

378 Stylobate and Roof in the Olympieion at Akragas

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Abstract 7 Fig 64 notes Archit.

80 Pythagorica. — BELL M., *Stylobate and roof in the Olympieion at Akragas*
[influence pythagoricienne]: cf. N° 6669.

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BELL M., *Stylobate and roof in the Olympieion at Akragas*: AJA LXXXIV
1980 359-372. | The numbers and proportions used in the design of the temple
indicate Pythagorean influence and suggest that the temple should be asso-
ciated with Theron, ruler of Akragas in 488-472 B.C. Construction was prob-
ably begun prior to the battle of Himera in 480 B.C. [6669]

1642. BELL M., *Stylobate and roof in the Olympieion at Akragas*:
AJA 84 1980 359-372.

Les nombres et les proportions utilisés dans l'architecture de
l'Olympieion d'Agrigente témoignent d'une influence pythagoricienne.
Ces éléments impliquent en outre que le nom de Théron doit être associé
à l'édification de ce temple. On peut donc en fixer la construction entre
488 et 472, et probablement avant la bataille d'Himère en 480.



Stylobate and Roof in the Olympieion at Akragas

Author(s): Malcolm Bell

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Stylobate and Roof in the Olympieion at Akragas

MALCOLM BELL

(Pl. 47)

Tutto in quel tempio è degno di studio; perchè
tutto ha il suo perchè, e saldissimo perchè.

N. Palmeri, 1832.

Abstract

The Temple of Zeus at Akragas is poorly preserved and imperfectly known. This article offers an analysis of its dimensions and of the principles which might have determined the anomalous arrangement of the columns. Suggestions are made for the interior plan and for the roofing of the structure, which probably included an hypaethral section in the center. Pythagorean beliefs and number theories may have influenced the shaping of this unusual temple.

Among Doric temples the Olympieion of Akragas stands apart.¹ Anomalous in scale and architectural form, the building seems intended to set forth a radical solution to the problem of Doric design. In size it was the largest temple in Sicily and the largest ever attempted anywhere in the Doric order. The strange design (ill. 1) transforms the anticipated peristyle into a perimeter wall, creating interior spaces of unprecedented vastness. The order is treated with great freedom, with regard both to its structure and to the inclusion of non-Doric elements, some Ionic in origin and others unique. The temple bore the only major pedimental sculptures in Sicily, now almost entirely lost, and it incorporated into its design a series of colossal male

figures, or Atlantes, which for more than a century have provoked debate as to their function and meaning.

Modern interest in the Olympieion begins in the eighteenth century, when Diodoros' description of the temple challenged the imagination of Winckelmann.² His observations remain perceptive, despite the fact that he had no first-hand knowledge of the building. Haphazard excavation was commenced shortly after 1800, bringing to light the first of the Atlantes and stimulating the appearance of numerous pamphlets by local antiquarians and enthusiasts of the antique.³ Although the temple also attracted English, German, and Italian scholars and architects, it was not until the arrival of Koldewey and Puchstein in 1896 that study of the Olympieion was based on close observation of the building and extensive knowledge of the traditions of Greek architecture.⁴ The plans and drawings of Koldewey and Puchstein still offer after eighty years the most accurate account of the temple. More recently new evidence has been produced by the excavations of Marconi, Cultrera and Ricci, although only those of Marconi were ever published.⁵ Several specialized studies have also elucidated aspects of the building, but as yet there has been no attempt to

¹ I am indebted to the National Endowment for the Humanities for a fellowship which enabled me to study the Olympieion in 1976, and to Prof. Ernesto De Miro, Soprintendente alle Antichità di Agrigento, for his kind assistance during my visits to Agrigento. I also wish to thank Frank E. Brown, John F. Kenfield, Daniel T. Devereux, and Pamille Berg, who read and criticized a draft of this paper; and Erik Thorkildsen, who drew the plans and diagrams which appear in ill. 1, 2, 4 and 7.

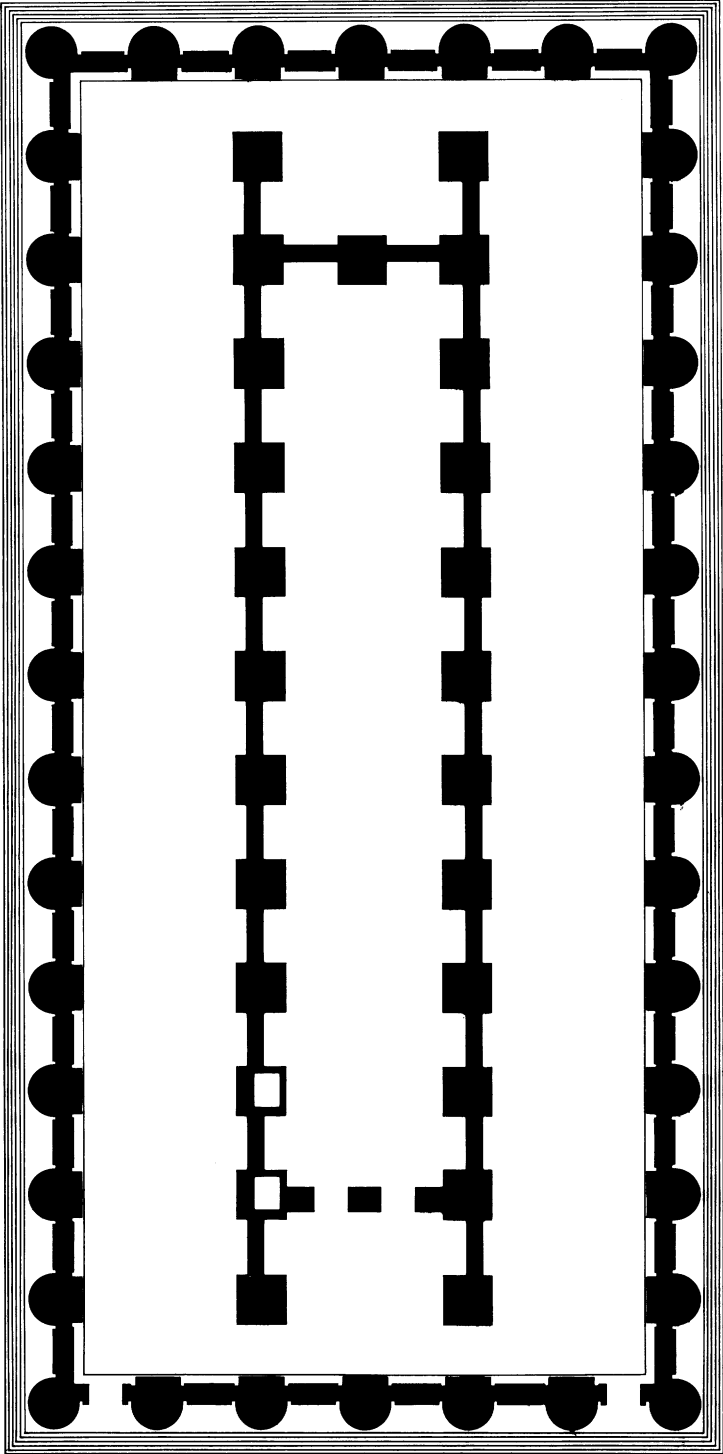
² J.J. Winckelmann, *Anmerkungen über die Baukunst der alten Tempel zu Girgenti in Sicilien* (1759), in *Sämtliche Werke*, vol. II (repr. 1825 ed., Osnabrück 1965) 312-26.

³ This pamphlet tradition combines varying portions of erudition, observation, and eloquence. It has also made several significant contributions to our understanding of the temple. The most prolific of the early writers was Raffaele Politi; others include L. Klenze, G. Lo Presti, N. Palmeri (a quotation from

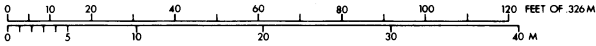
whom begins this paper) and the Marchese Haus. The engineer D. Bentivegna first suggested that the Atlantes support the architrave in every intercolumniation (in *Memoria sulla precisa collocazione dei giganti nel tempio di Giove Olimpico* [Girgenti 1875]); he did so some twenty years before Koldewey and Puchstein arrived independently at the same conclusion. A recent addition to this literature is A. Prado, *Il tempio di Zeus in Agrigento* (Agrigento 1973). Prado publishes plans of the 1940 excavations of G. Ricci.

⁴ R. Koldewey and O. Puchstein, *Die griechischen Tempel in Unteritalien und Sicilien* (Berlin 1899) 153-66, and pl. 23.

⁵ P. Marconi, "I telamoni dell'Olimpieion agrigentino," *BdA* (1926-27) 33-45; "Studi agrigentini, l'Olimpieion," *Rivista Arch* 1 (1929) 185-231; *Agrigento, topografia ed arte* (Florence 1929) 57-66; "Novità nell'Olimpieion di Agrigento," *Dedalo* 12 (1932) 165-73. For the excavations of G. Ricci, see *infra* n. 24.



ILL. 1. Olympeion at Akragas, plan



build on the evidence produced by the excavations of this century.⁶

Although several recent works on Greek architecture have expressed interest in the design of the Olympieion, there have been few attempts to account for the remarkable extent of its divergences from Doric norms.⁷ One effort at this sort of exegesis was made forty years ago by H. Drerup, who saw in the temple a reflection of the architectural traditions of the ancient Near East, consciously adopted by the Greeks of Akragas after their victory over the Carthaginians in 480.⁸ The Punic architecture of Carthage was then to be regarded as an intermediary. Although Drerup attempted to account for some of the unusual features of the temple, which was also placed in an historical context, his views have proved difficult to accept because of the absence of similar buildings in Punic sites of North Africa or even of buildings with similar details.⁹

The disastrous condition of the Olympieion, which is owed as much to human depredations as to the workings of nature, has always been a major obstacle to study. Because of the temple's ruinous state there are still many gaps in our understanding of its original appearance. We are, moreover, still very much in the dark about the more general ideas and intentions of the architect and builder, which find such remarkable expression in the building. Consideration of two aspects of the temple's design—the dimensions of the stylobate and the nature of the interior spaces—may help to explain at least some of its unusual features and also to suggest ways of approaching the larger problems of its originality.

⁶ F. Krischen, "Das Olympieion von Akragas," *AA* 1942, 1-19; P. Griffo, "Sulla collocazione dei telamoni nel tempio di Giove Olimpico in Agrigento," *Quaderni di Archeologia, Arte, e Storia* 2 (1952) = "Recenti ipotesi ricostruttive del tempio di Giove Olimpico in Agrigento," *Atti VII. Congresso Nazionale per la Storia dell'Architettura* (1956) 229-38; E. De Miro, "Nuovo frammento di Telamone dal tempio di Zeus in Agrigento e nuova ipotesi ricostruttiva," *CronCatania* 8 (1969) 47-52.

⁷ W.B. Dinsmoor, "The Basis of Greek Temple Design: Asia Minor, Greece, Italy," *Acts of the Seventh International Congress of Classical Archaeology* 1 (Rome 1961) 355-68; V. Scully, *The Earth, the Temple, and the Gods* (New Haven 1962) 142-44; F.E. Winter, "Tradition and Innovation in Doric Design I: Western Greek Temples," *AJA* 80 (1976) 143-45; J.J. Coulton, *Ancient Greek Architects at Work* (Ithaca 1977) 82-85.

⁸ H. Drerup, "Der Tempel des Zeus Olympios in Akragas," *Bericht über den VI. Internationalen Kongress für Archäologie,*

THE STYLOBATE

The first task is to determine the length of the foot used by the architect. The Olympieion belongs to the small group of Greek buildings whose dimensions were recorded by an ancient writer. In his brief but valuable description Diodoros tells us that the temple measured 340 feet in length, 160 in width, and 120 in height.¹⁰ If Diodoros' figures are compared with the metric stylobate dimensions recorded by Koldewey and Puchstein (W: 52.85 m., L: 110.00 m.), we find that two slightly different feet result for the width and length (W: 0.3303 m., L: 0.3235 m.), indicating that Diodoros' figures are not exact and may have been rounded off.¹¹ Yet these two "feet" are close enough to one another to suggest that the actual foot length was about 0.32-0.33 m. Indeed the use of such a foot would not be surprising, for the normal Doric foot in the fifth century B.C. has a length of ca. 0.326 m.¹² Using this foot, the width of 52.85 m. would become 162.116 F, and the length of 110.00 m. would equal 337.423 F. These dimensions depend of course on the accuracy of the modern measurements. They can be checked by working from the length of the interaxial spaces (the distance between the axes of the engaged columns), which is almost the same throughout the temple (ill. 1). The width and length of the stylobate equal the sum of the interaxials on ends and flanks, with the addition of two half-columns representing the extension of the stylobate beyond the axes of the corner columns (W = 6 I + 1 col.; L = 13 I + 1 col.).¹³ The intended interaxial was evidently 25 F (or 8.15 m.), and the column diameter was half

Berlin 1939 (Berlin 1940) 379-87.

⁹ It seems unlikely that a Greek architect of the early 5th century would have used barbarian models, even under the circumstances suggested by Drerup. This apparently did happen in the 4th century, at Selinus—where there was a strong Punic element in the population; see D. White, *AJA* 71 (1967) 341-52.

¹⁰ Diod. 13.82.1-5. Diodoros gives the width as sixty feet; the emendation to 160 is owed to Winckelmann (*supra* n. 2).

¹¹ I have used the measurements recorded by R. Koldewey and O. Puchstein (hereafter K-P). Dinsmoor's figures, except for width and length, are derived from averages, in W.B. Dinsmoor, *The Architecture of Ancient Greece* (London 1950) 338.

¹² W.B. Dinsmoor, (*supra* n. 7) 359-60. Henceforth the abbreviation F will be used for measurements in Greek feet.

¹³ The abbreviation I will be using hereafter to refer to interaxial spaces. Although the columns of the Olympieion are in fact engaged half-columns, they are centered on the stylobate and are treated by the architect as if they were normal columns.

this figure (12.5 F or 4.075 m). The width of the stylobate is therefore $25 \times 6 + 12.5 = 162.5$ F; the length is $25 \times 13 + 12.5 = 337.5$ F. These dimensions correspond closely to the figures in feet derived from division of Koldewey and Puchstein's metric width and length by a foot of 0.326 m. (162.116 F and 337.423 F).

If the dimensions of 162.5 by 337.5 F are correct, and the temple was accurately laid out in the manner suggested above, then its total metric dimensions *ought* to be 52.975 m. (162.5×0.326 m.; as against 52.85 Koldewey and Puchstein, 52.74 Dinsmoor) by 110.025 m. (337.5×0.326 ; as against 110.00 m. Koldewey and Puchstein, 110.095 Dinsmoor). The slight differences can be explained as the result of errors either in the modern metric measurements or in the laying out of the temple. It should be noted that accurate stylobate dimensions are today very difficult to obtain because of the ruinous state of the temple; for example, the width of the stylobate must be calculated on the east end, where neither corner is preserved. Projection of the flanks is therefore necessary, and there is strong probability that the metric dimensions are not entirely accurate.¹⁴

A similar procedure in planning the relationship of interaxials to stylobate had been followed a generation earlier, in the laying out of the temple of Athena at Poseidonia.¹⁵ There the desired total flank measurement of 100 F consists of 12 interaxials of 8 F, with the addition of 4 F corresponding to two column halves. But the similarity of the temple of Athena to the Olympieion lies not only in the way the interaxials of constant length were placed on the stylobate, but also in the fact that stylobate dimensions were themselves predetermined and fixed.

In the Olympieion the primacy of stylobate dimensions over other factors is demonstrated by the disparity between the ideal interaxial of 25 F (8.15 m.) and the slightly different interaxials on ends and flanks, as recorded by Koldewey and Puchstein (average on east: 8.071; on south: 8.121). The difference in end and flank interaxials is explained by

the necessity of accounting for the bases of the corner columns, which could not overlap the stylobate and consequently required that the axes of their columns be set back.¹⁶ Moreover, the bases were themselves set back slightly from the edge of the stylobate (ill. 2). The total amount of this setting back was then divided between the interaxials of ends and flanks, producing in consequence slightly wider spaces on the flanks, where there were more interaxials to absorb the adjustment, and smaller ones on the ends. Ill. 2 depicts an ideal interaxial. Assuming first that the column bases had a diameter of 13.5 F (or. 4.401 m.), which allows for an extension of $\frac{1}{2}$ F around the column, and then that the bases were set back another $\frac{1}{4}$ F, a total of $1\frac{1}{2}$ F had to be subtracted from the interaxials of ends and flanks. This amounts to 0.0815 m (or precisely $\frac{1}{4}$ F) per interaxial on the ends, and 0.0376 (not quite $\frac{1}{8}$ F, or 0.04075) on the flanks, or interaxials of 8.0685 m. on the ends and 8.1124 m. on the flanks. These adjusted interaxials are in general agreement with the average interaxials recorded by Koldewey and Puchstein (8.071 m. and 8.121 m.).¹⁷ It is necessary again to emphasize the difficulty of obtaining accurate measurements.

It is possible that there were further adjustments in the corner flank interaxials, as is suggested by Koldewey and Puchstein's slightly smaller measurements on the south (first interaxial: 7.99 m., second: 7.98 m.). If these figures are accurate, there may have been slight angle contraction, with the corner interaxials reduced by about $\frac{1}{2}$ F to $24\frac{1}{2}$ F (from 8.15 to 7.987 m.). Yet there is reason to question the significance of the short interaxials recorded by Koldewey and Puchstein. The first two interaxials are still covered by tons of debris and their measurements could only have been made from the centers of the interior pilasters. The amount of contraction is also quite insufficient, and there is, moreover, no contraction on the east end. The presence of angle contraction on the south flank therefore seems doubtful.

It is interesting to note that a similar situation

¹⁴ As is in fact suggested by the differences in Dinsmoor's and K-P's figures for length and width; the largest difference (0.11 m.) is in the width.

¹⁵ For the dimensions of the temple of Athena at Poseidonia, F. Krauss, *Die Tempel von Paestum I, Der Athenatempel* (Berlin 1959) 13-19.

¹⁶ I have used a base diameter of $13\frac{1}{2}$ F (4.401 m.); Dins-

moor assumes a base of ca. 4.30 m. On this and related questions, see the appended note on ill. 1 and 2.

¹⁷ The average interaxials are here calculated by dividing the total interaxial measurements (the distances between the axes of the corner columns) by the number of interaxials on the ends and flanks, or 6 and 13.



was faced by the architect of the temple of Athena at Poseidonia, who also had to make small adjustments in the interaxials because of a fixed stylobate dimension (there the length of 100 F). The baseless Doric columns were set back ca. 0.04 m. from the edge of the stylobate, and consequently ca. 0.08 m. had to be subtracted from the total axial measurement of the flank. The flank interaxials therefore have a length of $7 \frac{15}{16}$ F, rather than the planned 8 F. On the ends, where a fixed dimension was not a consideration, an amount equivalent to the margin ($\frac{1}{4}$ F) was then added to the width of the stylobate, and so—on the east end, at any rate—the interaxials approximate 8 F.¹⁸

Why could not an amount corresponding to the thickness of the column bases and their setback have been added to the length and width of the stylobate, thereby avoiding the necessity of making small adjustments to the interaxials? And, if we accept the presence of angle contraction on the flanks, why then could not the stylobate have been reduced by the proper amount, again avoiding adjustments? Such procedures were not followed in the Olympieion simply because the architect desired above all to preserve the dimensions of the stylobate, as expressed in a width of 162.5 F and a length of 337.5 F. In his comments on the Olympieion, W.B. Dinsmoor noted that, according to the dimensions recorded by Diodoros (160 by 340), the periphery of the stylobate measured *in toto* 1000 F.¹⁹ But the actual periphery was, according to Dinsmoor, only $994\frac{1}{2}$ F, a figure which resulted from his proposed foot length of 0.32712 m.²⁰ As a consequence of using the slightly smaller—and better documented—foot of 0.326 m., the periphery of the stylobate returns in its total length to the resounding figure of 1000 F. ($337.5 + 162.5 + 337.5 + 162.5 = 1000$). This agreement with the total dimensions of Diodoros seems both to confirm the foot of 0.326 m. and to suggest that Diodoros' figures, while rounded off, still produce accurately the

larger number which was a major factor in the planning of the temple.

It may be that in the early planning stages the architect began with the dimensions recorded by Diodoros. With a width of 160 F and a length of 340 F the temple would have the desired periphery of 1000 F, and its ends and flanks would be related in the ratio of 8:17. Yet it was still necessary to place columns on the stylobate. The architect apparently had clear ideas about these as well, for the number of columns on ends and flanks (7 by 14) was to be related in the ratio of 1:2. Small changes had to be made if these were to be fitted on the hypothetical stylobate proportioned 160 by 340. Working with interaxials of 25 F and 7 by 14 columns, the total interaxial measurements came to 150 by 325 F; to these figures had to be added the width of one column, the diameter of which in relation to the interaxial was determined by the same ratio that had governed the number of columns on ends and flanks. The columns therefore had a diameter of $12\frac{1}{2}$ F, which, added to the total interaxial figures, gave a width $2\frac{1}{2}$ F greater than 160, and a length $2\frac{1}{2}$ F smaller than 340—and, still, a total peripheral dimension of 1000 F. The ratio of width to length was now 13:27. The problem of fitting the columns with their broad bases on the stylobate required small adjustments, as apparently did the angle contraction on the flanks, but these were made in the interaxials and not in the overall dimensions of the stylobate, which were not altered.

If this account of the stylobate dimensions of the Olympieion is correct, then there is no reason to assume, as has been done, that the building's length was derived from temple GT at Selinus, and the width calculated therefrom.²¹ The fact that the two buildings have almost the same length is coincidental, for in both the length was determined by internal considerations. The dimensions of the Olympieion begin with the decision to build a great temple to Zeus with a peripheral measure-

¹⁸ For the dimensions of the Temple of Athena, see Krauss (supra n. 15). For a different explanation of the stylobate of this temple, J.J. Coulton, *BSA* 69 (1974) 81 (using Dinsmoor's figures). Despite the obvious differences, the Temple of Athena has many similarities with the Olympieion; interest in number is combined with great freedom in the handling of the order. See also *infra* n. 51.

¹⁹ Dinsmoor (supra n. 7) 361.

²⁰ Dinsmoor derived this foot from a hypothetical normal

flank interaxial of 8.180 m. = 25 F. The dimensions of the stylobate would then be simply the sum of a sequence of interaxials of slightly varying size. This hypothesis does not account for the difference between the "normal" flank interaxial and the smaller interaxials on the ends. In the present study it is assumed that stylobate proportions determined the length of the interaxials, rather than vice versa.

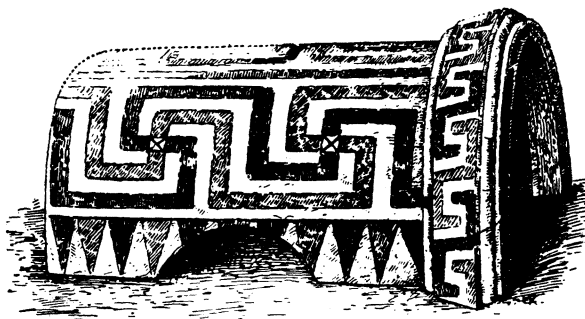
²¹ Coulton (supra n. 18) 71.

ment of 1000 F. The architect's choice of this number is probably significant, as are the stylobate proportions of 13:27. Reasons for the use of such numbers will be suggested in the conclusion.

THE CENTRAL SPACE

Our evidence for the interior of the Olympieion (ill. 1) is even more unsatisfactory than for the exterior. The rows of piers which divided the building into three long spaces were constructed of relatively small blocks, as were the intervening screen walls and the two cross walls, and consequently it was the interior that suffered most when the temple was used as a quarry in the eighteenth century and earlier. Only three piers are preserved above the interior floor level (south pier 1, north 1 and 12), although others can be traced at varying foundation levels. There are no known blocks which can be assigned either to the pilasters which formed the outer sides of the piers, or to the massive piers themselves; and so very little can be said about the parts of these supports which would interest us most, namely their capitals and entablature.

Despite the paucity of evidence, it is still possible to come to an understanding of the interior arrangement of the Olympieion which is accurate in its general outlines. The most important evidence was recovered in the excavations of P. Marconi and G. Ricci. In 1926 Marconi found numerous fragments of terracotta roof tiles in the south hall, including several pieces which belong to kalypteres (ill. 3).²² The presence of such tiles, which were intended to run along the summit of a pitched roof, within the south hall indicates that this part of the building had such a roof with two slopes, and these can only have run east-west—that is, along the long axis of the temple. A similar roof over the north hall can be assumed. These huge roofed halls (ill. 4) must then be the spaces which Diodoros calls *στοαί* and which in their size and height greatly impressed him.²³ The inner slopes of



ILL. 3. Olympieion at Akragas, terracotta kalypter. (Drawn by R. Carta)

the roofs then must have been inclined towards the central space of the temple, and so it is hard to avoid the conclusion that this space was from the start intended to be open to the sky.

The proof, if it be needed, for an open court was found by Ricci in the important war-time excavations of 1940, which unfortunately have never been published.²⁴ Concentrated in the eastern sector of the temple (ill. 1), the excavations laid bare the foundations of piers 1-3 in the north and south rows and pier 4 in the north row, and also revealed for the first time the foundations of the pronaos wall between the second pair of piers.²⁵ A second important discovery was made at the time, the significance of which has not been appreciated. Piers S 2 and S 3 (pl. 47, figs. 1-2) were revealed to be hollow, with rectangular shafts extending deep into their foundations.²⁶ The shaft in S 2 is at least as deep as the tenth foundation course, while that in S 3 is present in the uppermost surviving foundation course immediately below the ancient floor level, and extends down at least nine courses. The bottoms of both shafts are today covered by debris and so their full depths cannot be ascertained. The foundation courses are 2 F in height (ca. 0.63-0.65 m.), and thus the depth of both shafts below the ancient floor level is more than 20 F, or six meters. Both shafts are rectangular, measuring 1.95 by 2.60 m. (6 by 8 F, thus

²² P. Marconi, "Studi agrigentini II," *RivStArch* 1 (1929) 220-24.

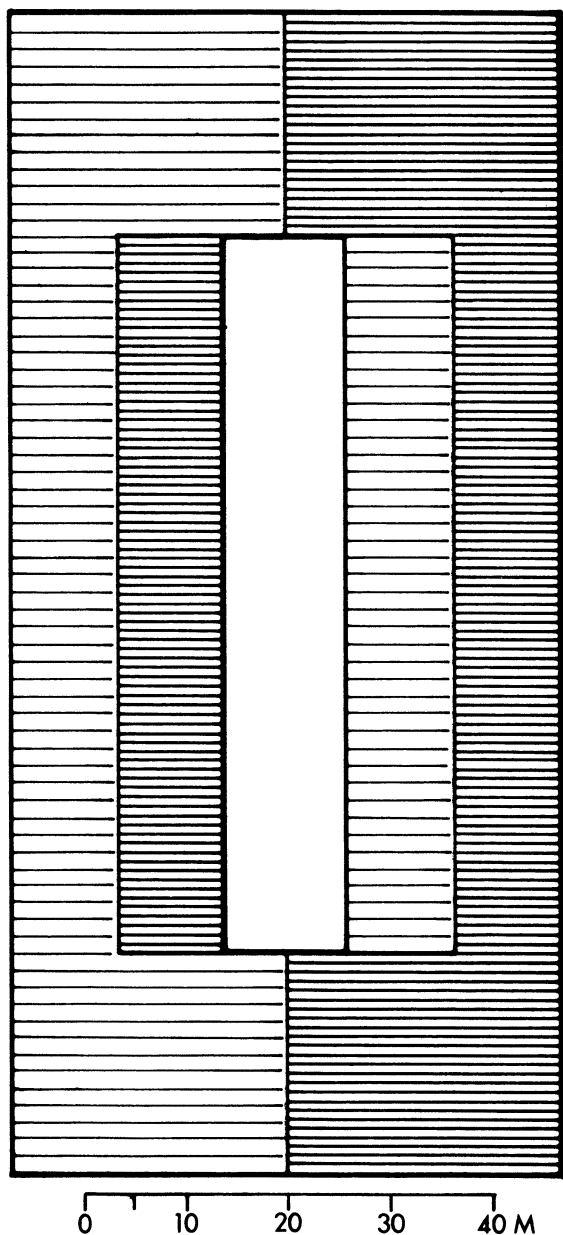
²³ Diod. 13.82.4. Marconi considered this solution but rejected it.

²⁴ G. Ricci, *Le Arti* 3 (1940-41) 135-36; H. Fuhrmann, *AA* 1941, 687-88; P. Griffo, "Ultimi scavi e scoperte in Agrigento," *Quaderni di Archeologia, Arte, Storia* 3 (1946) 18-19; A. Prado, *Il tempio di Zeus in Agrigento* (Agrigento 1973) 20, fig. 5

(the only published plan of the 1940 excavation).

²⁵ The piers have been numbered beginning at the east: N 2 indicates the second pier in the northern row. Of the piers excavated in 1940, only S 1 and N 1 are preserved above floor level; S 3 survives to the uppermost foundation course, while S 2 and N 2 and 3 are reduced to the lowest foundation levels. N 3 and 4 have been covered over again.

²⁶ Griffo (supra n. 24) 19.



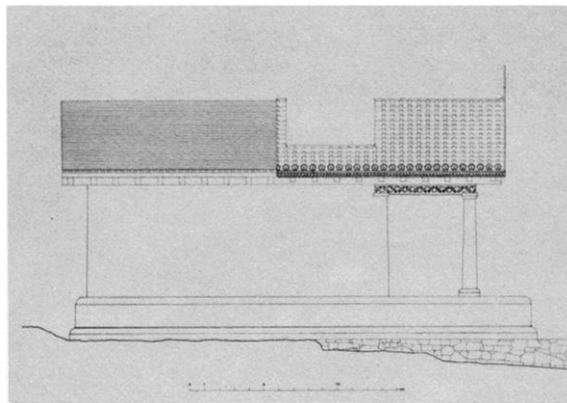
ILL. 4. Olympeion at Akragas, roofing diagram

proportioned 3:4), and they are so placed within the piers as to leave a thicker wall on the sides which face the south hall (pl. 47, fig. 2). The inner surfaces of both shafts are covered with a layer of hydraulic cement, 0.025 m. in thickness.²⁷

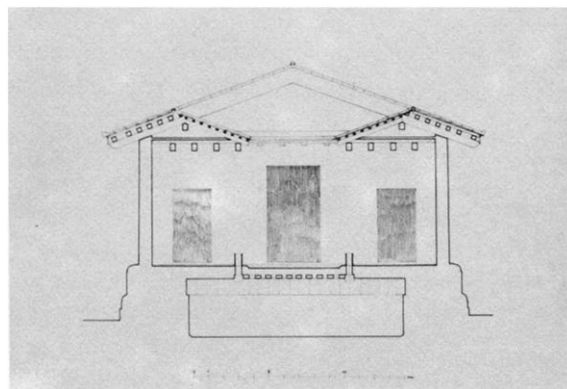
²⁷ Griffo (supra n. 24) 19.

²⁸ Winter (supra n. 7) 144.

²⁹ One of the piers above the interior floor level may have housed a wooden stair, giving access to the roofs; so Ricci,



ILL. 5. Capitulum at Cosa, restored elevation.
(By F.E. Brown)

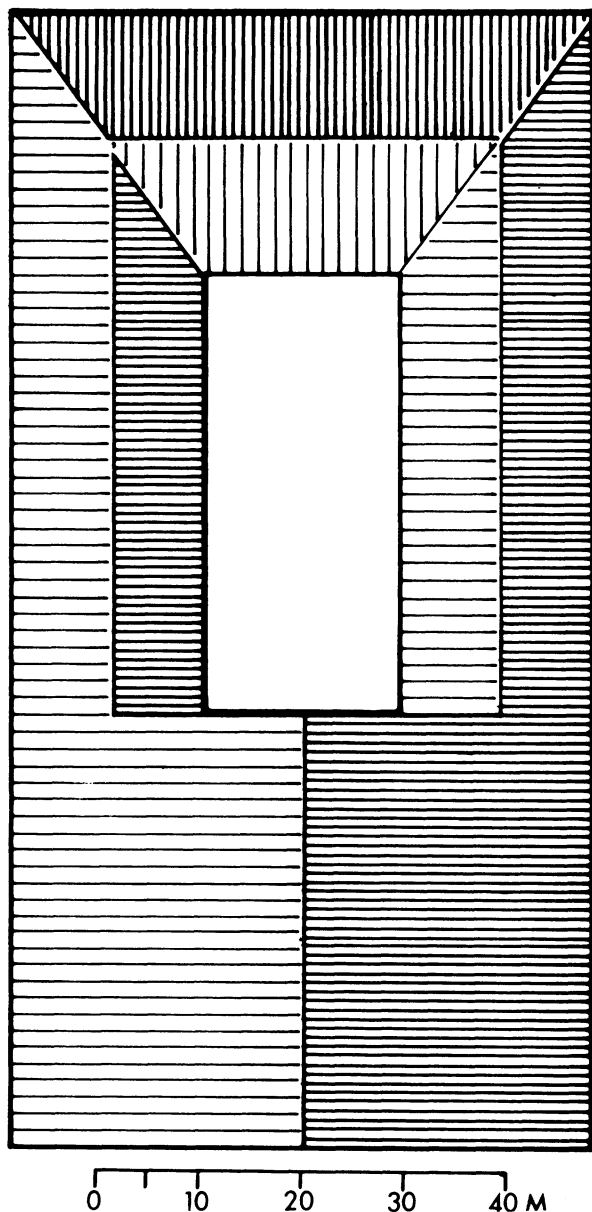


ILL. 6. Capitulum at Cosa, restored section.
(By F.E. Brown)

This cement is an unmistakable sign of the function of the two shafts: they were cisterns, and the water that filled them must have come both from the runoff of the inner slope of the roof over the south hall and from the hypaethral court.

The massive piers extend into the central space much more than into the two halls, and it has recently been argued that they were therefore intended to carry a roof at pediment level.²⁸ Yet the shafts in piers S 2 and S 3 must have been carried through to the tops of their respective piers, and it seems unlikely that hollow supports of this sort could have been used to sustain such a high roof.²⁹

(supra n. 24) 136; the other shaft must then have been open to the roof, serving to channel rainwater into the cistern. In this case the two cisterns may have been connected by a passage at their lowest level.



ILL. 7. Archaic temple of Artemis at Ephesos, roofing diagram. (After A. Bammer)

Moreover, the thicker walls on the outer sides of the piers correspond to the pilasters of the south hall, which, as is shown by Marconi's kalypteres, did carry a roof. An even greater objection to a roof over the central space is raised by these lateral roofs. Marconi's tiles show that they had two slopes, and the cisterns reveal what became of the rain that fell on their inner surfaces. Another pitched roof over the central space would have in-

terfered fatally with the runoff of the hall roofs. The presence of cisterns within two internal piers thus precludes a roof over the central space of the temple. The Olympieion evidently belongs among those temples of Zeus identified by Vitruvius as being hypaethral (*De arch.* 1.2.5, 3.2.8).

Cisterns are normally filled by the runoff of a roof or of an exposed paved area at ground level, and the presence of cisterns within a building indicates that there must have been an opening in its roof, in the form of a central court or compluvium. Cisterns are not therefore normally found in peristyle temples, and I know of no parallel among Doric temples for the cisterns in the Olympieion. As far as I know, cisterns do not occur in hypaethral temples, where they might be expected. In both the archaic and later temples at Didyma, drains were provided to carry off any water that fell in the central court.³⁰ The arrangements in the archaic Artemision at Ephesos, presumed to have been hypaethral, are evidently not known.³¹

An interesting parallel for the Olympieion is found in the Capitolium of the Roman Republican colony of Cosa.³² This podium temple in the Italic tradition was built towards the middle of the second century B.C. Under the porch is a large cistern,

³⁰ T. Wiegand, *Didyma I*, H. Knackfuss, *Die Baubeschreibung* (Berlin 1941) 54, pl. 105, 149 (later temple); 121b (earlier temple). See also B. Kehr, "Zur Geschichte des Apollonheiligtums von Didyma," *MarbWinck Prog* 1971-72, 56.

³¹ Not discussed in A. Bammer, *Die Architektur des jüngeren Artemision von Ephesos* (Wiesbaden 1972). Temple GT at Selinus was hypaethral and cisterns may well have been used there in the generation preceding the planning of the Olympieion. Orsi believed that the Athenaion at Syracuse was hypaethral; although he has not been followed in this, the circumstance which led him to such a conclusion remains problematical: a large drain runs away from the north side of the temple, connecting with a N-S channel which emerges from the third foundation course below the euthynteria. If the drain continues into the temple at a right angle to the flank, as it appears to do, it must come from the area of the cella. Below the pronaos of the Athenaion are two open rooms, formed by N-S foundation walls; these spaces give no evidence of ever having served any specific function, and they were certainly not cisterns. Yet the existence of open spaces beneath the pronaos suggests at least the possibility that there might be others beneath the cella, and the drain raises the possibility that these might have been cisterns. The source of the water which left the temple via this drain is indeed mysterious, and Orsi's proposed hypaethral cella offers a solution to the problem; on the drain, P. Orsi, *MonAnt* 25 (1918) 380-90, figs. 15-16; on the rooms beneath the pronaos, P. Orsi, *NSc* 1910, 537-38, pls. A, B.

³² F.E. Brown, in *Cosa II* (*MAAR* 26, 1960) 59-65, figs. 74, 75. I am indebted to Prof. Brown for the elevation and section which appear in ills. 5-6.

which can only have been filled by rainwater falling from a compluvium in the roof above (ills. 5-6). Frank E. Brown's reconstruction of the wooden roof of the Capitolium gives us a valuable parallel for the roof at Akragas. Despite the differences in size and function of the openings, the smaller pitched roofs which flank the compluvium at Cosa are quite similar to the roofs here proposed for the two halls of the Olympieion. At Cosa the main roof is placed at the level of the exterior gables, as would be expected, and this was probably also the case at Akragas (ill. 4).

Central ridge-poles will then have extended from the apex of the pediments as far as the two cross-walls (ill. 1) which define the pronaos and adyton (or opisthodomos, as it may be), and there will have been internal "pediments," perhaps of wood, above these walls. A lower roof over pronaos and adyton, at the level of the roofs of the two long halls, seems unlikely, for then the east and west pediments would have had no more function than a Baroque church facade, rising high above the roof behind. A solution which places a high pitched roof over pronaos and adyton, and lower pitched roofs on the flanks, is similar to the roofing system proposed by A. Bammer for the first Artemision (ills. 4, 7).³³

The hypaethral court must have served as a great light-well for the illumination of the two flanking halls. The walls which connect the piers are not so thick as their counterparts between the columns and so must not have been as high; rather, these were screen walls which terminated at a certain height in order to let light into the two halls. They are analogous to the exterior screen walls of temple F at Selinus. As for windows in the *exterior* inter-columnar walls, enough of the fallen sections of this wall remains together at the second column of the south flank to prove that exterior windows never existed.³⁴

The presence of elements of the Ionic order in the Olympieion has long been known.³⁵ The engaged columns of the exterior are set on high

bases, decorated with narrow mouldings; Ionic mouldings were used in the elevation; and the use of Atlantes as a supporting device is evidently derived from the caryatids of Ionic origin. The great size of the Olympieion and its high, stepped platform are also eastern features, and it seems possible that even the pilaster order of the south and north halls is derived from some source in Asia Minor, perhaps the archaic Didymaion.³⁶ Not least among the Ionic elements of the Sicilian temple is the hypaethral court, which must have been suggested to the architect by the colossi at Ephesos and Didyma.

AN INTERPRETATION

Although the Ionic features of the Olympieion can be interpreted as an appropriate response to the decision to build a very large temple, they explain neither that decision nor the essential strangeness of the building which resulted from it. One approach to these questions is suggested by the numbers and proportions which were used in the temple's design. Although an interest in number would hardly be surprising in an architect of the early fifth century, here it is a question of the particular numbers and proportions which were used. Three areas seem especially significant: the total peripheral dimension of the stylobate, the number of columns chosen for the ends and flanks, and the ratio of width to length in the stylobate. In each case the numbers or ratios appear to have significance in Pythagorean numerology.

The size of the Olympieion on the stylobate was evidently determined by the total dimension of 1000 F, and we have seen that the architect preferred to make small adjustments in the interaxials rather than adopt the easier solution of altering the width and length of the stylobate. The number 1000 is the cube of 10, which as is well known was the most meaningful of numbers for Pythagoras and his disciples. Ten is the sum of the first four digits, which form the components of the most important intervals of the musical scale: the octave

³³ Bammer (supra n. 31) 13, fig. 8; see also G. Gruben, "Das archaische Didymaion," *Jdl* 78 (1963) 151, fig. 37 (hipped roof on ends).

³⁴ I intend to deal with the problems of the elevation of the Olympieion in a later and more extended study.

³⁵ F. Krischen, "Das Olympieion von Akragas," *AA* 1942, 1-19; Winter (supra n. 7) 145. The freedom with which Ionic

features are combined with the Doric in the Olympieion suggests a deliberate improvement on—even criticism of—Temple GT at Selinus, where the purely Doric solution seems, even today, clumsy and inappropriate in a temple of such large scale—however daring the conception may be.

³⁶ G. Gruben (supra n. 33) 172.

1:2, the fifth 3:2, and the fourth 3:4. The number 10 was symbolized by the *tetraktys*, the equilateral triangle formed of ten dots arranged in four rows. The Pythagoreioi called this "the source and stem of ever-flowing nature," and on it they swore oaths.³⁷ The *tetraktys* embodied all numbers, but its basic elements were three and ten. The number 1000, ten to the third power, may be understood as deriving from the *tetraktys*, and the temple may then be seen as a physical embodiment of the sacred symbol, generated from the number ten.

The number 1000 also appears to have had symbolic value. In Pythagorean doctrine about metempsychosis each cycle of incarnation was believed to last a fixed number of years or seasons, which were often calculated as exponential multiples of ten. Thus Empedokles, who was Akragas' greatest son, declared that the soul returns to a new body after 10,000 years.³⁸ Plato later described cycles of 1000 years.³⁹ It is generally assumed that Plato drew on Pythagorean sources but it has not been determined whether his thousand year cycle was an article of belief in the fifth century.⁴⁰ Although the stylobate dimension of 1000 F in the Olympieion probably was *not* derived from doctrine about metempsychosis, the number itself evidently was significant in Pythagorean thought.

A second possible manifestation of Pythagorean numerology occurs in the use, in the design of the temple, of proportions based on the octave. This was "the most beautiful of the (musical) intervals and the best of ratios."⁴¹ Not only are the engaged

columns on ends and flanks in the unique proportion of seven to fourteen, but the proportion of column diameter to interaxial is in the same ratio of 1:2. The number of columns seems particularly curious; the choice of seven columns for the ends required that there be a central column, rather than a void, something carefully avoided in normal Doric design. Although a number of contemporary or slightly earlier temples have peristyles with six by twelve columns, none has seven by fourteen. Other measurements based on the major intervals of the scale are found elsewhere in the building.⁴²

A third possible appearance of Pythagorean number theory is found in the ratio of width to length in the stylobate, $162\frac{1}{2}:337\frac{1}{2}$ or 13:27. Both 13 and 27 have symbolic meaning in the musical theory of the fifth century Pythagorean Philolaos.⁴³ In his calculations of the smaller intervals of the diatonic scale, 27 represented the whole tone and 13 represented the *diesis*, or smaller semitone.⁴⁴ It would therefore seem that the ratio of width to length in the Olympieion consists of those numbers which signified for Philolaos the tone and semitone, the basic units of the scale—just as the total dimensions appear to have been generated from the number 10, which symbolized, among other things, the major musical intervals.⁴⁵

The occurrence of significant numbers and proportions in the Olympieion raises the question of whether the religious consciousness which shaped the temple's remarkable interior may not also have had a Pythagorean orientation. The followers of

³⁷ On the *tetraktys*, A. Delatte, *Etudes sur la littérature pythagoricienne* (Paris 1915) 249-68; W. Burkert, *Lore and Science in Ancient Pythagoreanism*, trans. Edwin L. Minar, Jr. (Cambridge, Mass. 1972) 72, n. 120.

³⁸ H. Diels and W. Kranz, *Die Fragmente der Vorsokratiker* I (Berlin 1951) Empedokles 115.

³⁹ Plat., *Rep.* 615a, *Phaedrus* 249a. In (Iamblichos) *Theologoumena Arithmeticae* (ed. de Falco) 52.10ff., the cycle of incarnation consists instead of 216 years; 216 is the cube of 6, as 1000 is the cube of 10.

⁴⁰ See A.E. Taylor, *Plato, the Man and his Work* (Cleveland and New York 1956) 308, n. 1; R. Hackforth, *Plato's Phaedrus* (Cambridge 1952) 83, n. 1; W.K.C. Guthrie, *A History of Greek Philosophy* II (Cambridge 1965) 253.

⁴¹ Ptol., *Harm.* (ed. Düring) 11.21-22 . . . τῶν τε συμφωνῶν ἢ διὰ πασῶν ἐστὶ κάλλιστη καὶ τῶν λόγων ὁ διπλάσιος ἄριστος.

⁴² Even the blocks of the exterior wall measure 2 by 4 feet; other intervals are found in the elevation, as that of the sima and geison (3:2). No other temple has a peristyle of 7 by 14 columns. The proportions of the Temple of Poseidon in Plato's *Atlantis* are 1:2 (*Kritias* 116c).

⁴³ Burkert (supra n. 37) 389, 399-400.

⁴⁴ Twenty-seven is the difference between the interval of the whole tone 243:216 ($9.8 = 243:216$). Thirteen is the difference between the interval 256:243; this is the remainder when two whole tones are subtracted from a fourth: $(4:3):(9:8):(9:8) = 256:243$. This is the *λείπον* of Plato, *Tim.* 36a-b, called the *diesis* by the Pythagoreans. The theory of Philolaos is discussed by Burkert (supra n. 37). According to Plutarch, *De an. procr.* 14.1019a, it is with the numbers 13 and 27 that "the mathematicians measure clearly the melodic intervals, calling one the *diesis*, the other the tone."

⁴⁵ It is interesting to note that the significance of the ratio 13:27 lies not in the ratio itself but in the symbolic value of its components. In this respect "Pythagorean design theory" differs from usual Greek practice, in which simple ratios of small whole numbers play a more important role. The proportions of the Olympieion are derived from a symbolic harmony, whereas those of the Parthenon ($W:L = 4:9$) are based more on a harmony of perception—even if $2^3:3^2 = 4:9$. The Olympieion also belongs to the tradition of designing with sacred measurements, as exemplified in the 100 foot temples of the archaic period. See also *infra* n. 51.

Pythagoras did not ignore the traditional gods; the philosopher himself was identified with Apollo, and to the question, "What is most just?," his disciple replied, "to sacrifice."⁴⁶ In Pythagorean cosmological thought Zeus was associated with the fire which burned at the center of the universe. This central place was referred to allusively as the *φυλακὴ Διός*,⁴⁷ *Ζανὸς πύργος*, *Θρόνος Διός*⁴⁸ and *οἶκος Διός*:⁴⁹ Guardhouse, Tower, Throne, and House of Zeus. Could it be that one or more of these images, which are concrete and strikingly architectural, lies behind the strange form of the Olympieion, that the temple should be seen as a symbolic representation of Zeus' seat at the center of the universe? The light-filled court at the center of the temple, an appropriate focus for the cult of Zeus as a celestial god, could also have been planned as a place for a central fire or hearth.⁵⁰ Unfortunately we have no literary or archaeological evidence to explain the function of the interior spaces, so such hypotheses cannot be tested. Yet the interior of the temple is unique in the sacred architecture of the classical period. Given the possibility of a Pythagorean contribution to the planning of the building, speculation about the function and meaning of the interior spaces, and about the form of the building as a whole, seems justified.⁵¹

To what extent are Pythagorean ideas likely to have circulated in Akragas in the early fifth century? The sources which associate Pythagoras himself with the city are all late and of little value. Although Iamblichos includes Akragas among the cities which the philosopher is supposed to have set free, such an event is otherwise unattested and difficult to reconcile with historical tradition.⁵² The Hellenistic writer Hermippos claimed that Pythag-

oras died after a battle between Syracusans and Akragantines, when he refused to retreat across a field of beans.⁵³ Pythagoras' death in Metapontion in southern Italy is better attested and Hermippos' account is rightly identified as a piece of anti-Pythagorean ridicule.⁵⁴ There is no evidence to suggest that the philosopher ever visited Akragas, or even Sicily. In Iamblichos' list of famous Pythagoreans the only Akragantine is Empedokles, who was born in the 470s and came to maturity after the building of the Olympieion.⁵⁵ Yet Empedokles was strongly influenced by Pythagoras, whose ideas are likely to have been current in Akragas at least as early as the youth of the younger philosopher.

The best evidence for knowledge of Pythagoreanism in Akragas in the first quarter of the century is found in a literary work written by a poet from the Greek homeland. The second Olympian Ode of Pindar was composed for Theron, ruler of Akragas, to commemorate his chariot victory in the games of 476. To celebrate the victory Pindar came to Akragas. In the unusually personal second Olympian, Pindar describes the dynast's expectation of an exalted existence after death, promised by his achievements, high position and virtue. Pindar alludes to metempsychosis, a judgment in the underworld, and the attainment of an heroic existence after death. Pindar hardly needs to invoke the name of Pythagoras to remind us that such beliefs form the core of Pythagorean doctrine about the survival of the soul.

Truly wealth patterned with prowess
Brings the moment for this or for that,
If it rouses deep ambition to range afar,

Hesiod, *Theog.* 517-19, Zeus punishes Atlas with his Ananke, requiring the rebellious Titan to uphold the sky forever. The Atlantes of the temple should be viewed in such terms, not as symbols of the defeated Carthaginians after Himera.

⁵¹ Pythagorean number theory has been proposed for the Temple of Athena at Poseidonia by R.R. Holloway, "Architettura sacra e matematica pitagorica a Paestum," *ParPass* 21 (1966) 60-64.

⁵² Iamblichos, *De vita Pyth.* 20.1.

⁵³ Diog. Laert., *Pythagoras* 40, 45; also schol. Plato, *Rep.* 600b. The battle fought in 476 between Syracusans and Akragantines (Diod. 11.53.4-5), won by the former, might be considered a possible candidate for this event, but the participation of the aged philosopher seems most improbable.

⁵⁴ Aristotle, frag. 191; Aristoxenos, frag. 18.

⁵⁵ Iamblichos, *De vita Pyth.*

⁴⁶ On the identification of Pythagoras with Apollo, see Burkert (supra n. 37) 141-46; Iamblichos, *De Vita Pyth.* 144 (the commandment "first honor the gods. . .").

⁴⁷ Aristotle, *De caelo* 293b.1-11; also Aristotle, frag. 204 (Simplicius, in *De caelo* 511.25).

⁴⁸ Aristotle, frag. 204.

⁴⁹ Diels and Kranz (supra n. 38) 44 A 16, where other terms including "altar," "hearth" and "meeting point" are used. In Plato, *Kritias* 121c, Zeus assembles the gods in the center of the universe.

⁵⁰ See Burkert (supra n. 37) 350, n. 64. I take Empedokles, frag. 142, to refer to the *oikos Dios* literally. With its plan derived from significant numbers, the Olympieion might also be called a *μέτρον φύσεως* (Diels and Kranz, A 44 16). The Atlantes of the Olympieion may also have a symbolic meaning; in *Theologoumena Arith.*, 80.5, 82.5, the number ten was identified "by the Pythagorikoi" with both Atlas and Ananke. In

A transcendent star, the truest light for a man.
 —If any man has it, and knows what shall come,—
 That of those who die here
 The lawless souls at once pay penalty,
 And sins done in this kingdom of Zeus
 Are judged by one below earth
 With harsh inexorable doom.

But in nights like ours for ever,
 With a like sun in their days,
 The good win a life without labor,
 Nor brace their hands to trouble earth
 Or the sea's water for an empty livelihood.
 Beside the most honored of Gods
 Those who delighted to keep their word
 Pass unweeping days; the others
 Support a burden not to be looked upon.

All who have endured three times
 In a sojourn in either world,
 To keep their souls utterly clean of wrong,
 Go by God's road to the Tower of Kronos,
 Where the Airs, daughters of Ocean,
 Blow round the Island of the Blest,
 And the flowers are of gold. . . .

OL. II, 52-74, trans. Bowra

These beliefs are not so much the poet's own as his patron's. Pindar "turns into high poetry Theron's own views, and he is able to do this because he must to some extent have absorbed them into his imaginative consciousness. Theron must have instructed Pindar on his own esoteric beliefs."⁵⁶ Theron was given heroic honors after his death; his tomb was of extraordinary size, as would befit a man who was believed to have become a god.⁵⁷

Theron ruled Akragas from 488 until his death in 472. The building of the Olympieion is generally thought to have commenced only after the great victory over the Carthaginians at Himera in 480, in which Theron played a decisive role, but there is no conclusive evidence to support this view. A passage in Diodoros indicates that the city's largest buildings were constructed by Carthaginian prisoners captured at Himera, but Diodoros says nothing about the inception of work on such buildings,

nor does he refer specifically to the Olympieion.⁵⁸ W.B. Dinsmoor argued that the date of the temple should be pushed back to ca. 510 B.C., on the grounds of the absence of appreciable angle contraction and his own assumption that the Olympieion was an immediate response to the building of Temple GT at Selinus, which is dated about 525.⁵⁹ In light of the interpretation of the Olympieion which has been offered here, neither of these arguments seems particularly valid.⁶⁰ Moreover, in 510 B.C. Akragas had been in existence for only seventy years and could hardly have sustained the construction of such a large and costly edifice.

Yet Dinsmoor's assertion that the Olympieion was begun before the battle of Himera seems to me to be correct. Because of the late archaic sculptural style of the Atlantes and the profiles of the capitals, which point together to the late 470s, there is every reason to believe that the Olympieion was begun well before Theron's death in 472.⁶¹ His rule over Akragas is usually assumed to have been established in 488, but he is already mentioned with a certain awe in the sixth Pythian of Pindar, written for his brother Xenokrates in 490.⁶² Although a date for the beginning of work after 480 remains possible, an earlier start during the decade 490-480 seems to me to be more probable. Sufficient time would then be allowed for the planning phases and for construction up to the level of the capitals at about the time of Theron's death. In this view the Carthaginian work force will have contributed to the completion of a building project already in progress.

The apparent Pythagorean elements of the Olympieion suggest that the temple should be associated with Theron himself, rather than with the victory over the Carthaginians. The dynast must have known of the great buildings begun by such autocratic rulers as Polykrates of Samos and the Peisistratids in Athens, and so on his accession to power a project of comparable scale may have seemed fitting to him. The story of Theron's seizing of power is in fact associated with the building contract which he held for a temple to Athena, and

⁵⁶ M. Bowra, *Pindar* (Oxford 1964) 121. See also U. Wilamowitz von Moellendorff, *Pindaros* (Berlin 1922) 243.

⁵⁷ Diod. 11.53.2, 13.86.2.

⁵⁸ Diod. 11.25; see also Winter (supra n. 7) 143.

⁵⁹ Dinsmoor (supra n. 11) 101.

⁶⁰ Angle contraction is (largely) ignored because of the primacy of stylobate dimensions; the similarity of the two build-

ings is limited to their length and, as has been suggested above, this is coincidental.

⁶¹ Dinsmoor (supra n. 11) 101, n. 1.

⁶² Pindar, *Pyth.* 6.46. The beginning of Theron's reign is assigned to 488, as Diodoros states that he ruled sixteen years and died in 472 (11.53.1).

there is much other evidence for his interest in embellishing Akragas.⁶³ The Olympieion was the most ambitious of these undertakings. It would demonstrate not only the magnificence of his reign, but the harmony of nature perceived in number. It stood as a microcosm, an offering to Zeus who was perceived as the embodiment of the order of the cosmos. For the Olympieion, Theron chose an architect of great imaginative power, who was, like Pindar, in sympathy with his religious ideas. These then evidently became the determining influence on the building's form.

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A NOTE ON ILLS. 1 AND 2

Any plan of the Olympieion must be in good part hypothetical. The plan which appears here as ill. 1 assumes original stylobate dimensions of $337\frac{1}{2}$ by $162\frac{1}{2}$ feet, as described above; and a foot unit of 0.326 m. The interaxial is slightly less than 25 feet. Doors are placed in the outermost intercolumnar spaces of the east facade; the presence of the intercolumnar wall in the four central spaces (preserved only in interaxials E 2-3 and 3-4) eliminates the possibility of doors there, as has long been known.⁶⁴ Similar doors may once have existed in the same positions at the west end, which is now totally destroyed. Steps must once have been cut into the raised stylobate platform at the doors, both on the exterior and interior; the upper surface of the stylobate is so much higher than the top step on the exterior (1.10 m.) and the paving blocks on the interior (ca. 0.80 m.) that such steps were necessary. They do not survive at E 1-2 and are not indicated on the plan.

The two N-S cross walls which delimit the hypaethral central space at east and west are shown in the plan in somewhat hypothetical form. The location and thickness of the walls is established by the surviving foundations (thickness: east, ca. 1.95 m.; west, ca. 1.35 m.). The east wall is much thicker than the E-W screen walls running between the piers, and so, unlike them, must have been a bearing wall, supporting the internal "pediment" behind the east facade (cf. ill. 4). Any proposal for doors in this wall must remain conjectural, for the foundations are preserved no higher than six courses below interior floor level. The western cross wall has the same thickness as the screen wall between the piers. If there was also an internal "pediment" here (there can be no doubt about the external west pediment, which is mentioned by Diodo-

ros and blocks of which still survive with their relief sculptures) then it may have been carried by a central pier, substituting for the thicker wall at the east. I can offer two observations in support of this hypothesis: the positioning of the wall in relation to the two piers which it joins to north and south produces the same setback as that of the E-W screen walls (ca. 2.0 m.), so that the projection of the supposed central pier from the cross wall would agree with that of the other piers; and an analogous central pilaster appears at the short ends of the north and south halls. The west cross wall has never been fully uncovered; excavation would no doubt produce more evidence than is available at present.

Illustration 2 illustrates an ideal interaxial, without adjustments. No interaxial or column is sufficiently well preserved to make a complete measured drawing possible, and so this one is a composite, based on measurements taken in many places.

Several details require comment: 1) The columns (diam: 4.075 m. or $12\frac{1}{2}$ F) are centered on the stylobate, which has a width of 4.564 m. or 14 F. A $\frac{3}{4}$ foot margin results, with the column base accounting for $\frac{1}{2}$ F and the setback of the base for the remaining $\frac{1}{4}$ F. These measurements can be made only at E 2, which has the only surviving column block in situ, and where the column base is in fair condition. The base setback is preserved at N 7. 2) A vertical framing channel between column and intercolumnar wall allows the central flutes in the column axis to be fully carved, or almost so. The outer surface of the intercolumnar wall does not, therefore, extend up to the edge of the columns; instead, the shadow-producing channels interrupt it, giving the columns a greater sense of plasticity, perhaps even giving the impression that they were in the round. This channel is preserved only at E 3-4, and has not, to my knowledge, been previously discussed. 3) The thickness of the intercolumnar wall is 1.630 m. or 5 F, as measured at E 2-3 and 3-4. Only in the latter is the outer surface of the wall preserved, and there only in one small place. The wall extends $\frac{1}{4}$ F *beyond* the axis of the columns; the normal base setback of $\frac{1}{2}$ F was here reduced to $\frac{1}{4}$ F. The thickening of the wall beyond the axes of the columns is undoubtedly owed to the difficulty of supporting the architrave; it would have been masked, to some extent, by the framing channels. 4) The pilasters are set back $\frac{1}{2}$ F from the inner edge of the stylobate and therefore do *not* coincide with the projected circumference of the columns, which would fall $\frac{3}{4}$ F in from the stylobate edge. Flanking the pilasters at the points where they join the wall were framing channels, analogous to those on the exterior but shallower. Pilasters and bases are relatively well preserved at S 13 and E 2-4, and dimensions here are much more easily obtained than on the badly weathered exterior.

to north; and on the flanks, from east to west. E 2-3 thus refers to the second interaxial from the south on the east end.

⁶³ Polyainos 6.51; Diod. 11.25.2-5.

⁶⁴ To facilitate reference to specific surviving details, I have numbered the columns of the temple: on the east, from south



FIG. 1. Olympieion at Akragas, piers S 3 and 2, from W

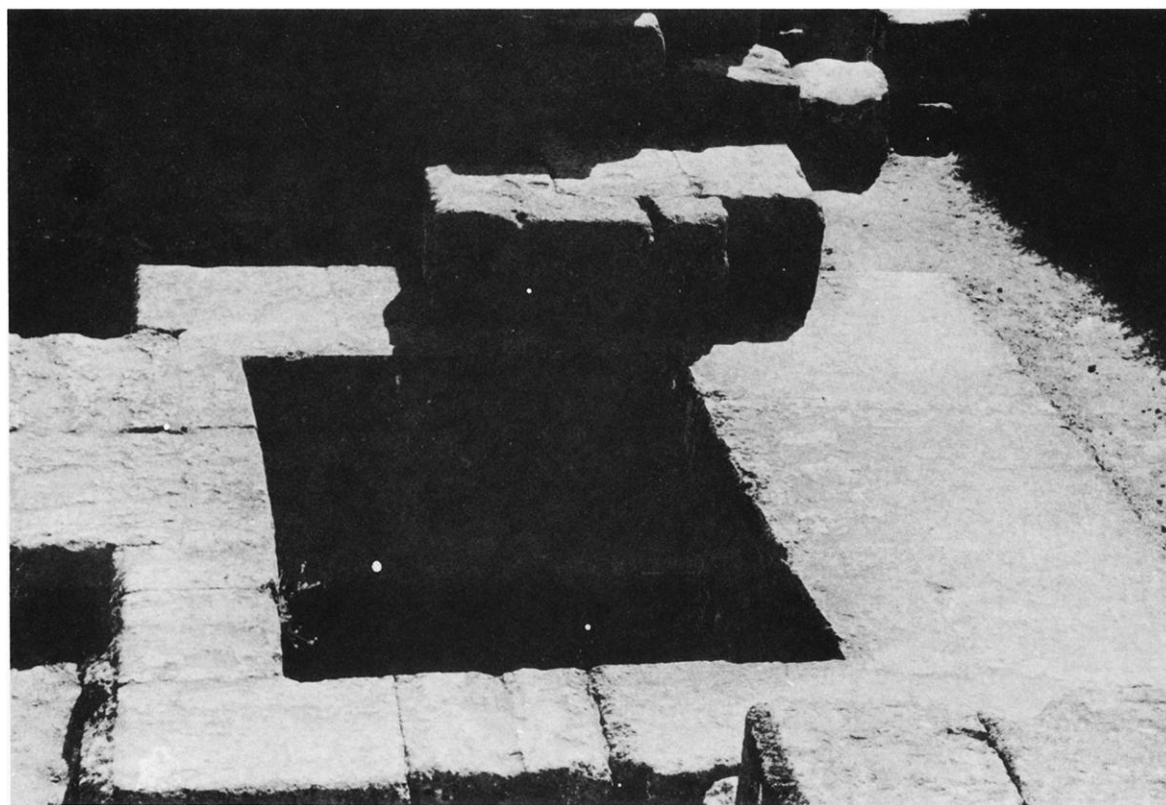


FIG. 2. Olympieion at Akragas, pier S 2, from W