

REMARKS UPON THE COLOSSAL CHRYSELEPHANTINE STATUE OF ATHENA IN THE PARTHENON

INTRODUCTION

IT is not to be expected that even fragments of the gold and ivory colossal statue of Athena in the Parthenon should have survived the ravages of time. However, a good deal is known about the statue from small copies in the round and from coins, plaques, gems and the like; also, the famous statue is mentioned by ancient writers, sometimes at considerable length. Consequently we have a fairly good idea of her appearance.

And when we come to consider the pedestal on which the statue stood, we find that there are data which can be studied to advantage. Obviously the importance of the statue called for a carefully designed pedestal. Thus it is desirable that all existing data concerning the pedestal be recorded.

Let us, then, make a few remarks not only about the colossal statue, but also about the pedestal on which the statue stood.

I

ATHENA PARTHENOS, THE CLIMAX OF THE PANATHENEA

Figure 1 shows the position of the colossal statue (often referred to as the Parthenos) in the east cella of the temple. The blocks which give the position of the statue are toward the west end of the nave and on the axis of the temple. They are poros blocks of the type used for foundations. They are flush with the marble pavement of the nave, and they are *in situ*. The poros blocks, thirty in number, cover an area so extensive that they at once tell us that the statue which stood above them was of colossal size (Figs. 1, 2).¹

Another point to be noted is the great distance of the statue from the eastern peristyle of the temple. Did the statue receive light only through the big east door, or was there an opening in the roof of the cella? There is proof that the temple was *not* hypethral, for the pavement of the nave of the east cella was at a lower level than all its four sides, and the pavement is well enough preserved to assert that there never was a means of draining off rainwater. During the winter months the rain, just as it

¹ The thirty poros blocks have not failed to interest archaeologists. The best of their numerous articles is by W. B. Dinsmoor (*A.J.A.*, XXXVIII, 1934, pp. 93-106). He gives many useful references. Dinsmoor's article deals largely with the date of the repairs to the pedestal. The present article, on the other hand, will take up certain details of an artistic and architectural nature.

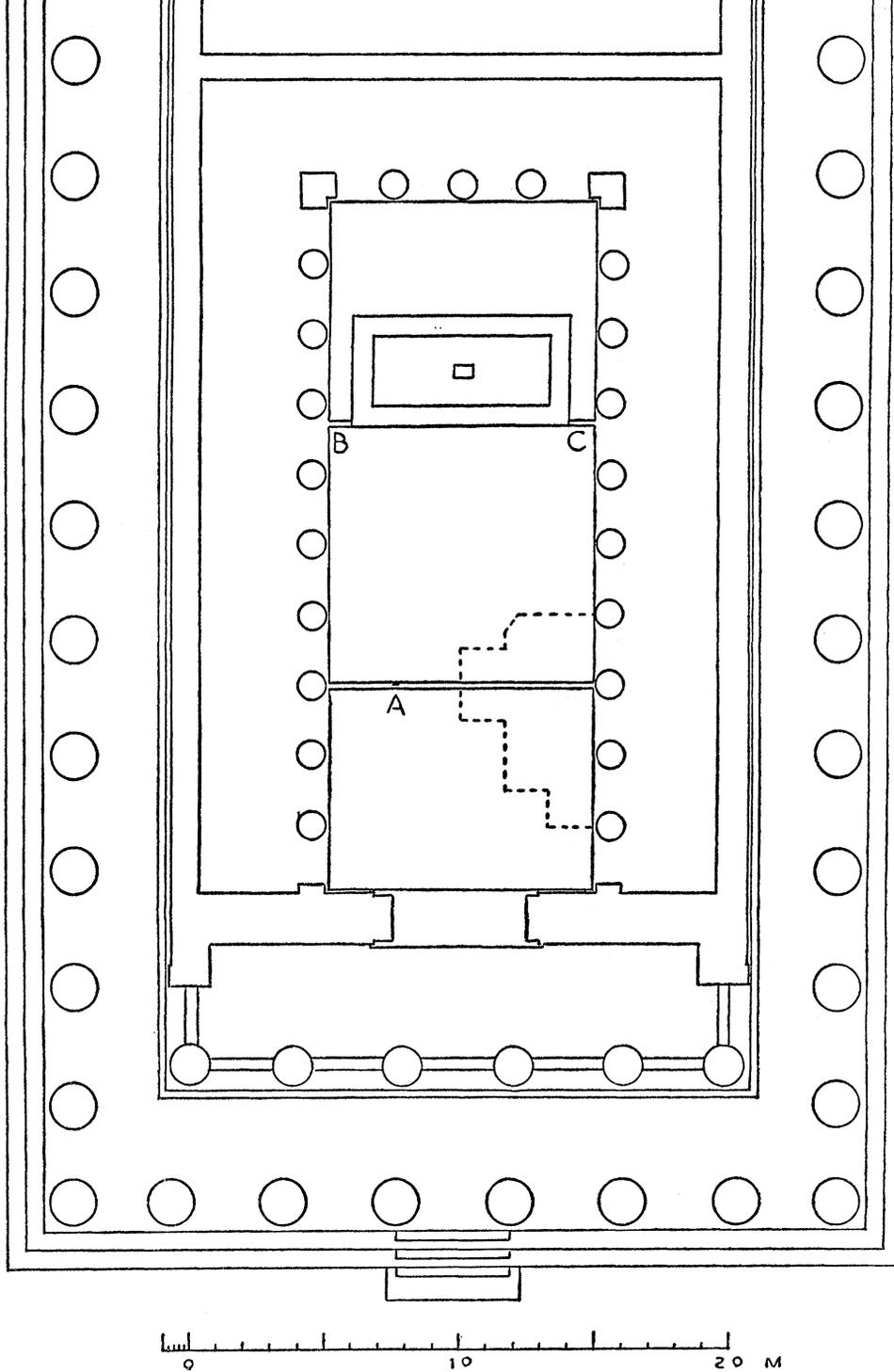


FIG. 1. Plan of the east cella of the Parthenon showing 1) the position of the base of the colossal chryselephantine statue of Athena; 2) at A, B, and C traces of the rim of a water basin in front of the statue. The pavement where dotted is gone.

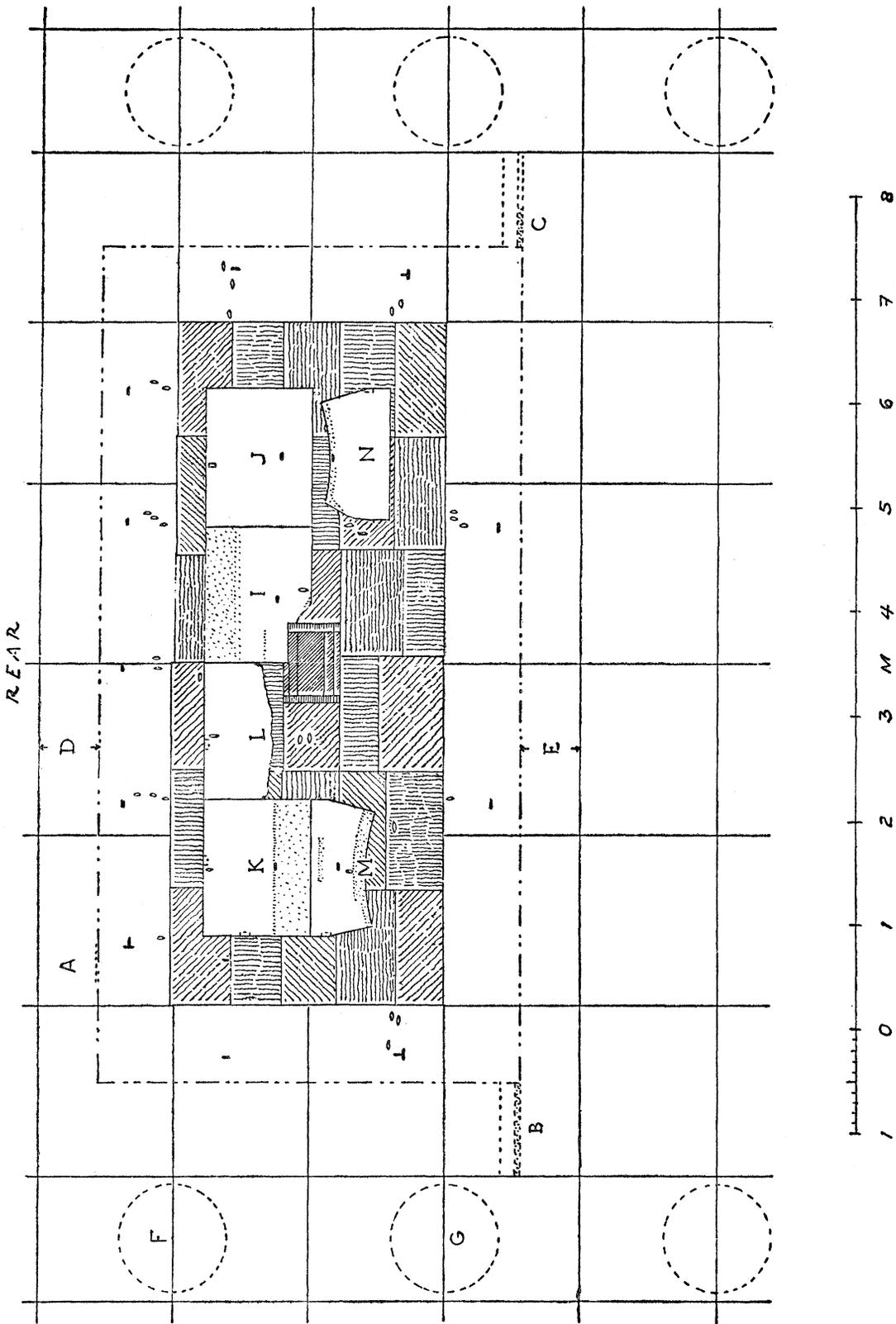


FIG. 2. Data for the original pedestal. The dotted line gives the outline of the pedestal upon the pavement of the temple. The hole in the center of the poros foundations is the socket for a large post which ran through the pedestal and up into the statue. The post was the chief member of the armature of the statue. Dressings at C and D are later than the original pedestal, but earlier than the restored pedestal.

does today, must have come down at times in torrents. There can be no doubt that, if the nave had no roof, the rainwater would have been disposed of in an efficient manner.

But the lighting of the statue was undoubtedly carefully considered by Pheidias, the famous sculptor of this famous statue. A very expensive and beautiful statue, and a cult statue at that, would not be put in a place where it did not receive the kind of lighting wanted by the sculptor. The east door was a large one, measuring *ca.* 4.80 m. from side trim to side trim and *ca.* 9.60 m. from the sill to the bottom of the lintel. Further, the columns of the pronaos were made 0.07 m. less in diameter than the columns of the opisthodomos, an operation which admitted more light into the cella than if the columns had not been made slimmer.² Still further, the angle intercolumniations of the columns of the pronaos were less than the intervening intercolumniations, an arrangement which allowed more light to pass through the three central intercolumniations than if all the intercolumniations were equal.³ Lastly, there is the peristyle of the temple. In this case the end intercolumniations are contracted on all four sides of the temple. If we confine our attention to the peristyle of the east façade, we note that, as in the case of the colonnade of the pronaos, more light reached the cella than if all seven intercolumniations had been made equal. It is evident that the lighting of the cella from the east, the direction of the rising sun, was studied with care.

Pheidias certainly was aware of the mystic quality of a statue which is placed in a subdued light, and, good sculptor that he was, he would know how to emphasize that mystic quality. Consider the materials he used for the statue. Gold and ivory are both effective in a subdued light: the gold (which does not tarnish to any great extent), because the highlights from it gleam in a half light when most other materials used for statues do not; the ivory, because it is a number of tones lighter than human flesh—a light tone, especially for the face, was needed in a dim light if the statue was to be awe inspiring, surely one of the *desiderata* of the sculptor.⁴

Moreover, Pheidias must have been fully aware of the great value of contrasts for works of art, *including a contrast in lighting*. Suppose that you, reader, are an ancient Greek taking part in the famous Panathenaic Procession. All the way from the Dipylon to the Parthenon you are walking in the open air, with the statues, monu-

² *Hesperia*, Suppl. III, p. 67.

³ Cf. *Ibid.*, fig. 56. The intercolumniations of the columns of the opisthodomos were treated in a similar way, probably for the same reason, namely, to give more light to the Treasury.

⁴ Polished white marble for the flesh might have been about as effective in tone as ivory. But, since the statue was to have drapery of gold, it had to be constructed over a wooden core. Ivory had been, since archaic times, the material regularly combined with gold drapery for the face, the hands, and the feet. Ivory has a decided advantage over marble for a statue constructed about a wooden core, as we shall see was the case with the Parthenos, for ivory is a fairly tough material. It can be cut into thin pieces and fastened to its background with no danger of the ivory breaking. This is an advantage which cannot be claimed for thin pieces of marble.

ments and buildings on either side bathed in a fantastically brilliant summer light (the procession took place in August), *until you enter the Parthenon*. What an overwhelming impression the Athena makes upon you, due not alone to the marvellous beauty and masterful technique of the statue, but also to the unexpected features you encounter—the large size of the statue, the lavish use of gold and ivory, the mystic subdued light inside the temple contrasted with the broad sunlight outside the temple! What a tremendous climax for those taking part in the Panathenea! Here is good art at its best.

II

ORIGINAL PEDESTAL FOR THE PARTHENOS⁵

There is definite evidence from contemporary records that the Parthenos was dedicated in 438 B.C. Consequently the pedestal beneath the statue is not later than 438 B.C. But the pedestal was probably in position before this date, for it is not likely that the colossal gold and ivory statue took less than a year to set up. Thus, although an exact date cannot be assigned to the pedestal, we have an approximate date which is quite good enough for our purposes. The reader will find that our discussion of the first pedestal will be concerned almost entirely with matters dealing with the fifth century B.C.

1. FOUNDATIONS OF THE PEDESTAL

The Parthenon was largely built upon a pre-existing solid platform of poros. The temple, from its northeast corner westward for about half the length of the temple and from the same corner southward for almost half the width of the temple, rests directly upon the Acropolis rock. But everywhere else there are solid poros foundations going down to the Acropolis rock. Along the south side of the temple the foundations descend for somewhat more than 11 m. below the upper surface of the top step of the temple.

Let us make a cross section of the foundations of the Parthenon, taking the section through the middle of the foundations of the Parthenos, and let us carry the section downwards as far as the Acropolis rock (Fig. 3).⁶ In Figure 3 we see the rapidly sloping nature of the Acropolis rock, and, further, we note that there was

⁵ The pedestal shows traces of having been restored only once. The first pedestal we will call the "original pedestal," and the second pedestal the "restored pedestal."

⁶ The level 145.61 in Figure 3 is obtained from levels given by Kavvadias and Kawerau, 'Η Ανασκαφή τῆς Ἀκροπόλεως, Πίναξ Ζ'. The level 157.33 is the level of the stylobate where our section is taken. (Due to the crowning of the stylobate, level 157.33 is 0.13 m. above the level of the stylobate at the southeast corner of the temple, where Kavvadias and Kawerau give the level as 157.20).

probably as much as 7 m. of solid poros construction beneath the center of the pedestal of the Parthenos.⁷

The pedestal of the Parthenos overlapped its poros foundations on all sides (Fig. 2). The poros and marble paving blocks upon which the pedestal stood have pry holes, dowel cuttings, and weather marks of a number of different periods, but there is little difficulty in distinguishing between evidence of the fifth century B.C. and that of later periods.

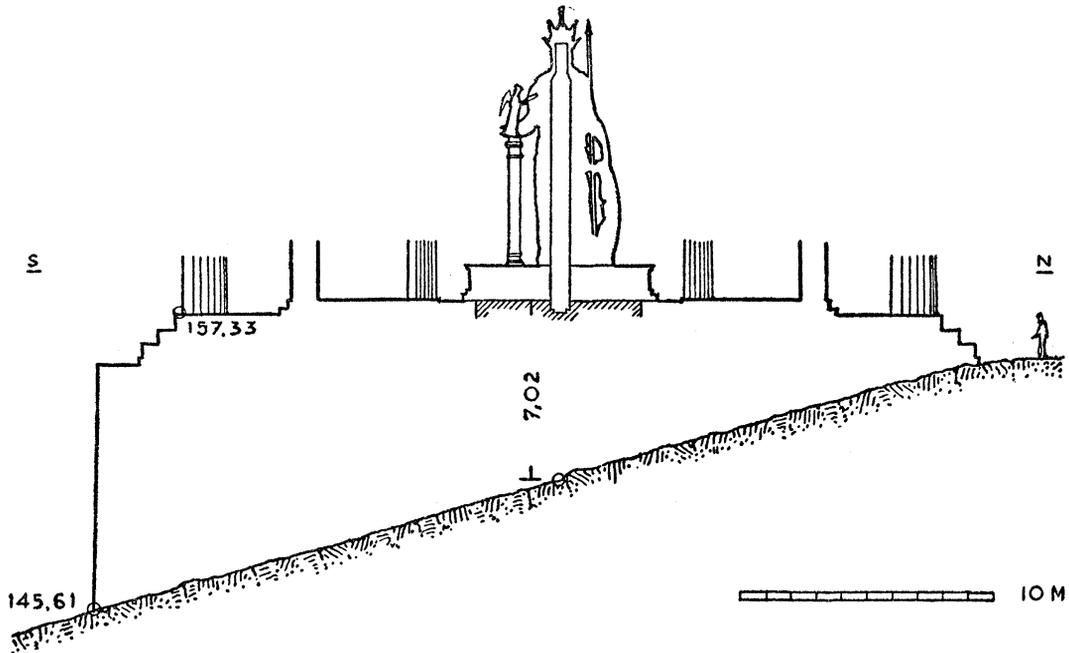


FIG. 3. Cross section of the foundations of the Parthenos, showing the approximate relation of the poros foundations of the statue to the Acropolis rock.

The six marble blocks now lying on the poros foundations of the pedestal hide a good deal of those poros foundations (Fig. 2). However, a fairly accurate restoration of the hidden portions of the foundation can be made (Fig. 18, lightly dotted lines).

A number of important Greek pry holes in the poros foundations are fortunately not covered by the six marble blocks. These pry holes, together with the six marble blocks themselves, help us to restore the jointing of the eight marble blocks which originally rested upon the poros foundations (Figs. 2, 4).

⁷ A good example of a solid poros foundation for a temple may be seen in Aegina, in the temple of Apollo (?) near the town of Aegina. Greek temple foundations are generally more economical in type; only walls and colonnades, as a rule, have well designed foundations.

But by far the most important feature of the poros foundations is the socket for the vertical timber which ran up through the pedestal and into the statue, where it became the chief supporting member of the armature of the statue (Figs. 2, 5, 6, 7). Figure 5 shows that the post did not exactly fit the hole left for it in the poros blocks; the hole was not quite long enough and 0.10 m. too wide. These discrepancies neces-

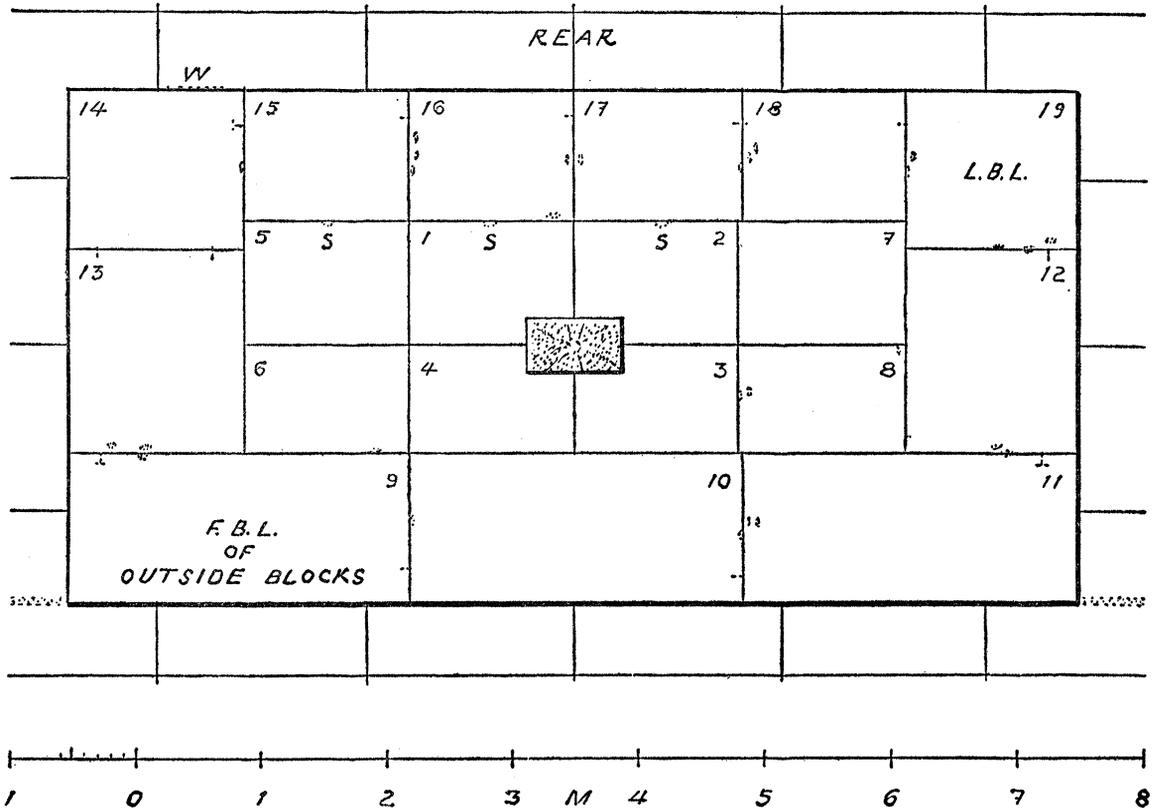


FIG. 4. Restoration of the lowest course of the pedestal of the statue. The cuttings for dowels and pry holes and the weather line at W are in the plane of the pavement of the temple (cf. Fig. 2). The three shift holes (marked S) are on the under sides of the blocks of the bottom course of the pedestal; they served to shift these blocks into position.

sitated trimming back slightly the vertical faces of the poros blocks to the north and south of the post, and making a cutting in the bottom of the hole to receive a lug projecting from the bottom of the post—a lug which prevented the bottom of the post from moving in either an easterly or a westerly direction. Further, we should note that the above trimming and cutting inside the hole could not have been done after the interior blocks of the pedestal were in place: here, then, we have an indication that the poros foundations, the pedestal, the statue (in all three of which the post was buried), and the post itself were conceived as a unit.

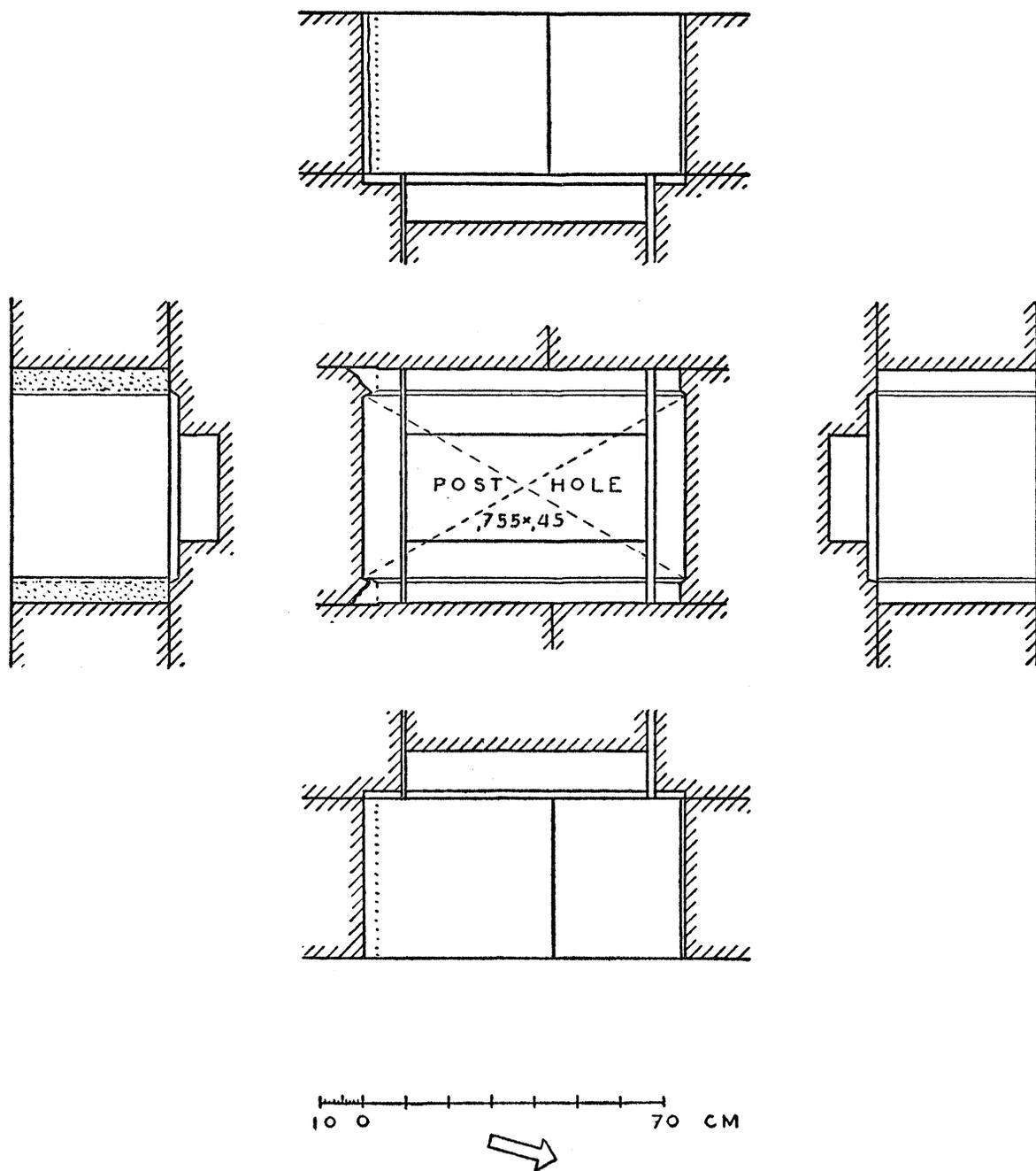


FIG. 5. Detail of the socket in the middle of the poros foundations of the Parthenon.

The cuttings for the post within the hole measure 0.755 m. x 0.45 m. (horizontal measures). If we express these figures in ancient Attic feet of 1 AT.FT. = 0.328 m., we have, nearly, 2 AT.FT. — 4 DACS. by 1 AT.FT. — 6 DACS. Now 2 AT.FT. — 4 DACS. is equal to 0.738 m. This gives a play of 0.0085 m. on the north and south sides of the post, a play necessary for inserting the post. (We have seen that there already existed ample play to the east and the west of the post). In the poros foundations, then, the post itself had a cross section of 2 AT.FT. — 4 DACS. by 1 AT.FT. — 6 DACS. We shall note further on, that the post was carried, unchanged in cross section, through the bottom course of the pedestal.

2. BOTTOM COURSE OF THE PEDESTAL

The existing data for the bottom course of the pedestal are shown in Figure 2, where all cuttings, etc. later than the original pedestal have been omitted (with the exception of dressings B and C). The data consist of:

- a) Dowel cuttings, pry holes and a weather line in the plane of the pavement of the cella.
- b) Data derived from the six marble blocks, recently reset, but originally coming from the interior of the pedestal (Fig. 2).
- c) Dressings at B and C, dating between the completion and the repair of the pedestal. They give the north and south outlines of the original pedestal upon the pavement of the cella.

We begin with the outlines of the pedestal upon the pavement. The west face of the bottom course of the pedestal is given by a weather line at A, Figure 2 (also indicated at W, Figure 4). The east face of the bottom course is found by making E, Figure 2, equal to D, Figure 2, for the following reasons:

- 1) The marble paving blocks of the cella have almost a constant width, and every other north-south joint runs through the center of a column of the nave (Fig. 2).
- 2) The poros foundation of the pedestal and the socket in this same foundation are on the axis of the intercolumniation F-G, Figure 2 (as well as being on the axis of the nave).

The east face of the bottom course of the pedestal is thus found to line with the east edges of dressings B and C, Figure 2 (cf. also Figs. 1, 4); in other words, the dressings did not run under the pedestal. They were made after the bottom course of the pedestal was in place. They ran up to that bottom course where they stopped, thus indicating the positions of the north and south faces of the bottom course of the pedestal.

It will be seen by looking at Figure 2 that the bottom course of the pedestal overlapped the poros foundations almost exactly an equal amount on all four sides.

We now take up the outside blocks of the bottom course of the pedestal. The positions of the vertical joints running in from the outside of the pedestal are easily found from the pry holes and dowel cuttings in the pavement (Fig. 4). Note that the southeast block was the first block laid, and that the northwest block was the last laid. There were three large blocks on the east side of the pedestal—the front of the pedestal; six smaller blocks on the west side—the rear of the pedestal. Thus, the ancient Greeks, upon entering the cella, saw the colossal statue ahead of them standing on a pedestal the bottom course of which was made up of large blocks (averaging 2.688 m. in length)—big blocks, in scale with the big statue. The corresponding blocks at the rear of the pedestal were in a less conspicuous place and consequently could be of a more convenient size (averaging 1.344 m. in length, half the length of the blocks on the front of the pedestal).

A height of 0.30 m. for the bottom course of the pedestal is given by the height of the marble blocks now lying upon the poros foundations (Fig. 2). To demonstrate this we will show that block I, Figure 2, whose height is 0.30 m., is now occupying its original position. And to show that block I is in its original position will require proof that the pedestal was made up of three courses, of which I belonged to the bottom course.

The top of the pedestal should not be above the eye of a man standing on the pavement of the cella, otherwise some of the gold of the statue, and possibly some of the ivory of the feet, would always be hidden. Why use such expensive materials and then hide even portions of them? The distance from a man's eye to the pavement on which he is standing is generally taken to be 1.50 m. We would, then, expect the height of the pedestal to be not more than 1.50 m.

There are two statuettes representing the Parthenos, the Varvakion and the Lenormant, which are of value for our argument.⁸ Each pedestal is low in proportion to its statue. And each pedestal is made up of three parts—a set of moldings at the bottom, a die, and a set of moldings at the top, of lesser height than the moldings at the bottom. In the case of the Varvakion statuette the height of the pedestal is one-tenth the distance from the bottom of the pedestal to the top of the crest of the helmet; in the case of the Lenormant statuette, the height of the pedestal is one-sixth the distance from the bottom of the pedestal to the top of the head (the crest is not preserved, but if like the Varvakion's, its height would be one-eighth the height of the statue). This base, unlike the Varvakion base, is decorated with a frieze of figures. Unfortunately the frieze is in bad condition. The center of gravity of the frieze is

⁸ Jane Harrison, *Mythology and Monuments of Ancient Athens*, p. 447, fig. 47, and p. 449, fig. 49; Richter, *Sculpture and Sculptors of the Greeks*, figs. 599-601.

well above the center of gravity of the face of the pedestal, a characteristic which doubtless existed in the original pedestal of the Parthenos, otherwise the original frieze

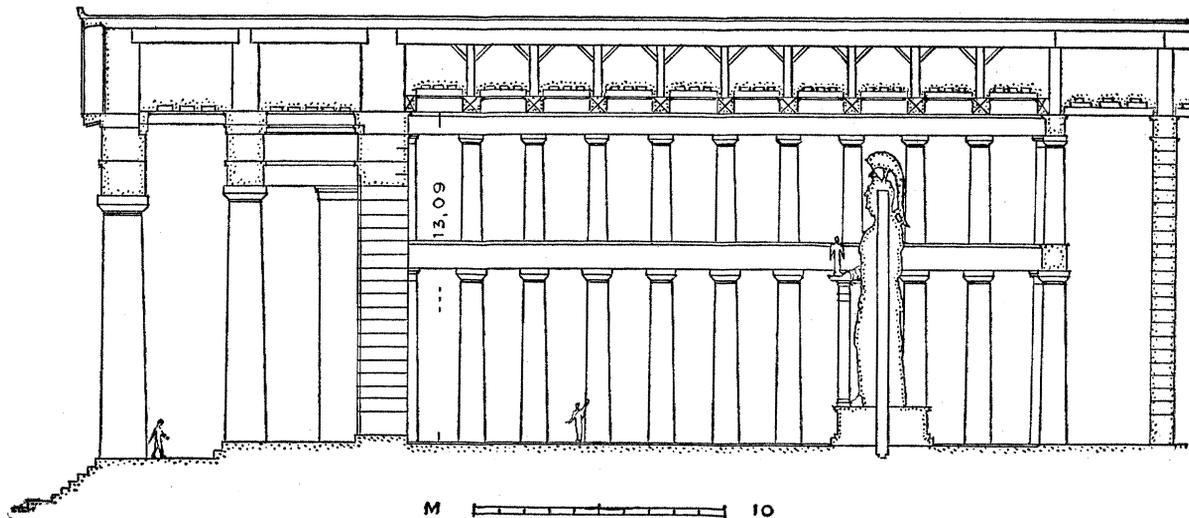


FIG. 6. Longitudinal section through the east cella of the Parthenon: restoration.

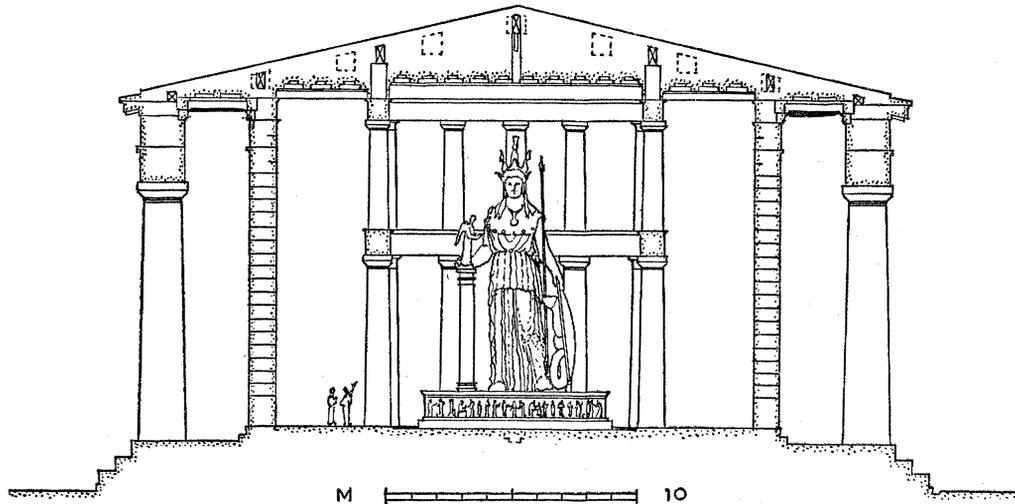


FIG. 7. Cross section through the east cella of the Parthenon: restoration.

would have been too near the pavement of the cella to be seen effectively. Pausanias tells us that the original pedestal was ornamented with a frieze representing the birth of Pandora,⁹ in the presence of twenty gods and goddesses. The frieze, then, if we

⁹ Pausanias, I, xxiv, 7. For a relief in white marble at Pergamon, a fragmentary copy (?) of the relief on the pedestal of the Parthenos, consult *Jahrb.*, V, 1890, p. 114, fig. 9. Praschniker in *Jahresh.*, XXXIX, 1952, pp. 6-12, presents a valuable discussion of the relief of the birth of Pandora on the pedestal of the Parthenos.

include the figure of Pandora, had twenty-one figures. We shall shortly see that the two statuettes are of help in establishing the height of the original pedestal and the distance of the original frieze above the pavement. From the height of the pedestal we shall deduce that the pedestal had three courses, and that 0.30 m. (the height of the blocks now resting on the poros foundations) was a suitable height for the bottom course of the three courses.

Now, the fifth century Greeks who entered the cella from the pronaos should not find the cella, which is by far the largest division of the temple, less high than the pronaos (Fig. 6). This means that the bottom of the wooden beams across the nave should not be below the coffers of the pronaos (Fig. 6). The bottom of the wooden beams across the nave could not be at a higher level, because there would be too little space between the wooden coffers which rested on the beams and the wooden construction which supported the marble tiles of the roof (Fig. 7).¹⁰ The clear height of the cella thus becomes 13.09 m. (Fig. 6).¹¹

¹⁰ Mr. Paul Mylonas, a graduate of the Polytechnic School of Athens in both Architecture and Mechanical Engineering, called the writer's attention to the way the timbers of the roofing above the nave were arranged (Fig. 6, 7). Mr. Mylonas has studied the roofing in some detail, and he hopes to publish his investigations before long.

The writer is grateful to Mr. A. A. Trypanis, Professor of Mechanical Engineering at the Polytechnic School of Athens, for his valuable assistance. He calculated the loads on the cypress beams across the nave, and determined the necessary cross section for the beams. The beams are 11 m. long, and 0.65 m. x 0.65 m. in cross section. The loads on any one of the beams are of two kinds (Figs. 6, 7):

1) Loads concentrated at the center of the beam:	
Woodwork supporting the marble tiles.....	1.847 kg.
Marble tiles	2.608
	—————
Total	4.455 kg.
2) Loads uniformly distributed over the beam:	
Weight of beam	2.230 kg.
Weight of wooden coffers	1.440
	—————
Total	3.670 kg.

The effects of the two kinds of loading were taken into account in calculating the size of the beam. The maximum fiber stress in the beam and also the maximum shearing stress in the beam proved to be acceptable working figures for cypress. The greatest deflection of the beam was *ca.* 0.01 m., which is an allowable amount for this particular beam.

Assuredly scaffolding would be needed for repairs to the colossal statue and especially for the rapid removal of the gold plates in times of danger. Also, since in the Parthenon there are no traces of stairs leading to the attic between the horizontal ceiling and the pitched roof of the temple, scaffolding would be required for repairs to that part of the temple (Fig. 7). Repairs to the antifixes would need scaffolding on the outside of the temple. And scaffolding would be wanted for the other buildings on the Acropolis. There are two areas on the Acropolis designed to store materials of all kinds, where scaffolding might have been kept; one area is northeast of the Propylaea, the other at the east end of the Acropolis behind the Heroon of Pandora (cf. *Hesperia*, V, 1936, pp. 512-513; *Hesperia*, XV, 1946, pp. 24-25). The Chalkotheke is another place where materials were stored.

¹¹ Penrose, *Principles of Athenian Architecture*, pl. 16.

Pliny gives the height of the statue as 26 cubits, but he does *not* say that the 26 cubits (11.544 m.) *excludes* the height of the pedestal.¹² But let us suppose that this is what he meant, namely, that 11.544 m. was the height of the statue alone. Figure

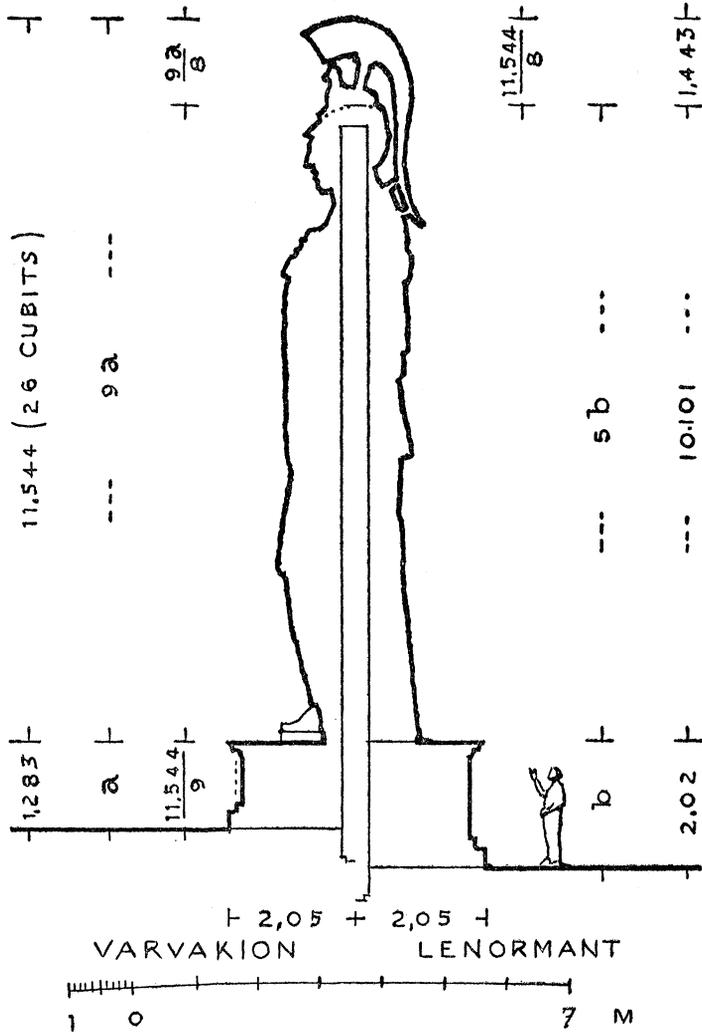


FIG. 8. Parthenos 26 cubits (11.544 m.) high.

8 shows how the height of the pedestal of a statue 11.544 m. high can be found by proportion from both the Varvakion and the Lenormant statuettes.¹³ The average height of the two bases is

$$\frac{1.283 + 2.02}{2} = 1.652 \text{ m.}$$

¹² Pliny, *Nat. Hist.*, XXXVI, 18. For the length of the Greek cubit consult *Enciclopedia Italiana*, Vol. XII, p. 76. The encyclopaedia was published in 1929, but it has been brought up to 1948 by the addition of a number of volumes.

¹³ For the calculations derived from the Lenormant statuette, we have (Fig. 8):

$$\begin{aligned} 5b + 1.443 &= 11.544 \\ b &= 2.02 \text{ m.} \end{aligned}$$

Such a base is too high, as it is *ca.* 0.15 m. above the level of a man's eye—the golden portions of the statue in contact with the pedestal would never be seen, which is hardly permissible. Further, using the average height of the pedestal, namely, 1.652 m.,

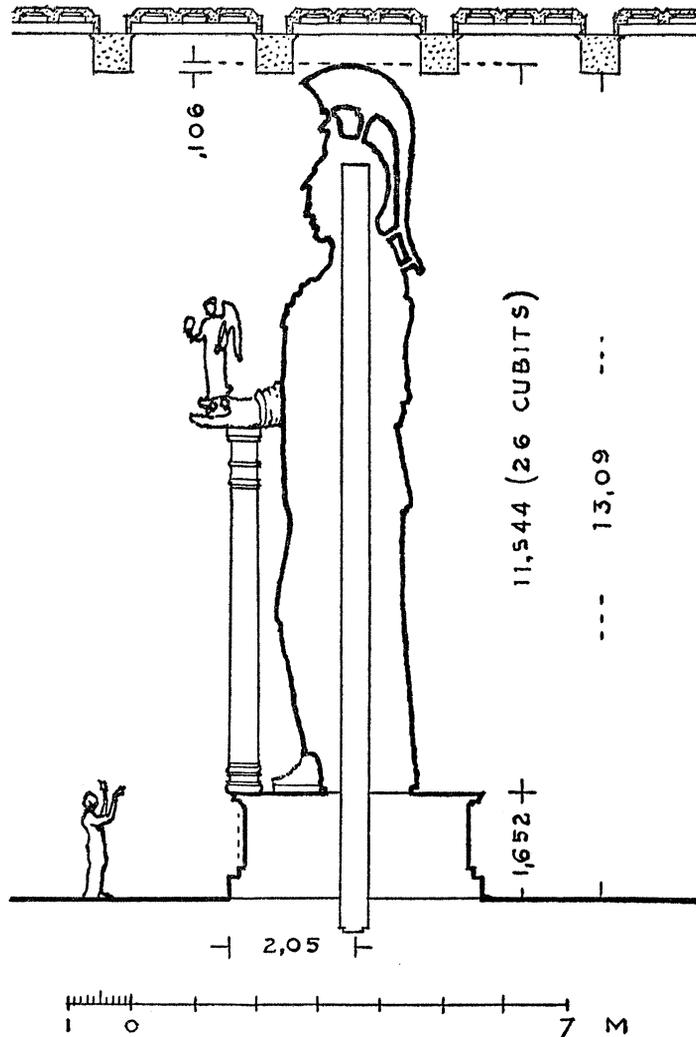


FIG. 9. Parthenos 26 cubits (11.544 m.) high placed upon a base of an average height derived from the Varvakion and Lenormant statuettes.

we obtain a height of 13.196 m. ($11.544 \text{ m.} + 1.652 \text{ m.} = 13.196 \text{ m.}$) for the statue and the pedestal together (Fig. 9). But 13.196 m. is 0.106 m. above the bottom of the beams across the nave (Fig. 9). This relation will never do. Moreover, the column supporting the victory in the hand of the Parthenos is such a great distance in front of the "backbone" of the statue that the face of the column overhangs the die of the

pedestal (Fig. 9. Half the width of the plinth of the pedestal, 2.05 m., is obtained from direct measurement on the pavement of the cella). We are, therefore, obliged to abandon the supposition that Pliny's 26 cubits represented the height of the statue *without the base*.

But, taking Pliny's 26 cubits as *including the base*, that is, taking 26 cubits to mean the distance from the pavement to the top of the crest of the helmet, we obtain

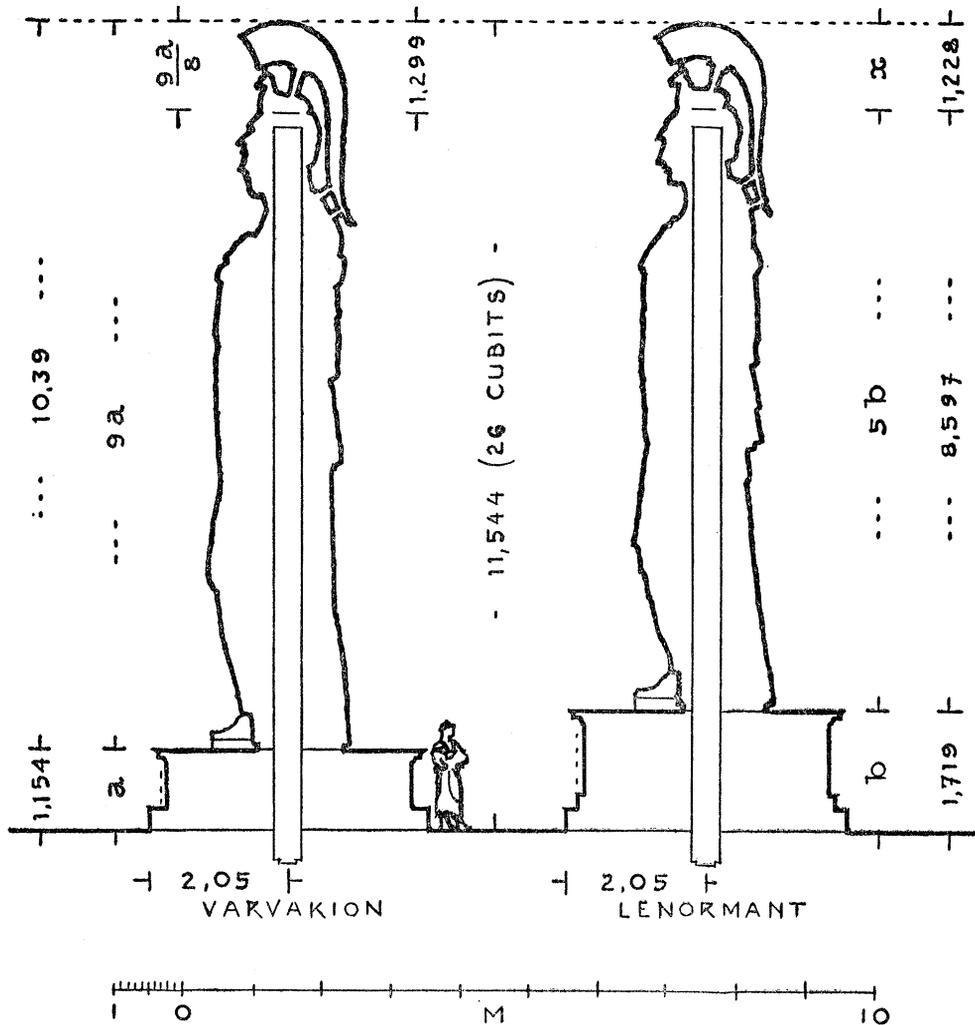


FIG. 10. Parthenos and its base together 26 cubits (11.544 m.) high.

satisfactory results. Figure 10 shows the dimensions for the Parthenos and its base if these two were to measure together a height of 26 cubits (11.544 m.). In the case of the dimensions obtained from the Lenormant statuette, the height of the crest (the crest is not preserved) and the height of the base are found as follows (Fig. 10):

$$1) \quad x = \frac{x + 5b}{8}$$

$$= \frac{5}{7}b$$

$$\therefore x = \frac{5}{7} \times 1.719$$

$$= 1.228$$

$$2) \quad x + 6b = 11.544$$

$$\frac{5}{7}b + 6b = 11.544$$

$$b = 1.719$$

The average height of pedestal is $\frac{1.154 + 1.719}{2} = 1.437$ m. This is a good height

because the top of the pedestal is 0.063 m. below a man's eye, and, consequently, no part of the gold and ivory of the Parthenos would be hidden by the upper part of the base. Using 1.437 m. for the height of the pedestal for the Parthenos, the relation of the statue to the interior of the cella becomes as indicated in Figure 11, where, it will be seen, there is a suitable distance of 1.546 m. between the top of the crest of the helmet and the bottom of the wooden beams across the nave (see, also, Figs. 6 and 7 for more complete representations of the Parthenos in the interior of the cella). Thus we have shown that Pliny's 26 cubits included the base, and that—this is important for our argument about the height of the bottom course of the pedestal—the total height of the pedestal was less than 1.50 m.

We are now in a position to return to our argument about the height of the bottom course of the pedestal. We have still to show that the height of the bottom course is given by the height (0.30 m.) of the six marble blocks now lying on the poros foundations. We shall prove our proposition by demonstrating that block I, Figure 2, is in its original position.

We suspect that the six blocks were expressed by a plinth *ca.* 0.30 m. high on the outside of the pedestal, for, such a plinth is no higher than the sill of the big east door (which was the same size as the west door¹⁴), and, moreover, such a plinth would serve to lift the carved frieze of the pedestal into a position where the figures could be seen to advantage (this lifting of the frieze is suggested by the Lenormant statuette). A 0.30 m. plinth at the bottom of the pedestal is surely not too high for our colossal statue.

A pedestal a little less than 1.50 m. in height would be built up of three courses. For this reason the pedestal of the Parthenos, like the bases of the two statuettes mentioned above, was, with little doubt, composed of three members—one at the bottom, another in the middle (a die), and a third at the top (a set of capping moldings). Now, the outline of the pedestal upon the pavement measures 8.065 m. from north to south (Fig. 2). The face of the die, on which the figures of the frieze were cut, must have measured from north to south somewhat less than 8.065 m.; say, 7.505 m. (Figs. 12, 13). From 7.505 m. we find 0.357 m. as the average axial distance

¹⁴ *Hesperia*, Suppl. III, fig. 58.

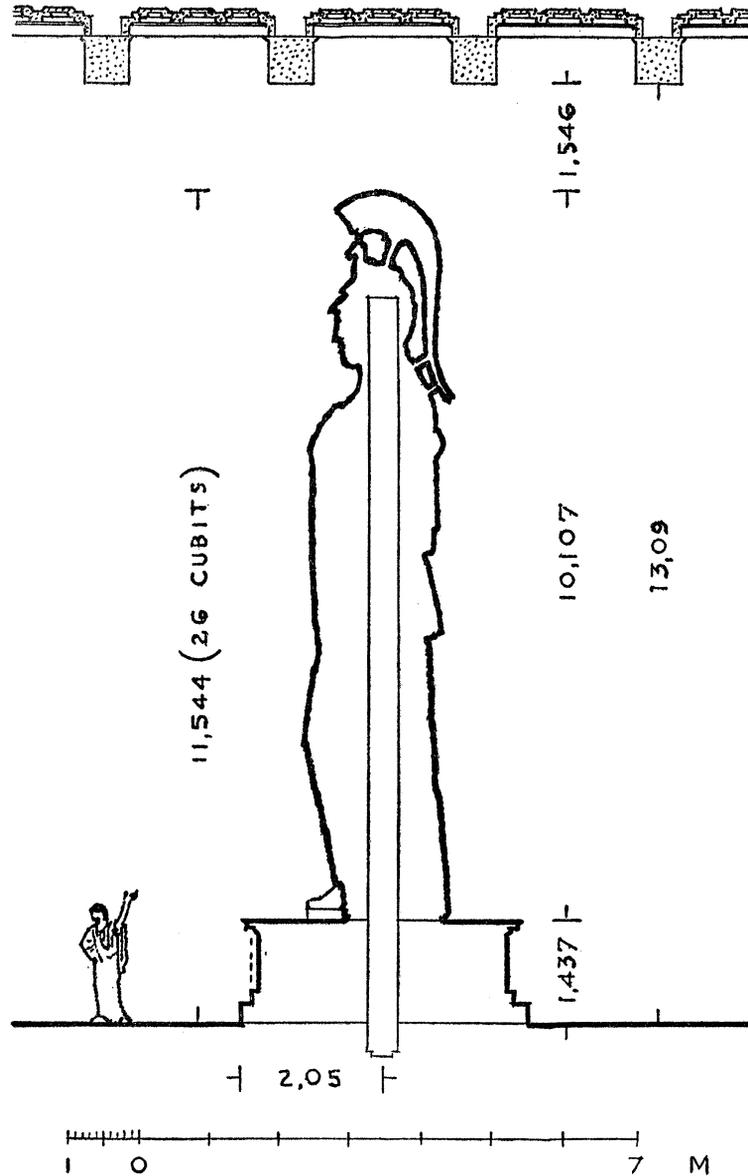


FIG. 11. Parthenon and its base together 26 cubits high, in which the Parthenon is standing upon a base of an average height derived from the Varvakion and Lenormant statuettes.

of the twenty-one carved figures of the frieze, and 0.357 m. in turn gives *ca.* 0.75 m. for the height of the background for the carved figures, obtained by proportion from similar friezes of the fifth century B.C.¹⁵ There was probably some sort of an archi-

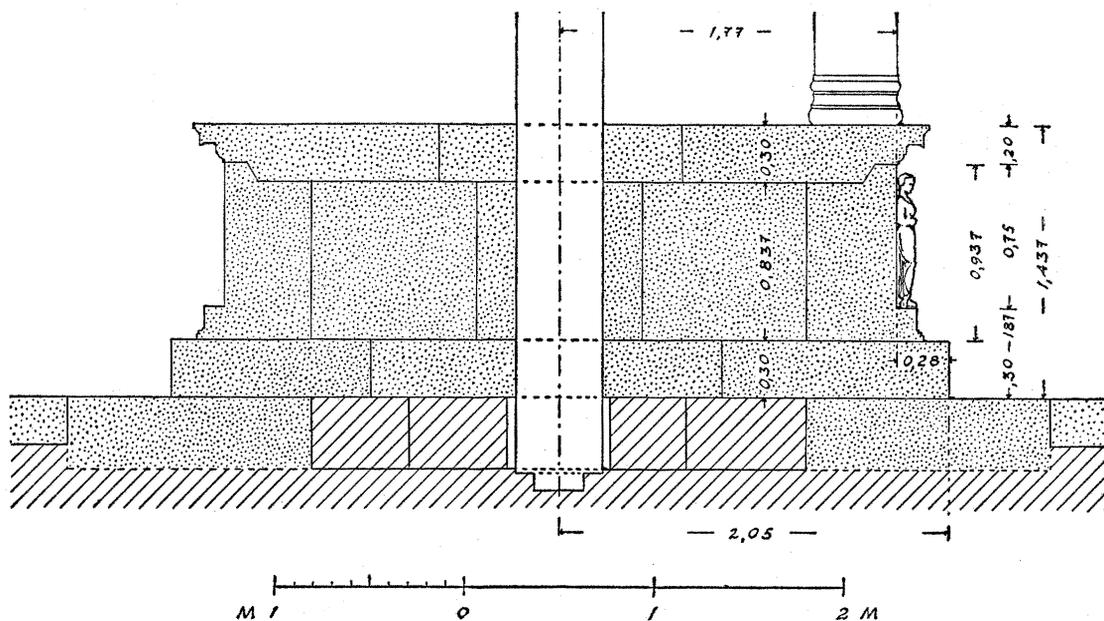


FIG. 12. Section through the pedestal of the Parthenos, looking north: restoration.

tectural member at the bottom of the frieze for the carved figures to rest on, which gives *ca.* 0.937 m. for the total height of the die (Fig. 12).

And the height of the crowning moldings? With a height of 0.30 m. for the bottom course, *ca.* 0.937 m. for the height of the die, and *ca.* 1.437 m. for the total height of the pedestal, the height of the crowning moldings of the pedestal becomes *ca.* 0.20 m. (Fig. 12).

For the proof that the blocks now lying on the poros foundations come from the interior of the pedestal, we submit the following: They are dressed in the manner of the fifth century B.C., and their dowel cuttings, pry holes and shift holes are also of the fifth century type. Of course this is not proof that the blocks come from the interior of the pedestal. But what makes us sure that they belonged to the interior is that:

- 1) The six blocks show no fire damage, just as we should expect in the case of blocks from the interior of the pedestal.
- 2) The six blocks fit the pry holes that are today visible in the poros course beneath the six blocks (Fig. 4).
- 3) One of the six blocks, I, Figure 2, has a good fifth century cutting the right size for one quarter of the "backbone" of the colossal statue.

¹⁵ Praschniker, *Jahresh.* XXXIX, 1952, p. 8, fig. 1.

From what course inside the pedestal did the six blocks come? They have good Greek dowel cuttings and pry holes on their tops, showing there was a course of the fifth century above them—this means that the six blocks could not have come from the top course of the pedestal (Fig. 12).¹⁶ There could have been no relation between the six blocks and the die of the pedestal, as the heights of these two courses are so different (Fig. 12). Consequently, by elimination, the six blocks could have come only from the bottom course of the pedestal.

When we look at the six marble blocks lying on the poros foundations, we are not particularly impressed with them (Fig. 2). But they bear examination. All the blocks were reworked in comparatively late times for some purpose which had nothing to do with our fifth century pedestal. The blocks were placed in their present positions about thirty years ago.

Block I, Figure 2, is the most important of the six blocks; because it is the block which has the good Greek cutting which accurately fits around a quarter of the “backbone” of the Parthenos. The block cannot be placed southeast of the “backbone,” because the width of the block is too great (Fig. 4)—the block could only have come from the northwest of the “backbone.” Now, we have already shown that these six blocks belonged to the bottom course of the pedestal. In other words, block I is at present in its original position. Blocks J and K, on account of their width, surely come from the western portion of the pedestal, but J should be turned around, as we shall see when we discuss the order in which the blocks in the course above were laid. Block J thus turned around appears to be in its original place. If L is in its original position (see below), then M and N surely come from the eastern portion of the pedestal. M and N are too wide to go about the “backbone.” M is in its correct position, judging by the pry hole in its top, used for the block above (Figs. 2, 13). N, thus, must be in its original position, for there is no other place to put it. L is too wide to go to the east of the “backbone”; L is in its original position.

The shift holes under blocks K, L and I, Figure 2 (cf. also Fig. 4), show that:

- 1) These blocks were being shifted in an easterly direction when they were laid.
- 2) These blocks were put in place before the blocks to the west of them (the outside blocks of the pedestal).

If we look at Figures 2, 5 and 12, we note that the blocks of the bottom course of the pedestal, which were in contact with the east and west sides of the “backbone,”

¹⁶ It may be suggested that the pedestal had a plinth above the capping moldings. This is not likely, as neither the Varvakion nor the Lenormant statuette has a plinth. The writer has measured ten bases in Athens all dating from the fifth century B.C. These bases have crowning moldings with no plinth above the moldings; bronze statues have lug cuttings in the tops of their bases for the feet of the statues (example, Athena Hygieia of the Propylaea of the Acropolis); marble statues rest directly upon their bases (example, the Themis from Rhamnous in the National Museum). The pedestal we propose for the Parthenos does not violate Greek tradition of the fifth century B.C.

overlapped their poros foundations—this is the reason why the “backbone” had a lug on its bottom.

We have now shown that the marble blocks at present lying on the poros foundations ran as a course to the outside of the pedestal and were there in all likelihood expressed as a plinth 0.30 m. high. We may safely add that, as the pry holes and dowel cuttings in the marble pavement immediately around the poros foundations (Fig. 2)

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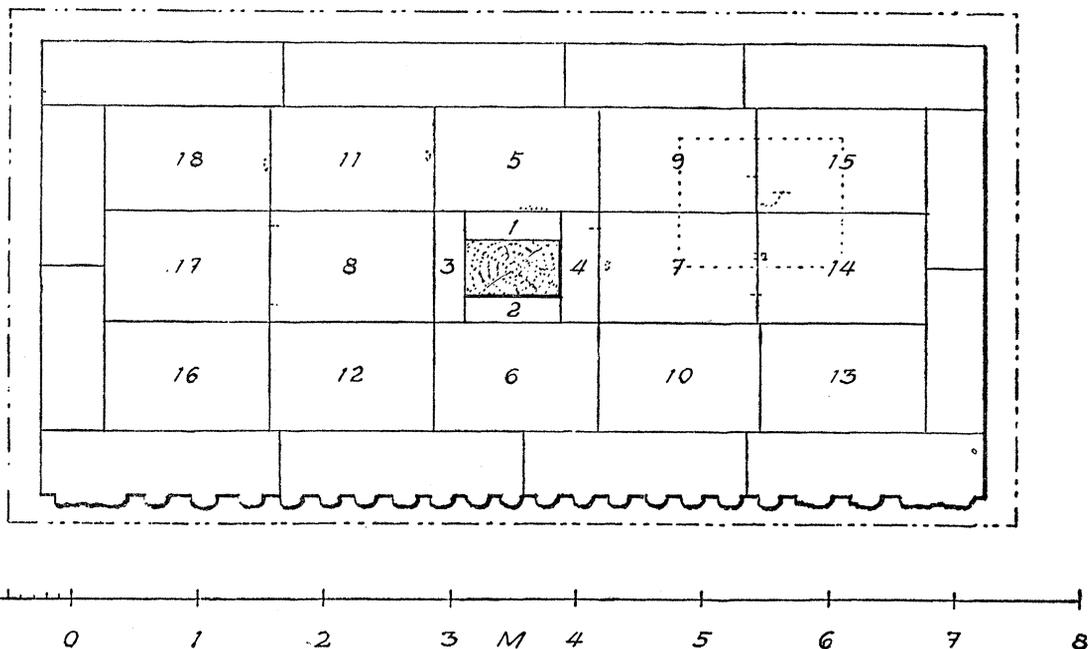


FIG. 13. Restoration of the middle course of the pedestal of the Parthenos. The dowels and pry holes are in the tops of the blocks now lying on the poros foundations of the pedestal (cf. Fig. 2).

are of the types used in Athens in the fifth century B.C. for fine-grained hard stones, the outside blocks of the bottom course of the pedestal were of marble, of Pentelic marble like the blocks lying on the poros foundations and like the paving blocks of the cella.

The probable order in which the blocks of the bottom course were laid is shown in Figure 4 (1 to 19 inclusive). The “backbone” was already in place. The first blocks laid would then be those about the “backbone,” blocks 1 to 4 inclusive—they braced the “backbone.” The next blocks laid would be the remaining blocks of the interior of the course (blocks 5-8 inclusive). Finally the exterior blocks of the course were laid (blocks 9 to 19 inclusive, of which 9 was the first block laid). Block 19 was the last laid of all the blocks of this course.

3. MIDDLE COURSE OF THE PEDESTAL

As we have said, there is a very probable copy in Pergamon of a portion of the frieze of figures on our pedestal.¹⁷ The figures of the copy are carved on the face of a white marble block, in this respect probably imitating the original. The average axial distance of the figures in the copy multiplied by twenty-one (the number of the figures) agrees with the long dimensions of pedestal of the Parthenos less twice the setback (*ca.* 0.28 m., Fig. 12) of the frieze behind the face of the plinth. This agreement shows that the frieze in Pergamon was at the same scale as the original in Athens. Further, with the birth of Pandora occupying the entire front of the pedestal, it is safe to say that the sides and back of the pedestal were undecorated, as in the case of the pedestal of the cult statues in the Hephaisteion.¹⁸ Thus the copy in Pergamon gives us good suggestions for the frieze of the pedestal of the Parthenos—marble blocks with figures carved upon them (probably with a painted background to make the figures stand out), height of the background of the carved figures, *ca.* 0.75 m. (Fig. 12), and sculptured figures only on the front of the pedestal.¹⁹

We have mentioned that the ground of the frieze was probably set back *ca.* 0.28 m. from the face of the plinth at the bottom of the pedestal (Fig. 12). This setback is not altogether guessed at, for it could not be greater without making a column, five meters high, overhang the frieze—this was the column which, as we shall see, supported the goddess's extended hand with a Nike four cubits high in it (Figs. 6, 12). If the inner face of the frieze blocks lined with the vertical joints between the marble and poros blocks of the foundations of the pedestal, as seems likely for proper bonding, then we have about the same thickness for our frieze blocks as in the case of the pedestal in the Hephaisteion (Fig. 12).²⁰

The vertical joints of the frieze blocks should break properly with the vertical joints of the course below (Figs. 4, 13).

As has been said, the height of the background for the figures of the frieze is estimated from the Pergamon copy. Further, we have suggested that there was some sort of member for the frieze figures to stand upon—a member which at the same time would raise the figures a suitable distance above the pavement, as indicated in the Lenormant statuette (Fig. 12).

The tops of the frieze blocks were probably cut like the tops of the frieze blocks of the pedestal in the Hephaisteion (cf. footnote 20). Such an arrangement had two advantages:

¹⁷ See footnote 9.

¹⁸ *Hesperia*, XIX, 1950, p. 153, figs. 5, 6.

¹⁹ Were the frieze blocks made of dark Eleusinian stone with white marble figures dowelled to the frieze blocks, as in the case of the cult statues in the Hephaisteion? No Eleusinian blocks suitable for our pedestal have been found. That the Pergamon copy suggests marble figures carved on marble blocks is about all that can be said.

²⁰ *Hesperia*, XIX, 1950, p. 153, fig. 5.

- 1) The colossal statue rested on a course it would not crack.
- 2) The height of the mouldings above the heads of the frieze figures was in scale with the small figures of the frieze (Fig. 12).

We have seen that the course *below* the middle course of the pedestal was wholly of marble. The course *above* the middle course was also of marble because it was a visible course. This indicates that the middle course itself was probably of marble (no other material would be sandwiched between two courses of marble except possibly Eleusinian stone, but there is no evidence of Eleusinian stone in the Parthenon).¹⁹ Besides, a pedestal made entirely of marble is a good strong pedestal on account of the high crushing strength of marble. And marble blocks can be securely doweled and clamped together. Such a pedestal was needed to carry the great weight of the colossal statue.

The widths and lengths of the interior blocks of the middle course of the pedestal are given by the pry holes, dowel cuttings and a dressing on the tops of the six blocks now lying on the poros foundations beneath the pedestal (Figs. 2, 13).

There would be but one course back of the frieze blocks if the pedestal was to be as solid as possible. The approximate height of the course is shown in Figure 12.

Let us see in what order the blocks of the middle course of pedestal were laid. In this connection we should remember that all the blocks of the bottom course of the pedestal were in place, and also that the "backbone" was in its position, *before the blocks of the middle course began to be laid*.

There are enough pry holes, and dowel cuttings, and a dressing to the west of the "backbone," in the upper surface of the course below the middle course to indicate the probable order in which the blocks of the middle course were laid (Fig. 13, 1 to 18). *First*, the blocks about the "backbone" were put in place (Fig. 13, 1, 2, 3, 4), to brace the "backbone." *Second*, blocks 5, 6, 7, 8 were laid, thus further bracing the "backbone." *Third*, blocks 9, 10, 11, 12 were pried into their positions. *Fourth*, blocks 13 to 18 were put in place. The special dowel cutting (Fig. 14)²¹ and the ordinary dowel cutting in J, Figure 2, do not indicate the above order for the laying of block 15, Figure 13, but, when J is turned around, a satisfactory solution is obtained. *Lastly*, the frieze blocks were laid around the inside blocks of the pedestal (Fig. 13).

There is no data to indicate the order in which the frieze blocks were laid.

4. THE TOP COURSE OF THE PEDESTAL

The jointing of the blocks of the top course is determined from the jointing of the blocks below—for good construction the joints of these two courses should break (Figs. 13, 15). The length and width of blocks 5-18 inclusive (Fig. 15) is almost the same

²¹ Orlandos, *A.J.A.*, XIX, 1915, pp. 175-178; Tschira, "Keildübel," *Ath. Mitt.*, LXVI, 1941, pp. 166-169.

as the length and width of the paving blocks of the cella. A natural order for laying the blocks is given in Figure 15—every block is doweled to the course below except blocks 15 and 18, which, to keep them from moving, were probably clamped on their tops to their neighboring blocks (18 to 10 and 17, 15 to 9 and 14). The angle blocks 13 and 16, toward the east, probably had T dowels beneath and double T clamps on top

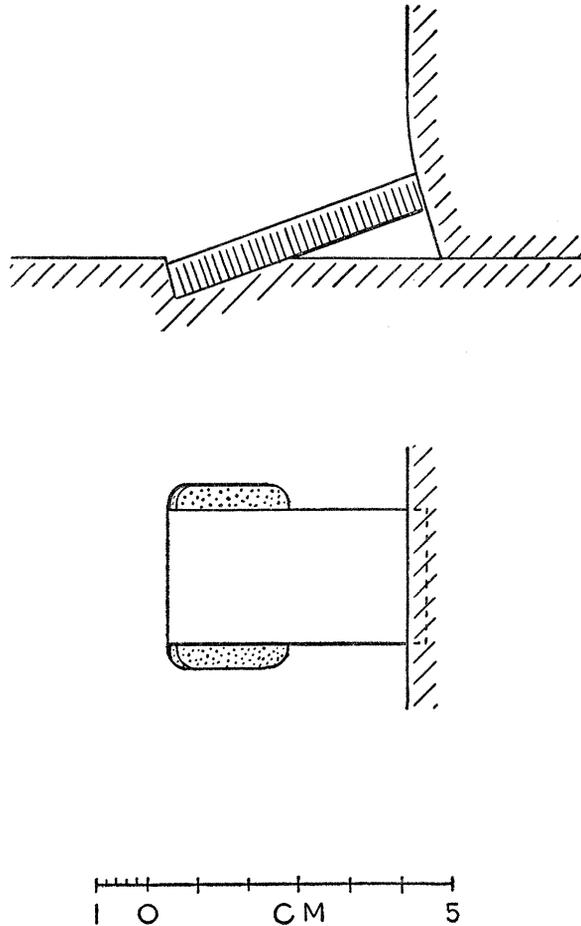


FIG. 14. The special dowel used beneath the northwest interior block of the middle course of the pedestal of the Parthenos.

to hold these blocks securely in place (Fig. 15). Clamps in the upper surface of our top course would show, but in such cases the clamps were either concealed by pieces of marble, or the lead which was poured about the clamps was made flush with the top surface of the block so that only the lead remained visible.²²

²² The Erechtheum has two clamps still partially hidden by pieces of marble (cf. Paton and Stevens, pl. XVII, 4).

At the southeast corner of the pronaos of the Parthenon, in the bottom step, is a cutting, 0.485 m.

5. ADDITIONAL REMARKS

Is the pedestal of the Parthenos too wide (Fig. 7)? The generous width makes one feel that the colossal statue is securely poised upon its pedestal. In addition, there is very desirable space upon the top of the pedestal for votive offerings.

Scholars have raised the question that the column which very evidently supports the victory in the Varvakion statuette did not originally exist in the colossal statue. As we have seen, the socket for the "backbone" is on the axis of the nave. The "back-

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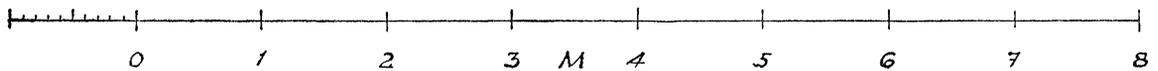
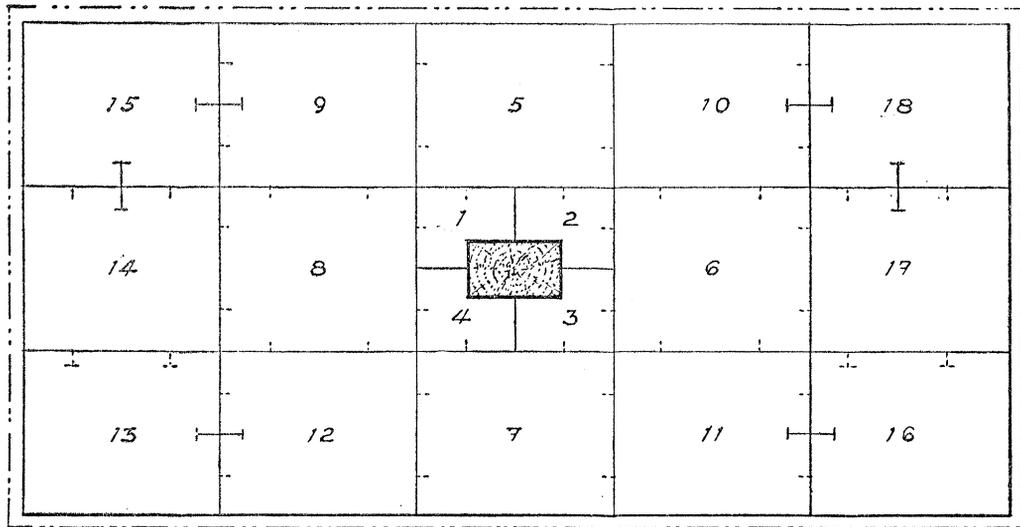


FIG. 15. Restoration of the top course of the pedestal.

bone" would naturally run into the head of the statue, thus bringing the head on the axis of the nave, where the head should be. Now please look at Figure 7. Some object is surely needed to the left of the statue (as one looks at it) to balance the mass of the shield and serpent on the right of the statue. The distance from the "backbone" to the outside of the column beneath the Nike equals the distance from the "backbone" to the outside of the shield, so that the statue as a whole, seen from the door—the most

long, for a clamp. The cutting is only 0.065 m. deep, which is not enough for the height of a clamp of this length plus the thickness of a marble covering. And when clamps are hidden by pieces of marble, the pieces are set in specially prepared beds; the clamp cutting at the southeast corner of the Pronaos has no traces of such prepared beds. As one half of both heads of the clamp cutting project beyond the riser of the step above, these portions of the head could have been hidden, and prevented from rusting, only by lead flush with the tread of the step.

important place from which to view the statue—is centered on the axis of the nave. This is a very important matter from an artistic point of view, especially for a colossal statue, *if the statue is to have dignity*. Here, then, is a good argument in favor of a support under the hand as part of the original statue.

As a further indication that the original statue had a columnar support, we may mention that some of the coins representing the Parthenos have such a support.²³ Unless the original statue had a support, why indicate one in the coin? But here there is a difficulty; the statue may have been set up without a support, and as the centuries passed a support may have become necessary. Did the early die cutters see the statue *without* a columnar support, while the late die cutters saw the statue *with* a columnar support? But the die cutters were not obliged for structural reasons to put a column in their coins. Is it not possible that some of the cutters thought their coins looked better without a column? By far the greater number of the published coins do not have the column.²⁴ If we could only point to a coin which has the column and is of early date, the argument in favor of a column in the original statue would be strengthened. Such evidence is at present lacking. The coins do not settle the question of a columnar support beneath the Nike. But there is a bas-relief, dated as early as the first half of the fourth century B.C., which represents the Parthenos with a column beneath the extended hand.²⁵ The early date of the bas-relief fairly convinces one that the statue had a column from the beginning.

Did the statue of the Parthenos require a column beneath the Nike for structural reasons? Figure 16 shows the sort of armature needed to support the extended arm and the victory in the hand of the Parthenos *provided there was no support under the victory*. In this case there would always be a considerable bending moment at “a,” another one at “b,” and a large amount of torsion in the horizontal portion of the wrought iron bar passing through the “backbone.” By putting a column under the victory these strains, which might in time deform the statue, could be eliminated—a very desirable feature for a statue which was surely designed to last for many centuries. The column transmits directly downward to the pedestal the weight both of the extended arm and of the victory, without causing bending or torsion in the armature.

The column under the hand was of wood, judging from the slimness of the column in the Varvakion statuette and from the fact that the “backbone” was of wood. The column was very probably covered with thin gold plates to make it harmonize with the gold of the drapery of the statue. The column was 5 m. high and was an important element in the composition of the statue (Figs. 7, 16), for, as we have said, the column

²³ Jane Harrison, *Myth. and Mons. of Ancient Athens*, p. 448, fig. 48(b).

²⁴ Svoronos, *Trésor des Monnaies d'Athènes*, pls. 71, 82, 83, 87.

²⁵ *Katalog der sammlung antiker skulpturen, Berlin, Museen, III, Griechische skulpturen des 5 und 4 jahrh. v. Chr.*, pl. 83.

made the center of gravity of the statue as a whole, when seen from the main entrance, appear to be on the axis of the temple.

Calculations by Prof. A. A. Trypanis of the Polytechnic School in Athens indicate that without the columnar support the wrought iron for the extended arm and the victory required a cross section of *ca.* 0.08 m. x 0.08 m. and a length of between 4 m. and 5 m. (Fig. 16).²⁶ The forging by hand of such a wrought iron member would

²⁶ Again, the writer wishes to record his indebtedness to Prof. A. A. Trypanis. He found that the maximum stress in the wrought iron bar occurred at "a," Figure 16, and was due to a combination of bending and torsion, in which the torsion stress was a little more than three times the bending stress. The writer supplied Prof. Trypanis with estimates for the weight of the arm and the weight of the Nike. Two articles were a great help in making the estimates: that of Mrs. Homer A. Thompson, an excellent presentation of the golden Nikai of the Acropolis of Athens (*Hesperia*, XIII, 1944, pp. 173-209); and that of Mr. Pierre Amandry, a preliminary report upon the remarkable ivory and metal objects he found under the Sacred Way at Delphi (*B.C.H.*, LXIII, 1939, pp. 86-119). The Athenians of the time of Perikles did not allow the gold bullion of the state to remain in the unartistic form of ingots; it was made into gold plates and used to cover statues, but the plates were so attached to the statues that they could be removed if the state needed the gold in the form of money. The gold Nikai mentioned above are examples of such artistic use of gold bullion. After careful study of Mrs. Thompson's and Mr. Amandry's articles, the writer of the present article has come to the conclusion that the core of the Parthenos was constructed in the following way:—The outside portion of the core was built up of wooden blocks, each block *ca.* 0.50 m. x 0.50 m. x 0.30 m. thick. The blocks were bonded together like the blocks of a marble wall and tied to the "backbone" with struts. Thus the core was really a statue in wood, which the sculptor could bring to the highest degree of finish. The wood for the outside portion of the core was linden (*φλαμούρι*), which is still used in Greece for life-sized statues. The gold plates, which were a respectable three quarters of a millimeter thick and extremely malleable, were then pressed into the irregularities of the wooden statue, and held in place by silver screws with gilt heads. In Mr. Amandry's article mention is made of the use of silver nails with gilt heads, and the nails attached gold plaques to wooden cores. A silver screw with a gilt head is a natural development of a silver nail with a gilt head—give the nail the thread which the ancient Greek augur had (cf. Paton and Stevens, *Erechtheum*, p. 197, fig. 126) and a slot on top of the head for the reception of a screw driver, and you have the screw. If the gold plates were removed, the statue would be revealed as a carefully finished wooden statue. This seems to account for the saying that, when the tyrant Lachares removed the gold plates of the Parthenos in *ca.* 300 B.C., "he left the statue nude."

The ivory portions of the statue could be glued or tenoned in place with little trouble.

Thus we may think of the Parthenos as a hollow wooden statue largely covered with detachable gold plates, and with the important portions of the statue, such as the face, hands and feet, emphasized with ivory.

The "backbone" was obviously the chief member of the armature within the statue. Like the beams across the nave, the "backbone" was probably of cypress—a tree which in antiquity produced big straight timbers suitable for beams. The height of the "backbone" (11.50 m., Fig. 16) was almost exactly the length of the beams across the nave (Figs. 6, 7). If the beams were obtainable, so likewise was the "backbone"; it was not an unreasonably large timber for the fifth century B.C.

Such a wooden statue was easily destroyed by a fire of any severity.

Granted a statue of the type we suggest and supposing that the extended hand had no supporting column beneath it, there is little difficulty in estimating, fairly accurately, both the weight of the arm and the weight of the Nike (Fig. 16):

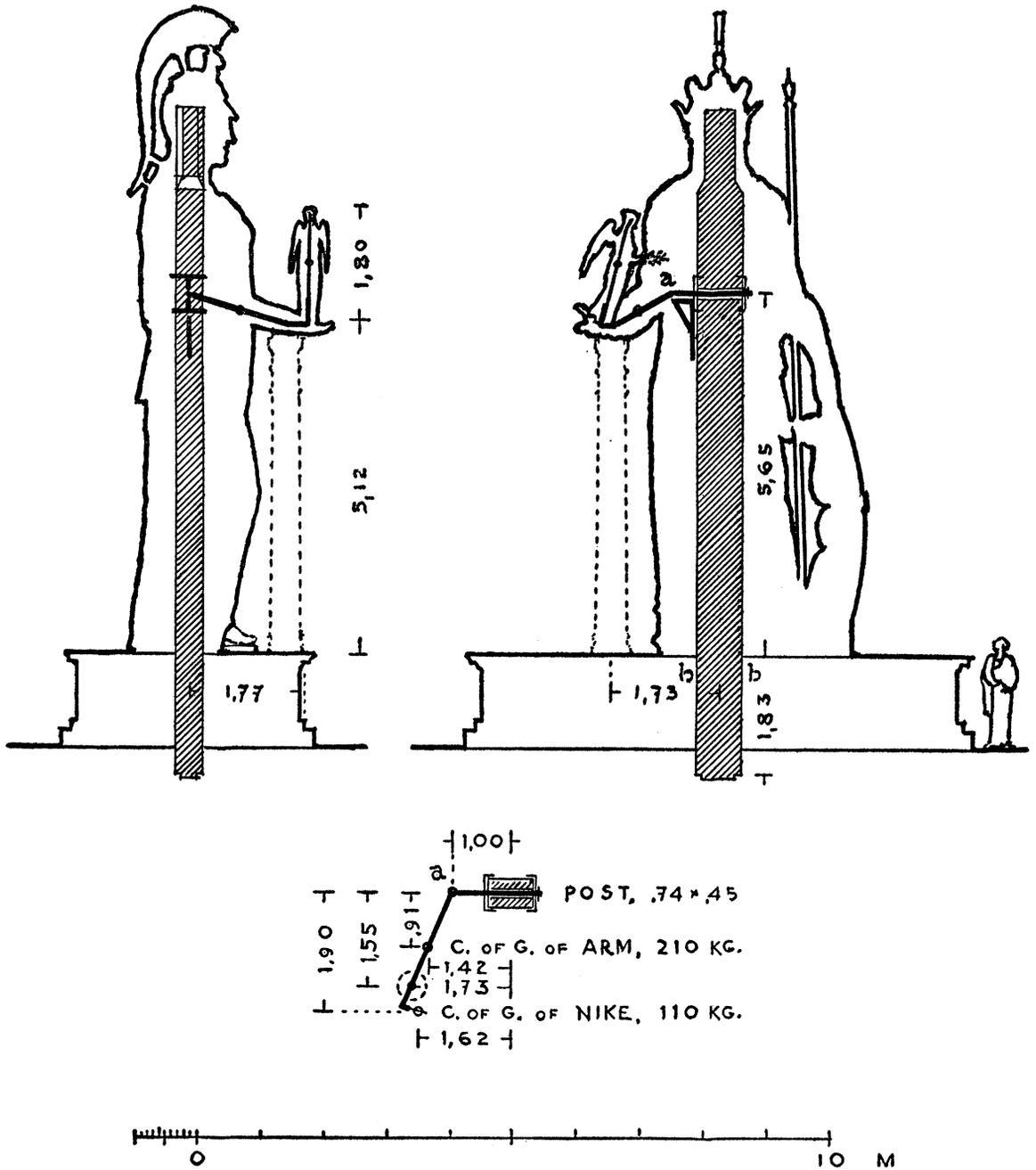


FIG. 16. Possible armature for the right arm of the Parthenos and its Nike, if there is no support beneath the arm.

certainly be difficult in the fifth century B.C. (The wrought iron bars in the architraves over the Ionic columns in the Propylaea of Athens had a section of 0.071 m. x 0.113 m. but were only 1.783 m. long.) Thus, from a structural point of view as well as from an artistic point of view we have an argument in favor of a support under the hand from the beginning. Everything considered, it seems likely that the idea of a support under the hand originated in the fertile mind of Pheidias.

III

WATER BASIN IN FRONT OF THE PARTHENOS

We have stated that the bands of dressing at B and C, Figures 1 and 2, run to the plinth of the pedestal of the Parthenos and there stop, thus giving the position of the north and south faces of the plinth; it is clear that the bands were cut after the bottom course of the pedestal was in place. The bands were sunk 0.0025 m. below the level of the pavement and then further dressed in a somewhat regular fashion with a pointed tool (not a tool with teeth)—we are here dealing with a special technique. There is an exactly similar dressing at A, Figure 1, running half way across the nave—this is as far as the pavement blocks are preserved; without doubt the dressing originally ran entirely across the nave. At A, Figures 1 and 17, is a wrought iron dowel the lower portion of which is still held in place with lead. The dowel is thicker and less wide than the dowels of the fifth century B.C.

How can dressings A, B and C and the dowel, mentioned in the last paragraph, be explained? The usual interpretation is that they give the position of a barrier which prevented people from approaching the cult statue too closely. But this theory would require similar dressings between the columns along the sides of the nave, where no such dressings exist, although the pavement in some of the intercolumnar spaces is well preserved. Pausanias, however, comes to our help. He says when visiting Olympia (V, 11, 5, J. G. Frazer's translation) :

<i>Arm</i>	W. I. bar	121 kg.
	Wooden core	66
	Gold plates	23
	Total	210 kg.
<i>Nike</i>	W. I. connections	20 kg.
	Wood statue.....	38
	Gold plates	52
	Total	110 kg.

These estimated weights together with the distances indicated in the plan in Figure 16 give the means of calculating the size of the wrought iron bar needed for the extended arm

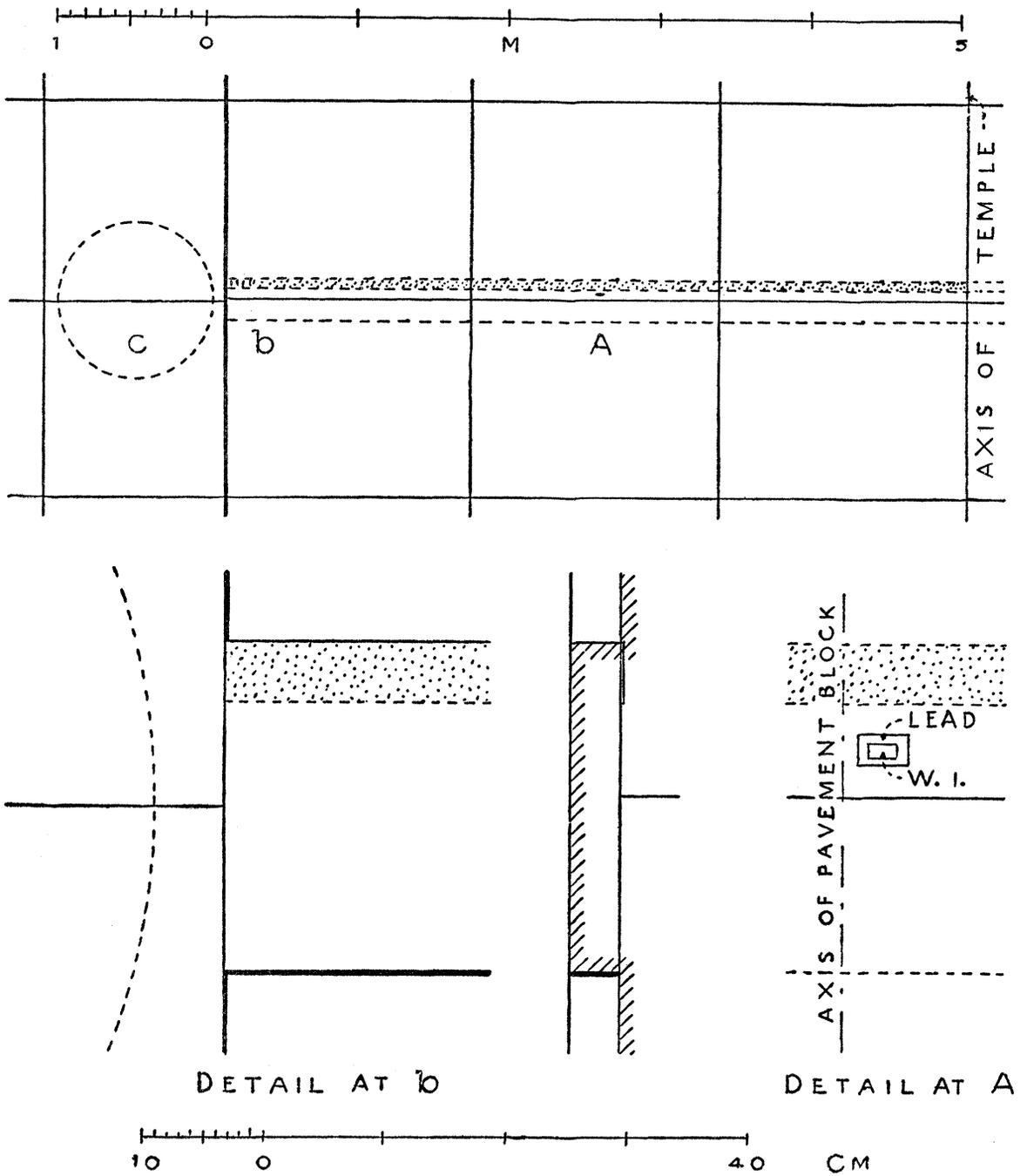


FIG. 17. Details for the rim of the water basin at A, Figure 1.

The ground in front of the image (of Zeus) is flagged, not with white, but with black stone. Round about the black pavement runs a raised edge of Parian marble to keep in the olive oil which is poured out. For oil is good for the image at Olympia, and it is this that keeps the ivory from suffering through the marshy situation of the Altis. But on the Acropolis at Athens it is not oil, but water, that is good for the ivory in the image of the Virgin. For the Acropolis being dry by reason of its great height, the ivory of the image needs water and moisture. At Epidaurus, when I asked why they poured neither water nor oil on the image of Aesculapius, the attendants of the sanctuary told me that the image and throne of the god were erected over a well.

Pausanias, who was in Athens about A.D. 150, either saw a water basin in front of the Parthenos, or was told about one which existed probably not more than a generation or two before his day. How can we interpret the quotation from Pausanias to mean anything but that, like the Zeus at Olympia with its basin for oil, which travellers see to this day, just so the Parthenos had its basin not for oil but for water? The basin did not need to be used in winter, for rain falls abundantly in Athens in that season; in winter there is no complaint of a lack of humidity in the air. But the summers are exceedingly dry, and a means of controlling the humidity in the cella of the Parthenos was evidently found necessary. It seems clear that a water basin was installed at some time between the dedication of the Parthenos and the visit of Pausanias.

We shall see a little later on that the basin continued to be used after the restoration of the pedestal.

As the pavement of the nave was on one level, the rim of the basin must have risen above the pavement. What was the rim like? Its position and shape can be defined. The fact that the west edges of dressings B and C are in line with the face of the east plinth of the pedestal indicates where the east faces of the rims over B and C were, for the rim would not project beyond the plinth (Figs. 2, 7). Just as the west edges of dressings B and C give the east edges of the rims above B and C, so likewise the west edge of dressing A gives the west face of the rim above A. Figure 17 shows how the width of the rim is found, namely, by centering the rim on the axis of column "C." Note that the dowel at A, Figure 17, is almost in the middle of the rim—the dowel could not be placed exactly in the middle on account of the jointing of the paving blocks below.

The height of the rim? The columns on either side of the nave rest on a course which is raised 0.041 m. (2 dactyls) above the pavement of the cella. The rim would undoubtedly be this same height, a height which Iktinos himself thought would not seriously interfere with circulation between the nave and the aisles.

We can make a good guess as to the meaning of the peculiar dressings at A, B, and C. As the rim of the basin rested on the pavement of the nave, water from the basin might work its way under the rim and then spread over the pavement outside the rim. To avoid this danger it would only be necessary to smear a waterproofing

over A, B, and C, possibly the pitch used for the seams of ships. To make such water-proofing effective, it should be placed on the side of the rim toward the water danger and in actual contact with the water. These are features displayed by A, B, and C in our restoration of the rim (cf. Figs. 2, 17).

If the basin and the pedestal were designed at the same time, we should find a dressing similar to A, B, and C under the east edge of the pedestal. There are no traces of such a dressing. It appears that the basin was an afterthought, found necessary because, as time went on, the ivory of the statue began to crack from lack of humidity. If Iktinos had been called upon to design both pedestal and water basin, the result would have been happier.²⁷

The water for the basin came undoubtedly from the five great rock-cut wells just north of the Parthenon, wells which in the rainy season collected water from the roof of the Parthenon in sufficient quantity to last through the summer. We may imagine temple attendants on hot summer days bringing water from the wells and pouring it into the basin. The water, spreading itself thinly over the large area of the basin, rapidly evaporated, giving humidity to the air of the cella and thus helping to preserve the ivory of the statue. The whole operation could be done overnight, without interfering either with religious services or with everyday circulation in the cella. The basin served a practical purpose and was made as inconspicuous as possible.

IV

RESTORED PEDESTAL FOR THE PARTHENOS

There are evident indications that the outside blocks of the bottom course of the pedestal were replaced along the north and east sides of the pedestal at a time when dowels with pour-channels were in use (Fig. 18). The outside blocks along the south and west sides of the pedestal were also replaced, for, if these blocks had only been cut back, traces of the cutting chisel would have remained upon the marble pavement; there are no such traces. These blocks were very probably held in place by hook clamps in the tops of the blocks. On the other hand, the six remaining inside blocks of the pedestal show no signs of replacement. We may explain such a repair as necessitated by a fire which could not get at the inside blocks; these blocks were protected from the fire by the outside blocks of the pedestal. We may add that the whole pavement of the east cella, with the exception of the blocks beneath the pedestal, shows signs of fire damage—eloquent proof of the severity of the fire. The six blocks are original blocks from the interior of the pedestal.

If the outside blocks of the pedestal needed a thorough repair, the colossal statue,

²⁷ Curtius and Adler, *Olympia*, pls. II, VIII, IX, XI, XII for the basin for oil in front of the colossal statue of Zeus at Olympia.

with a core which was largely made up of wood ("backbone," struts and background for the gold plates and ivory parts) probably entirely disappeared in the same fire.²⁸ The history of the pedestal and the history of the statue must be considered together.

Figure 18 gives the late dowel cuttings, pry holes and weather marks by means of which the silhouette of the restored pedestal upon the pavement of the nave is

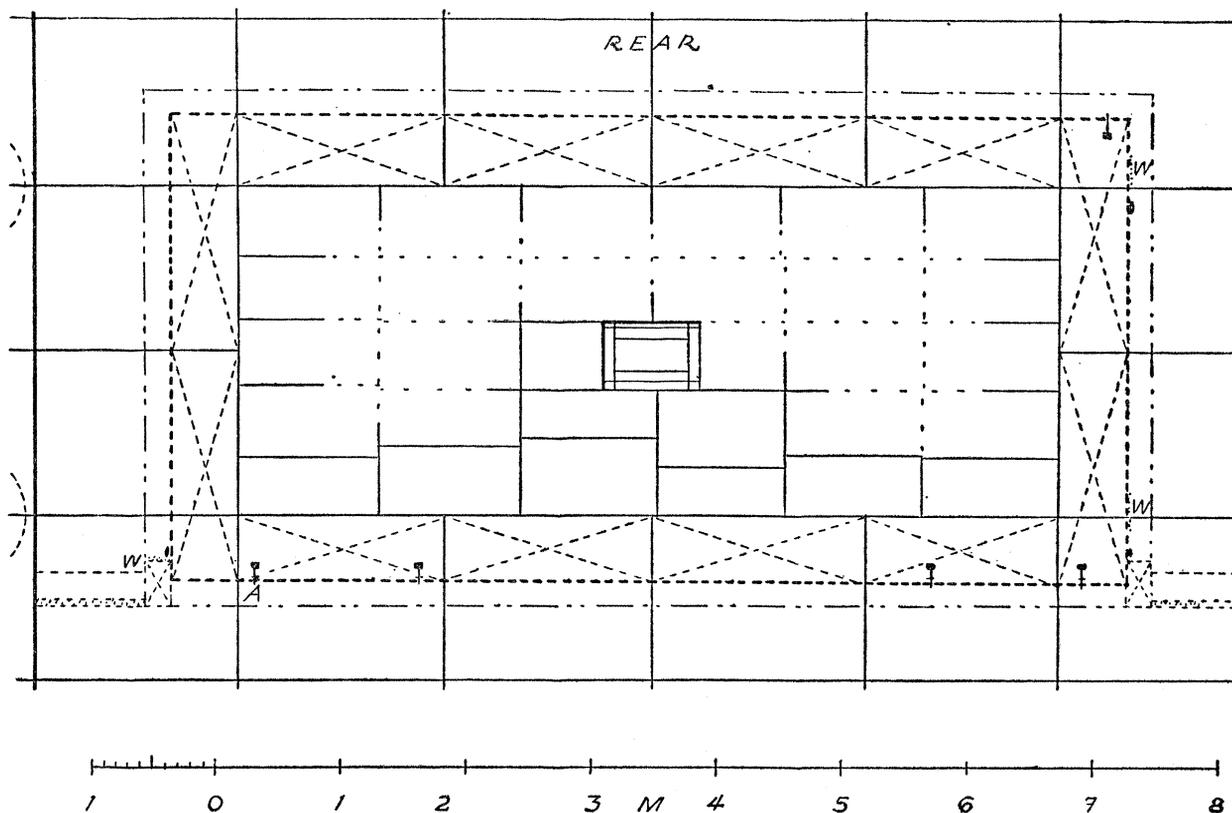


FIG. 18. Data for the restored pedestal of the Parthenon. The heavy dotted line indicates the outline of the pedestal determined. Note that the plinth of the new pedestal was set back 0.19 m. on all sides (Fig. 19).

Why was the plinth set back? The frieze of Pandora was certainly destroyed by the same fire that damaged the original plinth of the pedestal. And the destruction of the frieze would be all the more complete if the frieze figures were cut in the round, like the frieze figures of the big altar at Pergamon.²⁹ What more natural than to make

²⁸ Lucian, *Gallus*, 24 (Loeb ed., II, p. 224). In this dialogue the cock says to Mikyllos that inside the colossal statues of Pheidias and other famous sculptors, there were bars, props, beams, wedges and pitch, and that sometimes mice and rats lived within the statues (reference kindly supplied by Mr. B. H. Hill).

²⁹ *Altertümer von Pergamon*, III, 1, pl. XIII.

the restored frieze of not more relief, relatively speaking, than that of the Pan-athenaic Procession (Fig. 19)? There are many effective reliefs where the height of the figures is about that of the frieze of the Parthenos, and where the greatest projection of the carving is *ca.* 0.045 m. And to reduce the frieze figures in the round to figures in relief would decrease the chances of their destruction by future fires. Experience is a good teacher.

The plinth does not seem to have been *cut back* 0.19 m., for the four dowel holes with pour channels on the east side of the pedestal (Fig. 18) show that *new blocks*

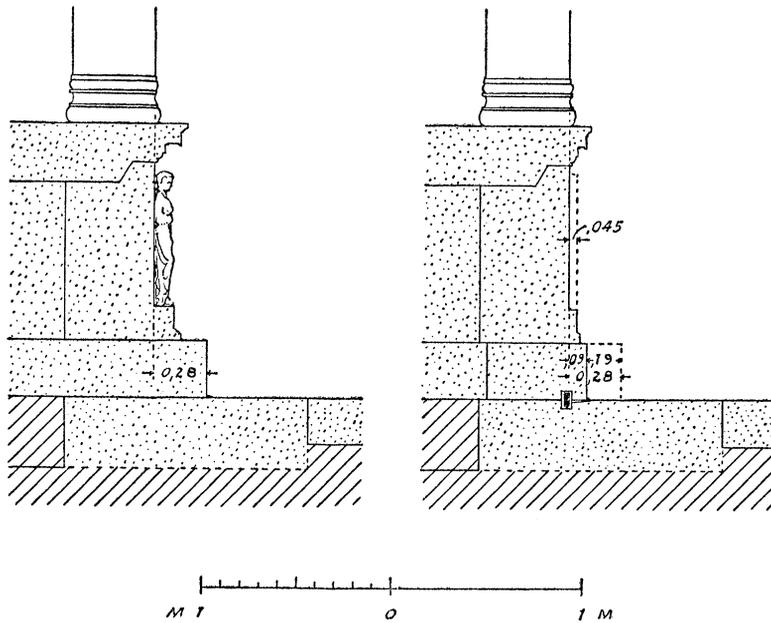


FIG. 19. The original and the repaired pedestal, showing the set-back of the plinth and the possible substitution of frieze figures in relief for the original frieze figures in the round.

were held by these dowels. And the use of new blocks is borne out by the fact that while the original pedestal had three blocks across the east, the joints of which did not line with the joints of the pavement, the restored pedestal had six blocks the joints of which did line with the joints of the pavement (Figs. 4 and 18).

In order to set new plinth blocks, the frieze blocks must have been removed (Fig. 19)—new frieze blocks were required.

It is likely that all the blocks of the top course of the pedestal had to be replaced, for the top of the pedestal was exposed to the full fury of the fire (Fig. 12).

To return to Figure 18 for a moment. Note that the plinth of the restored base is shown 0.19 m. back of the western rim of the water basin. This does not mean that the basin was no longer thought necessary, for, if moisture was needed for the

ivory of the statue before the restoration of the pedestal, moisture would likewise be needed for the ivory of the restored statue. Figure 20 shows how the rim used in connection with the first pedestal was adjusted to the restored pedestal. There is a weathering on the pavement to the west of the adjustment block A, Figure 20, which confirms the restoration shown in the figure.

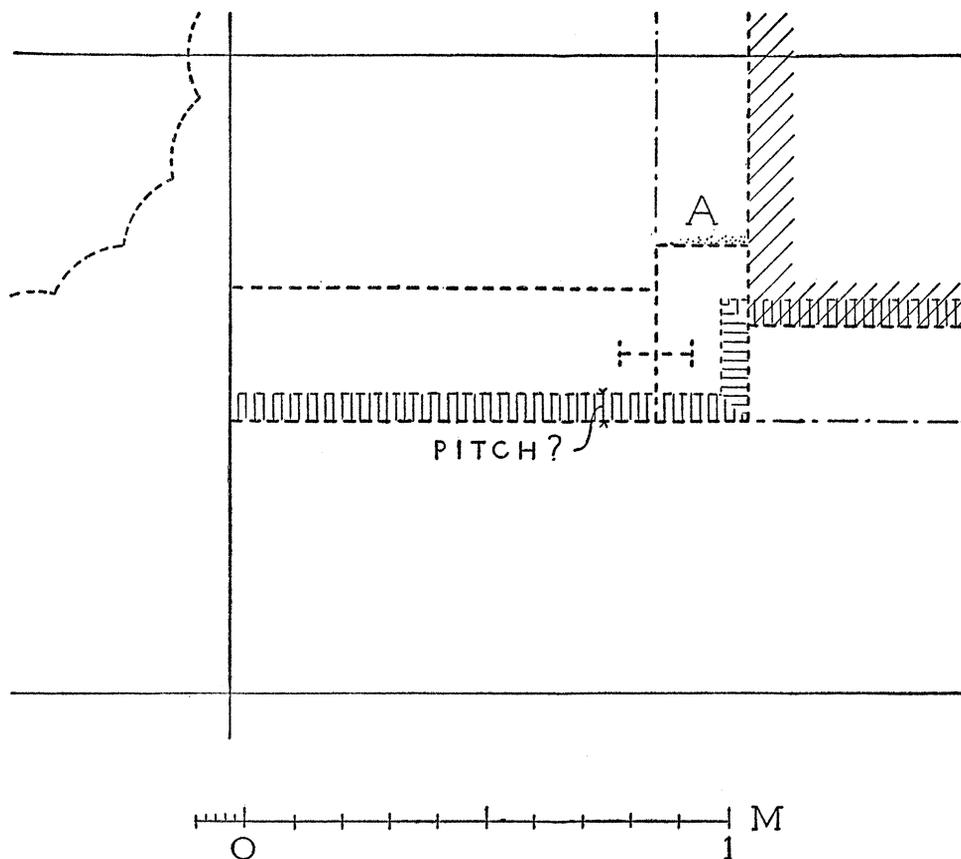


FIG. 20. Adjustment between the rim of the basin and the southeast corner of the restored pedestal.

The adjustment block A could have been held firmly in place by a clamp, as indicated in Figure 20.

How was the water of the basin prevented from finding its way not only under the block of adjustment between the rim and the pedestal, but also under the blocks of the restored pedestal (Figs. 18, 20)? It is highly probable that pitch or some other waterproofing material was smeared on the pavement, as shown in Figure 20, before block A and the restored blocks of the pedestal were laid. Such a method of waterproofing is borne out by the dowel cuttings with peculiar pour channels under the

east blocks of the restored pedestal (Figs. 18; 21). There are four dowel cuttings on the side of the pedestal toward the tank and all have the peculiar pour channels; there is only one dowel cutting on the west side of the pedestal, but its pour channel is of the usual type where there is only a pour channel running straight in from

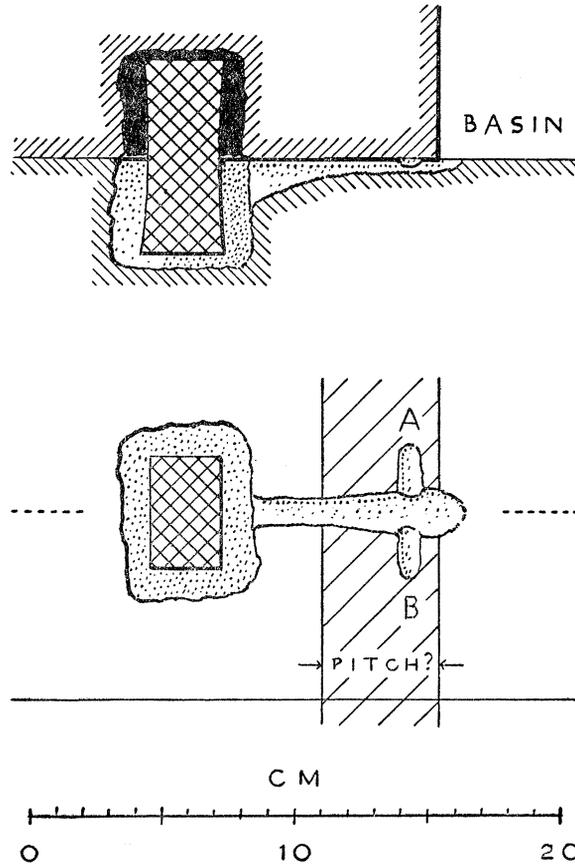


FIG. 21. Late dowel cutting and its peculiar pour channel: at A, Figure 18.

the outside of the block to be set. Blocks where late dowels and pour channels are used must be pried into place without having their under surfaces in contact with the blocks they are to rest on, because the blocks to be set have one or more dowels projecting from their under surfaces (Fig. 22), and because only until the dowels are directly over their respective holes in the courses below can the blocks be lowered into their final positions. It is evident that the blocks to be set cannot be pushed along the pavement, a movement which would displace ruinously any waterproofing beneath the blocks. On the other hand, the vertical lowering of the blocks upon a waterproofing

would make good watertight joints by squeezing the waterproofing material into the cracks and crannies.

Let us suppose that the waterproofing, suggested above, has been applied, care, however, having been taken not to smear the pitch over the pour channel, as that would clog the channel. Now the time has come to run the lead around the dowel in its cutting in the pavement (Fig. 21). Evidently there was fear that without the crossarm

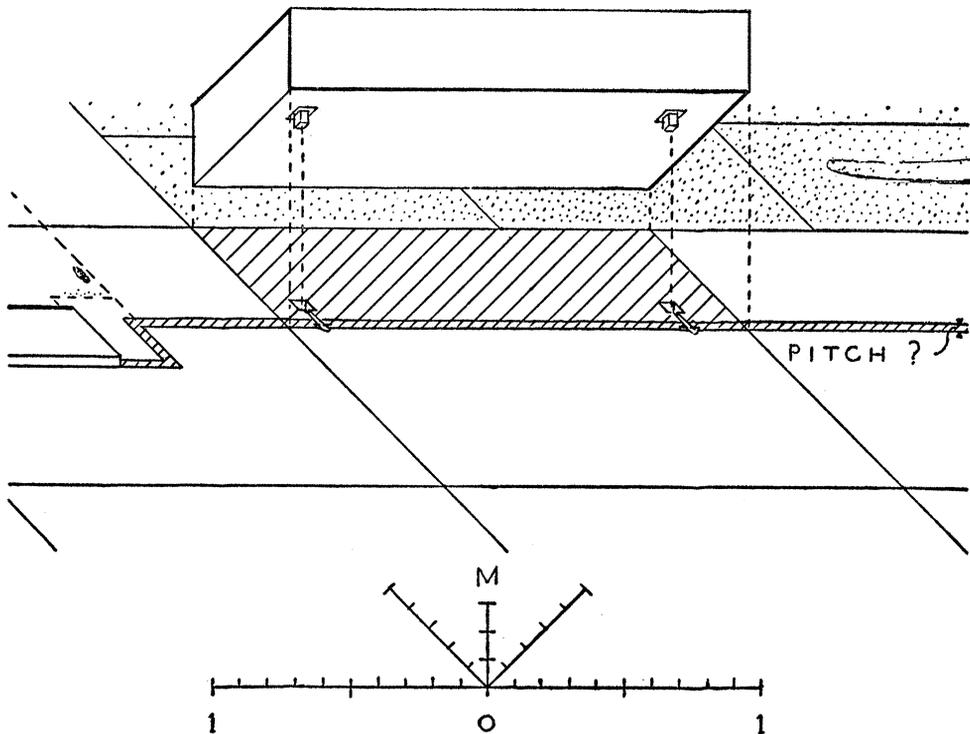


FIG. 22. A block with dowels protruding from its bottom needs to be lowered into place (the east plinth block of the restored pedestal next the southeast corner block).

A-B, Figure 21, the molten lead would destroy the pitch in contact with the sides of the pour channel and thus open passages through which the water from the basin would work its way under the block. The lead in the crossbars sealed these passages.³⁰

The date of the restoration of the pedestal, as given by the architectural evidence, is uncertain. About all that can be said is that the restoration took place after a major conflagration of late date. Once the ceiling caught fire, how could the conflagration be put out? The blazing ceiling would fall to the floor and there burn fiercely, sending great heat through the lofty east door. This is the reason why:

³⁰ For waterproofing by lead in the Erechtheum see Paton and Stevens, *Erechtheum*, pp. 114-115, pl. XXVII, 1 and 2.

- 1) The sill of the east door was restored (if the sill was damaged, the jambs and lintel were likewise damaged).
- 2) The columns of the pronaos were badly calcined from top to bottom, but only on the sides toward the door.

The crudeness of the restorations connected with the fire indicates a Roman date. And the peculiar dowel cuttings of the restored base go well with such a late date, for Hellenistic dowels with pour channels were smaller and better cut (Fig. 21). To the writer the repairs upon both the door and the pedestal seem to be of the Roman period, and the damage in each case to be caused by the same fire.

CONCLUSIONS

We present the following conclusions :

- 1) The Parthenos, on its original pedestal, of which six interior blocks of the plinth remain, appeared in 438 B.C.
- 2) A water basin was arranged in front of the pedestal at a subsequent date, but prior to Pausanias' visit in Athens (*ca.* A.D. 150).
- 3) As the pedestal shows signs of having been repaired but once, its restoration was with little doubt caused by the *greatest* fire that swept through the cella.
- 4) A great fire occurred in Roman times.³¹
- 5) A Parthenos, if not the original, was destroyed by the same fire which ruined the pedestal.
- 6) The water basin was adjusted to the restored pedestal. This indicates that the Parthenos was also restored, for moisture continued to be needed for the ivory of the statue.

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³¹ Was the statue, thus destroyed, the original statue, or was it already a replica of the original? Did the original statue have a treetrunk for a support under the hand as indicated on some of the coins (Jane Harrison, *op. cit.*, p. 448, fig. 48 b), and did a column take the place of the treetrunk when the statue was restored (either a treetrunk or a column would make a good support)? Were the Varvakion and the Lenormant statuettes copies of the original, or copies of a replica? These are intriguing questions, but they are hard to answer.