146, 159, note 2.
7. The early technology of stone cutting at Corinth has been examined in Rhodes 1987b, 1987c; Brookes 1981.
8. This was Professor Henry Robinson’s apt description.
nied and inspired, at least in part, by their increasing understanding of the structural capabilities of that stone. Contributing to the new “monumentality” in the post-Dark Age architecture of Greece is the practical concern of creating stronger, more long-lasting structures. The Corinthia, in the late 8th and 7th centuries B.C., witnesses a gradually increasing use of cut poros limestone for purposes of structural reinforcement in retaining walls and in traditional half-timbered rubble and mudbrick constructions. Thresholds (Fig. 6.3), jambs, corners, socles (Fig. 6.4)—all positions traditionally occupied by wood in half-timbered construction—are more and more often constructed with stone, either as a replacement for wood or as a smooth bed for it. But the superstructure of Corin-
Debris and its interpretation are discussed in Rhodes 1984; its relation to the development of the earliest architecture in the Corinthia is also discussed in Rhodes 1987b, 1987c. The final publication of the early temple at Corinth is now being prepared by the present author.

10. In 1994 fragments of both ridge tiles that formed the transition with the hipped ends of the temple were identified, proving that both ends were hipped.
temple tiles are very early, but each tile is molded as a combination cover and pan, and the decorative articulation of pan and cover as separate elements in each of the combination tiles presupposes even earlier Lakonian-type roofs at Corinth, with more conventionally Lakonian, noncombination tiles.

The Corinth temple's system of intricately interlocking and overlapping terracotta tiles gave the impression of a normal tiled roof, but the consistently fixed relationship of pan and cover in the combination construction added a uniformity of pattern difficult to accomplish in the more flexible system of unattached pan and cover. The result was a more impressive, more monumental roof covering and temple. Elsewhere in Greece a new interest in the monumentalization of temple architecture had begun to be expressed through decorative elaboration and increasing scale; the larger buildings required heavier, more carefully constructed walls, and local traditions of neatly squared, carefully joined, cut-stone foundations and socles had begun to appear. But it seems to have been at Corinth that the roof was first recognized as being an appropriate vehicle for the further monumentalization of the Greek temple, and it is in the 7th-century temple of Apollo on Temple Hill that that crucial invention can first be documented in Greece and its immediate consequences analyzed.

In 1994–1995 preparation for the final publication of the early Corinth temple began with a study of the remains of building blocks and tiles. Although nothing of the building remains in situ and the blocks and tiles are in a fragmentary state, the temple debris is extensive, and it provides enough evidence to allow us to restore with confidence the lines of the temple and the details of its construction (Figs. 6.7 and 6.8). As a result of this new study, eight major types of neatly squared poros blocks have been identified in the debris (of which five are reconstructed in Fig. 6.9): foundation blocks, unadorned wall blocks, two types of wall blocks that anchored a timber framework (Fig. 6.9c), stuccoed wall blocks whose face was finished in a vertical band to receive a vertical timber of the framework (Fig. 6.9d), two major types of cornice blocks (Fig. 6.9a, b), and a corner cornice.

It is possible that the Corinth temple walls were stone from foundation to cornice. It is also possible—in the light of the large quantities of decayed mud brick found among the block and tile debris—that the lowest courses of the walls served as the substantial socle for a mudbrick superstructure. The mud brick in turn would have been capped by a heavy poros cornice course (Fig. 6.10). Squared stone masonry foundations and socles were being employed elsewhere in Greece—in large-scale temples with lighter, traditional roofs of thatch or some other material—but the introduction of the new heavy tile roof at Corinth required additional structural compensation. Most immediately, the roof tiles required that there be a substantial system of supporting roof timbers and direct reinforcement where the weight of the roof met the walls. The result was the invention for the Corinth temple of the stone cornice.

The most numerous type of cornice block in the Corinth temple debris indicates a course into whose upper surface a series of carefully notched cuttings was let (Figs. 6.9b and 6.11). The cuttings served as

11. Due to illness, Henry S. Robinson was unable to prepare the final publication of this building. I would like to express my gratitude to Professor Robinson for the hours he spent with me in the late 1970s on Temple Hill explaining his new excavations, and to him and Mrs. Robinson and Charles K. Williams II for entrusting to me the publication of the early temple. I would also like to thank Pieter Broucke for assisting me for three weeks on Temple Hill in 1994 and for contributing to Fig. 6.10. Finally, I am grateful to the 1984 Foundation for the financial support that made it possible for me to undertake this project. The publication of the early temple on Temple Hill is planned as a volume in the Corinth series.

12. As suggested in Roebuck 1955, p. 157, and contra Robinson 1976a, p. 227. Unfortunately, no trace of in situ foundations or bedrock cuttings of this temple is preserved.
Figure 6.9. Typical blocks from Corinth early temple: (a) primary cornice, (b) secondary cornice, (c) blocks with plug cuttings for anchoring timber framework at base of wall, (d) wall block with stuccoed panel and smooth bed for vertical timber

Figure 6.10. Corinth early temple: reconstruction
horizontal (or nearly horizontal) beds for wide, transverse timbers, which anchored the rafters to the cornice and ultimately held the roof in place; the notching prevented the transverse timbers from pushing out of the wall on its exterior face (Fig. 6.10). These timbers projected beyond the face of the wall to form supports for the eaves tiles, and the very slight downward slope of the timber beds toward the exterior face of the wall (no steeper than 1 : 10) effected a simple drip for the projecting eaves timbers.

For the most part, the spacing of these transverse beddings corresponds to the spacing of the cover tiles of the roof and, therefore, to that of the rafters: a row of cover tiles would have been supported by each rafter. At regular intervals, however, an intermediate rafter was attached to the cornice by another method: it was anchored to a timber that ran the length of the block instead of transversely, a timber set into a deep bedding cut along the inner edge of the top of the block (Figs. 6.9a and 6.12). These blocks are much less numerous than the other type of cornice block, but it is certain that they were distributed in the same course with the transverse timbers. The upper surface of these blocks slopes down toward the exterior face of the wall at a shallow pitch similar to that of the beddings for the transverse timbers. In addition, the upper surface of the blocks was carved to receive the underside of a pair of eaves pan tiles: where the pans rested, the surface was smoothed, and where the pans curved up in the center beneath a cover and did not rest directly on the block, the original, more roughly finished surface of the block was left intact. The overhanging portion of the eaves tiles was supported by a combination of the projecting transverse timbers and a fascia board that was attached to the ends of those timbers and faced the eaves for the entire length of the roof (Fig. 6.10).

The two types of cornice blocks preserved from the Corinth temple indicate the presence of a system of primary and secondary roof support, the more numerous secondaries normally helping to anchor a pair of rafters (one at each end of the block), the primaries set at regular intervals among them and supporting a single, centered rafter (Fig. 6.10). In other words, a secondary cornice block with a pair of beddings for transverse beams served as an anchor, while the entire weight of a primary cornice block was utilized as an unambiguous counterbalance to the weight of a single rafter. Thus, at regular intervals the roof was reinforced by means of more securely supported rafters.

Systems of primary and secondary support are common in hipped roofs of later periods, as, for example, in some Victorian constructions, where the hip rafters themselves (that is, the diagonal timbers that form the transition between the flanks and ends of the roof and whose lower ends are supported at each corner of the building) are thicker in section than the others. It is impossible to restore the section of the Corinth hip rafters, but primary supports were used for them. Similarly—on the basis of the tile system, which requires a cover and, therefore, a rafter on the axis of each hip—we can assume primary supports there as well. To judge, however, from the number of preserved...
primary cornice blocks, they must also have been set in intermediate positions on the hipped ends of the building, as well as at regular intervals along the flanks. This seems to indicate that the primary supports of the Corinth temple were employed not only at points of particular structural vulnerability, but also as a more general system of regular roof buttressing. It is possible that they supported rafters of thicker or wider than normal section, but it is perhaps more likely that the perceived advantage of the primary supports lay not in the size of the rafters they anchored, but in the reinforcement they provided at regular intervals and at strategic positions in the cornice. The system of reinforcement in the Corinth roof may, in fact, have been exactly what is preserved—a system of primary and secondary cornice blocks—rather than a system of primary and secondary rafters.

The finishing of the primary cornice blocks to receive the eaves tiles is additionally significant for the reconstruction of the Corinth temple, for it confirms that, like the beddings for the transverse timbers that supported them, the orientation of the eaves tiles was essentially horizontal, not pitched like the rest of the roof. This orientation is reflected in the character of the tiles that formed the transition from the hipped ends of the roof to the flanks. For that place special hip tiles were constructed, square tiles which had to be bent along their diagonal to accommodate the intersecting slopes of the roof (Fig. 6.5). It is a physical impossibility that the two unbent hip tiles found in the Corinth temple debris could have formed the transition between adjacent slopes. They could only have rested on the horizontal supports at the eaves of the temple.

In studies of Greek architecture, a roof whose covering or structure is broken at the eaves, that is, a roof whose covering or structure is horizontal or nearly horizontal along the eaves and more steeply sloped above, has traditionally been called “Chinese.” Clearly, such was the nature of the underlying structure of the Corinth roof, and its roof tiles were laid accordingly; yet in spite of this, the break in the slope of the roof covering and the consequent visual effect would not have been great, perhaps even negligible, for a slight slope was molded into the upper surface of the eaves tiles themselves, and the pitch of the roof above was remarkably shallow. The significance then of the Chinese roof at Corinth lies not so much in its visual effect as in the structural design of the tile support at cornice level, a design different from that of later, Doric buildings.

Plug cuttings (Fig. 6.9c) that anchored timbers at the base of the wall indicate that, in the tradition of half-timbered construction, both faces of the Corinth temple walls carried a framework of vertical and horizontal timbers (Fig. 6.10). They were tied to the top of the wall via the transverse timbers of the cornice, and to the bottom by the wooden plugs, and thus served as extra support for the roof, helping distribute its weight throughout the entire elevation of the wall. Finally, wall blocks whose face is roughened and stuccoed on either side of a smoothly finished band, which received a vertical of the half-timber framework (Figs. 6.9d and 6.13), show that on at least one side of the wall the timbers framed stuccoed panels. It is possible that the stuccoed panels were painted, though to this point no pigment has been detected. It should be noted here that the appearance of the upper edge of these stuccoed panels on the cornice blocks of the Corinth temple (Figs. 6.9 and 6.10) precludes the possibility that the cornice rested on a colonnade.

It can be concluded with assurance that the early temple at Corinth was not Doric and that it did not have a surrounding colonnade. It was a simple, rectangular, half-timbered building that made extensive use of squared stone masonry, certainly at the base of the walls and at cornice level, and perhaps in between. It is impossible to restore the dimensions of the temple with any certainty, though the size of its individual elements suggests that it was substantial. We can at least say that it was longer than it was wide, for numerous ridge tiles are preserved. Whatever its overall measurements, it is probably not unreasonable to assume that the temple’s width was a simple fraction of its length, for simple proportions were at the heart of the design of the temple’s most complex feature, its roof.

The widths of each tile and all its component parts stand in simple proportional relationship one to another. The logic of these relationships is revealed in

13. As mentioned above, the slope is only great enough to form a simple drip for the eaves timbers.
14. Fragments of painted stucco from wall panels are preserved in the debris of the slightly later 7th-century Temple of Poseidon at Isthmia (Isthmia *I, pp. 53–54).
the method of tile design, in which the width of each element is a simple fraction of the construction unit, and the smallest significant measurement is not a millimeter or an inch, but the equivalent of ca. 0.085 m (one palm, in ancient Greek parlance). The builders of this early monumental temple were thinking in broad outlines of proportion and dimension, not in the minutely precise terms of the refinement-filled buildings of the Classical period; there was no need. The tiles of the Corinth temple were reproduced in molds, so their measurements were consistent, but the building below required an order of accuracy and precision only great enough to accommodate that roof. The considerable variation in the spacings of the cuts for the transverse timbers of the cornice indicates that rather than following a minutely precise, preconceived plan of construction, the overall plan allowed the roof builders a generous leeway within which they were free to err and correct as each successive rafter was set in place.

In the absence of refinements and any of the elements of a formal architectural canon, the single overwhelming determinant of design and appearance in the 7th-century Temple of Apollo at Corinth was its roofing system. Thus, besides determining the character of the walls and the cornice through structural requirement, the roof was also the focus of decorative elaboration. This included the careful articulation of pan and cover on each combination tile; intricate eaves tiles whose covers are peaked at the lower end; and, finally, the colorful glazing of the tiles, which were most probably arranged in vertical stripes.

Since the most characteristic features of the Corinth temple have yet to be found (or at least reported) in any far-flung Greek context, and since they did not survive as regular structural features of later Greek architecture, their appearance outside Corinth would immediately suggest close contact with Corinth and its building tradition. In fact, scattered remains at several other sites indicate that this tradition of early monumental architecture extended well beyond the suburbs of Corinth and included the entire Corinthia, even beyond. Fragments of virtually identical combination tiles (including hip tiles), cornice blocks with notched, transverse beddings, and plug cuttings for anchoring a framework of half-timbering were discovered at the nearby Corinthian sanctuary of Poseidon at Isthmia. They belong to a slightly later building that was modeled in almost every detail—perhaps even built by the same workmen—on the early Corinth temple (Fig. 6.14). Similarly, fragments of a cornice block with notched, transverse bedding, almost indistinguishable from those at Corinth, were discovered in the debris from the late-7th–early-6th-century Temple of Zeus at Nemea. This block and the terracotta remains of the hipped roof it helped support—together with the noticeable lack of any columns or anything recognizably Doric in the Nemea temple debris—indicate that at this early date the monumental, nonperipteral style of the Corinth temple extended even beyond the immediate environs of Corinth, to the very edge of the Corinthia.

Beyond the edge of the Corinthia, a number of blocks from another late-7th–early-6th-century, nonperipteral, pre-Doric temple are preserved on the

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15. lateral overlap = \(\frac{1}{6}\) cubit (1 part)
cover tile = \(\frac{1}{2}\) cubit (3 parts)
exposed pan (after laid) = \(\frac{7}{3}\) cubit (4 parts)
exposed pan (before laid) = \(\frac{5}{6}\) cubit (5 parts)
exposed tile (after laid) = \(\frac{1}{6}\) cubits (7 parts)
total tile = \(\frac{1}{5}\) cubits (8 parts)

16. Robinson suggested this possibility on the basis of the numbers and types of yellow and black tiles (1976a, pp. 233–234; also 1976b, p. 249, fig. 9). Other evidence supporting this arrangement will be discussed in detail in the final publication of the temple.

17. The remains of the Isthmia temple were published in detail by Broneer (Isthmia *1, pp. 1–56, 64, 69–70; summarized in Broneer *1976, pp. 41–46). His preliminary reports on the excavations in the temple precinct appear in Broneer *1953; *1955, pp. 110–122, 128–141; *1958, pp. 24–31, 34–37. Since then, his interpretation of the remains and his suggested reconstruction of a wooden peristyle surrounding the temple have been called into question by the present author (Rhodes 1984, 1987b, 1987c). Subsequently, a restatement of Broneer’s views, including his restoration of a peristyle, was presented by the Isthmia excavation team (Gebhard and Hemans *1992, pp. 23–40; Hemans *1989), but it was published before the present study of the Corinth temple was begun. The remains of the Isthmia temple must now be reinterpreted in the direct light of its immediate predecessor and inspiration, the early temple at Corinth, and in the light of its two closely related successors in the region, the early temples at Nemea and Mycenae, which, like the temple at Corinth, had no peristyle (see below). The Isthmia temple and the scholarship surrounding it will be considered in detail in an appendix of the *Corinth* volume on the early temple on Temple Hill.

18. The fragments of the early Nemea temple are described by Stephen G. Miller in Miller *1979, pp. 81–82; *1980, pp. 183–187; *1981, pp. 51–55. For the cornice block with the transverse bedding, see Miller *1980, p. 185, pl. 38d.
acropolis at Mycenae. The specific correspondences between its building blocks and those of the Corinth temple are not as close as in the blocks of the temples at Isthmia and Nemea, but their surface finish is similarly "spatulaed," and plug cuttings in several of the blocks indicate that, as at Corinth, the walls of the Mycenae temple carried a framework of timber. Similarly, paired cuttings in the upper surface of one block (like the paired cuttings in the secondary cornice blocks at Corinth) and a deep bedding along the back edge of another simple, unadorned, pre-Doric cornice block, suggest the possibility that the Mycenae temple roof was reinforced at cornice level by means of the Corinthian system of primary and secondary supports. Finally, fragments of combination pan and cover tiles should be associated with this temple.

Combination tiles very similar to those from the Corinth temple—and including a hip tile—were also found in the Corinthian sanctuary of Hera at Perachora (Fig. 6.15). The context of the Perachora tiles is unknown, but their size indicates that the building (or buildings) of which they were a part was considerably smaller than the Corinth temple; and the Corinthian profile of the preserved hip tile—with continuously peaked covers—indicates that its building was constructed somewhat later than the Corinth temple.

A final direct representative of this early Corinthian style of monumental architecture is preserved in the so-called Treasury of Kypselos at Delphi, reputedly constructed by the first tyrant of Corinth. The roof cover consisted of a similar system of interlocking combination tiles, and a plug cutting in one of the in situ wall blocks indicates that a framework of timbers was anchored in the base of the wall in the Corinthian manner.

In the 7th century B.C., a tradition of pre-Doric, monumental stone temple architecture emerges in the Corinthia. Its roots clearly lie in earlier traditions of half-timbered rubble and mudbrick construction, and the technique of its stoneworking and even the specific uses of the cut stone are closely related to Corinth’s venerable heritage of shipbuilding, framing, and carpentry. Increasing awareness of the practical advantages provided by poros limestone results in an increasingly pervasive use of cut stone in the fabric of early Corinthian buildings, as does an increasing drive toward architectural monumentality. Throughout Greece in the 7th century, temples embody conscious attempts to monumentalize religious architecture. The means to that end are various—larger scale, heavier masonry, colored tiles, columnar facades, architectural sculpture. In the 7th-century temple on Temple Hill in Corinth neatly squared stone facades and impressive scale are used to structural and visual advantage. But most important for the subsequent development of monumental architecture in Greece is that the builders at Corinth covered their temple with a new, permanent roof cover of baked clay tiles. With the introduction of this immensely heavy, intricately wrought roof, the primary purpose of the temple walls suddenly shifted from the punctuation of space to the support of the roof. As a result, both the structural and decorative focus of the temple shifted to the top of the walls—for which the builders of the Corinth temple invented the heavy stone cornice—and to the roof itself.

Here at Corinth, for the first time in Greece, monumental size, neat masonry walls, a stone cornice, and a heavy tiled roof are all combined in the same building, and with the building of the Corinth temple the subsequent course of early monumental architecture in the Corinthia and environs is clearly set.
REFERENCES


