

THE PANATHENAIIC FRIEZE

OPTICAL RELATIONS

(PLATES 61–63)

THE many studies of the frieze of the Parthenon have dealt almost exclusively with stylistic or iconographic problems and only occasionally has reference been made to the manner in which it was actually seen when in its place on the building.¹ The statement is made that only from the peristyle could the entire display be observed, but in this case the angle at which the spectator must look upward and the extreme foreshortening of the figures make recognition very difficult. From such a position the frieze would exist essentially as an offering or dedication.

Gorham P. Stevens² has called attention to the fact that the frieze was designed to be seen from the platform or terrace on which the temple stood, but he did not dwell on the fact that in such a case the actual procession is broken up into a series of panels, framed between columns, and shifting with the location of the observer. Since previous studies of the frieze have not taken notice of any arbitrary divisions save those in subject matter, such as groups of gods, horsemen, chariots and sacrificial animals, etc., but rather treated the frieze as a whole, it would appear that little attention has been given to any planned relation between the figures and groups of the relief and the spaces through which, perforce, they must be seen. Nor is this surprising since it is clear that an infinite number of points of view may be said to exist all around the perimeter of the temple, following a zone parallel to the rectangle of the stylobate.

Among this infinity of station points, however, there should be some which would recommend themselves especially to an observer as, for instance, on the axis

¹ This paper owes its origin to a visit to the Metropolitan Museum in New York many years ago when I noticed in the model of the Parthenon an intriguing relation between the columns of the peristyle and the portions of the frieze that could be seen between them. Not until long after did I have the opportunity of testing this more fully by means of a model made in the Architectural Laboratory of Princeton University. I had the benefit at the time of advice and observation from Professor Jean Labatut, Director of Graduate Design at the Architectural School.

The inspiration of a modern master of Greek style and his study of the East Pediment of the Parthenon (*Hesperia*, II, 1933, pp. 1-88) induced me to try, in a modest way, to attempt a contribution to the corpus of studies of that monument. It had been my intention to carry this study a good deal further, especially in connection with the frieze on the north and south sides. Whether I shall have time or ability to do so rests in the future. Meanwhile, this brief commentary is dedicated in admiration and affection to one to whom so many owe such a great debt, Rhys Carpenter.

² *Hesperia*, Suppl. III, 1940, p. 59. *The Periclean Entrance Court of the Acropolis at Athens*, Cambridge, Mass., 1936, p. 39. Also *Hesperia*, V, 1936, p. 481.

of the building, opposite the west or east doorways. Other points of vantage might be expected most naturally opposite the center of an intercolumniation where the eye could focus on a section of the frieze framed between two adjacent columns. Also possible, though less likely, would be a station point directly opposite a column where one could observe the frieze to either side.

Since only the western section of the frieze is still almost all in place, but since at that end the original level of the terrace is no longer preserved, it seemed that the most practicable way of testing the problem was by means of a model. Thus the frieze could be studied as it were at first hand and recorded by photographs from controlled positions. Accordingly, a model was constructed of plywood at the scale of one inch to the foot. Dimensions were taken from Penrose³ and the frieze, as published by Michaelis,⁴ was reduced photostatically to the proper scale and inserted. Since the east and west porticoes are so nearly alike a model of one end could serve for the other by the substitution of the proper sections of frieze. It was not practical to attempt to reduce photographically the large plates in Smith⁵ or Collignon⁶ since the reductions would not have shown up clearly enough when the model itself was photographed. The drawings used as illustrations to the text were carefully traced from the actual photographs of the model.

A glance at the section in Figure 1 will show that the furthest distance from which the frieze can be viewed is determined by a line drawn from the top of the frieze tangent to the inner edge of the soffit of the main epistyle. A position further away will cut off more or less of the tops of the figures. On the other hand, there is no precise distance at which one must stand within this limit of vision save that the nearer one approaches the building the more difficult it becomes to view the sculpture conveniently. The broad abaci of the capitals cut into the frieze at the outer distance and decapitate the figures at either side of any given panel. For a full view we should assume a distance where the lower edges of the abaci coincide with, or are a little higher than, the moulding that tops the frieze. By approaching even nearer the panels seen between the columns become slightly wider, but a series of photographs taken with the lower edges of the abaci coinciding with the upper edges of the filler blocks between the beams show that the increase between this distance and the first is not great and does not effect any important modification of the compositions.⁷ We shall speak, then, of a zone or belt of observation, a few feet wide, that runs parallel to the four sides of the building, approximately thirty feet away from the stylobate.

³ Penrose, *The Principles of Athenian Architecture*, London, 1888.

⁴ A. Michaelis, *Der Parthenon*, Leipzig, 1870.

⁵ A. H. Smith, *The Sculptures of the Parthenon*, London, 1910.

⁶ M. Collignon, *Le Parthenon*, Paris.

⁷ The difference as shown by two photographs taken facing the central "panel" of the west frieze is as follows: (1) at 32 feet from the stylobate 12¾ feet of frieze can be seen. At this distance the lower, rear edges of the abaci come just above the frieze crown. Six feet nearer, at 26 feet from the stylobate the "panel" expands to 13½ feet, an increase of nine inches.

It is, of course, impossible to compel an observer to stand at a precise station point, or points, along this zone. As he stands opposite an intercolumniation, for instance, he may shift to one side or the other. He may glance upward at the frieze as he moves along parallel to the side of the temple and not view it at right angles, which would compel him to stop, or twist his head around, but look upward and

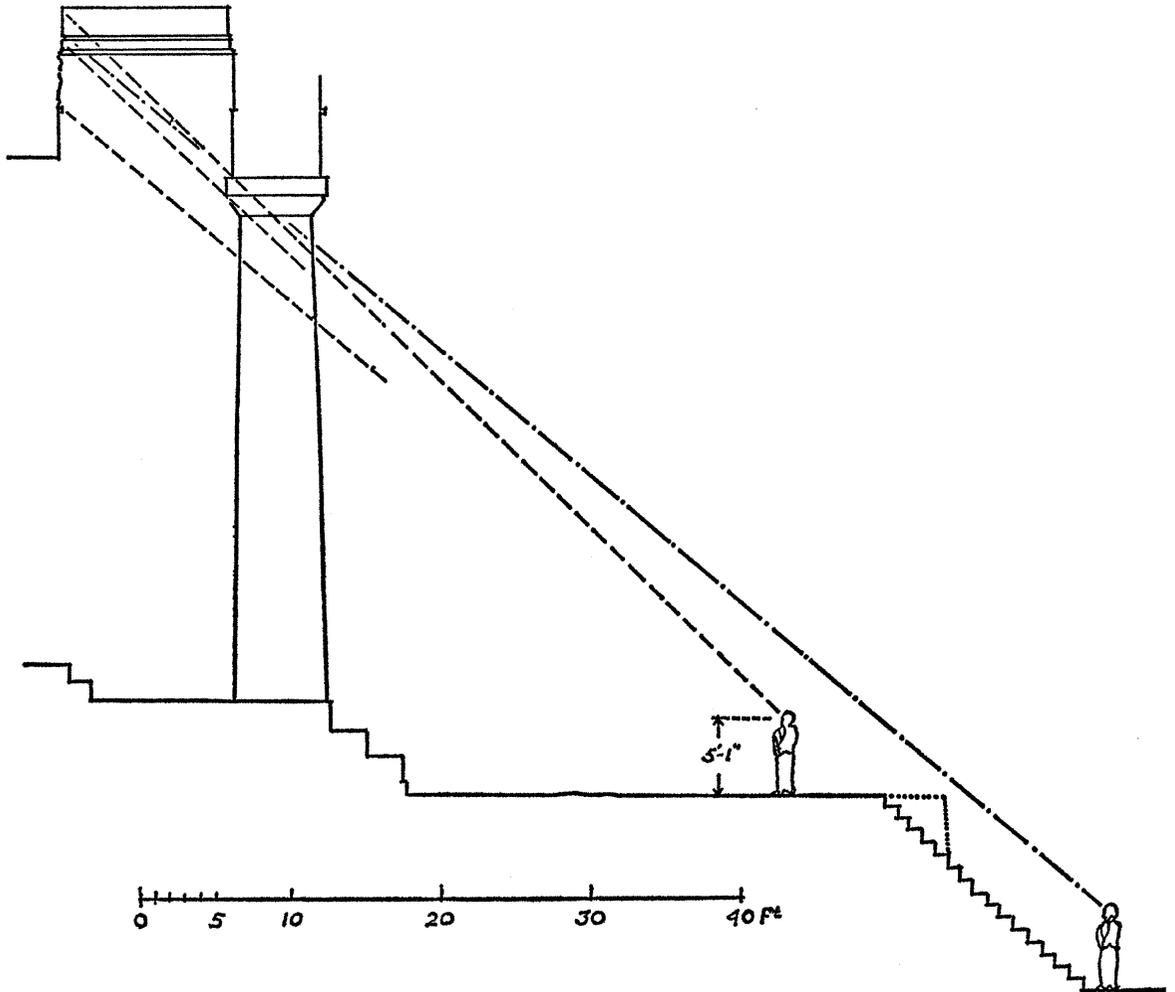


FIGURE 1

forward at a diagonal. If he moves in the same direction that the figures are represented as travelling, and observes them without actually stopping, the columns will appear to move in a direction opposite to his motion and hence the procession will seem to move forward just as a distant landscape seen from a train moves forward with one while the telegraph poles near by rush rapidly backward. One may object that for the sides of the temple this effect would be reversed should the visitor look at it as

he moves from east to west, but it may be argued that the first and hence the most memorable view would be when proceeding along the terrace or the processional route from the Propylaia to the east front of the Parthenon.

Three questions arise: (1) is there a planned relation between the rhythm of the frieze, the spectator, and the columns through which the procession is seen? (2) Are there certain points at which it is intended that the spectator should pause, and is the disposition of the figures calculated to form a composition at such points? (3) What means are employed to induce a pause, and when the pause has been effected will the spectator automatically make such minor shifts in his position as to bring a group or a combination of groups into a frame between columns?

It would be strange if no such phenomena appear since Greek architecture frequently took account of optical effects, calculated from a perspective, three-dimensional standpoint rather than one based on an arbitrary orthographic projection. The east wall of the Erechtheion⁸ and the south wall of the pinakothekē of the Propylaia,⁹ each with its peculiar spacing of openings, are cases in point. Let us then proceed to a more detailed inspection.

THE WEST FRIEZE

The terrace west of the Parthenon sloped down very slightly (*ca.* 0.17 m.) from the euthynteria to the top of the broad flight of steps which Stevens restores as a continuation of the rock-cut steps on the east side of the court of the Chalkotheke. Standing about six feet east of the line of the top step the lower, rear edges of the abaci come about half way up the frieze crown, or well clear of the frieze.¹⁰ Stevens has shown that the court was probably built, save for its south side, about the time of final work on the Propylaia, 432 B.C., just as the Parthenon was finished. He also suggests that "Iktinos may have been responsible for the designing of the court and temple as a unit."¹¹ In support of this we note that the lowest step of the flight is at such a distance from the temple that a spectator who stands here and looks at the frieze will see it fully revealed. The abaci of the capitals are just tangent to the top of the frieze. The angle of the rock-cut steps is the same as that of the steps of the krepis of the temple, which also suggests a planned relationship. If Stevens' restoration is accepted, the poros stone steps of the upper half of the flight are a little steeper.¹²

⁸ Paton and Stevens, *The Erechtheum*, Cambridge, Mass., 1927.

⁹ G. W. Elderkin, *Problems in Periclean Buildings*, Princeton, 1912.

¹⁰ The eye level of the spectator is calculated at 5' 1" assuming the average height of a fifth century Athenian at 5'-5¼". Cf. J. Lawrence Angel, "Skeletal Material from Attica," *Hesperia*, XIV, 1945, p. 324. The height according to him is based on only three specimens, but is said to be normal for the rest of Greece at this period.

¹¹ *Hesperia*, Suppl. III, p. 40.

¹² *Op. cit.*, p. 28. W. B. Dinsmoor informs me that he believes there was a terrace wall built at the top of the rock-cut steps instead of the flight of poros steps as restored by Stevens. If so,

This would have increased slightly the area of the platform and added to the margin of safety so that a visitor would be somewhat less in danger of falling backward down the steps. The relation of steps, platform, and frieze are too striking to be the result of chance.

Observation of the model soon showed that the positions that one would normally expect, opposite the centers of the intercolumniations, do not, in the case of the west frieze, give definitive sets of compositions except in the case of the two ends, where adjacent to the north and south ends the view is at right angles between the second and third columns from the corners of the peristyle (Pl. 61, 1, 2). Elsewhere along this front a different scheme appears, one which is adapted to a spectator moving parallel to the façade and looking up at the frieze in a diagonally forward direction. There is a distinct physical advantage in this scheme since the angle of gaze is less, and the head need not be thrown so far back. There seems, also, to be a pattern in which key figures, either by position or gesture, induce a pause and when this happens the viewer is almost invariably rewarded by a well balanced group.

Let us test the arrangement on the theory that the intercolumnar view was taken into account. The discussion should be followed by referring to the plan (Fig. 2) where the station points are marked 1, 2, 3, etc., corresponding to the numbered views on the plates.

The first two station points are on the zone of observation extended about fourteen feet (a normal intercolumniation) beyond the line of prolongation of the outer face of the main epistyle. From these points the ends of the frieze come clear of the masking effect of columns I and VIII. On the north end (Pl. 61, 3) we see the first two slabs of the frieze with figures 1-3 including all of the horse on which 3 rides. At the corresponding position on the south (Pl. 61, 4) are figures 28-30. Not only does 30 suggest a movement around the southwest angle toward the south flank of the building, but 29 and 28 reinforce this direction, both being turned toward the south. The composition is closed by a standing figure at either end. From the same station points we also can see between columns II and III or between VI and VII and here, in the first instance, we find, exactly framed, figures 9-12. The first turns his head and the last his entire body to the south. If we look at him closely he seems to invite the spectator to move on in a southerly direction. Figures 1 and 3, on the contrary, have a governing movement northward, around the angle of the cella. Standing at the southern observation point, however (Pl. 61, 4), and looking between columns VI and VII we see figures 20-23. A balance is struck between 22 and 23, but the compelling right hand gesture of 23 suggests a movement toward the center which is slowly taken up by the rider, 21. The next horseman, 20, is one of

there would be an even broader platform at the terrace level, without interfering with the view of the frieze from the level of the Chalkotheke court when standing at the foot of the steps. Cf. Fig. 1 where the terrace wall is dotted in.

the few who wear a plumed helmet and a full chiton. His horse is thrown back on its haunches and thus the movement begun by 21 is checked.

The next pair of station points follows naturally and as noted above is the only pair where a view directly facing the frieze gives a closed composition. These are opposite the spaces between columns II and III and VI and VII. The first (Pl. 61, 1)

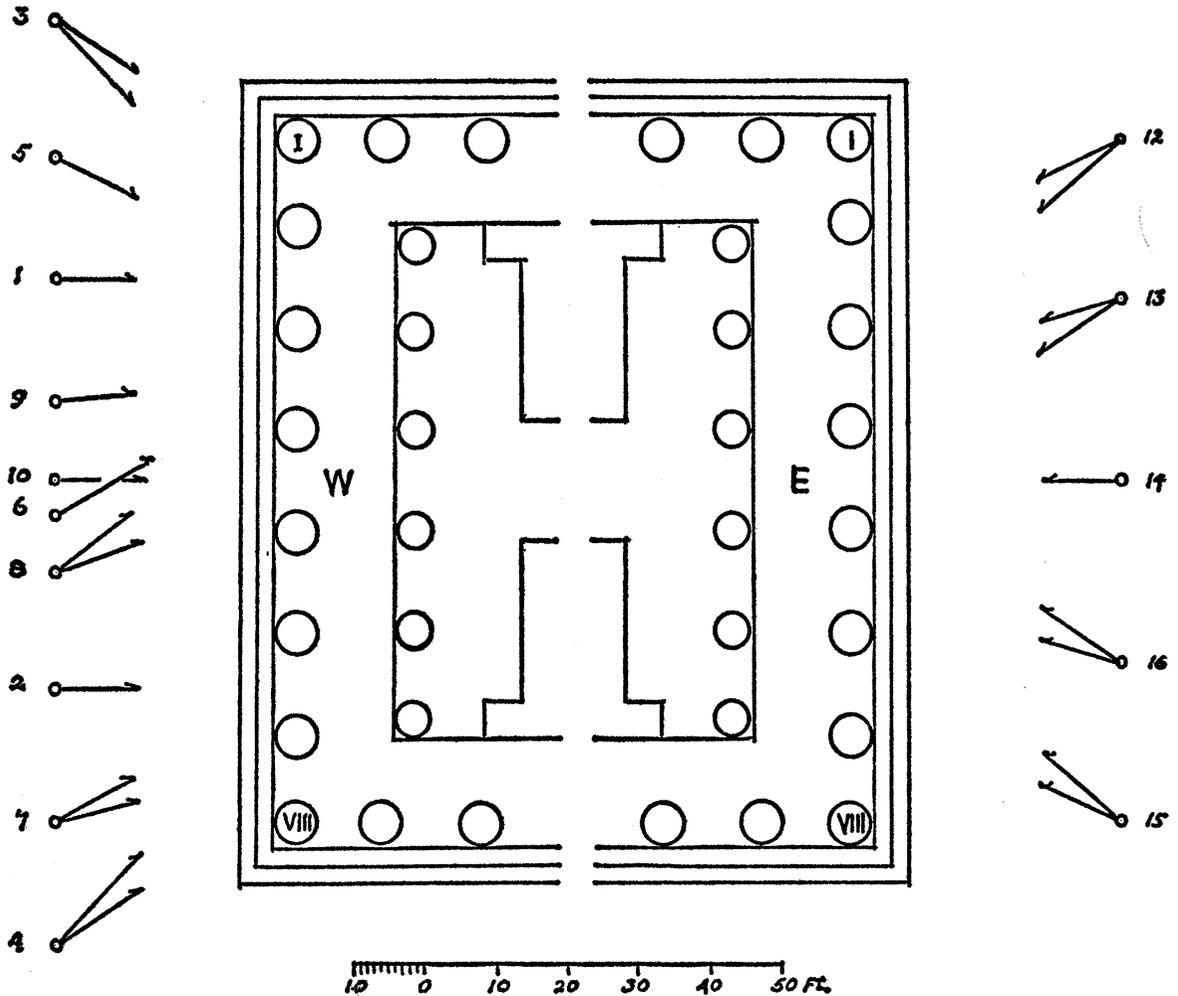


FIGURE 2

gives a complete group consisting of 1-6, the standing youth on the right who closes the composition. At the south end (Pl. 61, 2) we have 26-30, the last, as already noted turned, to the south, and 26 as well, most emphatically as he reins back his rearing horse. The standing figure, 28, falls almost exactly in the center of the group. Thus we see that the first three slabs of the frieze counting from either end form groups that may be divided into two distinct parts, and may be added together to make whole compositions.

From here on towards the center, however, the views directly facing the frieze opposite any intercolumniation do not give closed compositions and, as one moves, the tendency is to resume the diagonal view. It would appear then that, except for the end panels, the frieze was intended to be seen as one would move across the face of the building while one looks up diagonally. Let us try. Working inward from the north end at a point about two feet south of the axis of column I (Pl. 61, 5) we see, between columns II and III, figure 4 standing swung to the south, although he looks backward in a northerly direction; after him the figures range through 9 who turns his head suggestively south. Were we moving from south to north, in the general direction of movement, the same group would show between columns III and IV (Pl. 61, 6), a reciprocal of Pl. 61, 5. Standing exactly opposite the axis of Column I, we would see the figure of 1, isolated and, in the next space, 5-10, the first with his horse's head thrown strongly backward, the last with his mount's croup gathered under him.

The south end presents a similar choice. A station two feet north of the axis of column VIII shows figure 23, his mount's head turned down as the animal rubs its nose against its foreleg; the other end of the panel is formed by 26 and the horse that he strives to control. If we move south about two feet (Pl. 62, 7) and stand opposite the axis of column VIII we see 30, isolated just as would be figure 1 when seen from the corresponding point of view at the north. In the space between columns VI and VII are 22, facing south, and 26 who terminates the composition at the nearer end, not as well as might be desired since part of his horse disappears behind a column.

Moving north, following the procession, we come on another panel. The station is $12\frac{1}{2}$ feet south of the axis of the temple and, as we look up and forward we see figure 12 who turns to face 13 and 14 and the dramatic effort of 15 whose flying chlamys seems to help pull his horse back on its haunches (Pl. 62, 8). Looking on to the next panel, between columns III and IV we see another group consisting of figures 3-7, fitting exactly the space between the columns. Eleven feet north of the axis is another panel, part of which we have seen before (Pl. 62, 9). Here 7-11 fill the space very exactly and the figure of 9 standing against the flank of his mount forms the center of the composition. Surely the rhythm of the figures was calculated with an episodic effect in mind and the spacing adjusted to the apparent visual spaces between columns. It would be logical to expect, just as we shall see presently on the east frieze, that a station on the axis, looking directly at the building, would give a definite result, but in the west frieze enough of figures 14 and 18 is seen to incline one to move forward in a northerly direction (Pl. 62, 10). The motive of starting off the procession might be thought of as discouraging any arrangement that would incline the visitor to stop with the idea of entering the west door, and, in fact, the use of the rear portion of the temple as a treasury defended by massive grilles between the columns of the inner porch would contradict any such inducement. The photograph (Pl. 62, 11) taken by

Miss Alison Frantz serves to illustrate how closely the model conforms to the real conditions. The slightly smaller length of frieze subtended is due to the distance from which the picture had to be taken, since the terrace no longer exists and the station had to be nearly at the top of the rock-cut steps, or 10 to 12 feet further away from the stylobate than in the case of the model. It is interesting to compare this view with that on Plate 62, 8 where figure 15 forms the right hand part of the composition.

THE EAST FRIEZE

The zone of observation at the east is essentially on the same level and at the same distance from the stylobate as it is on the west. After turning the corner and advancing to a position where the girl, 63, who is last at the north end, is still in view to the right of Column II (Pl. 63, 12) we see between it and Column III the group of elders 43-46 at the left and the other figure up to and including the marshal, 52, who is facing 53 and 54 just emerging from behind the column. Beyond column III can be seen the peplos group 31-35 and one seated divinity, Zeus, 30.

Moving southward the entire group of gods, 36-42, is revealed, seated in the entire effective space between columns III and IV (Pl. 63, 13). In the panel beyond are four gods, facing left, and three elders. The adjustment of the length devoted to the group of divinities 36-42 to the apparent interval between the columns can hardly be the result of accident.

As one should expect, the central view on the axis of the building is absolutely balanced, since here is the principal entrance to the cella, and in distinction to the central view at the west, there is here an invitation to move directly to the main doorway (Pl. 63, 14). Two gods on either side form a powerful frame to the peplos group, itself the culmination of the entire processional ceremony. The positions of Hera, 29, and Hephaistos, 37, who turn their heads toward the center, prevent the composition from having a centrifugal aspect. To either side of the central columns IV and V may be seen the elders, but the remaining gods to right and left of 29 and 37 cannot be seen. It may also be noted that from the normal viewing distance the divinities at either end of the central panel are not entirely clear of the columns, but a nearer approach would reveal them in their entirety. May this be a means of inducing the spectator to move inward, toward the entrance, and can it be ascribed to a conscious design?

From a position analogous to that in Pl. 63, 12, but beginning from the south and looking diagonally northward, we see, to the left of column VII, the figure of a marshal 1 (Pl. 63, 15). Between columns VII and VI are six maidens and six figures of marshals and elders. The gods 24-30 are lost behind column VI, while beyond, as in the approach from the north, is the peplos group, and two seated gods. Naturally since the groups of the east frieze are basically symmetrical we find that by moving still further north the gods 24-30 fit exactly the space between columns VI and V

(Pl. 63, 16). The lengths of frieze given to the groups of divinities are about 10 to 11 feet, while the intercolumnar spaces near the tops of the shafts are barely 9 feet. It is clear from this that allowance was made for the perspective effect.

One other peculiarity might be noted. If one refers to Plate 63, 14 and supposes that one is standing further away from the building than the normal viewing distance it will be easy to see that the lower edges of the abaci will block out Poseidon and Hera, but that the figures of Zeus and Athena will still be fully apparent until one moves so far back that they, in turn, will be lost. The attitudes of the two figures seem to be curiously appropriate to the angles formed by the inner rear corners of the abaci, and the lower rear edge of the epistyle will still be clear of the peplos group.

Since the east frieze represents the culmination of the Panathenaic procession there is every reason to suppose that the intent was to allow the greatest possible interrelationship between the sculpture and the architecture. It was here, above all, that the visitor was meant to pause, retrace his steps if need be, and examine all with the closest attention.

THE FRIEZE AND THE CEILING BEAMS

The ceiling of the pteroma is carried at either end of the temple by seven beams, parallel to the axis of the building, which span the gap between the hexastyle porticoes and the outer colonnade.

An inspection of the frieze as shown in the model might suggest that any architectonic relation between beams and figures could, from the very number of the latter, be principally the result of chance. A closer look, however, suggests that in most cases there seems to be a conscious effort in the location and posture of certain figures to suggest the idea of support for the beams and especially to relate these figures to the location of the re-entrant angles formed by the sides of a beam and the filler blocks to either side.

The west frieze has a looser grouping of figures and we will consider that first. Moving from the south, the first beam (7) has its north edge over the head and shoulders of figure 29 (Pl. 61, 4). Beam (6) has its south edge over the head of 26 (Pl. 62, 7) and the north edge falls over the upraised muzzle of the horse just to the right of 25, whose right leg and petasos slung from the shoulder suggest a stiff bracing diagonal (Pl. 62, 7). Beam (5), on its south side, is over the bowed head of 21; the north edge lies over the forelegs and nostrils of the horse ridden by 20. The mass of the rider's crested helmet, closely set between two horses' heads, gives a further sense of support. If the relation of beam and frieze were shifted the north side of the beam would fall over the void between 20 and 19, but apparently care was taken to avoid such a relationship.

The central beam (4) corresponds on its south side to the head of 16 (Pl. 62, 10). The north edge is directly above the head of 15. His flying cloak and the upturned

head of the horse behind fill the space below the soffit and reinforce the supporting effect. Beam (3) corresponds, on its south edge, to the standing figure 12. The north edge is carried by the upflung head of the horse ridden by 11 (Pl. 62, 9). Is it merely coincidence that the only helmeted heads on the west frieze come below ceiling beams—figures 11, 12 below beam (3) and 20 under beam (5)? These two beams are the ones next to the central one. The south edge of beam (2) falls directly over the head of 7 (Pl. 61, 5) as he sits firmly upright, while the beam's north edge meets the vertical of the tall standing figure 5. The last beam (1) is aligned on its south side with the head of the horse ridden by 2 (Pl. 61, 1).

In no case do we find the angle of a beam placed over a void or a low point in the composition. This correspondence of figures and architecture is, of course, no surprise since numerous examples may be cited, as, for instance, on the Hephaisteion in the grouping of heavy, seated figures on the frieze above the antae.

When we turn to the east end, beam (6) has its north edge over figure 52, on the line of the weight bearing leg (Pl. 63, 12); the south edge comes over the head of 49, which has apparently been thrown backward slightly to bring it into line with the beam's edge. Beam (5) comes just behind the head of Eros, 42, whose figure, as he leans against his mother's knee (41), carries the eye to the edge of the beam (Pl. 63, 13). The south edge is sharply recognized by the uplifted hand of 39.

The central beam (4) is well carried on its north side by the tall figure of the priest, 34 (Pl. 63, 14). The attendant girl, 31, is a less convincing support at the south side, but her *left* shoulder appears to be raised, which is not normal since it is her right hand that is lifted to steady the stool that she carries on her head. It is the right shoulder that should have been higher, but that is not the case and it may be suggested that the position was a concession to architectonic relationship.

Directly above a closely knit group of three gods, 24, 25 and 26, beam (3) bears a close relation with the figures (Pl. 63, 16). The two edges correspond with the heads of 24 and 26 and, in addition, the hand of 25 is raised as though to help support the beam. The north edge of beam (2) comes directly over the head of the leading maiden, 17, as she advances from the south (Pl. 63, 15). Figure 13 seems to carry the southern edge, but here the figures are so closely grouped that it is an even chance should a figure correspond. None the less, there is no doubt that it is a figure and not a space that falls below the edge of the beam. The last beam (1) has its north edge directly over 3 while the standing marshal, figure 1, supports the southern side.

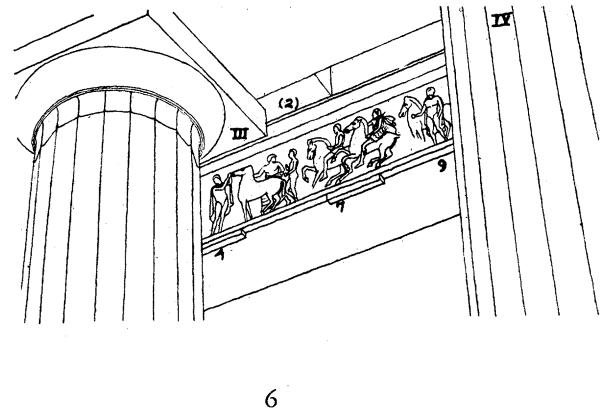
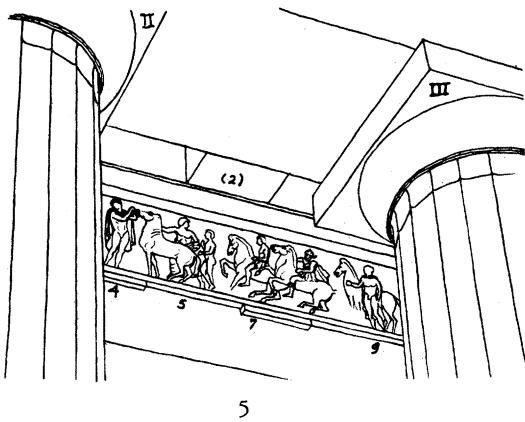
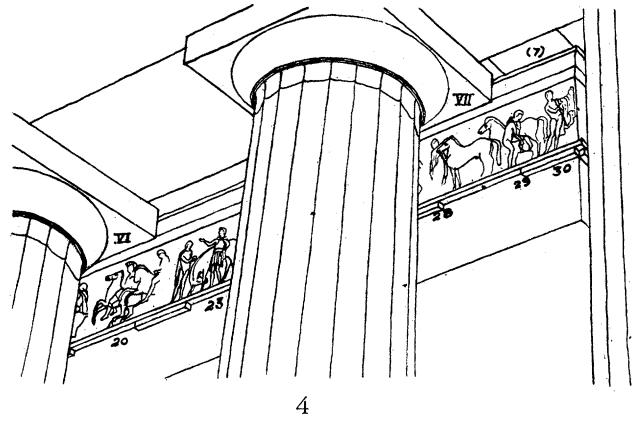
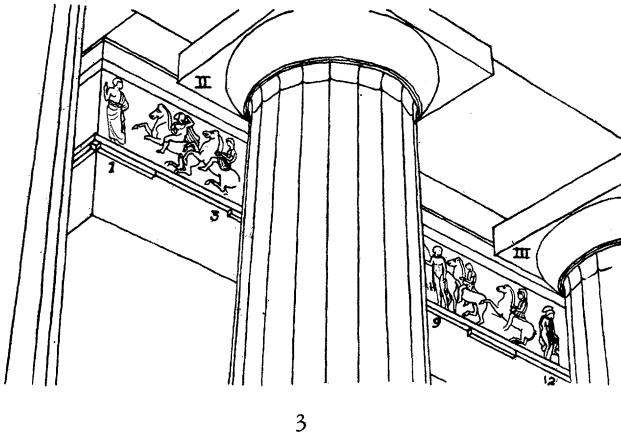
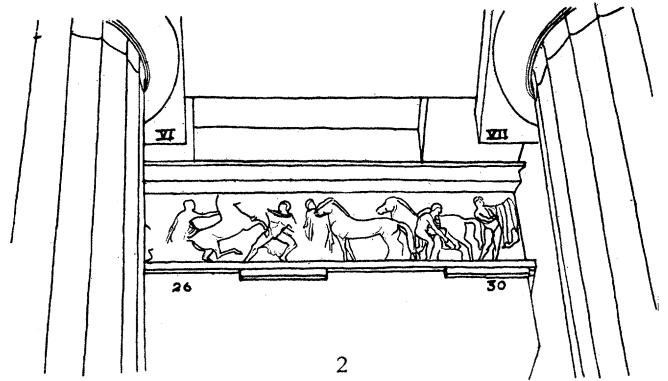
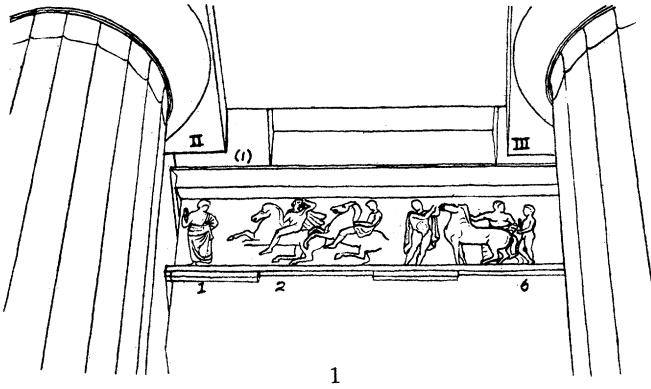
Though not so obvious as on the west frieze, or perhaps with greater subtlety, we find a conscious adjustment of frieze figures and beams on both east and west porticoes.

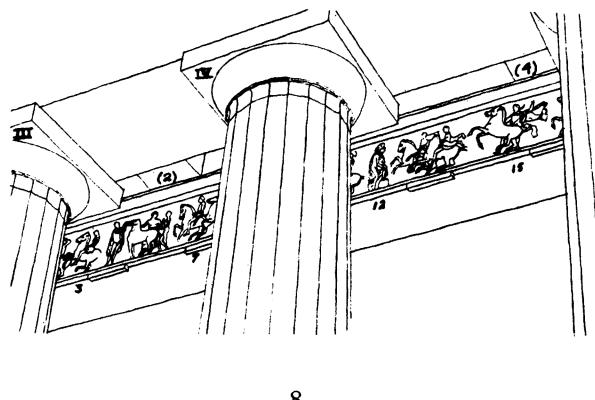
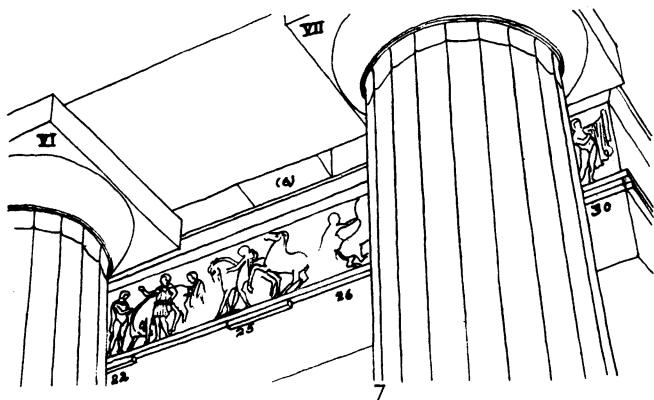
Objection might be made to a theory that compels the master of the Parthenon to take account not only of visual intercolumnar relationships and compositions and at the same time of the exigencies of suiting the sculpture to an architectonic quality of visual support. But there should not have been an insurmountable difficulty in

carrying out the two aims. A very slight adjustment in the placing or gesture of a figure would scarcely have disturbed the compositions, and such modification could have been made without sacrificing the major aspects of the panels. What is more difficult to understand is how these relationships were actually worked out—whether by drawings or models, or by drawing on the frieze blocks with charcoal or some other medium after they had been put in place, and before they were carved. The demonstration raises pertinent questions with which this paper does not propose to deal. If the blocks, as seems to be the case in some instances, were carved on the ground, and models were not used, we must argue for an excellent working knowledge of perspective. In any case we should add another credit to the designers of the Parthenon.

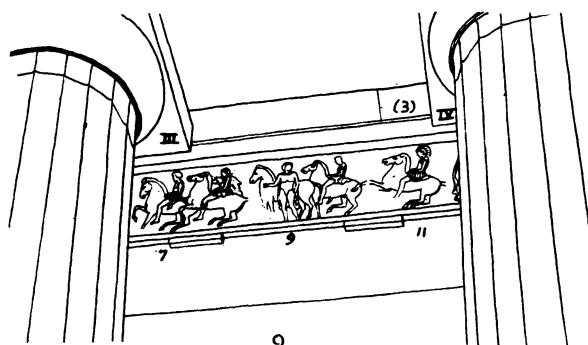
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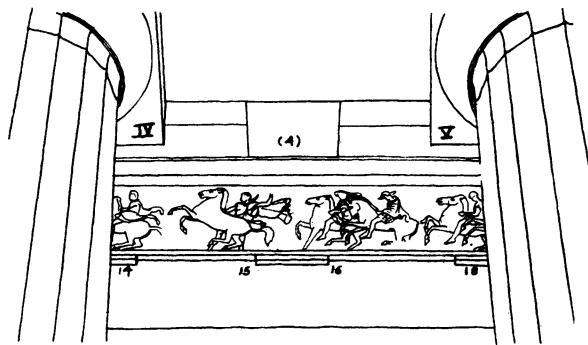




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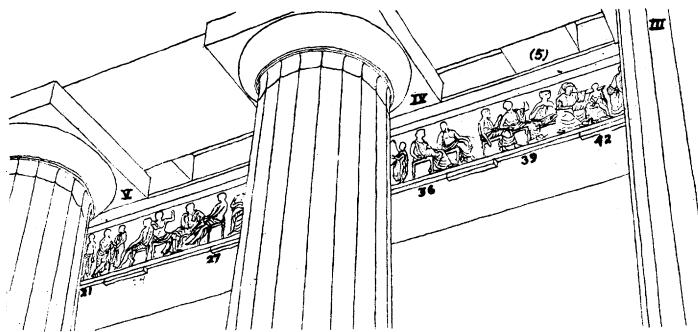
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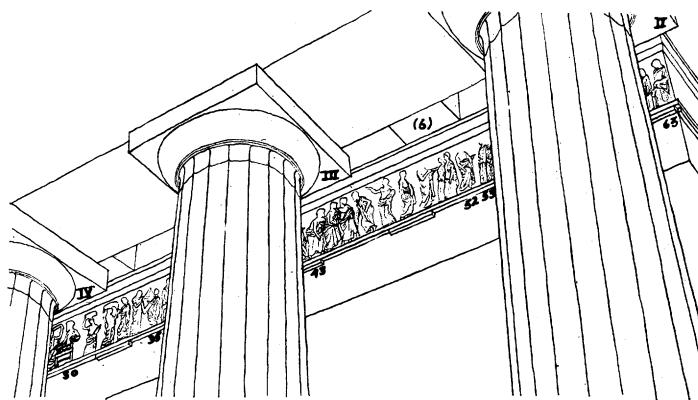
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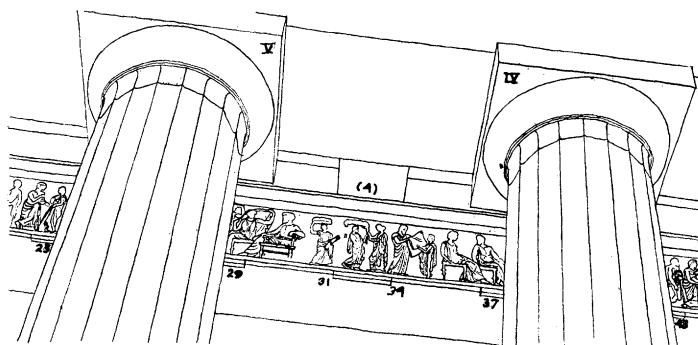
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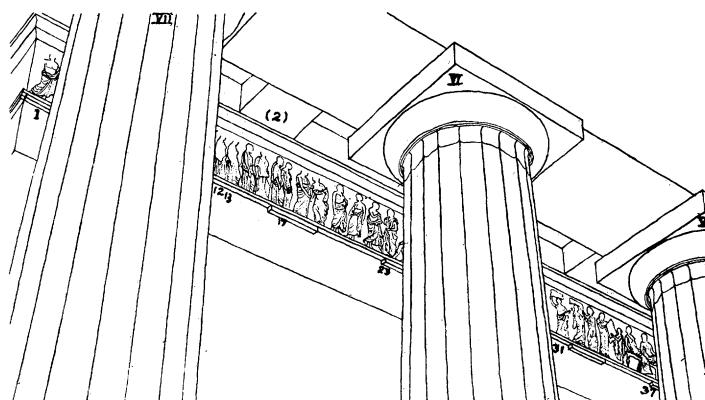
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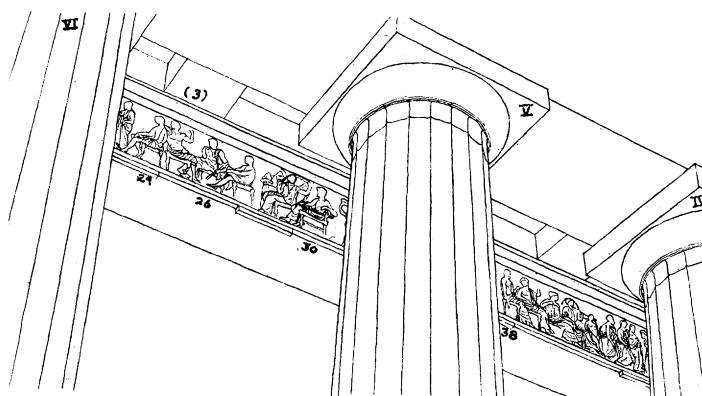
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