ΑΡΧΙΤΕΚΤΩΝ

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ΜΑΝΟΛΗ ΚΟΡΡΕ

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Ευαγγελια Σημαντωνη-Μπουρνια

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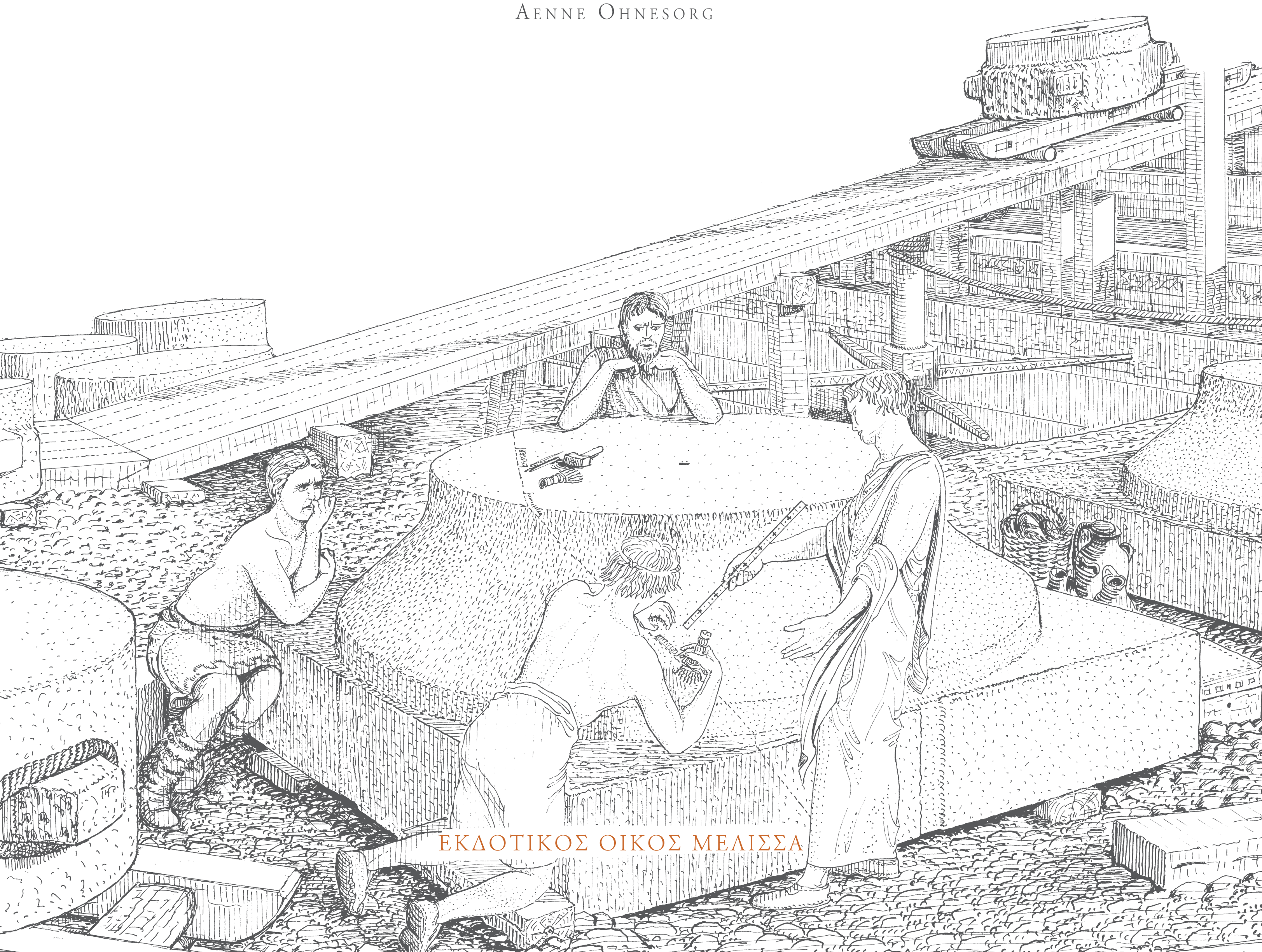

ΕΚΔΟΤΙΚΟΣ ΟΙΚΟΣ ΜΕΛΙΣΣΑ

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HONORARY VOLUME FOR PROFESSOR

MANOLIS KORRES

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THE ROLE OF CYCLADIC WORKSHOPS IN LATE ARCHAIC ARCHITECTURAL CHANGE[1]

Giorgio Rocco

In recent years, the Cycladic architecture gained remarkable importance in the panorama of Archaic and proto-Classical architecture. These brief notes intend to provide a further contribution to the knowledge of the role played by the Cycladic craftsmen in the context of the architecture of the late Archaic age. The inquiry is oriented especially on the Doric Cycladic architecture and on the interaction between this one and the architectural production of the mainland. Focus of my contribution are two buildings highly significant for the period, the *temple of Apollo of Delphi*, in its reconstruction *post* 545 BC, and the temple of *Athena Polias* on the *Acropolis of Athens*. Undoubtedly the two edifices are innovative for the period and are clearly marked by a relationship of competition and emulation among them, primarily due to the rivalry between Alcmeonids and Peisistratids, whose respective roles in the achievement of both temples was decisive[2].

A review of the architecture of the Alcmeonids' temple, although entirely based on the published data[3] and primarily on the F. Courby monograph[4], can contribute to a new interpretation of its architecture and provide additional elements useful to a improved knowledge of the building. In fact, in the well-known publication, the A. lists the found fragments, giving precise measurements and technical data helpful to the analysis and understanding of the temple's architectural features.

In fact, from a careful reading of Courby text some relevant information derives: the peristasis was probably entirely made of *poros*, since fragments of more than 150 column drums are preserved, all made of this material; the epistyles of lateral and rear sides were also worked in *poros*, as attested by two fragments which survived; instead, those of the eastern front were of Parian marble and consisted of three overlapping courses, of which four fragments of the upper one and some of the intermediate survive. As for the Doric frieze, composed of separately worked elements, two triglyphs made of Parian marble and one metope of *poros* are preserved. The cornice was worked in two overlapping courses, the lower with *mutuli* and the upper with the corona; 29 elements of the lower tier, all made of Parian marble, are preserved while no one belonging to the upper tier survived. Notwithstanding the absence of elements with corona, neither in marble, nor in other stone, Courby believed that the two tiers of the cornice were both made by marble along its entire extension. The roof, also worked in Parian marble, was bordered by a *sima* with a vertical front section and tubular spouts on the sides, while along the pediment it was moulded with an interesting *cyma reversa* profile on a high fascia. The *cella* walls consisted of isodomic courses of *poros* blocks raised on an orthostate basement made of Parian marble; in the same stone the columns of the pronaos were also worked[5].

1. I'm really grateful to the Editors for having invited me to contribute to this important volume dedicated to Manolis Korres. His studies constitute for all of us a fundamental lesson to read ancient Greek architecture.
2. Notwithstanding it has been proposed to lower the chronology of the temple to the first Cleisthenes period (beginning of the construction in 510 BC: see Stähler 1972; Tölle-Kastenbein 1983, 579-580, n. 52; Stewart 1990, 129-130; Childs 1993; Childs 1994, and still more recently Stewart 2008), its architectural features seem strictly connected with the Peisistratid production (compare, among others, the contemporary *Telesterion* roof). Also the chronology of the temple of Apollo at Delphi has been debated for a long time, with extremely different positions; on the subject see also the already mentioned article of Childs (1993), which in this case is in favor of a high dating of the pedimental statues (530 against the traditional dating of 510 BC) and of the architecture (540 BC), chronologies both objectively too high for the characteristics of the temple.
3. In this respect the interpretations given here are obviously not conclusive and only a careful review of materials and archaeological documentation can possibly confirm the assumptions.
4. See Courby 1915.
5. These columns had a lower diameter smaller than those of the peristasis (1.72 instead of 1.80 m).

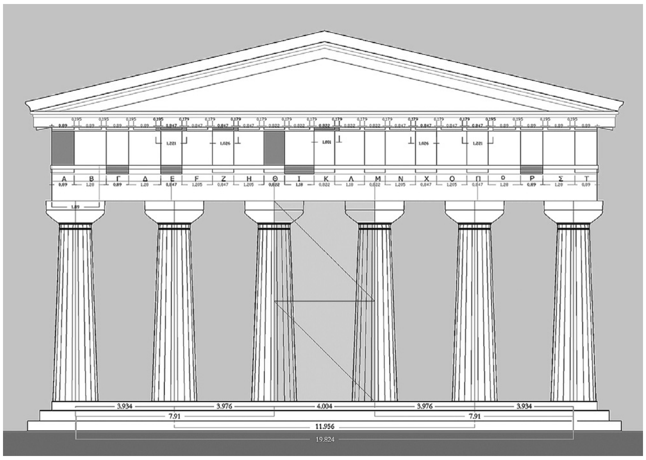

Fig. 1. Delphi, temple of Apollo (Alcmeonids temple): graphic restoration of the eastern front based on data provided by Courby 1915 (Drawing G. Rocco).

The French publication shows that, considering the surviving fragments, it is possible to restore entablature elements of different size (fig. 1); according to Courby and taking into account the preserved *regulae*, triglyphs and *mutuli*, it can be ascertained the existence of three variations for the triglyphs' width (average values 0.892, 0.846, 0.820 m) and three variations for the width of the combined elements *mutulus/via* (average values 0.892+0.18= 1.072, 0.846+0.18=1.026, 0.82+0.18=1.00 m). The French scholar assigned the first two values to the front and the third smaller one to the sides of the building, suggesting a restoration of the temple with different axial spacings between the front and the sides and a simple corner contraction. On the basis of the pediment width, the author determined the overall dimension of the five axial spacings to be 19.68 m, with the following sequence: 3.68, 4.10, 4.10, 4.10, 3.68 m.

However, even without an advisable review of the preserved fragments, a more careful examination of the published data leads to a partially different conclusion.

The starting point of a new analysis is obviously based on those elements whose location can be considered as unquestionable, among which, first, the corner triglyph should be taken into account[6]; albeit fragmentary, it can be restored with a width of 0.89 m and we can assume that, in correspondence to the corners, that the frieze elements probably were expanded, as it is common, in order to reduce partially the amount of the corner contraction, making it less noticeable.

This remark is confirmed by the two variants which characterize the elements pertaining to the upper tier of the marble epistyle, which have dimensions equal to the triglyphs and metopes of the frieze; the first type, corresponding to the triglyph, consists of *taenia*, *regula* and *guttae* and the second one, under the metope, is crowned by a simple *taenia*. In fact two of these elements, characterized by the presence of *regulae* measurig 0.89 m, are surely identifiable as the third and the nineteenth blocks of the upper tier of the epistyle, corresponding to the second and tenth triglyphs of the front. Besides, as Courby already noticed, the letters Γ and Ρ are respectively inscribed on the lower surfaces of these two blocks; they are clearly part of a numbering series and allow to restore a reliable sequence of the blocks' positioning. Furthermore the marble elements belong to the eastern front only, as the epistyle of the remaining sides of the temple was made of *poros*, a feature deduced by two preserved blocks.

However, the French scholar seems not to draw all possible conclusions from the available data; in fact, there is an element of the lower tier of the cornice with a *mutulus* of 0.847 m and two *viae* of different width, respectively of 0.194 and 0.179 m. Considering that the width of other preserved *viae* is 0.179 m, which is evidently the current value, it seems clear that this element of cornice was located on a triglyph with a width of 0.847 m (average values 0.845m), neighboured by metopes of different sizes. The existence of triglyphs of this size is confirmed by the presence of *mutuli* with a width of 0.845/0.847 m and perhaps also by a *regula* of the same width (0.847 m) belonging to the upper marble tier of the eastern front epistyle[7].

Among the basic data it is useful now to mention also the width of the metopes, deduced from the measurement of *mutuli* and *viae*. Also for the metopes three different sizes can be deduced: 1.28 m (0.194 +0.891 +0.194), 1.205 m (0.179 +0.847 +0.179) and 1.18 m (0.179 +0.822 +0.179), where it seems natural to combine the larger *viae* with *mutuli* of m 0.891, not preserved but certainly originally existing, given by the triglyphs of this dimension.

Taking into account the presence of metopes of different width, it is likely that the larger ones were associated with the wider triglyphs (0.89 m). Furthermore, considering that the triglyph measuring 0.847 m was placed be-

6. The triglyph is preserved to its original height, equal to 1.373 m; the knowledge of this measure, considering the normal width of the triglyphs, equal to 0.822 m, permits to restore a proportion of 3:5 between base and height.

7. Here Courby is not explicit and it is therefore possible that the epistyle block with a *regula* of m 0.847 has to be identified with one of the two fragments of *poros* epistyles (Courby 1915, 96).

tween two metopes of different widths, it probably can be identified as the third triglyph of the front; the width of the adjoining metopes can be restored, according to the dimensions of the two different *viae* and to the interposed *mutuli*, equal respectively to 1.280 and 1.205 m.

Summarizing, the two triglyphs near to each corner should be restored with a width of 0.89 m, in combination with the two adjacent metopes, which measured 1.28 m; the third and fourth triglyphs, as well as the eighth and ninth, had a width of 0.847 m, while the related metopes were 1.205 m large.

The problem now concerns the three triglyphs and two metopes of the central intercolumniation, which, according to Courby, had the same dimensions as the adjacent ones. In fact, the author, as we have seen, doesn't consider the larger *viae*, suggesting a dimension for the corner metopes of 1.205 m, and restoring the three central axial spacing all of the same size (4.104 m), with a single corner contraction.

However, other surviving fragments, and, in particular, an element of the upper tier of the marble epistyle, are in my opinion very helpful for the restoration of the eastern front of the building; the block has a width of 1.174 m, and it is considered by Courby as intact and intended to be inserted between two elements provided with *regulae* and therefore corresponding to the size of the metope[8].

The information is even more important as the marble elements of epistyle, as already highlighted, are attributable only to the front elevation; therefore in the same location the presence of metopes of about m 1.174 m can be deduced, corresponding to a combination of *viae* and *mutuli* respectively measuring 0.179 and 0.820 (0.179 +0.822 +0.179 = 1.180) m. Besides, the same scholar lists six elements of the lower tier of the cornice, consisting of a *mutulus* and a *via* with an overall width of 0.993/1.005 m, as well as four *mutuli* with a width varying between 0.815 and 0.820 m and eight *viae* with a size ranging between 0.178 and 0.183 m.

Obviously, if on the eastern front there was a metope with a width of 1.174/1.180 m, certainly there must have been triglyphs measuring 0.820 m: indeed a marble triglyph with these dimensions is preserved, even if it has been considered by Courby pertaining to the sides of the building. The attribution of the marble triglyph to the sides of the building, proposed by the author, however, gives rise to some concern especially taking into account the presence of a *poros* metope: a combination of marble triglyphs and poros metopes is, in fact, somewhat unusual, since, on the contrary, the opposite combination is widely attested.

In conclusion, it seems necessary to restore an eastern front of the temple that shows the elements of epistyle, frieze and cornice, varying in dimensions from center to corners according to their progressive enlargement (fig. 1).

This layout is not accidental, but responds to a specific project and finds important implications; indeed, assuming a canonical arrangement of the columns, i.e. at the third, fifth, seventh and ninth triglyph, the axial spacings sequence would be 3.82, 4.09, 4.00, 4.09, 3.82 m, with the second and fourth axial distance greater than the central one, with a solution obviously unacceptable. Consequently it seems clear that the second and fifth column cannot be aligned to the third and ninth triglyph, but have to shift outwards, narrowing the second and fourth axial spacing and widening the first and fifth ones. Moreover, the adoption of triglyphs and metopes larger than the normal ones must be connected to the problems related to the corner conflict; in fact, the more canonical procedure is to enlarge the frieze elements in order to reduce the extent of the corner contraction.

The observation that the widening of the frieze elements involves, albeit to varying degrees, not only the components of the first and fifth axial spacing (the corners axial spacing), the common praxis, but also those related to the second and fourth axial spacing, along with the inevitable misalignment of the second and fifth columns with the third and ninth triglyphs, induces to conclude for the adoption of the double corner contraction, of which both the peculiarities previously described are a closely related indicator.

Restored in this way the sequence of the frieze elements, the eastern front of the temple and in particular the proportions of the axial spacing can be reliably reconstructed. While the central axial spacing is given, we have some problems with the other ones: in fact, the corner axial spacings and the two adjacent ones are known only as a total value, ruled out, as previously highlighted, by the correspondence of the second and fifth columns with the third and ninth triglyph. The overall dimension of the two adjacent axial spacings is about 7.91 m, with a rather small con-

8. The block is also reproduced in COURBY 1915, fig. 76, where it is erroneously dimensioned with a measure of m 1.10, clearly in contrast with the metric scale, which confirms the value of 1.174 m.

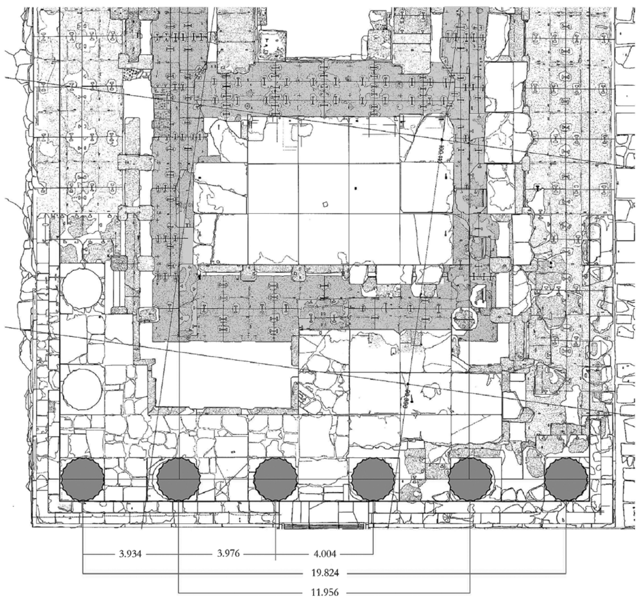

Fig. 2. Delphi, temple of Apollo (Alcmeonids temple): overlapping of the eastern colonnade, as restored, to the drawing of the present state (graphic elaboration from Hansen, Algree-Ussing, Bramsnaes 1975, plan 12). Note the alignment between the axis of the second and fifth column and the longitudinal axis of the foundations of the walls of the naos.

traction (less than 0.10 m); as usual, this amount could be distributed between the corner axial spacing and the adjacent one, two thirds of the value to the corner spacing and one third to the adjacent one. Then, the axial spacings sequence can be reconstructed as follows: 3.93, 3.97, 4.00, 3.97, 3.93 m.

It is interesting to note that, although the overall amount of corner correction corresponds to 0.535 cm (epistyle thickness - triglyph width/ 2), most of the value is recovered by a gradual enlargement of the frieze elements, bringing down the entity of contraction to less than one fifth of the original consistency; this is a very low value compared to the more common standards close to two thirds. This quantity is also shared between two axial spacings, thus making almost imperceptible the columns' displacement[9]. It seems possible to deduce the intention to resolve the corner conflict mainly by reducing the architectural distortions until they become almost unnoticeable.

From the restoration of the temple's eastern front other observations arise: once cleared that the triglyphs of 0.82m pertain to this side, it seems probable that the surviving marble triglyph is one of them, while the *poros* metopes and triglyphs, unfortunately not preserved, belong to the lateral ptera. Therefore presumely the frieze made of marble elements, as well as the epistyle, were limited to the eastern front only; on the contrary, the large number of cornice fragments and the derived substantial linear extent suggest that the two tiers of the marble cornice could run along the entire perimeter of the temple.

In addition, the dimension of the central axial spacing, approximately 4.00 m, should coincide with that of the sides, perhaps only slightly smaller if the size of the triglyph documented by the preserved *poros* epistyle fragment, measuring 0.815 m, is not the product of occasional fluctuations in the measurements of the element. The width of a *poros* metope of 1.21m, clearly belonging to the sides or to the western front, testifies the presence of triglyphs measuring 0.845/0.847 m, also documented by a *regula* of 0.847 m preserved on a further fragment of *poros* epistyle.

Finally, an undoubtedly relevant point emerges in connection with this new evidence related to the corner axial spacing; in fact, according to the proposed reconstruction, this is 0.25 m wider than suggested by Courby, with a value of 3.93 instead of 3.68 m. This widening accentuates a peculiarity, already highlighted by the French scholar[10], recognizable in the contraction of the lateral *ptera*, a consequence of the misalignment between the outer edge of the longitudinal walls of the *naos* and the axis of the second and fifth columns, a solution standing in contrast to a feature in the mainland considered as canonical.

The consequence of the resizing of the interaxial spacings is more clearly highlighted overlapping the eastern colonnade as restored to the drawing of the current state[11] (fig. 2), a simple operation that underline a peculiarity difficult to reduce to a mere accident. Indeed the accentuation of the phenomenon, already observed by Courby, determined by the shift of the second and fifth columns towards the center[12], causes an almost exact alignment between the axis of the second and fifth column and the longitudinal axis of the naos walls foundations in the Alcmeonids temple, which are incorporated inside the crepidoma of the fourth century temple.

At this point it is interesting to extend the analysis to the temple of *Athena Polias* on the Acropolis of Athens,

9. Similar values can be detected in the Hera temple at Akragas, where, compared to a total value of ca. 0.36 m, the actual contraction, however, divided on two axial spacing, is equal to 17,4 cm, while the rest is absorbed by the frieze (see Mertens 1984, 98-108; Mertens 2006, 386-391).

10. Courby 1915, 92 and fig. 71.

11. Hansen - Algreen-Ussing - Bramsnaes 1975, pl. 12.

12. A repositioning which is the consequence of the proposed new articulation of the spacing on the eastern front.

which for many reasons is closely related to the Alcmeonids temple of Apollo at Delphi.

My interest in the Peisistratids temple lies primarily in the numerous similarities between the two buildings and also in the antagonistic role that the Athenian temple plays against the temple of Alcmeonids. Notwithstanding the controversial debate on the relative dating of both the buildings[13], the two edifices are in my opinion closely related. Among the common elements, we can list the dimensions[14], the same proportions of the front elevation, with axial spacing equal to half the height of the column, the peculiar typology of the *sima*, in my opinion a Cycladic variant of the Corinthian *sima*[15], and the common extensive use of Parian marble; in fact this stone was used for roofs, metopes and pedimental statues - the first, together with those of the east gable of the temple of Apollo at Delphi, made entirely of marble.

A further similarity relates also the layout: the restoration proposed by H. Riemann[16] shows a contraction of the lateral *ptera* similar to the one highlighted by Courby for the temple of Apollo; in fact, also in the Athenian edifice, according to the author, the amount of contraction was not enough to determine a strict correspondence between the axes of the longitudinal walls and those of the second and fifth columns of the short sides. The arrangement of the columns on the front was restored by Riemann with current axial spacing of 4.04 m and a single contraction which reduces the axial spacing in the corner to 3.74 m, but also this restoration may require a thorough revision.

Fig. 3. Athens, temple of Athena Polias*: entablature blocks reassembled and exposed in the northern fortification wall of the Acropolis (photo G. Rocco).*

Taking into account the observations carried out at the temple of Apollo, in fact, the contraction of the lateral ptera of the temple of Athena Polias, with the consequent absence of the canonical alignment between the outer edge of the walls and the longitudinal axis of the second and fifth columns, lead us to investigate whether a double corner contraction, that could easily allow a more precise alignment between the axis of walls and columns, was adopted, even in the Athenian temple.

Although a review of the surviving architectural fragments of the Athenian temple's entablature is an urgent desideratum, some interesting data can still be inferred from the blocks reassembled in the northern fortification wall of the Acropolis (fig. 3). Their careful observation shows that the eastern end of the second epistyle block from west reveals the presence of a portion of *regula* with

13. See n. 2.
14. The front widths of the two temples, measured at the stylobates, is quite identical: about 21.50 m (Courby 1915) / 21.60 (Rocco 2008) for the temple of Apollo *versus* 21.34m (Riemann 1950) for the temple of Athena *Polias*.
Otherwise, the dimensions in length, evidently influenced by the particular requirements of the specifics worships and by the orographic context of the two buildings, are quite different.
15. This *sima* profile, composed by a *cyma reversa* on a *fascia*, results from a modification of the mid-sixth century Corinthian *sima*, characterized by an *ovolo* profile with a wide *fascia* at the base; besides, the two *simae* share the same decoration. The progressive attenuation of the transition between the *ovolo* and the *fascia* would have produced a profile close to a *cyma reversa* crowning a wide *fascia*; this profile will evolve, during the fifth and fourth centuries, with a gradual reduction of the lower *fascia*. This peculiar typology of *sima* seems to appear initially in the mainland, in the temple of Apollo at Delphi and in the temple of Athena *Polias* on the Athenian acropolis; afterwards, it is possible to find it again in the temple of Aphaia at Aigina, in the temples of Athena at Karthaia and Korissia, both on the island of Keos, in the so called *Tesmophorion* at Delos, in the Doric *thesauros* of the Marmarià at Delphi, in the temple of Hera (?) at Mon Repos, in Corfu, at Kalauria and in many terracotta *simae* from the acropolis of Athens. In the fifth century this *sima* is recorded also in Western colonies, as attested by the temple of Hera at Capo Colonna, nearby Croton, the temple A of Metapontum and the Doric temple at Caulonia. It is remarkable that all these buildings have roofs made of Parian marble. Already identified by E. Buschor (1929, 212 e note 76) and A. Ohnesorg (1993, 38 ff.), as an Attic product, this peculiar modification of the Corinthian *sima* seem to me rather a realization of Cycladic craftsmanship, as in particular revealed by the sixth century specimens, all directly or indirectly linked to this area. Moreover, even the fifth century *simae*, both from the motherland and from the West, when not directly related to Cycladic temples, are in any case associated with island marble roofs. In this respect, it seems clear that, being the simae an integral part of the roof revetment, they were made by the same workers involved in its construction; again, it seems highly probable that the introduction of this sima can be ascribed to the same workshops accompanying the consignment of Cycladic marble for the principal sanctuaries of the mainland and Western Greece.
16. Riemann 1950.

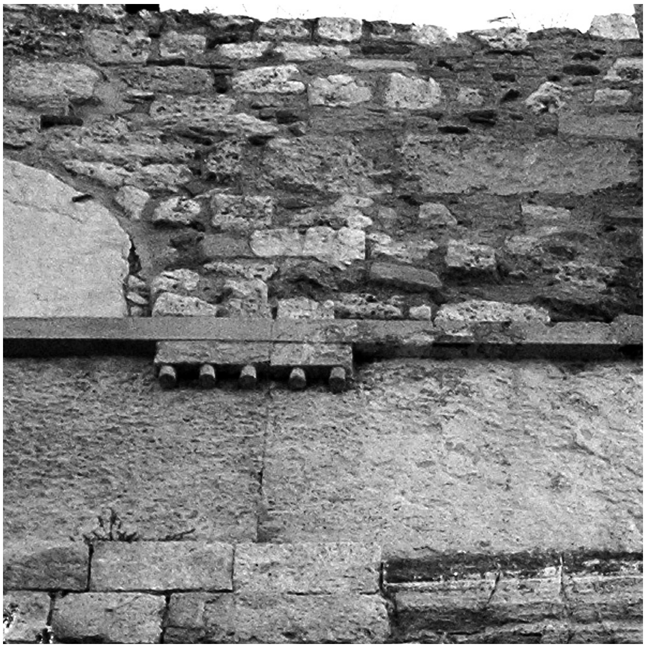

Fig. 4. Athens, temple of Athena Polias*: detail of the second epistyle from west (photo G. Rocco).*

only two *guttae* instead of three (fig. 4); usually, taking into account the location of the regula under the triglyph and the canonical position of the latter above the axis of the column, the junction between two contiguous epistyles divides the *regula* exactly in the center, separating two semi-*regulae* each with three *guttae*.

The presence of a portion of *regula* with only two *guttae* necessarily reflects a misalignment of the column below with respect to *regula* and triglyph located immediately above. Actually, as we pointed out in the analysis of the temple of Apollo at Delphi, this is one of the effects arising from the adoption of the double corner contraction, which, as we have seen, involves the translation of the second column toward the center of the building resulting in the contraction of the second axial spacing from the corners (fig. 5). This particular detail, only apparently secondary, is therefore a revealing element of the adoption of a double corner contraction, from which derives, as previously noted for the temple of Apollo, some relevant consequences for the plan of the building. In fact the translation of the second and fifth column toward the center of the front accentuates the phenomenon, already highlighted by Riemann, to the point of determining an exact correspondence between the axis of the longitudinal walls and that of the second and fifth column of the eastern and western fronts (fig. 6).

The double corner contraction and, simultaneously, a layout with exact correspondences between the longitudinal walls and the front columns, together with the proportions of the front elevation and the peculiarities of the marble roofs, including the *sima*, accentuate significantly the similarities between the temple of Athena Polias and the temple of Apollo at Delphi. These similarities clearly link the two temples in a wider context which refers to a cultural environment that could be identified as Cycladic-Attic, and is mainly marked by a constant presence of Cycladic workmen. In this context the salient features of these two buildings are of special importance, also with regard to their reappearing in temples, unrelated to the Attic context, but characterized by the occurrence of Cycladic workshops, favored by the growing demand for marble, especially for roofing, which seems to characterize a large part of the building yards in the motherland.

Among these features the ratio 1:2 between axial spacing and column height is also comprised, a peculiarity which appears in other edifices of Greece, including the temple of Zeus at Olympia, and before it, apart from the temples of Apollo at Delphi and Athena Polias at Athens[17], in the temples of Athena at Karthaia[18] and of Aphaia at Aegina[19]. This latter feature is especially meaningful in that it is always associated with Parian marble roofs and then occurs in building yards where an employment of Cycladic workshops[20] is well attested, a coincidence which finds further evidence in proto-classical architectural production of the Western Greek settlements together with the adoption of the double corner contraction[21].

The double corner contraction, from the evidence shown, is far from being a marginal datum, while its presumed sudden appearance, around 480 BC, in the temples of Syracuse and Himera and the subsequent rapid spread in the Western Greek cities seems to be no longer sustainable[22]. The documented presence of the double corner contraction at Karthaia, on the island of Keos, by the end of the sixth century, is of particular importance for our purposes, since it testifies its adoption in Doric Cycladic ar-

17. According to Riemann restoration (Riemann 1950).
18. Østby 1980.
19. Bankel 1993, with previous bibliography.
20. Schuller 1985; Schuller - Ohnesorg 1991; Bankel 1993.
21. With regard to the role of the Cycladic workshops in the architectural production of Magna Graecia and Sicily see Rocco 2008; Rocco 2009; Rocco 2010.
22. The western origin of this peculiar solution has already been called into question by E. Østby (Østby 1980, 189-223; Østby 1990-91, 285-391).

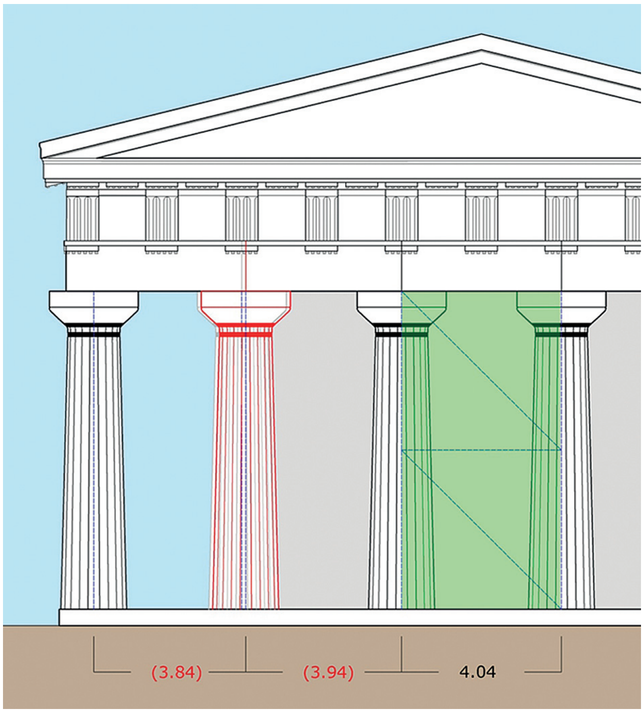

Fig. 5. Athens, temple of Athena Polias*: graphic restoration of the eastern front (Drawing G. Rocco).*

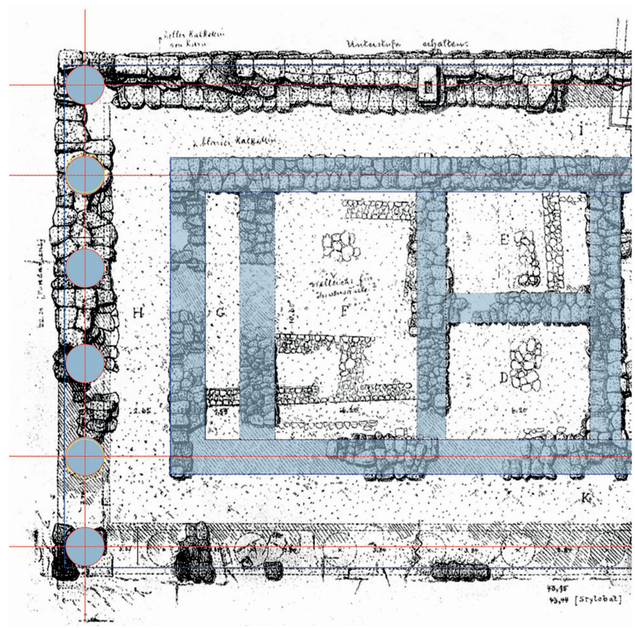

Fig. 6. Athens, temple of Athena Polias*: overlapping of the eastern colonnade, as restored, to the drawing of the present state (graphic elaboration from Dörpfeld 1886); note the alignment between the axis of the second and fifth column and the longitudinal axis of the foundations of the walls of the naos.*

chitecture certainly on a date prior to the Dinomenides' architectures.

This observation is even more important in connection with the deductions concerning the double corner contraction in the eastern façades of the temples of Apollo at Delphi and of Athena Polias on the Acropolis of Athens, highlighting the close relationship between this solution and the Doric Cycladic architectural production. It is interesting to underline that the double corner contraction applied to a hexastyle building involves a decreasing axial spacing from the central intercolumnium to the ones at the corners, resulting in a solution that closely resembles the arrangement of the front colonnades of the Ionic temples. A further feature revealing the Ionic influences is the columns' slenderness, a phenomenon particularly striking in the temple of Athena *Polias*[23]; the values are comparable with those of Cycladic buildings, especially the *Delion* of Paros and the *Athenaion* at Karthaia, as well as the *thesauros* of the Athenians at Delphi and the temples of Apollo and Aphaia at Aegina[24].

Likewise indicative is the coincidence between the longitudinal axes of the walls and those of the columns on the front; in fact, such a solution, which partially reduces the *ptera* depth determining at the same time a closer interrelationship between peristyle and *naos* walls, clearly recalls the Ionian temple plans, confirming, into the overall design of the building, the important role of Ionic craftsmen, clearly formed not only by workers, masons and carpenters, but also by architects.

The previous considerations reflect the role played by Cycladic workshops in some of the most important building yards during a crucial period of architectural production in the motherland. Doric Cycladic architecture that arose between the end of the third and the beginning of the last quarter of the sixth century, together with the spread of Parian marble roofs in the main building yards of the

23. Respectively 4.9 and 5.3 lower diameters for the fronts and sides (Riemann 1950), compared with the average values for the period which are lesser or equal to 4.5 lower diameters.

24. The ratio between lower diameter and column height for fronts and sides in the Aphaia temple at Aegina is respectively of 5.22 and 5.30, a little lower value than that of the temple of Apollo at Egina (5.65), of the Athenians *thesauros* at Delphi (5.47) and of the *Delion* at Paros (5.6).

motherland, induce to interpret the available data concerning the itinerant Cycladic workshops as an evidence of a far more significant role played by them than known until today. In fact, if on the one hand their activities constitute an important means for the transmission of architectural models and peculiar solutions from one site to another, in other respects some recurring characters seem to testify a properly Cycladic origin.

The presence of Cycladic workshops is attested, albeit with some delay, even in close correlation with the spread of marble roofs, in Western Greece, where it seems to have played a central part in the major changes that characterize Western Greek architecture in the first decades of the fifth century. The issue is particularly significant with regard to the fact that these changes constitute one of the most problematic events that mark the evolution of the Western Greek architecture; in fact, the most distinctive trait of this phenomenon lies mainly in the abandonment of the architectural traditional forms peculiar of the various areas of Sicily and Magna Graecia in favor of a linguistic renewal, strongly influenced by the contemporary production of the motherland. The phenomenon involves not only plans and elevations, but also the morphological characters of the Doric order. Equally significant, moreover, is the extent of the changing, which involves most of the Western Greek *poleis*, and, at the same time, the noticeable speed with which it spreads in different areas.

The elements at our disposal allow us to highlight as a fundamental means in the transmission of architectural models from the motherland to the West should be recognized in those itinerant Cycladic workshops, more and more frequently called upon to give prestige to main architectural projects with the realization of marble roofs[25].

The relevance of the role played by the Ionic workshops in the late archaic and early classical Doric architectural production is, in my opinion, one of the most significant new elements in the field of Greek architecture in recent years; without the important contributions of the colleagues engaged in archaeological researches in the Cycladic areas, the advancement of knowledge in this important field of study would not have been possible. But the chance for a revision of our knowledge with respect to so a crucial stage in the history of Greek architecture depends largely from the new acquisitions and from the reexamination of the monuments already published; a task which needs to be carried out by combining the data coming from the Aegean with those of the motherland and Western Greece, in order to improve the research tools and better understand the complex relationships between the different areas of the Greek world.

25. See note 21.

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BIBLIOGRAPHY

BANKEL, H. 1993. *Der spätarchaische Tempel der Aphaia auf Aegina*, Denkmäler antiker Architektur 19, Berlin.

BUSCHOR, E. 1929. *Die Tondächer der Akropolis* I, Berlin / Leipzig.

CHILDS, W.A.P. 1993. Herodotos, Archaic Chronology, and the Temple of Apollo at Delphi, *JdI* 108, 399-441.

CHILDS, W.A.P. 1994. The Date of the Old Temple of Athena on the Athenian Acropolis, in: W.D.E. COULSON - O. PALAGIA - T.L. SHEAR (eds), *The Archaeology of Athens and Attica under the Democracy. Proceedings of an International Conference held at the American School of Classical Studies at Athens, December 4-6, 1992*, Oxford, 1-6.

COURBY, F. 1915. *Fouilles de Delphes* II. *Topographie et Architecture I. La Terrasse du Temple*, Paris.

DÖRPFELD, W. 1886. Der alte Athena-Tempel auf der Akropolis, *AM* 11, 337-351.

HANSEN, E. - G. ALGREEN-USSING - A. BRAMSNAES 1975. *Fouilles de Delphes* II. *Topographie et Architecture. Sanctuaire d'Apollon*, Atlas, Paris.

GRUBEN, G. 2001. *Tempel und Heiligtümer der Griechen*, München.

MERTENS, D. 1984. *Der Tempel von Segesta und die dorische Tempelbaukunst des griechischen Westens in klassischer Zeit*, Deutsches Archäologisches Institut Rom, Sonderschriften 6, Mainz.

MERTENS, D. 2006. *Città e monumenti dei Greci d'Occidente*, Roma.

OHNESORG, A. 1993. *Inselionische Marmordächer*, Denkmäler antiker Architektur, 18, 2, Berlin.

ØSTBY, E. 1980. The Athenaion of Karthaia, *Opuscula Atheniensia* 13, 189-223.

ØSTBY, E. 1990-91. Scavi di Pallantion. I templi di Pallantion, *ASAtene* 68-69, 53-94.

RIEMANN, H. 1950. Der Peisistratidische Athenatempel auf der Akropolis zu Athen, *RMdI* 3, 7-39.

ROCCO, G. 2008. Architettura protoclassica occidentale e influssi della Madrepatria, in: *Atene e la Magna Grecia dall'età classica all'ellenismo, Atti del 47 Convegno di Studi sulla Magna Grecia, Taranto 27-30 settembre 2007*, Taranto, 287-324.

Rocco, G. 2009. Il tempio di Hera al Capo Lacinio. Nuove acquisizioni ed elementi per una sua restituzione, in: C. Mezzetti (ed.), *Il Santuario di Hera al Capo Lacinio: l'analisi della forma, il restauro e la ricerca archeologica,* Roma, 107-134, 188-191.

Rocco, G. 2010. Il ruolo delle officine itineranti cicladiche nella trasmissione di modelli architettonici tra tardo arcaismo e proto classicismo, in G. Adornato (ed.), *Scolpire il marmo. Importazioni, artisti itineranti, scuole artistiche nel Mediterraneo antico, Atti del convegno, Pisa, 9-11 novembre 2009,* Pisa, 159-169.

Schuller, M. 1985. Die dorische Architektur der Kykladen in spätarchaischer Zeit, *JdI* 100, 319-398.

Schuller, M. - A. Ohnesorg 1991. *Architektur auf Naxos und Paros*, 1. *Der Artemistempel im Delion auf Paros*, Denkmäler antiker Architektur 18, Berlin.

Stähler, K. 1972. Zur Rekonstruktion und Datierung des Gigantomachiegiebels von der Akropolis, in: *Antike und Universalgeschichte. Festschrift H.E. Stier zum 70. Geburtstag am 25.5.1972*, 88-112.

Stewart, A. 1990. *Greek Sculpture: An Exploration,* New Haven.

Stewart, A. 2008. The Persian and Carthaginian Invasions of 480 B.C.E. and the Beginning of the Classical Style: Part I, The Stratigraphy, Chronology, and Significance of the Acropolis Deposits, *AJA* 112, 377-412.

Tölle-Kastenbein, R. 1983. Bemerkungen zur absoluten Chronologie spätarchaischer und frühklassischer Denkmäler, *AA* 1983, 573-584.

SUMMARY

Giorgio Rocco

THE ROLE OF CYCLADIC WORKSHOPS IN LATE ARCHAIC ARCHITECTURAL CHANGES

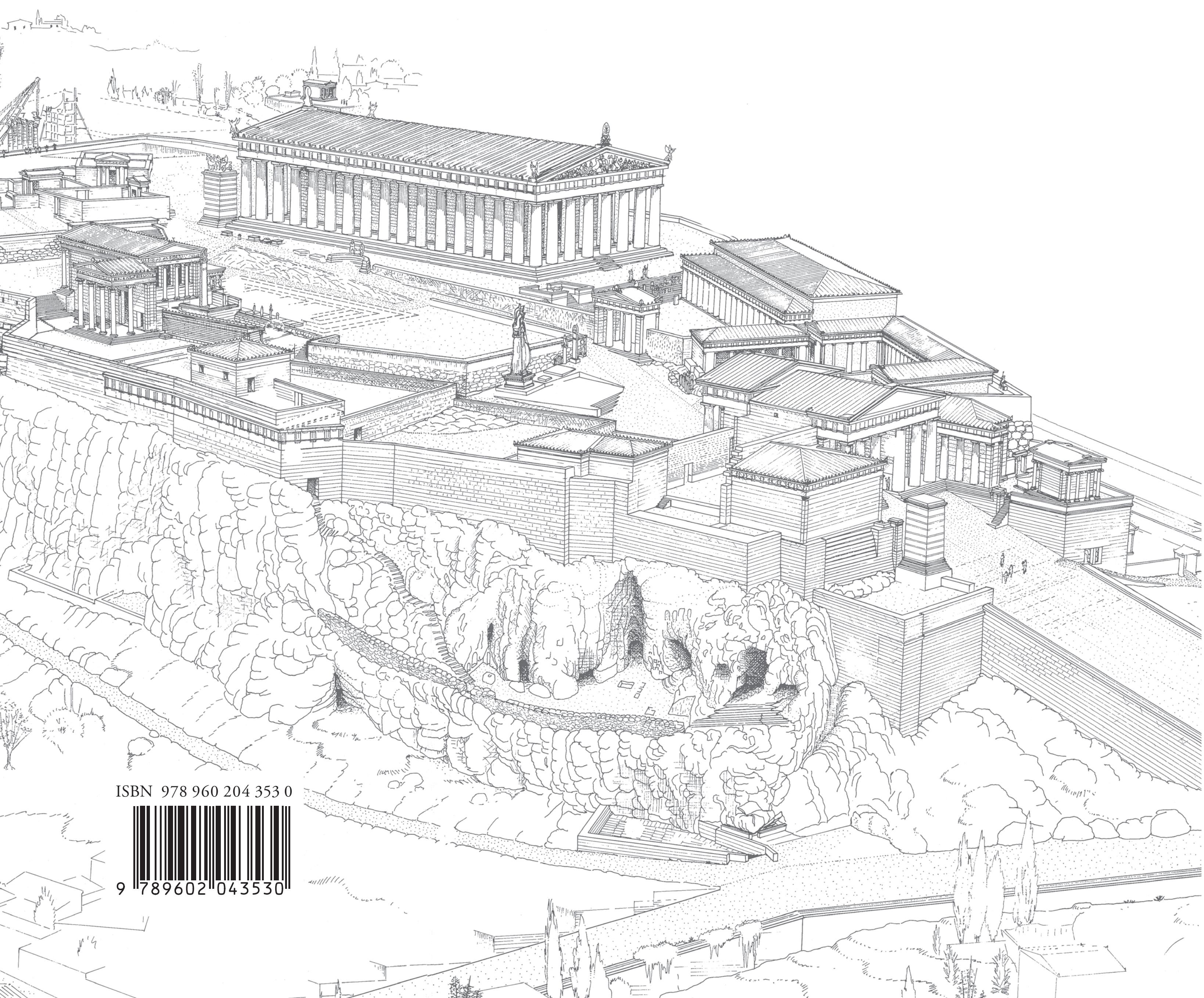
The analysis of architectural data concerning two famous mainland buildings, the temples of Apollo at Delphi and of Athena Polias on the Athenian Acropolis, led to new restorations and to a reconsideration of the Cycladic workshops' role in the building design.

A comparison between the two temples is very interesting, especially considering the antagonism between the Alcmaeonids and Peisistratids, who were responsible for construction of the two temples.

A review of the data concerning the temple of Apollo and some observations on the architectural fragments of the temple of Athena Polias, visible in the southern fortification wall of the Athenian Acropolis, allow us to demonstrate the adoption of double corner contraction in both temples. This conclusion, together with the identification of the same solution in the Karthaia temple at Keos, suggests that this particular arrangement, together with some other features, such as the column slenderness, the alignments between walls and columns, and some recurring proportions in the elevation, are connected with the Doric architecture of the Cyclades.

Of course the influence of Cycladic architecture was not restricted to these two examples, as confirmed by other Late Archaic mainland temples and by several Early Classical West Greek buildings. In fact it is possible to recognize many of these peculiarities in most of the buildings where there is evidence of Cycladic marble roofs.

Furthermore, the remarkable mobility of the Cycladic workshops, involved in the most important building sites of the period, indicate their essential role as a "medium" in the diffusion of architectural models between different areas.



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