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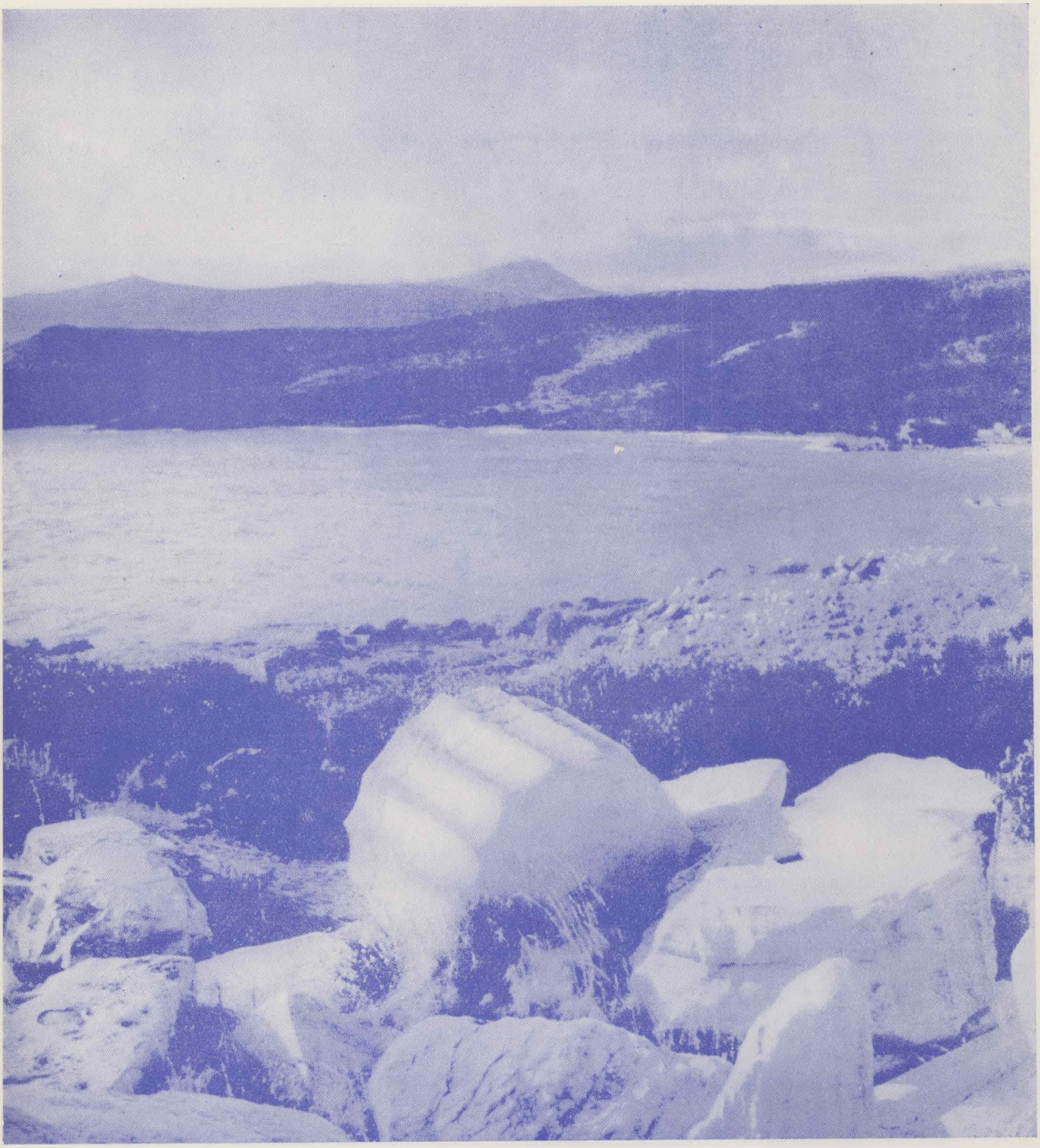
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SUNIUM — Marble drums of columns from the temple of Poseidon

SPACE CONSTRUCTION IN GREEK ARCHITECTURE WITH SPECIAL REFERENCE TO SANCTUARY PLANNING

by R. D. Martienssen, D.Litt.

The following paper is the fourth in a series dealing with Greek Architecture. The first was concerned with "The Hellenistic House," the second with "Greek Cities," and the third with "Some Aspects of Doric Temple Architecture." In this concluding inquiry an attempt is made to rationalise the arrangement of Greek temple sanctuaries by means of a detailed spatial analysis of six characteristic examples. The findings are largely based upon the experience gained during visits to four of the sites discussed, and recognise the brief suggestions made by Choisy in his section on the plastic effect of Greek architecture (Histoire de l'Architecture) with special reference to the Acropolis of Athens. No less enriching to my study of the subject was the lyrical exposition of the Acropolis buildings by M. le Corbusier in "Vers Une Architecture." If the present essay can stand as an extension to his brief but inspired commentary on the timeless creations of Athens it will express my gratitude for his "re-discovery" of the meaning of Greek art and architecture.

1. FESTIVAL AND SACRIFICE

We have examined in a previous issue the general "ordonnance" of the Doric Temple and the details of its corporate elements. With an understanding of the appearance and effect of the temple we may now investigate its siting and the treatment of its surroundings as evidence enables us to reconstruct the complete scene in historic times. Detailed study of the question of ritual and its manifestation in athletic, musical, oracular and other special forms of ceremony lies outside the scope of the present paper, but we may briefly note a few conditions that have a bearing on the spatial aspect of the architecture of religious institutions.

The festival in Greece occupied an extremely important place in daily life, and it is estimated that in Athens about seventy days in the year were given up to "holidays" of one type or another.[1] The succession of religious festivals according to Plato[2] was created by the gods as a rest for men from their labours. The civic festivals, especially spring and harvest celebrations, were probably common in most respects to all Greek states, although the times of these did not always coincide owing to "the erratic nature of the Greek calendar."

Confederate festivals, in which a group of states worshipped some divinity at an established centre were common in early Greece, and such amphictyonies as those which united in worship of Apollo at Delphi gave a special character and meaning to the selected sites. The four national festivals—Olympian, Pythian, Isthmian, and Nemean—had a strongly unifying effect in Greece, and as Gardner suggests "were not so much of a spontaneous growth as due to the encouragement of far-seeing politicians, especially the enlightened tyrants of Argos, Corinth, Athens and other cities."[3] The Pythia originated in the meetings of the Delphic amphictyony, and, no doubt influenced by the famous oracle, achieved universal recognition. Olympia was early recognised as "the chief centre of the worship of the Olympian Zeus in Greece," and the Isthmia and Nemea "probably owe their celebrity to the early importance of Corinth and Argos, which respectively presided over them."

Of special interest to our present purpose is the manner of worship, and as sacrifice was "the central and essential point of all acts of worship in Greece" it would be as well to record the proceedings during an actual ceremony. Most sacrifices were offered at the altar which stood in front of the temple, the latter thus served the purpose not only of a house for the god, but also of a splendid focal point or screen against which the elaborate rites could be enacted. Gardner[4] gives us an excellent picture of these rites:

"The proceedings at the actual sacrifice were usually the same. First came the preparations; garlands were worn by priests and by the victim, whose horns were often gilded. Then it was led to the altar; if it struggled, the omen was bad; if it bowed or shook its head, the omen was good. Next a bowl of water was sanctified by plunging in it a torch from the altar, and all present were purified with it, and the altar sprinkled. In the sacred silence which followed came the prayers. Then came the sprinkling, on and around the victim, of the grains of barley brought in a flat basket, which was therefore among the essential implements of the sacrifice. After this began the sacrifice itself; first some hair was cut from the victim and thrown in the fire; then it was stunned with an axe or club; its throat was cut, and the blood caught in a vessel, the head being turned down for Chthonian gods,

upwards for others ; the blood was poured on the altar, or sprinkled over the worshippers if the rite was piacular. (Flute-playing accompanied these proceedings.) Then the victim was skinned and cut up ; the entrails were inspected for the purpose of divination, and the portions set apart for the god were burnt on the altar. Usually they were the thigh-bones and fat, and portions of each joint, and the tail. The rest was cooked on spits, and divided among those present.

" The Greek worshipper prayed standing, with his hands raised, palm upwards, to heaven ; if he addressed the gods below, he might stretch his arms downwards, stamp on the ground to call their attention, or kneel to touch the ground with his hand ; but kneeling in prayer, except with this motive, was regarded as barbarian and unworthy of a free man . . . Prayer was usually made aloud . . ."

Of sites, Socrates[5] says that " the most suitable ground for temples and altars is that which is most open to view, and least trodden by the public ; for that it was pleasant for the people to pray as they looked on them, and pleasant to approach them in purity."

Of the constitution of an actual festival procession we can gain an excellent idea from the Panathenaic frieze of the Parthenon in which is depicted all the equipment of ritual, and all the paraphernalia of sacrifice, carried by the streaming crowd through the Propylaea, the animals following with their attendants. Schede[6] describes the events of the chief day of the great Athenian festival as beginning at sunrise with the gathering of the people in the town below, and their setting off in a procession through the main streets towards the Acropolis.

In fifth century Athens, where festivals and sacrifices were frequent and on a large scale, support from the state as well as from the treasuries of the divinities was the general rule.[7] The building of such structures as the Parthenon and Propylaea, involving as it did such a large outlay, is a practical indication of the dominant place of religion in public life.

2. ELEMENTS OF THE TEMENOS

In general we may note the occurrence of six separate elements, or classes of elements, in the Greek temenos :

(a) Propylaea; (b) Altar ; (c) Temple ; (d) Treasury ; (e) Stoa, and (f) Sculpture.

The temenos itself, as we shall see later in our investigation of extant examples, varied considerably in area, situation and configuration. In briefly discussing the characteristics of the components that were arranged within the boundaries of the temenos we shall not be specially concerned with their position.

(a) Propylaea.—The Propylaea provided at once a monumental entrance to the sacred enclosure, and a sense of deliberate separation from the surroundings in which it was set. The form of the propylaea (or propylaeum) echoed very closely the type of double portico that was employed in Mycenaean times, as for example, in the approach to the outer and inner courts of the palace at Tiryns. Thus on plan it consisted of two porches united in a single overall volume, with columns in antis ; the separation between these porches was a wall with openings the plane of which approximated to the plane of the temenos wall or peribolos. From both outside and inside the elevational appearance was that of a small temple with pedimented ends. The propylaea did not always assume this minimal form ; in the case of the Acropolis of Athens, for instance, where the site was extremely difficult of access, and where a supreme effort to maintain a powerful architectural unity under exacting conditions, involved a special solution, the forms of the propylaea were correspondingly complex.

(b) Altar.—The altar, focal point of the temenos from early times, provided the open air centre of ritual activity ; and as the temple was not entered as a place of assembly it must have assumed considerable importance as the visible and accessible setting for practical sacrifices and ceremonies. While the temple remained an aloof and enduring symbol of the god—a background—the altar was indicative of immediate and temporal activity. A notably fine setting for the altar is that to the east of the so-called Temple of Juno Lacinia at Acragas. In this example the formal arrangement of terrace and steps, and the lofty situation of the temple combine in an effect of great dignity.[8]

(c) Temple.—The temple has been discussed as a consciously created structure embodying established and developing aesthetic principles. In the present note it is only necessary to state that the temple housed a sculptural representation of the divinity concerned, and often served in addition as a store for tribute money and offerings. Almost invariably the principal entrance faced east (or nearly east) and the altar lay on this side, and some distance from the temple. (An exception to this orientation is the Temple of Apollo at Bassae which faces north.)

(d) Treasury.—The treasury which commonly took the form of a small temple with columns in antis, was not an invariable component of the temenos, but in the great religious centres such as Delphi and Olympia which were pan-Hellenic in intention it symbolised the homage of individual cities, and numbers were erected to this end. All that has been said of colour

treatment, the arrangement of the "order," and the general architectural qualities in the temple are reflected in these small buildings. In practice the treasury was used for the reception of arms, offerings and other properties in conjunction with the pilgrimages made to the sacred shrines.[9]

(e) Stoa.—The stoa which has been defined and discussed in an earlier section was in many instances a further architectural unit in the temenos scheme, and in some contexts played an important defining part in the general scheme.

(f) Sculpture.—Free-standing sculpture occupied in actual bulk a relatively small portion of the sacred enclosure, but as accents, and in their compelling solidity and repetition free statues played a considerable part in the general scheme of architectural forms against which they were "read." We may note the occurrence of exceptionally large statues such as that of the Athena Promachos on the Acropolis of Athens.

(g) General.—Dinsmoor[10] refers to the frequent occurrence of enclosures known to have been planted with trees and sacred groves. He comments that the conjectural restorations of Olympia, Epidaurus, Delphi, Delos and Eleusis made by some of the "Grand Prix" students, and based on actual remains, suggest

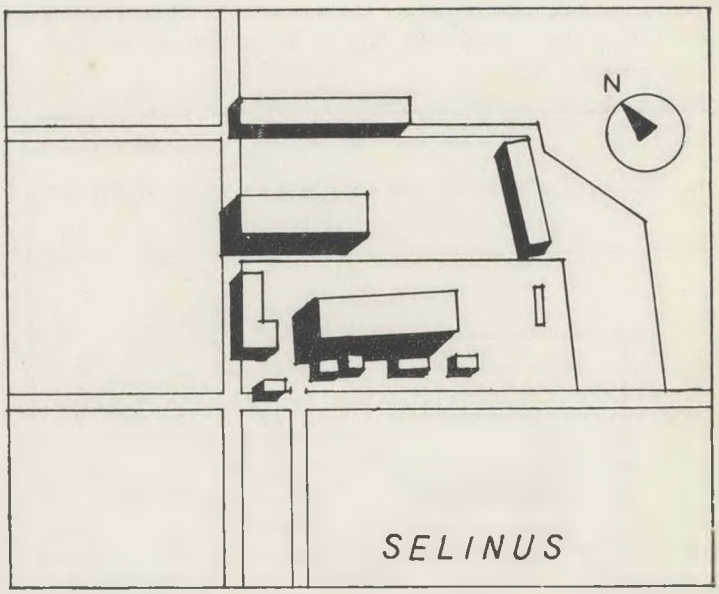
"a magnificence, a combination of nature and art, which it is now difficult to realise to its fullest extent, and of which the only parallel is to be found in some of the Buddhist sanctuaries in India, China, and Japan, where in consequence of a somewhat similar cult, temples, tombs, and other monuments exist up to the present day."

3. DESCRIPTIVE SURVEY OF SIX SANCTUARIES

Our next task is to examine the arrangement of the foregoing elements in specific contexts, and with special reference to the placing and appearance of the temple. Since it is desirable that findings in respect of each temenos shall follow consecutively without the interruption of historical or descriptive notes it is proposed to separate the treatment of the material into two parts : in the first the sites will be described and illustrated by a small key plan showing the principal elements, orientation, etc., in the second they will be analysed with reference to their spatial content.

The sites selected for treatment cover a wide range with regard to geographical and topographical situation, complexity, size, and detailed arrangement, and will be considered in the following order : Sanctuaries of; Temple "C" Selinus; Temple of Aphaia, Aegina ; Parthenon, Athens ; Temple of Apollo, Delphi ; Temple of Poseidon, Sunium ; Temple of Asclepios, Epidaurus.

(1) Temple "C" at Selinus

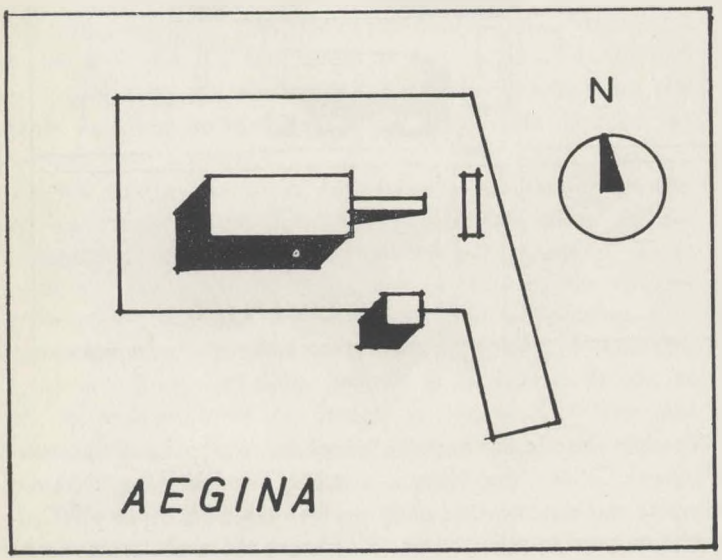


We have seen in our examination of the Acropolis of Selinus in "Greek Cities" that there is a strong possibility that a new town-plan dating from the early part of the fifth century B.C. may have been so adjusted as to embrace the archaic temples of 570-560 B.C. The fact that Temple "D" so closely abuts on the north-south street supports this view, and points to a certain degree at least of enforced adjustment in the temple setting. Whatever the street system may have been at the time of building these temples ("C" and "D") the extant relationship is the only one we are capable of assessing, and as there is no reason for supposing that the temples were less significant in the fifth century than they were in the sixth, we may assume that the remains represent a valid and sanctified arrangement at the time of the collapse of Selinus in the late fifth century.

Of the temenos that lies to the north of the main cross street of the acropolis, the northern half is given up to Temple "D," the southern half to Temple "C." The site of the latter building falls fairly rapidly towards the east, and the entrance to the sanctuary (immediately below the south-west corner of the temple) as shown by Hulot meets the topo-

graphical conditions reasonably. The temple lies at a slight angle to the east-west street, and between it and the street lies a group of small buildings including the so-called Megaron and Temple " B." Remains of other buildings lie to the west of the temple, and the altar was placed some distance to the east of the main front. The reconstruction of Selinus by Hulot which appears in " Greek Cities " gives an impression of the temples seen from the sea. The accompanying photograph (page 125) shows the present state of the temple on the north side of Temple " C."

(2) The Temple of Aphaia at Aegina



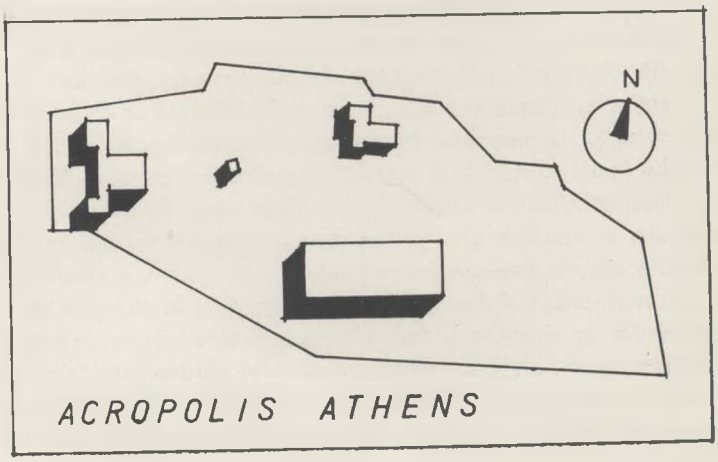
The accompanying diagram shows the three essential elements of the Aphaia sanctuary—propylaea, altar, and temple with its approaching ramp to the main entrance. The platform on which the temple stands is partly formed of solid rock, partly built up of large polygonal stones. The terrace so formed is about 230 feet 0 in. long by 130 feet 0 in. wide, and was paved with large square slabs of stone.[11] Welter[12] in his recent work on Aegina shows the development of the " Tempelterrasse " from its earliest configuration to its final form. At first irregularly shaped, and with a simple gateway in the surrounding wall, the oikos and altar in approximately the positions assumed by the corresponding elements in the later arrangements, it underwent an intermediate stage which shows the same orientation of elements and in which the shape of the early terrace is broadly maintained, but in which the gateway is replaced by a propylaea. The final form which we shall examine later was subjected to a considerable degree of regularising in the shape of the temenos, an increase in its area, and a change in orientation of propylaea, altar, and temple.

(3) The Temple of Athena Parthenos at Athens

The Athenian Acropolis offers an extremely complex arrangement of architectural units, for not only is the site itself irregular in shape and level, and access to its surface limited and difficult, but the ambitious spatial programme upon which architecture and topography are reconciled unites factors of an almost unparalleled diversity. The Acropolis rises clear of its surroundings ; it is truly a " high place " with its compact Doric silhouette visible from the sea, and its buildings still proclaiming the central thesis of their creation even in their ruined state.

The diagram shows schematically the propylaea on the west, the statue of Athena Promachos, the Parthenon on the south side, and to the north the Erectheion. With the arrangements of earlier buildings we shall not be concerned, our interest is in the appearance of the Acropolis in the fifth century at the point of completion of the great Periclean programme. To recall the multiple aspects of the Acropolis buildings one may refer to the fine records of Fougères[13] and Picard,[14] to the studies of Hege and Rodenwaldt[15] and to the detailed history by D'Ooge.[16]

One aspect which will be dealt with analytically later may be mentioned at this point with the object of recording in



outline the range of attitude to, and the positive research that has been undertaken on, the placing of the various buildings on the Acropolis.

The apparent lack of system and of finite relationship in the arrangement of propylaea and temples has given rise to considerable speculation. Penrose, whose exhaustive survey of the Acropolis structures in 1846-47 is the basis of our analytical knowledge of Doric architecture, called attention to the remarkable absence of parallelism in the location of the buildings on the Acropolis, and observed that " this lack of exact symmetry is productive of great beauty and exquisite variety of light and shade."[17] The remarkable insight of this finding has apparently escaped later students of the subject. Lavedan for instance is content to dismiss this problem of arrangement with the remark :

" Les édifices, pris en eux-mêmes, sont beaux et rationnellement construits. L'ensemble est une accumulation confuse d'autels, de temples, de statues, où manquent aussi bien le recul nécessaire pour juger de la beauté de chacun, que la subordination des diverses parties au tout."[18]

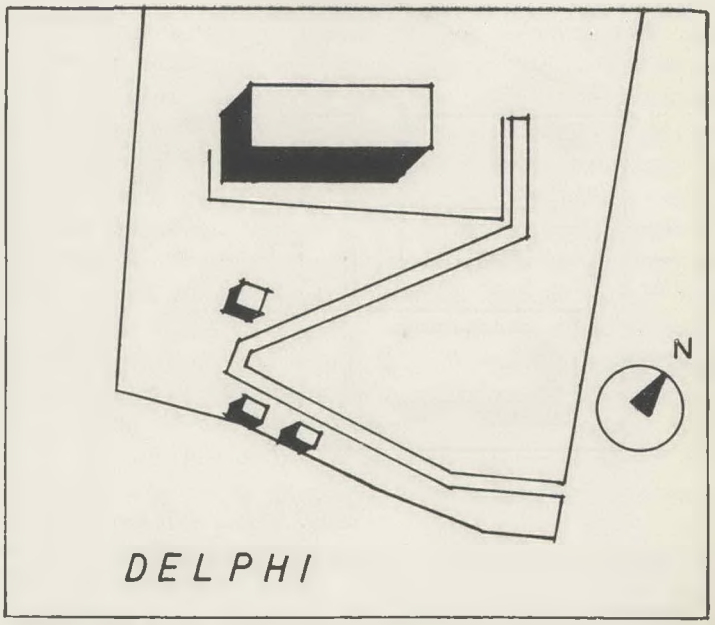
Apparently Lavedan assumes that the spirit of organisation that characterises the Greeks could not find expression in practical fields.

Choisy[19] on the other hand reinforces the impression conveyed by Penrose by a detailed and acute analysis of the progressive plastic effects that are offered to the approaching spectator as he passes through the Propylaea towards the Parthenon. His comments indicate that he found no confusion in the group.[20]

(4) The Temple of Apollo at Delphi

The situation of the temenos at Delphi is of an order quite different from those already mentioned. The site is one of impressive grandeur, cradled as it is between the giant Phaedriades and overlooking the Crisaean plain which stretches to the Gulf of Corinth. The actual shape of the temenos is irregular, and the surface slopes steeply up to the level platform of the Temple of Apollo. Above this, and to the north-west lies the second century theatre.

The diagram shows the main entrance to the enclosure at the south-east corner ; the " sacred way " leading up to the temple built on a platform which in turn is supported by a polygonal retaining wall ; and three of the treasuries which flank the ascending avenue. The history of the Temple of Apollo is briefly as follows. It was built towards the end of the sixth century B.C. to replace an earlier temple which had been destroyed in the middle of the same century. In the



early part of the fourth century the new temple was destroyed by fire or earthquake, and its reconstruction was undertaken, and completed by about 330 B.C.

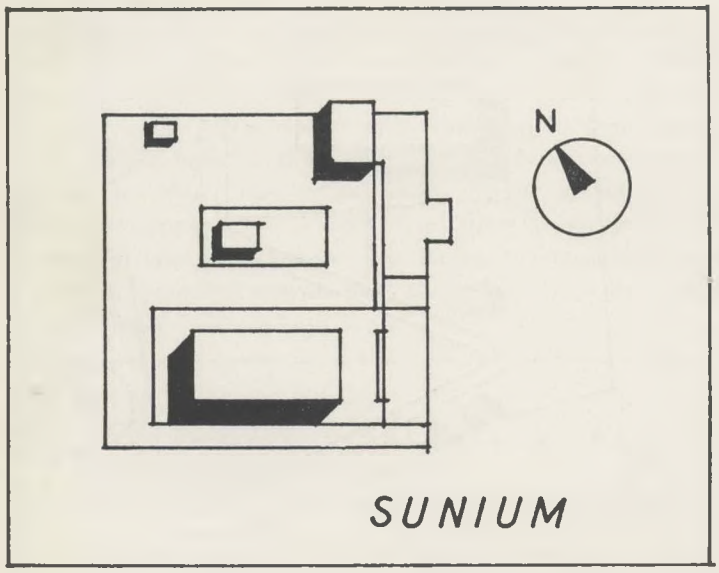
The Sicyonian Treasury (the furthest east of the three treasuries shown on the diagram) is dated by Homolle[21] between 580 and 560 B.C., but although this is the accepted date of the metopes connected with this building, the treatment of the structure itself has led Dinsmoor to place it at the close of the fifth century B.C.[22] If he is correct the metopes must originally have been incorporated in an earlier building.

The Siphnian Treasury, adjacent to the previous example, dates from the latter half of the sixth century,[23] and the Treasury of the Athenians immediately north of the turn in the " sacred way " was built probably between 490 and 480 B.C.[24]

Mention must be made of the Great Altar (or Altar of the Chians) which was situated at the point where the processional pathway ends, to the east of the temple. Frazer[25] refers to the level space at this point " the most conspicuous in the whole precinct." Here, apparently, was grouped a large number of votive offerings.

(5) The Temple of Poseidon at Sunium

" Cape Sunium, now called Cape Collona or Kollonnaes, from the far-seen columns which crown its brow, is a massive and lofty headland of rugged crystalline rock running far



into the sea and joined to the mainland by a low sandy isthmus. The sides of the headland fall sheer into the sea in cliffs about 200 feet high . . . . On the extreme and highest point of the cape is the ruined temple of Athena (Poseidon). The platform on which the temple stands is supported on the north and west by substructures of massive blocks, built to eke out the small level space on the summit of the headland."

Thus in a few words Frazer[26] describes most vividly a temple site which has a prospect " over the sea to the islands of the Aegean and the coast of Peloponnese . . ." The diagram indicates the general arrangement of the late fifth century temple in its enclosure—propylaea on the north side, temple on the south with its flights of steps, and the Poseidon monument centrally placed. Although the Sunium scheme has much in common with that of the Aphaia sanctuary at Aegina, there is an atmosphere of poise and harmony between its elements which accords with the refinement of the white marble construction of the temple, and which points to a developed sureness and subtlety in space technique that had hitherto been absent from the simple grouping of buildings on flat planes.

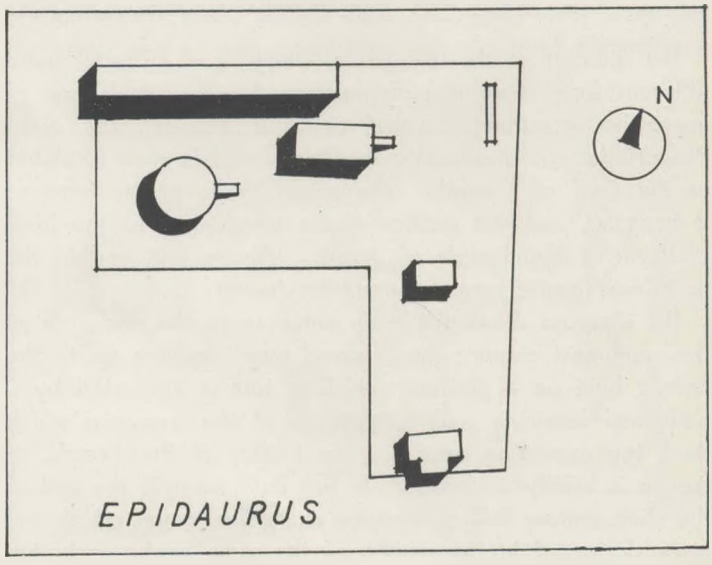
(6) The Temple of Asclepios at Epidaurus

" The sacred grove of Aesculapius is surrounded by mountains on every side." This brief description by Pausanias[27] introduces his chapter on the chief centre of the cult of healing. The setting is one of the most impressive in Greece. True, there is neither the rugged wildness of Delphi, nor the lyric calm of Olympia, but in what Frazer calls the " pleasing solitariness " there lies a quality that is still capable of moving the visitor despite the fact that the buildings are sadly ruined.

The sanctuary assumed its present form in the fourth century B.C., and the diagram shows what may be termed the specially sacred area. This was built partly on an artificial terrace and was approached from the south through a propylaea. Immediately north of the propylaea lay the temple of Artemis, and north again the Temple of Asclepios, with the Tholos to the west. Beyond these was a long stoa, and to the east of the temple was the altar. The conjectural restorations (illustrated later in this section) give us an excellent idea of the arrangement of the sanctuary in the fourth century B.C.

We have noted in the March " Record " some of the facts concerning the building of the Temple and Tholos at Epidaurus, any further discussion on these buildings will be reserved for the stage at which the spatial analysis of the whole sanctuary is undertaken.

This analysis will be based on the acceptance of Defrasse's reconstruction of the sanctuary published in Monuments Antiques. I have not been able to refer to " Epidaure "—Defrasse and Lechat (1895) or to " Fouilles d'Epidaure "—Kavvadias (1893) for corroboration of the arrangement, so that I am in some doubt as to the validity, for example, of the placing of the propylaea as part of the sanctuary group. In any case the scheme at Epidaurus requires a much more searching and detailed investigation than I have been able to undertake on incomplete data. I cannot hope at this stage to do more than offer a general interpretation of possible experience within the sanctuary.



4. ANALYTICAL SURVEY OF SIX SANCTUARIES

(1) Temple "C" at Selinus

In this example the portion of the site which is traversed by an approaching spectator, and upon which the bulk of the temple lies, is approximately level, so that the visual experience of such a spectator will be of a " simple " order (that is, not involving a noticeable change in level in his progressive approach to the temple). The temenos with its buildings offers in a distant view the clearly visible forms of the great temple. From the sea this appears as a dominant shape above the town, and on closer approach, for instance along the east-west street to the south of the temple, the long elevation is partly obscured by the smaller volumes of the " Megaron " Temple " B," etc.

Let us assume a spectator to enter the sanctuary at the point shown on the accompanying diagram. He will be immediately confronted with an angle view of the south-west corner of the temple—still partly obscured. Passing the west end of the temple (for it is unlikely that the main approach would lie along the south side with the relative obstruction of small buildings) he will experience a sense of the immediacy and size of the building ; the peristyle will " read " virtually as a tall screen of columns through which he will perceive the rectilinear cella form. In the short distance between the roadway and the temple there has been a rapid but restricted development of the form of the temple. The spectator is too close at the point of initial perception to experience the full intent of the building, and the continuation of his path parallel and close to the building while providing a further opportunity for measuring the west front does not afford the necessary distance to widen the first impression.

Progress along the north front maintains the same type of relation that was established on the west, and it is only as the spectator approaches the altar or a point between altar and temple that the first unrestricted view of the temple is possible. Even now the layout is such that by the time he is free of the north-west corner his path leads to a general area where his view of the building is planar rather than three-dimensional. At any point between temple and altar he sees only the east front of the former.

What are the conclusions to be drawn from this arrangement ?

First, one may note the inadequate preparation for the progression. The imperfectly defined entrance, the visual interference of the small buildings, and the extremely small angle which his range of vision makes with the west front result in a confused experience for the spectator. The continued restriction of view until the climactic point is reached prohibits a growing or progressive conception of the whole structure. Nevertheless it would be wrong to underestimate the intensely " quantitative " experience which such a close-range succession of viewpoints would produce. This lack of a harmonious perception of the temple such as that offered in later examples does incur a loss in the significance of the building as a whole, and as a nuclear form within a defining framework, but the sudden impact and maintained closeness suggest an emotional gain—a heightened sense of the local solidity and massiveness of the temple. Thus the experience from a rational point of view is only partial, but a certain intuitive satisfaction—tactile rather than perceptual —is granted in its place.

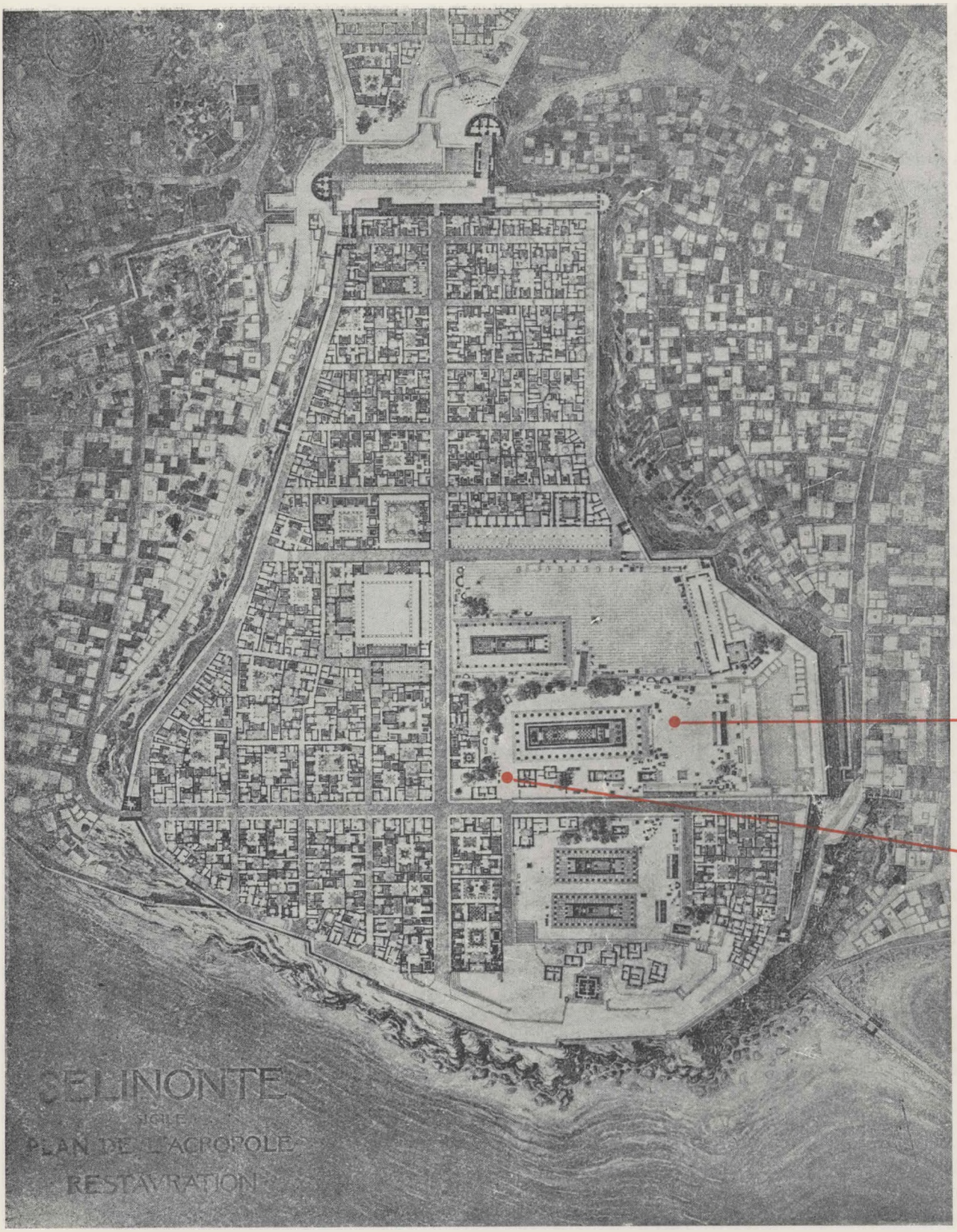
As far as the detail elements of the temple are concerned one may reasonably assume from its situation in the town plan that of its form the entablature with its strong polychromy would be clearly visible from the adjacent streets, while at a distance the effect would be of a boldly articulated structure, the minor components of which would not be easily separable. The interesting situation therefore arises that the temple having no real isolation from its surroundings must have been an object that was continually within range of the populace even when its members were not specifically entering the sanctuary. Thus simply seeing the temple from day to day did not in itself constitute a single or special experience, but these experiences combined with the deliberate approach to the temple for festivals or sacrifices suggest an overall or integrated experience of wide range.

Movement towards the temple and experience of its forms would, from a purely visual standpoint, have normally two components:

(1) The generalised and cumulative vision which is compounded of distant and infrequent views (the temple seen from the sea or across the bay) and recurrent involuntary vision brought about by passing the temple during daily activities, and

(2) Actual entry into the enclosure with the express purpose of taking part in some ceremony connected with the temple.

In the first group of experiences the general form of the temple would become familiar, the upper part of the building standing clear above secondary structures or trees. In the second, as the analysis has shown, the forms that would be most readily apprehended would be (1) the crepidoma with its strong directional quality, and (2) the peristyle with the sharp upward movement of the fluted columns. The " cradling " of the cella within the peristyle would be clearly visible, but


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PLAN DE L'ACROPOLE
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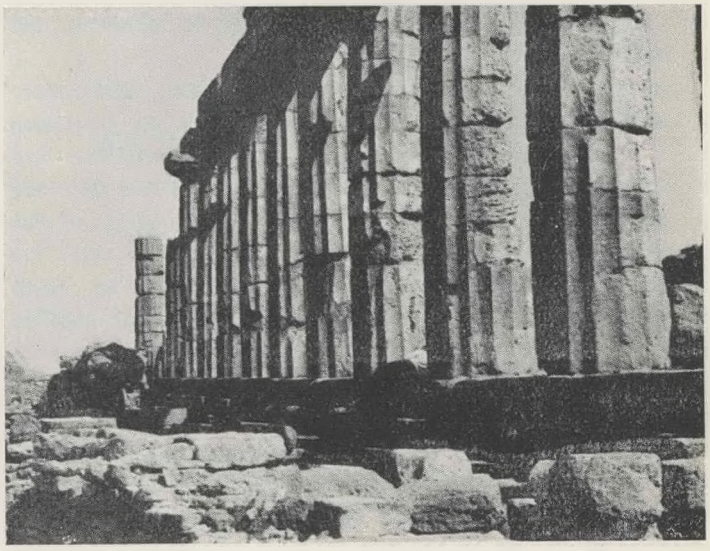
the polychromy largely restricted to the upper members of the structure would not lie within normal visibility.

In this example there is an obvious cleavage between the two groups of visual experience, and this arises from the availability of the building to the passer-by and the obscuring of its form by surrounding buildings. The casual transition from the outside world to the inner seclusion of the sanctuary cannot be assumed to decrease this separation, as both groups of perceptual activity are characterised by incompleteness, and although the physical transition—the movement factor—may be direct and unimpeded, the visual integration must tend to remain unresolved since it lacks the common unifying factor of a relatively complete experience of the whole temple at some stage of the process.

We shall see later that other arrangements will yield results that point to an increasing consciousness of the necessity for such visual unity. A factor which is sufficiently fundamental to have a wide application in Greek sanctuaries may be generalised at this point. The relationship between altar and east front was virtually constant. The actual distance between temple and altar naturally varied according to the scale of the arrangement but the final point reached by the spectator in his approach to the principal front of the temple was always such as to lie between the altar and the temple, so that his view of the building was a direct planar experience. The diagram of Temple "C" shows this final position, which one may venture to say in this case is the most satisfactory of all possible points within the sanctuary. Here in the area defined by altar and temple the emphasis is thrown on to the zone of the ritual; the sacrifice with its elaborate and rhythmic motions gives practical expression to the mystical process which the individual generates in his participation. Against these activities the temple stands, a timeless background, its impeccable geometry negating the transitory, the ephemeral. The approaching spectator who has measured the temple by his own movement now stands still; the movement is transferred to the ritual; and the temple, which in his movement was a changing shape, is now fixed in the calm static of its symmetry.

Regarding the temple and temenos as a unity one must conclude that the restrictions of the modified site (if our conclusions on dating are valid) must be accounted responsible for the fragmentary and visually congested nature of the arrangement. The strength and abstract quality inherent in the temple remain in themselves unaffected, but the possibility of their full exploitation has been inevitably lessened. Only in the final stage of visual progression, as we have just seen, can the arrangement be said to approach the degree of completeness that is the reflection of the Greek attitude to the material present.

The re-erected columns of Temple "C" at Selinus



(2) The Temple of Aphaia at Aegina

This example of temple arrangement introduces a characteristic that does not appear in the Selinus group. The construction of a level platform that will eliminate the accidents of an irregular setting is a significant move towards full control of the effect where the whole system consists of only a few units.

The plane of reference which such a platform provides has the practical advantage of offering a convenient surface for the movement and assembly of the participants in a religious ceremony. From a plastic or abstract point of view it serves as a strongly unifying factor in the disposition of the various structures which it carries. The creation of an artificial level is not exceptional in the context of Greek temple construction; in fact it is symbolical of the rigidly geometrical basis from which the whole idiom springs. For we must note that the platform was not merely of a size to support the temple itself but was designed to form a local setting—a clear separation from the natural state of the site—and was thus considerably greater in area than the plan of the temple.

The ruined state of most Greek temples has given rise to a misconception that "the temple appears to grow from its site." The facts are in complete opposition to such a romantic interpretation. The temple above everything proclaims its existence as a shaped, exact, and artificial construction. The ravages of time have in many cases reduced the shaped stone to its original state, and this now combines in a spurious picturesqueness with the long dead site, but the effect would have shocked the Greeks as greatly as it entrances the sentimental traveller.[28]

The spectator approaches the level platform, but before setting foot on its surface he must pass through the propylaea which marks the sole point of entry to the enclosure and formalises the first view of the temple that can be obtained (a) on the same level, and (b) within the boundary of the temenos. As at Selinus the spectator will have seen the temple at a distance, although in this case the steep perspective of its situation will lessen the possibility of anything more than a fragmentary picture from below.

Let us look at the propylaea in its space-defining role. The chief point to note is that its walls, columns, and roof define a volume, which, by virtue of its scale is readily apprehended by the spectator. Its relatively small size and the sharp decision of its surfaces enclose him in contrast to the unfettered sensation of walking on an open roadway. There is a sensation of adjustment, of preparation for an experience of architecture which the temenos is about to afford.

Strictly speaking one may separate this function of the propylaea into two components. The immediate, or local and conscious experience is one of response to the architectural treatment of the propylaea itself. The spectator on entry will thus momentarily, at least, be occupied with the contemplation of forms which bear a marked similarity to those of the temple. The second component is one of restriction, not easily definable in a formal statement. It may grow rapidly out of the first sensation, almost as a direct extension, or it may induce in the spectator a strong sense of bodily separation from the "outside" world from which the temenos is separated. Between these limits the form of the propylaea serves to control the vision (lateral openings never occur in this element) so that during the movement towards the temenos there is a neutral zone where the spectator cannot be said to stand outside its area, nor yet within its defined boundaries.

The deliberate induction of such a transitional experience is an essential factor in the creation of a system of formal architecture. The correlation of movement with vision, and the precise "release" of plastic effects at pre-determined points very largely determine the degree of response that can be evoked in the spectator. The depth of the propylaea, therefore, is especially effective. Without a measurable dimension in the direction of approach, conscious transition would be impossible, and in this respect the space which is occupied by the "volume" entrance has a value which infinitely surpasses that of a mere gateway.

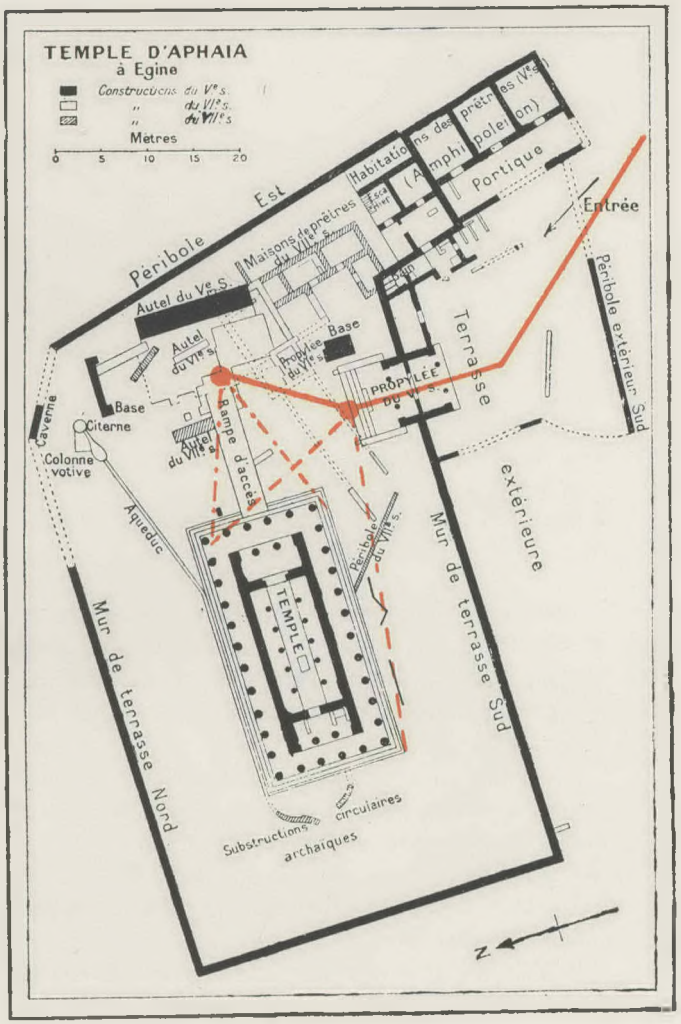
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The diagram shows the relative positions of propylaea, altar, and temple. It will be seen that the inner face of the propylaea lies approximately equidistant from the south-east corner of the temple and from the south end of the altar. Assuming, as we did in the case of the last example, that the general direction of the spectator will lead to a point between the east front and the altar, we note that the path taken to this end is short and direct, involving no change in direction and no obstruction to view. It will be seen also that the path does not traverse a lateral side of the temple.

The first view of the temple as the spectator emerges from the propylaea immediately discloses the chief attributes of the building; without change of position he can envisage the full extent of its form. Movement towards the altar progressively diminishes the degree to which the long (south) side can be seen, and finally only the east front—in full elevation—is visible. In general terms then, there is, in this short distance, a rapid visual modelling of the temple which terminates in the formal apprehension of the main front. Approach to the temple itself is by means of an inclined plane; a method which also occurs in other examples, and which, from the point of view of ritual or procession, would offer a continuity of movement and a subtlety of transition that could not be afforded by steps.[29]

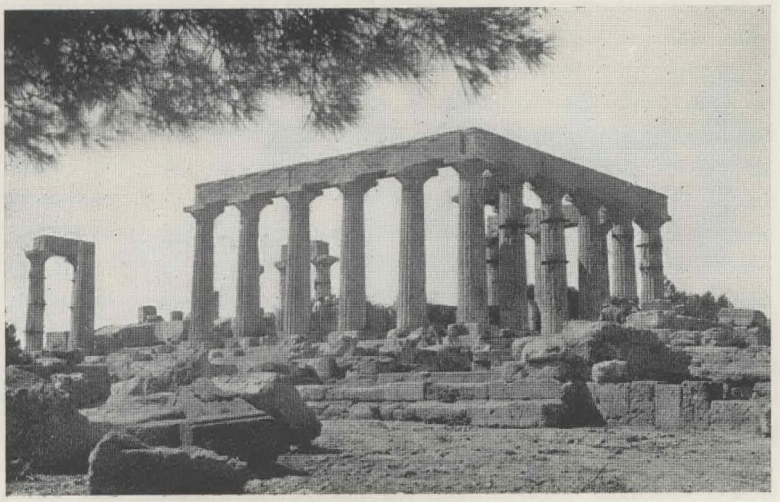
The group of buildings at Aegina offers an admirable demonstration of the critical disposition of elements in a Greek sanctuary. It has the necessary number of terms for a spatial "equation" of an advanced order, yet it is free of secondary elements which, though they may be productive of greater refinement in the total integration, would at this stage load our discussion too heavily.

The sanctuary of Aphaia has a unity of conception that is lacking at Selinus, and may thus be taken to reflect a positive stage in the attitude of Greek temple builders to the problem of providing an adequate setting for the ceremonies of the people.



THE TEMPLE OF APHAIA AT AEGINA

Plan showing path followed by a spectator approaching the east front of the temple from the propylaea



Remains of the Peristyle

(3) The Temple of Athena Parthenos at Athens

The Periclean scheme for a sanctuary that would surpass any known in the Greek world brought about an arrangement that is impressive for its daring and vitality. In fact the Acropolis has by common judgment come to be regarded as a symbol of the highest achievement in classical architecture. Our present purpose is restricted, however, to an examination of the experience of a spectator who approaches the sanctuary, so that any other form of assessment must be omitted.

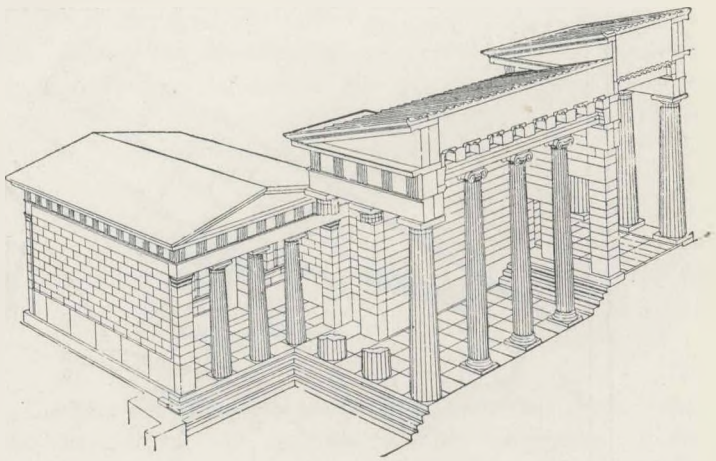
We have noted earlier that this particular site has received considerable attention from historians and archaeologists, at the neglect, perhaps, of other potentially interesting groups which, given the necessary investigation, may well throw light on the problems of the Parthenon setting.

The chief factors to be noted as a background to our analysis are as follows:

The Acropolis is a bold and isolated feature of the landscape that contains it, and the buildings that crowned it appeared as a compact, unified scheme. From the west the Propylaea and the Parthenon combined in a striking articulation. From the south the great length of the Parthenon gave direction to the whole mass, and from intermediate viewpoints the structures combined in a changing pattern of three-dimensional effect. The upper surface of the Acropolis was uneven, its outline was irregular, and approach was restricted and difficult. The Propylaea was placed at the only feasible point, on the west; and the Parthenon lay on the highest point of the Acropolis.[30]

The Propylaea in this example has to fulfil not only the functions defined previously, but owing to the complexity of the site and its great area, it frames the change in level between the surroundings of the Acropolis and its upper surface. This was not possible in a literal sense, the dimensions being too great to be covered by a single building of the propylaea type, but the structure is treated so that it "embraces" the western slope of the Acropolis, and at the same time bears a positive architectural relationship with the temple that is the focal point of the sanctuary.

The Periclean Propylaea is thus the most complex type that is encountered in Greek architecture, and its great size and bold silhouette do much to offset the limitations of a difficult site. In earlier times a smaller and differently oriented entrance was situated at the same point, but the present structure designed by Mnesicles is on a much larger scale. As finally carried out the Propylaea was only a fragment of the original scheme. Dörpfeld and others[31] have suggested the form that was originally intended, but for the purpose of an investigation of its essential spatial attributes we shall forego speculation. The "depth" portion of the Propylaea was actually built, and from the point of view of the spectator this portion satisfies the needs of his approach to the sacred enclosure.



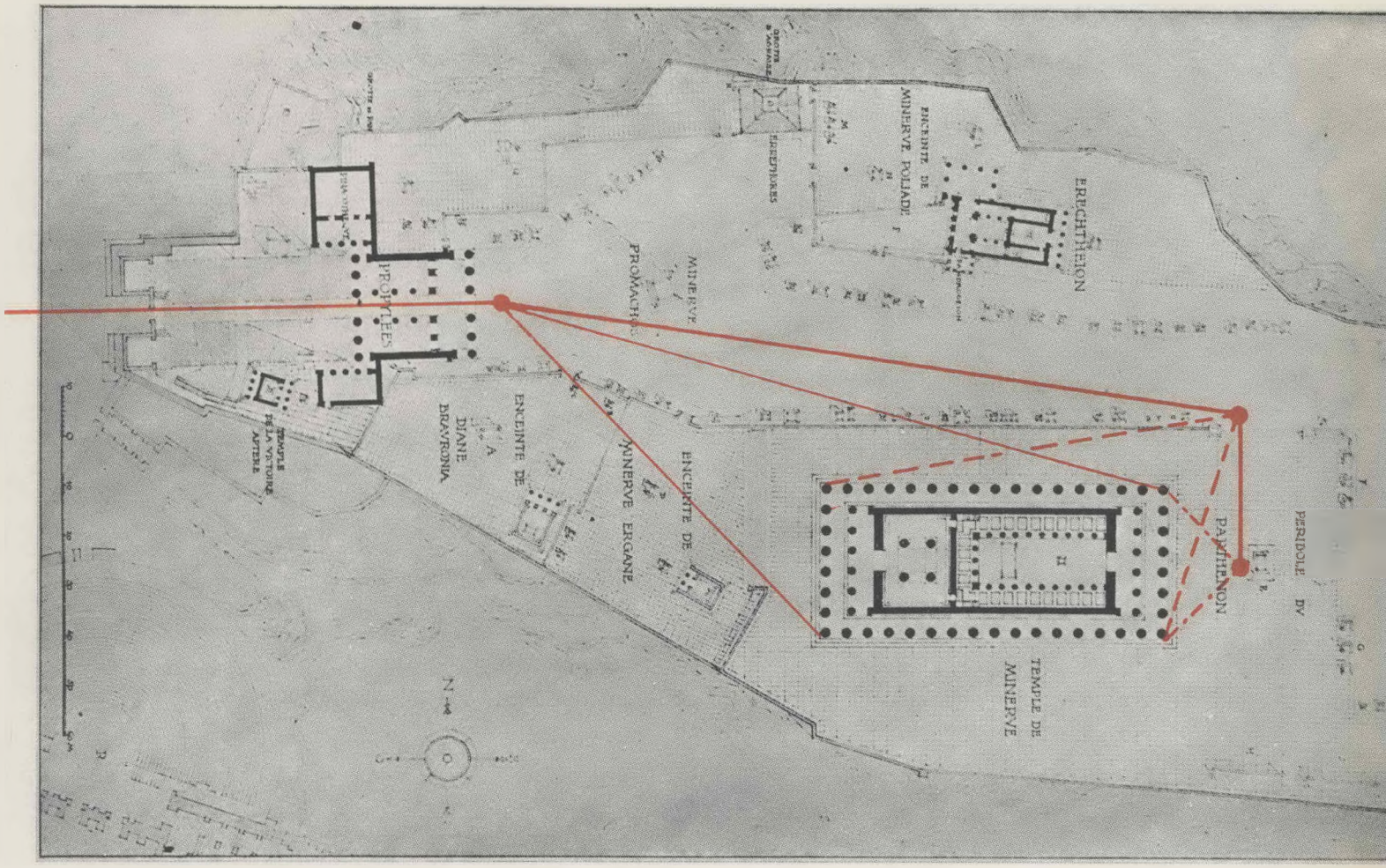
The Propylaea at Athens

On either side of the processional way projecting Doric porticoes frame the approach, and directly ahead the hexastyle colonnade of the central structure rises high above the spectator. There are five openings, the central one being wider than those on either side to provide ample space for formal processions.[32]

Within the structure the usual system of two porticoes is found, but two rows of Ionic columns in the west portico continue to mark the width of the central opening as far as the wall which separates the two porticoes, and this in turn is pierced by five openings. The effect of this columned corridor within the portico is one of emphasis to the depth of the structure, and consequently of prolongation of the sense of transition in the spectator. In addition there is a gradual change of level within this west portico, so that by the time the eastern limit is reached movement with two components (horizontal and vertical) has been undergone within the propylaea.

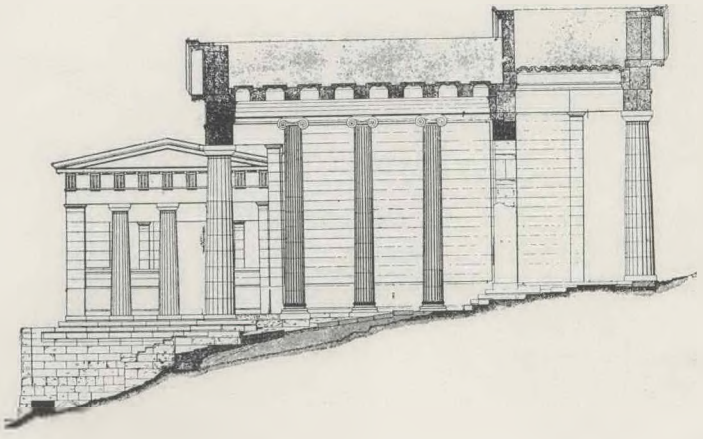
The general space significance of the propylaea has been discussed in the previous study of the Aphaia sanctuary; we may note in the present context the additional complexity that was deemed necessary to meet the special conditions of the Athenian Acropolis.

Let us imagine a spectator about to emerge from the Propylaea. Ahead of him, and slightly to the north, stands the tall statue of Athena Promachos, and behind it the



THE ACROPOLIS OF ATHENS

Plan showing path followed by a spectator in approaching the east front of the Temple from the propylaea



Section through the Propylaea



The Propylaea

THE ACROPOLIS OF ATHENS



Reconstruction by Gorham P. Stevens showing relationship of Propylaea to Parthenon

Erectheion. To the south-east the Parthenon stands on higher ground. Assuming these elements to have had no obstruction other than that caused by the sanctuary of the Brauronian Artemis, we may reasonably suppose that a procession would approach the east and principal front of the Parthenon by traversing the long north side and turning south to reach the front of the building.

In this way a progressive image of the building would be made up of:

(1) The distant initial view from the Propylaea, which is sufficiently removed and sufficiently far off the east-west axis of the Parthenon to give an adequate three-dimensional impression without overmuch preoccupation with its detailed treatment.

(2) An increasing angle perspective as the spectator approaches the north-west corner of the Parthenon with growing comprehension of the architectural treatment.

(3) The comparatively close and unchanging view of the north side along which his path lies, and finally

(4) The culminating direct view of the east front.

In comparison with the effect achieved at Selinus it will be seen that there are considerable differences in the nature of this approach to a climax, although some of the terms are common to both. First, the initial view from the point of entry is a distant one, where that at Selinus was close, so that an additional space was covered by the spectator before he actually rounded the building ; and second, the Parthenon although partially obscured by the sanctuary of the Brauronian Artemis, did not suffer the type or degree of visual interference that was encountered on entering the sanctuary of Temple " C."

At Aegina the initial angle view was completely unobstructed but relatively close, and the spectator in approaching the main front of the temple did not traverse its side ; the degree



of cognisance was therefore less complete than at Athens and Selinus, though the first "picture" must have been sharper and more organic than it was in either of these examples.

The researches of Gorham Phillips Stevens into the treatment of the Athenian Acropolis point to an entirely different approach to the east front of the Parthenon than that usually assumed from the extant remains. In his recently published monograph[33] on the Periclean Entrance Court he presents arguments which, if acceptable, must revolutionise our ideas on the arrangement of the Acropolis buildings. Stevens does not accept the apparent approach to have been the one employed in Periclean times. He suggests that the approach was defined first by a high Mycenaean wall behind the giant statue of Athena, and parallel to the east face of the propylaea; and secondly by the complex formed by the sanctuary of the Brauronian Artemis. Finally an irregular forecourt against the west facade of the Parthenon is postulated, and this is approached through a small propylon in its south-east corner.

One immediately notes the awkward changes in direction involved in such a scheme (especially for processions), the unsatisfactory screening of the Parthenon, and the restricted approach to the east front of the temple. According to Stevens the processions would split into two streams, one along the south and one along the north of the Parthenon.

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To-day the spectator sees the full form of the Parthenon from the propylaea; the lines of the crepidoma and the screen of the columns proclaim order on the sloping rock. The rise and fall of distant horizons are measured by their geometric exactness. If these attributes were negated by the obscuring of the temple, if the path to the altar were so tortuous and subject to so many changes of scale and so many interruptions, then the plastic effect of the group as a whole must have been sadly weakened by the dictates of outside influence. Whether it was political opportunism or the sanctity of tradition that interfered with the "pure" composition of the buildings the outcome was unfortunate if Stevens's findings are correct.

If the Periclean arrangement suffered these disabilities we are forced to return to a distant view of the Acropolis, and in seeing it as a whole to seek the splendour and capture the Attic perfection in unity that were apparently denied the spectator within the sanctuary.

(4) The Temple of Apollo at Delphi

At Delphi we encounter a site that introduces new characteristics in the relationship between spectator and temple during the range of his visual experience within the temenos. There appears to have been no propylaea at Delphi, and as we have discussed the significance of this element at some length we may at the outset inquire into its absence, and into the possibility of a compensating system that would conform with the tenets already suggested.

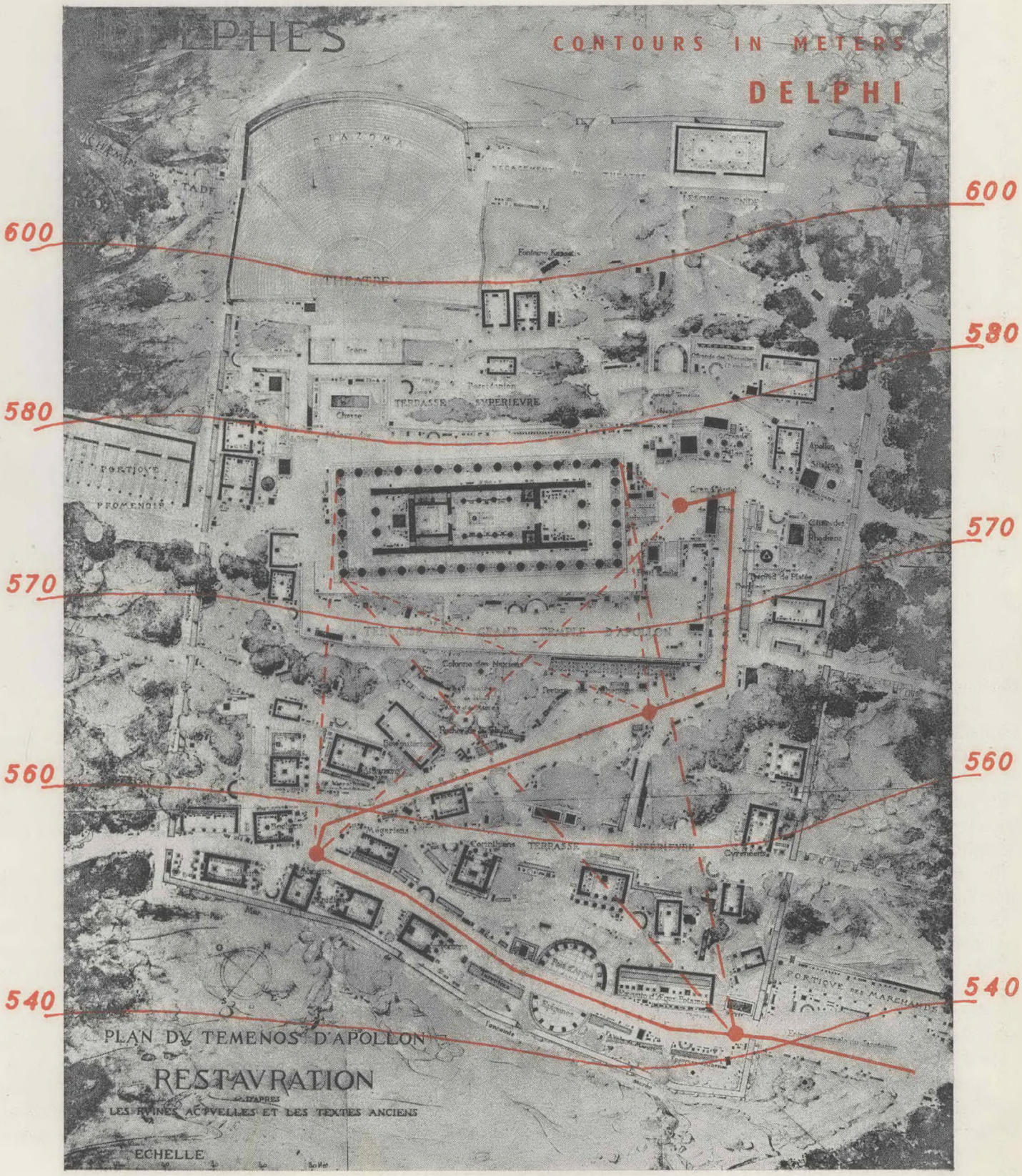
The main entry to the temenos lies at the south-east corner, and from this point the "sacred way" runs almost due west for about 300 feet, it then turns and for about 275 feet runs north-east. The final stage—about 100 feet—carries one n.n.-west to the front of the temple. The first portion of the paved pathway is lined on both sides with treasuries or similar structures, sufficiently close to one another to form an almost continuous screen. Thus despite the fact that there is no propylaea the avenue of small repeated buildings implies a sense of preliminary enclosure before the focal point of the sanctuary is reached. The screening suggested by the treasuries is naturally not so positive as that provided by a formal propylaea, as it is always possible to gain a view between and above them, but the great length for which the path is rigidly defined compares quantitatively, at any rate, with the momentary restriction of a propylaea.

Such compensation is only made possible by the topography of the site. Although a straight line drawn from the point of entry to the south-east corner of the temple measures about 300 feet, the length of the path taken by the spectator between these points is about 800 feet. About three-eighths of this distance has a degree of restriction that suggests an extended propylaea which only releases the spectator at a point almost in the centre of the temenos.

It will be seen from the diagram that the contours of the site run approximately east and west, and that the entrance to the temenos lies on the 539 meter contour. The temple level is about 573 m., its intermediate substructure is at 571 m., and the lower platform on which the whole rests is at 566 m.[34]

Let us examine the conditions encountered, without regard to the lines of vision of the spectator, but merely as he moves upwards towards the temple.

(For convenience of reference the "first section" will be assumed to denote that portion of the path that lies between entrance and the sharp bend; the "second section" from the bend to the south-east corner of the temple substructure; and the "third section" from this corner to the great altar.)


DELPHES
CONTOURS IN METERS
DELPHI
600
580
570
560
540
PLAN DV TEMENOS D'APOLLON
RESTAVRATION
D'APRES
LES RVINES ACTVELLES ET LES TEXTES ANCIENS
ECHELLE



Left: photograph "B"
Below: photograph "A"
These views, taken on a rainy day, are reproduced only to assist in visualising the nature of the site of Delphi and the appearance of the "sacred path" to-day. They convey little of the atmosphere of this interesting sanctuary



The path ascends the slope at a gradient of about 1 in 10 until the end of section two, where it turns steeply upwards at a gradient of about 1 in 4. Photograph " A " was taken just before the end of section two of the path, looking north-east. On the left is seen the polygonal wall of the temple terrace, and the remains of the Athenian Stoa. Photograph " B " gives a view looking down the steep third section, with the valley below. The terrace retaining wall can be seen on the right.

The extended approach at Delphi is worthy of detailed consideration since the whole of its length is included within the area of the temenos, and the effects that result from the arrangement of path and buildings are not merely the fortuitous product of viewpoints selected from strategic positions that have no intrinsic connection with the temple complex. Let us now trace the visual progress of a spectator within the temenos.

His first view on entering the enclosure shows the Temple of Apollo in steep perspective and relatively small, eye level being approximately 105 feet below the stylobate of the temple. The long, south, side predominates almost to the exclusion of the east front. At the end of the first section the spectator is higher, and nearer the temple. At this point he has progressed so far laterally across the long side of the temple that the west front is just visible. Just before the end of the second section he views the temple from the same direction as he did initially at the entrance, but now at 560 metres he is 65 feet higher than he was at the entrance, and instead of being 300 feet distant from the building he is only 100 feet from it.

The effect, then at this point is one of a close angle-view, eye level being about 35 feet below the stylobate. Progress along the steep third section discloses more and more of the east front, and the spectator rapidly attains the same level as that of the intermediate substructure. The final view of the temple as in the other examples is a direct one, the actual approach to the temple being by means of a ramp.

Such a long sustained approach cannot do otherwise than induce in the spectator a mounting sense of climax, and it is in the arrangement at Delphi that one sees a parallel to the construction of the Greek tragedy. Both in architecture and drama the end is in sight, the spectator is familiar with all



SANCTUARY OF THE TEMPLE OF APOLLO AT DELPHI

(From the reconstruction drawing in "Monuments Antiques.")

This illustration first appeared in the "Record" in June, 1935, to illustrate a paper by the writer entitled "Conflict in Hellas—Materials for an Integration of the Greek Spirit."

the elements that go to make up the particular unity to which they subscribe. He cannot influence the outcome of the plot in the one case, nor can be modify the arrangement in the other—but in each he is subject to a form of compulsion that renders the end more vital and more moving than it the " suspense " had been built up of elements of which he had no previous knowledge. Perhaps nowhere else in Greece has this ineluctable necessity of fulfilment in the spectator been better demonstrated than at Delphi, nor can surroundings be conceived of that could contribute more vividly to the mood of such an experience.

In formal terms the experience assumes a rather dry aspect, but as we are concerned with the spatial aspects of Greek architecture we must proceed to a summation that will aid a general finding in this respect.

Our study of the spectator's path showed that his progress was marked by a continually changing view of the temple above, and that the succession of " pictures " so formed in his mind was the result of sustained movement towards the object of attention. That each picture was different was due to the changes in direction with regard to the object that his path caused between initial and final positions. Thus change in apparent size and in apparent configuration was dependent upon movement and direction. The movement was of a complex nature ;

(1) Because the spectator began moving at a different level from that of the viewed object, and maintained a changing level until the conclusion of his approach ; and

(2) Because the direction was not constant ; four major changes of direction are undergone before the temple is reached.

The implications of these two factors may be assessed more directly, perhaps, if we set down what results would have been obtained:

(a) From movement in the direct approach to an object, with level constant and direction constant ; and

(b) From movement involving change of level but constant direction.

In the first case (a) the spectator would (supposing he were approaching the angle of a Greek temple) receive a series of impressions of the three-dimensional form of the temple between the limits of his initial and " small " view of the temple, and his final and close view. The process of movement and vision here results in a graded and cumulative " picture " of the object seen, but except for apparent changes in the relationship between minor portions of the structure due to the changing viewpoint, the characteristics of the object would remain the same throughout the distance covered. The limit of visual experience is set at the starting point with regard to horizontal range. The final viewpoint has a restricted horizontal dimension, but approach to that final position will increase the range of visibility of horizontal surfaces. Immediately against the angle of the temple, for instance, the spectator would be able to see the modelling of the echinus, the underside of the architrave, the coffering of the pteron ceiling, etc., none of which was available to him at a distance.

Let us now suppose that the temple is approached so that once again the direction is constant, but on this occasion the level is changed at a constant rate. Assume that the spectator approaches the building, starting at a distance from it, and below its level, and ending close to the angle, and on the same level as the stylobate. Once again the horizontal limits of vision are fixed at the outset ; once again the series of impressions is complete by a final close view, but under the new conditions the moving viewpoint, being from a lower level, provides an increasing picture of the depth dimension of the structure (depth of pteron, depth of architrave, etc.) which in the former case was only accessible at relatively close range.

By comparison, then, the latter mode of approach gives a three-dimensional impression over a greater range than the former was able to provide. Now in both cases it is to be remembered that the experience of characteristics, other than those perceived at the beginning of the movement, was not substantially increased during the approach.

At Delphi we have the condition as in the latter assumption above, but we have in addition a succession of viewpoints that do not lie on a straight line to the temple, but that occupy positions within a wide field relative to the perceived building. Thus the visual integration of three-dimensional impressions is of a considerably higher order. As the spectator moves westwards and upwards, the lateral dimension of the temple is experienced as well as those characteristics that the steep perspective makes clear. At the extreme of westward movement the main volume of the temple is re-affirmed by an angle view of the west front. Eastward, the path gradually approaches the side of the temple and passes beyond its south-east angle, but before this point is reached the view shares (as we saw earlier) the original direction of the view from the entrance.

A wide range of plastic " exploration " separates these points ; a journey has been undertaken that ends in the same general viewpoint with which he started, but now he is closer in distance and level. The datum impression is confirmed in greater detail. The concluding terms of the integration follow one another with dramatic rapidity as the steep pathway carries the spectator sharply upwards along the last section, and parallel with the east front. The movement terminates at

the suddenly gained repose of the altar space.

The site at Delphi was utilised by the architects in such a way that man as a moving and perceiving entity could establish a relationship with its buildings—a relationship in which the buildings are significant not only in the timeless and static nature of their forms, but in which they offer as well a perpetual and ever fresh demonstration of his own capacity to shape and order, and to create of inanimate material an abstract framework capable of defining the geometry of the visible world. In its complexity, and in our perception of the wide gamut of its spatial manoeuvres, emerges the true achievement of the Doric temple in its setting.

At Delphi the experiment was of profound significance, for here architecture was the formal bridge between the unaccommodating vastness of a mountainside and the demands of a people for whom religious ritual was the practical projection of a conviction of immortality—of identification with the gods of their own creation. The temple is part of the framework of ritual ; with its complementary functions it can be said to represent the intellectual ordinates against which are set the violent shapes of the emotions.

(5) The Temple of Poseidon at Sunium

At Sunium there is a relationship between propylaea and temple which recalls that of the Aphaia group at Aegina. At Delphi such factors as the occurrence of numerous treasuries and the steep slope on which the temenos lay, introduced a type of delayed approach which is not encountered in enclosures having only one important element. The Acropolis at Athens, with its irregular surface and widely separated buildings, carried problems of a special nature, and definitive conclusions on the present controversial interpretation of its remains are not feasible.

At Sunium the arrangement achieves a high degree of spatial harmony. Here again the Greek builders felt the necessity of providing a plane surface for the temple group, and in selecting this dramatic setting for the temenos they exercised conscious control by ordering the site through the medium of a substructure of massive blocks. The diagram shows the general scheme of the enclosure, and the key elevation indicates the changes of level that take place within the peribolos.

The spectator on emerging from the propylaea stands about 100 feet from the nearest point on the temple which lies before him so that the main (east) front is virtually out of range. The long side is visible in its entirety, the stylobate being well above the level of the propylaea pavement. The spectator gains, therefore, from his initial position a sufficiently " straight-on " view of the temple to assess its greater dimension. Comparison with the initial viewpoints at Selinus and Aegina indicates the essential difference between such a long-distance approach and the sharp, angular view which occurs in the earlier examples. The spectator emerging from the propylaea stands on a level area which dominates the temenos : on his left a broad flight of steps leads on to an intermediate level, which in turn gives on to a higher platform to the east of the temple. Thus the approach is not only a lengthy one, but undergoes a graded change in level until the final objective is attained. Four distinct levels are experienced between propylaea and temple, and during these changes a minimum of three changes in direction. It will be seen from the plan that the spectator stands at each level on a rigidly defined plane which affords him an assessable relationship not only with the temple itself (this element being set in alignment with the peribolos) but also with the defined space of the whole temenos.

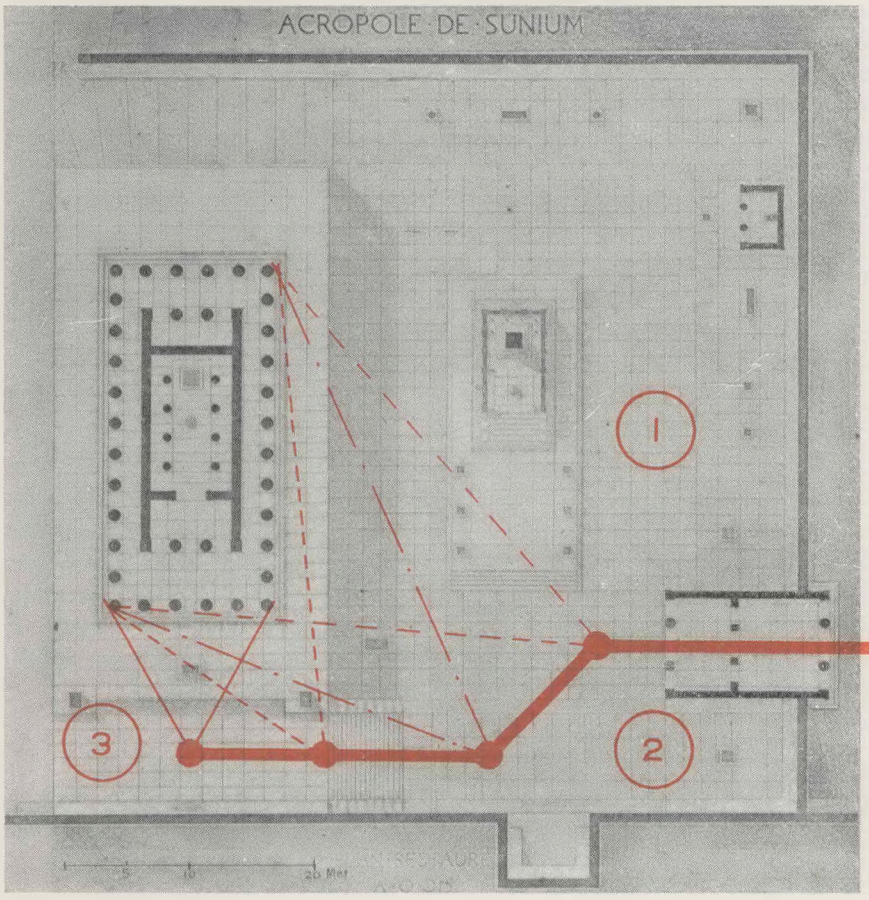
The lowest level, occupying the greater part of the temenos, provides a generous and continuous forecourt to the temple —a contribution to the stability of the whole space-structure which is of cardinal value.

The second level embraces an area considerably less than the first. The east wall of the temenos marks its position.

The third level has the same width as the second, and defines by its length the width of the temple platform.

The visual range possible within each of these defined planes has a specific connection with the temple position, and it is by correlating visual experience with the critical situation of these planes that we approach some understanding of the implications in the arrangement.

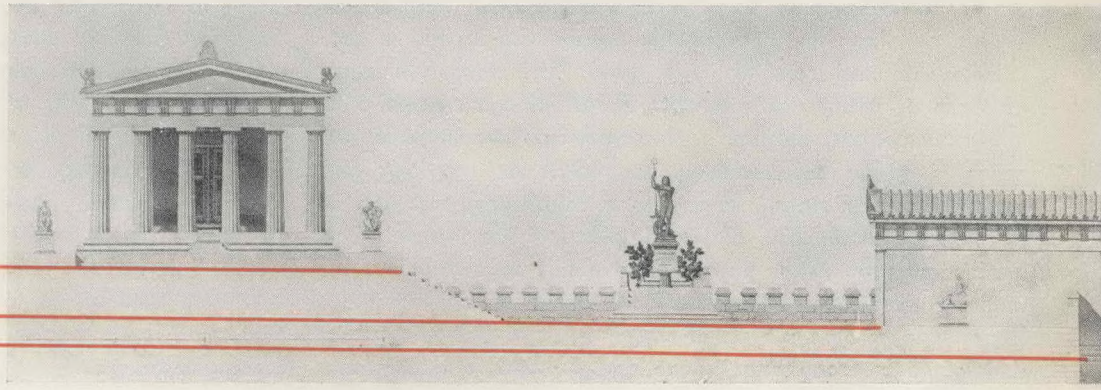
The spectator walking towards the temple undergoes an experience of " modelling " the building which is similar to those examined in the preceding cases. In the path followed his successive positions are such that he becomes aware of the three-dimensional attributes of the temple. This composite picture culminates as he passes the angle of the building, and assumes a " two-dimensional " significance as he faces the end of the temple. The nature of this experience, and the limits within which it can function, have perhaps been sufficiently discussed in the previous analysis. We may assume the purely visual activity to be of a generalised order arising from the characteristic position of propylaea and temple in Greek architecture. What we are concerned with is the correlation of this activity with the planes from which it is generated. This necessitates a differential examination of the zones in which visual experience of the temple is possible,



Plan of the Sanctuary showing path taken by a spectator in approaching the east front of the temple from the propylaea

ENTRANCE

SANCTUARY OF THE TEMPLE OF POSEIDON, SUNIUM



ZONES

3

2

1

Let us consider the area covered at the first level, or more briefly " zone one " as it may be termed. This is defined by the north and west walls of the temenos ; the east flight of steps ; and the north side of the temple platform. All movement within this zone results in a predominant cognisance of the long side of the temple. Lateral movement within east and west limits offers only a small knowledge of the short sides, and approach to the temple, while it increases the incidence of the vertical angle of vision, does not substantially widen the visual experience.

Movement towards the east to gain a more substantial impression of the principal short front immediately brings the spectator within the scope of the second zone, and it is clear from the plan that all points from which the principal front can be clearly perceived (without entering the last zone) lie in zone two. The nature of the experience possible from this zone is defined by two components ; the long and short sides of the temple. At the north end of the zone the long side is the dominant dimension ; at the south, long and short sides of the temple have for the spectator virtually equal value.

The transition from zone two to zone three is marked by a bold flight of steps, and it is at this point of change that the critical modelling of the temple takes place, for not only does the path past the north-east angle of the temple induce a maximum value for the volume of the building, but the considerable change in level results in a vigorous modification of the vertical angle of perception, with accompanying change in the relative appearance of the temple elements.

Zone three allows at the limits of its extent only an extremely small view of the long sides ; points within the greater part of its area permit views of the east front alone. Thus the smallest and last zone is deliberately restrictive and preparatory in function.

The kind of visual experience within any one of these zones bears a positive relationship to the form of the temple. Zone one is specifically concerned (no matter where within its bounds the spectator takes up his position) with the main, long aspect of the building ; its characteristic appearance in this respect is always defined from this initial area. To increase the range of these apparent characteristics necessitates movement into another zone, and the line of demarcation between these two zones is subtly but positively suggested by the long and shallow flight of steps. Zone two is transitional, not only in position but in the kind of view it offers of the temple. The whole range of vision possible within this zone provides an angle or essentially three-dimensional impression of the temple. Zone three affords a type of view that is complementary to that given by zone one. Zone one provides a generalised conception of the temple ; zone three is the basis for a particularised and concluding picture.

This demarcation of zones by means of defined areas and selected lines of change in level constitutes a notable extension to the type of arrangement that we have examined in the preceding examples. At Selinus the spectator was not provided with a defined starting point, nor was his position at any given stage in his path readily measurable in relation to the whole enclosure. Similarly, although at Aegina a propylaea was included, the straight-line path to the altar offered a rapidly graded experience which started at a maximum angle value and attained the final position in what was virtually a common zone.

At Sunium all positions assumed by the spectator bear a measurable relationship to the zone in which they occur, and each zone has directional and geometric properties which maintain the organic nature of the whole complex. These properties also induce in the spectator a full realisation of the co-existence of the zones whatever his position may be within the temenos. Movement is thus provided with a series of co-ordinates, and spatial experience within the bounds of the scheme is given a palpable framework.

The foregoing analysis shows a unity and balance in the component parts of the temenos that contribute a most significant background to the directional movement of the spectator towards the temple. The sustained geometric framework which is the essence of the Sunium arrangement differs from the setting at Delphi where the steady change of level and the winding pathway heavily underlined the approach to the temple. At Delphi the dominating frame of mountains and the steep slope of the site led to the bold solution of directly opposing the temple to its setting ; only the jutting platform of its base resists the downward slope of the ground and its attendant instability. At Sunium a rigidly induced stability of the immediate surroundings lends a local resonance to the forms of the temple. The plane of the sea beyond, only distantly accentuated by islands, offers the conditions for a detached and precise demonstration of the harmonies of arranged volumes.



REMAINS OF TEMPLE OF POSEIDON AT SUNIUM

" All history, it has been said, is contemporary history. When we study history, we are trying to understand ourselves, and in order to gain that understanding we are seeking to discover the pit from which we have been dug and the rock from which we have been hewn. No history matters more to us, and none is more really contemporary, than that of the Greeks. We are what we are, in a very large measure, because they were what they were. In many ways the paradox is true that the history of Athens in the fifth century B.C. is more modern than that of Europe in the eighteenth century A.D."
Ernest Barker: Greek Political Theory—Plato and his Predecessors.

(6) The Temple of Asclepios at Epidaurus

The Asclepian Sanctuary offers an arrangement whose components stand with notable freedom within their enclosure. In comparison with the previous examples there is a lack of obvious climax in the placing of the principal structure, and the apparent equality in distribution and emphasis of the elements contrasts strongly with those schemes in which dominance of position or rigidly defined approach implies a focal point.

The " L "-shaped temenos is approached from the south, and within its area stand :

(1) The small temple of Artemis ;
(2) The Temple of Asclepios ;
(3) The Altar ;
(4) The " Tholos " ;
(5) The Stoa.

Analysis discloses a constant measurement between the adjacent buildings in this list. Thus a circle with its centre in the Temple of Artemis cuts through the Propylaea, the Temple of Asclepios and the Altar. Similarly a circle centred in the Temple of Asclepios passes through the centre of the Tholos and the centre of the Altar. In view of the lack of alignment between these buildings, this strong positional identification within the temenos suggests a form of co-ordination that has its basis in a space continuum of advanced type. The " order of co-existing elements " is such that each building is profoundly significant as a volume, and any position taken by a spectator within the scheme tends towards three-dimensional conception of all these volumes.

This articulation of elements results in a rich interplay of separate entities whose visual possibilities can only be suggested by assuming the spectator to take every available position in the temenos.

●

Let us determine how movement along the principal line of approach from the propylaea to the temple will affect the relationship between all the elements from the spectator's point of view. Immediately inside the temenos he can see the south wall of the Temple of Artemis, and beyond the south-west angle of this building the whole of the south side of the Temple of Asclepios is visible. Slightly further away and to the west the Tholos with its non-directional cylindrical form is seen across the angle of the peribolos. Movement towards the Artemis building gradually eliminates the Temple of Asclepios from view, while the Tholos remains constant in its aspect. On entering the restricted area defined by the peribolos angle and the west wall of the Temple of Artemis, the full form of the Temple of Asclepios appears for the first time. This area has the effect of a second propylaea, though there is no screen to the west to provide a true restriction to vision such as has been defined for the propylaea in our discussion on the Aphaia temple.

That this is a critical point in the progress of the spectator is indicated by the conditions found here. Considering what is visible in a clock-wise direction we note :

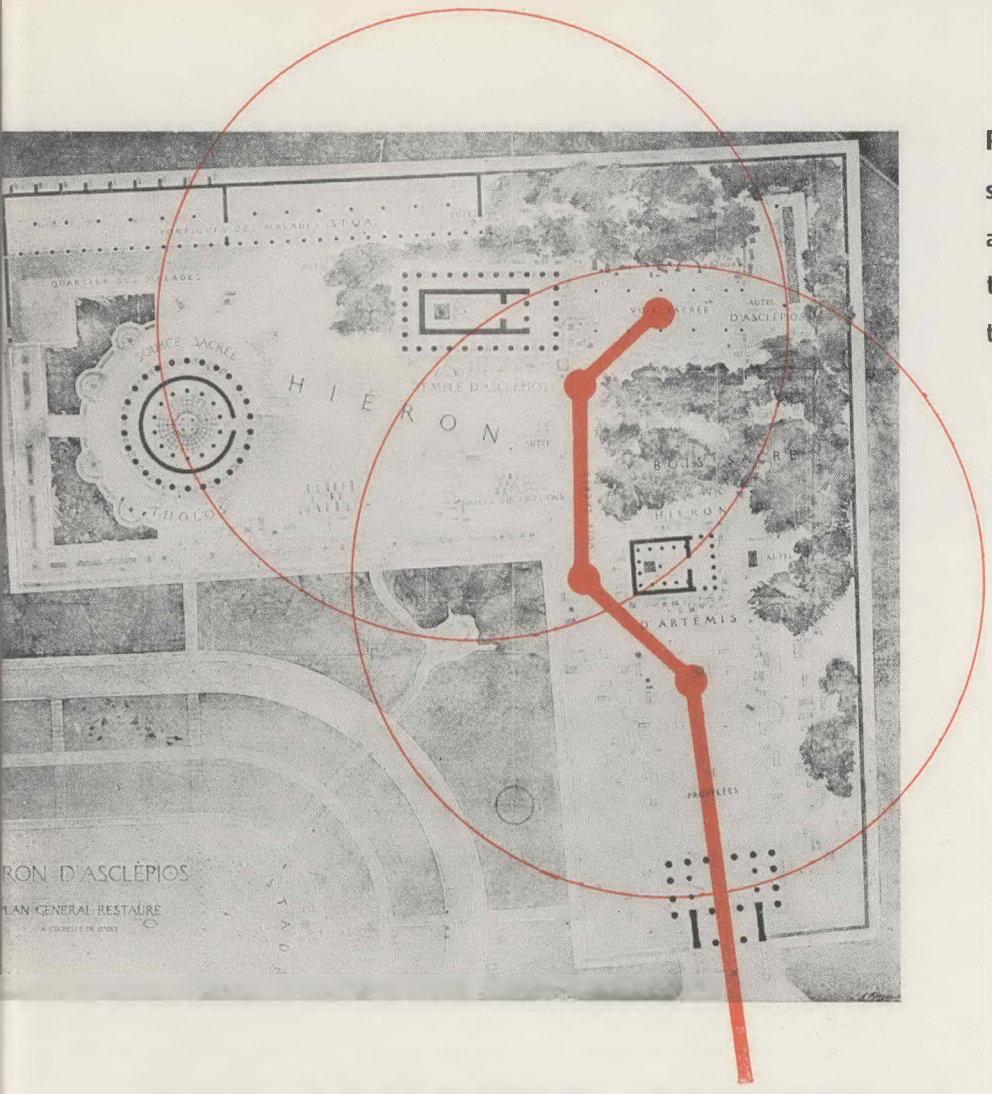
(1) The Tholos, subtending an angle of 18°.
(2) Portion of the Stoa, extending east from its extreme west side which is visible beyond the Tholos (21°).
(3) The Temple of Asclepios (31°).
(4) The space between the temple and the altar (35°).

In connection with (2) it is clear that this standpoint offers the fullest experience of the stoa from the main line of approach, and the fact that one of the limits of its form is also visible from the " secondary propylaea " serves to identify it with the " completeness " of the other elements. The Tholos tends to be a neutral or pivotal element in that its own appearance is constant, and from the " critical " point towards the temple and altar it is seen only against natural surroundings.

Further progress along the path is accompanied by a cumulative modelling of the temple such as we have discussed in the previous analyses. The great distance of the altar from the east front of the temple is notable, as well as the fact that its centre lies opposite the north-east angle of the temple ; this considerable lack of alignment means that the Tholos is not visible from any point within the greater part of the area defined by the temple front and the altar.

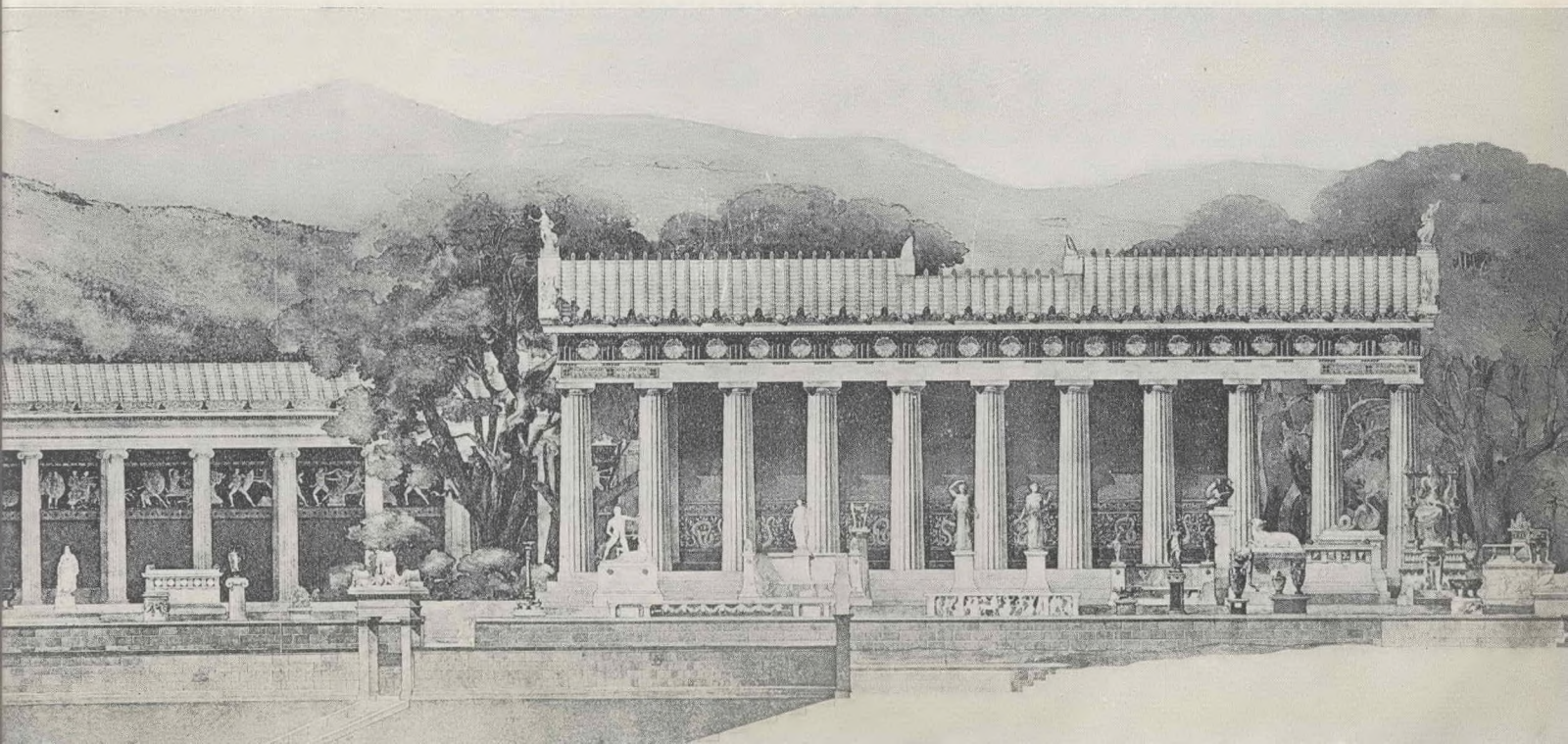
Approach to the Tholos is accompanied by a change in the appearance of the Temple of Asclepios which now shows only its south side. When the Tholos ramp is reached, however, the west front appears, and west and south elevations are seen against the stoa. Approach to the front of the Temple of Artemis from the propylaea is of a similar order to that shown for the Temple of Aphaia at Aegina ; the distance traversed, however, is considerably greater.

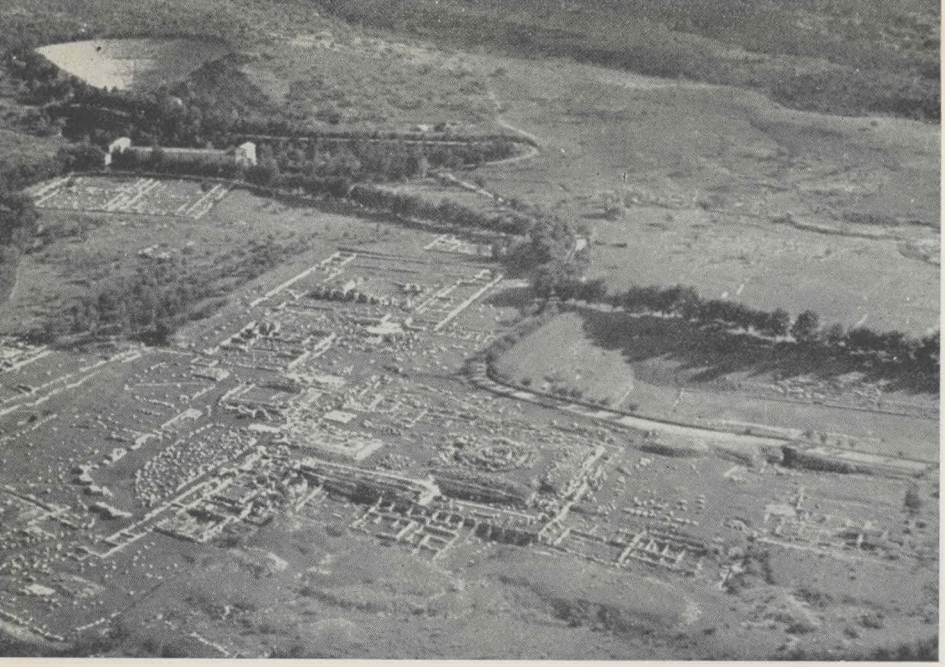
Such lines of approach indicate only a small number of the many positions in which these separate units can be seen in combination with one another, but sufficient has been suggested to show the manner in which their articulation enables clear perception to be made by the spectator of their individual forms, while an essential relationship is maintained. This is made possible by virtue of an arrangement which demands as a general condition the visibility of all elements from any standpoint within the temenos..



Plan of the Sanctuary showing path taken by a spectator in approaching the east front of the temple from the propylaea

THE ASCLEPIAN SANCTUARY AT EPIDAURUS





E P I D A U R U S

An air view looking S.E. over the site of Epidaurus. At the top left is the theatre. The remains of Temple, Tholos, etc., can be clearly seen. (Photo copyright of Greek Ministry of Communications.)

GENERAL NOTE

An essential contribution to the continuity within the temenos (enunciated above) is the grading of space which the characteristic peristylar arrangement of the temple affords. So far, in our examination of the temple in its surroundings, we have attributed to it a bulk volume, that is to say, we have assumed it to present a simple prismatic form without the space modulation that the peristyle contributes. It has been considered desirable not to load the discussion with references to all the aspects of space definition that occur when a temple is placed within constructed surroundings. The question, therefore, of transitional volume, as we may term the special relationship produced by the peristyle, will now be examined.

NOTES.

[1] **E. A. Gardner :** in Cambridge Companion to Greek Studies, p. 406.

[2] **Plato :** Laws II., p. 653 D, quoted by Gardner : loc. cit.

[3] **Gardner :** op. cit., p. 408.

[4] **Gardner :** op. cit., p. 405.

[5] **Socrates :** Mem. III, viii, 10.

[6] **Schede :** The Acropolis of Athens, p. 79.

[7] **Tod :** in Cambridge Ancient History, vol. 5, p. 29.

[8] See **Stuart and Revett :** Antiquities of Athens, etc., vol. 4, for notes on, and plan and section of, arrangement of Temple of Juno Lacinia at Acragas.

[9] **Anderson, Spiers, Dinsmoor :** The Architecture of Ancient Greece, p. 96.

[10] **Anderson, Spiers, Dinsmoor :** op. cit., p. 94. See also Osvald Siren : The Imperial Palaces of Peking, vol. I, for plans and photographs of Chinese monumental planning. An interesting parallel to Greek work in the spatial aspect is offered by the Chinese layouts.

[11] **Frazer :** Pausanias's Description of Greece, vol. 3, p. 269.

[12] **Welter :** Aigina, Figs. 56, 59, 60.

[13] **Fougères :** Le Parthénon, 2 vols., photographs and text.

[14] **Picard :** L'Acropole, etc., photographs and text.

[15] **Hege and Rodenwaldt :** The Acropolis (English Edition).

[16] **D'Ooge :** The Acropolis of Athens.

[17] **D'Ooge :** op cit., p. 113.

[18] **Lavedan :** Histoire de l'Urbanisme, Antiquité-Moyen Age, p. 142.

[19] **Choisy :** Histoire de l'Architecture (1929 ed.), pp. 415 ff.

[20] See **Le Corbusier :** Vers une Architecture (1928 ed.), pp. 31 and 39, for a recent evaluation of the planning of the Acropolis buildings.

[21] **Homolle :** quoted by Frazer : op. cit., vol. 5, p. 271.

[22] **Dinsmoor :** quoted by Poulsen : Delphi, p. 74.

[23] **Homolle :** quoted by Frazer : op. cit., vol. 5, p. 272.

[24] **Homolle :** quoted by Frazer : op. cit., vol. 5, p. 281.

[25] **Frazer :** op. cit., vol. 5, p. 310.

[26] **Frazer :** op. cit., vol. 2, pp. 1 and 2.

[27] **Frazer :** op. cit., vol. 1 (Paus. ii, 27, 1).

[28] See **Webster :** Greek Theories of Art and Literature down to 400 B.C. in The Classical Quarterly for October, 1939. "The Greek artist sometimes indulges his love for the **precision of formal and abstract design** where it is disturbing to the modern eye, though presumably unobjectionable to the ancient." (p. 171). This reference to vase-painting may well apply to Greek architecture. Emphasis not in original.

[29] The ramp as a means of reaching one level from another is employed to-day as an architectural solution where the conditions demand "continuity" rather than separation. For examples see **Le Corbusier et Pierre Jeanneret :** Oeuvre Complète, vols. 1 and 2.

[30] See **Fougères and Picard:** op. cit., generally.

[31] **D'Ooge :** op. cit., pp. 172 ff. gives an excellent chapter on the Athenian Propylaea.

[32] The central opening is 13 feet 8 in. wide and 24 feet 2 in. high. (**D'Ooge :** loc. cit.).

[33] **Stevens :** The Periclean Entrance Court of the Acropolis of Athens (1936).

[34] A convenient contoured map is that given in Grèce, edited by **Yves Béquignon** (Les Guides Bleus), 1935 ed. Baedeker (1909) gives no contours or levels.

5. A GENERAL THEORY OF RELATED VOLUMES

The characteristic elements of space-structure on an architectural scale (that is, in scale with the perceptive and material needs of man) may be assumed to comprise :

(1) the terrace ; (2) the wall or column, and (3) the lintel or slab.

Suggested enclosure or partial visual restriction on the basis of a constructed plane surface may be said to satisfy the general condition of architecture, but some form of practical enclosure (protective insulation from rain, cold, etc.) is usually postulated as a necessary extension to the visual function of architecture.

Although, in a sense, this function moves the architecture that embodies it into a special class, this class is such a predominant one in the general body of architecture that we shall at this stage carry our discussion somewhat further so as to examine the implications of relating practical and non-practical modes of enclosure. The term practical will be used to signify the idea of protection from the elements, while visual or non-practical, as must be evident, will refer to those aspects of architectural creation that are concerned with the perceptive equipment of man.

(a) Direct Transition. The creation of a closed or practical volume implies a relationship between that volume and the general space external to it and embracing it. A single opening can provide access from the " outer " volume to the inner, and the enveloping surface of the latter defines the transition between the two. Transition in the case of a simple cell is abrupt and without gradation ; the spectator who moves from one volume to the other does so without preparation or adjustment. The only transition (and that is momentary) is afforded by the thickness of the envelope (wall or screen). Thus movement from natural surroundings into a simple cell involves (1) a change in sensation or visual experience, and (2) a change in scale.

The two components of the above relationship may be briefly described as possessing respectively complete freedom and complete restriction ; and the visual necessity for grading the one component into the other, for adjusting the transition in a manner that will be apprehended by the spectator, demands an intermediate form of enclosure that will modify one component or partake of both.

(b) Simple Gradation. Let us assume a simple rectangular building constructed on a plane surface, and having a single doorway. Systems of gradation that would modify the natural or outer space in preparation for entry into the enclosed volume could, for example, take the following forms:

(1) Low flanking walls at the entrance running some distance out from the building. These would provide lateral definition, and although offering no restriction to upward vision they would modify the outer space and give a directional emphasis to the approach.

(2) A horizontally projecting slab above the entrance opening (either integrally constructed or independently supported). This would offer vertical restriction and consequent reduction in scale, although laterally there would be no visual restriction.

(c) Complex Gradation. Various combinations of (a) and (b) arranged either jointly or in succession can be postulated to meet the special demands of purpose, scale or topography. We can see on page 151 the wall employed as a grading element in a house at Tel-el-Amarna, and reference to the illustration will show the degree to which these principles apply.

A specific example will serve to illustrate the idea of complex gradation. The Egyptian temples (particularly those of canonical arrangement such as that at Edfu) offer an excellent demonstration of the deliberate and architectonic adjustment of visual range from " outer " to " inner " space.

The Temple at Edfu may be analysed briefly as follows :

(1) Position and direction with reference to general situation are primarily defined by an avenue of sphinxes which implies a selected path towards the entrance. These units of definition, while not forming continuous lateral planes of definition such as would be provided by walls (b) (1) above), offer a preparatory degree of enclosure to the spectator, as well as an extension to the actual forms of the main structure.

(2) The next stage of penetration into the building is provided by a peristylar forecourt, open to the sky but laterally restricted. Here is a positive diminution in scale compared with that suggested by the " point " accents of the sphinxes. The forecourt itself has a secondary gradation of volume by virtue of the colonnade which lies on three sides, a refinement that heightens the reciprocity between this element and the next in the graded approach.

(3) A columned portico, roofed but partially open to the forecourt by means of openings above a screen wall that is situated between the outer columns, marks the next stage. The relationship in this instance is of the type that partakes of both volumes, for direct lateral penetration of one volume into the other enables the existence of a strong liaison between the unroofed court and the roofed portico.

(4) The next volume is a practical one, roofed and protected from the elements, and marking a notable decrease in size from the portico, which in turn is considerably less in area than the forecourt.

(5) Finally the innermost sanctuary is reached, dark, narrow and low, completely insulated from the outside world, and only

approachable through a succession of ever more restricting volumes ; a cell which, within the limits imposed by human size, reflects a complete antithesis to the light and free space of the outer world.

In the light of the general categories of volume relationship enunciated above we may now proceed to a consideration of the Greek achievement in this sphere.

6. THE ABSOLUTE FACTOR IN GREEK VOLUME ARRANGEMENT

Bearing in mind the fundamental elements of space definition in architecture and the general theory of grading volumes set out above we may now attempt a statement on the central theme of Greek temple arrangement. Our analyses of specific groups, especially those where outside influence was not so marked as to offer practical difficulties in the course of construction, have provided wide terms of reference within which to seek the criteria of an underlying doctrine.

At Aegina, Sunium and Epidaurus in particular, externally imposed conditions are at a minimum, and a " pure " solution approaching a high degree of abstraction is the outcome of these favourable conditions. The sanctuaries at Delphi and Athens were subject to a greater extent to the special influences arising, in the former example, from the acute irregularity of the surface on which the group was arranged, and in the latter from similar natural factors coupled with the pressure of political, financial and religious restrictions. The scheme at Selinus illustrates the probable effect on a temenos of an adjusted town plan, and does not reflect a complete solution in the sense of a project that has been imposed on a site as a fully pre-determined arrangement.

Prime factors that have emerged from our analyses are the extreme flexibility and inherent generalisation of element distribution that characterise the sanctuary groups. These factors allow simultaneously an infinitely wide range of plastic experience, and a root similarity or recognisable framework in the contributory elements. Thus the kind of experience that is undergone by a spectator is fundamentally the same in each sanctuary, and although wide variations occur in the distances between elements, in the directional system employed, from propylaea to climax, and in the number, size and disposition of elements, that experience is the outcome of the application of a central thesis to the material expression of intangible demands.

So far we have examined the temenos as a complete and constructed system which is in process of being " explored " by a moving spectator who is thus assumed to represent a characteristic participant in an actual ceremony taking place within its boundaries. The movement and direction aspects are, in this form of analysis, predominant terms in the space system that arises from the combination of fixed and variable factors. Visual experience is a function (in the mathematical sense) of this combination and consequently cannot be assessed as an absolute value.

By assuming points of observation along a line of approach between the propylaea and a final position adjacent to altar and temple, and measuring the horizontal and vertical angles subtended by the visible portion of the temple at each of these points, it would be possible to plot on a graph the range of visual experience offered to a spectator by the form of the temple. Such an expression would require the suitable integration of this experience, in terms of vertical and horizontal angles, measured on one co-ordinate against the distance traversed, on another co-ordinate. Thus a comparison of the degrees of effect offered could be established by plotting the curves on a common diagram. Such an undertaking, however, will form more properly the subject of a separate inquiry, and will not be included in the present thesis.

Our immediate task is to investigate the relationship subsisting between the elements of the temenos considered as an abstract arrangement, that is, without reference to a perceiving spectator within the system.

The horizontal plane or terrace which " contains " all the elements of the group is the basis on which the system is generated, and which affords formal dimensions and unity.

(At Aegina and Epidaurus a single terrace carries the separate superstructures ; at Sunium a series of parallel planes is contained within the peribolos, but these planes may in turn be regarded as having a common basis.)

The peribolos or enclosing wall contributes vertical definition to the terrace, and separation in the sense of formal demarcation between natural and constructed surroundings. Its chief spatial function is thus the maintenance of material unity in the system.

The outcome of terrace and peribolos in combination is an implied volume in which are situated the separate component volumes of propylaea, temple, statues, etc. Terrace and wall do not provide practical enclosure, but their measuring and defining attributes are such as to formalise space.

The practical volumes consist of propylaea, temple and treasury (and in the case of Delphi and Epidaurus, stoa) and the relationship between these can be regarded through the medium of the generating plane, that is distance and height, or distance alone on a single plane system ; or more completely, in terms of volume relationship.

Altars and free-standing statues constitute " solid volumes " and these may be regarded as positive interruptions in the

continuity of the visually penetrable space that encloses them.

The final resolution of these elements in a self-contained system is primarily dependent upon the maintenance of some form of spatial continuity within the system, and this factor may now be discussed with reference to the propositions previously enunciated on simple and complex graded space. If we consider the " hollow " elements within the scheme (temple, treasury, and propylaea) in relation to their immediate surroundings we shall see that the relationship is a graded one, the transitional volume defined by the peristyle of the temple partaking both of the apparent volume of the structure and of the outer volume which encloses it. Thus, there is a mutual penetration of space which operates about the plane defined or suggested by the peristyle itself. We can assume apparent volume of the structure to mean the space enclosed by an envelope defined by the limits of its forms. Since, however, the nature of the peristyle is such as to allow penetration of the enclosing space as far as the walls of the cella, it is clear that a measurable volume can be said to pertain both to the structure itself and to the space which encloses it.

This shared volume in the case of the normal peripteral temple completely embraces the structure and is productive of an inter-relationship of a highly unifying order. Direct transition between a simple walled volume and its enclosing space cannot achieve this type of rapprochement as the exclusiveness of continuously defined volume must always result in isolation rather than in a mutually induced unity. Thus the temple which stands within the peribolos has a clearly assessable general identity by virtue of its free-standing apparent volume, and has a simultaneous " overlapping " value induced by the two stages of its definition. Thus its spatial individuality is enabled to co-exist with its state as a participant element in a specific space system.

The condition of the propylaea is similar, but its special function and position as a transitional as well as practical volume bring about corresponding variations in its form. The propylaea unlike the temple is situated against the peribolos, and although its hollow form is in direct contact with both the outer space beyond the temenos and the implied inner space of the temenos, the structure itself preserves the character of the enclosing wall by its own lateral walls. The characteristic " columns in antis " arrangement of the opening towards the temenos echoes the peristyle treatment of the temple, while the restricted form of the propylaea (i.e., enclosed by flanking walls) directs the penetration towards the focal point of the temenos.

Once again the individual structure is clearly expressed, and unity between the individual structure and the whole system co-exists.

Both elements (temple and propylaea) are thus identified with the space of the temenos, and through the medium of this common factor become related to one another. In terms of these constituents a formal arrangement has been created which approaches closely the perfection of an abstract theorem.

It will be seen from this discussion that the essential character of the Greek temenos is not derived basically from size or number so much as from the type and special combinations of its structural forms. Scale in relation to human size is necessarily a completing term in the system, but the purely quantitative aspect of construction, once this demand has been satisfied, always remains of secondary importance in Greek architecture. Again, when the components subscribe to a system of spatially related yet freely articulated entities within that system, the actual position or number of such elements though materially influencing the resultant plastic effect does not modify the intrinsic character that permeates the whole system.

The standardisation of the peripteral temple type is significant in this respect since the variable elements that occur in its structure are never such as to diminish the inter-relation function which the general type satisfies. Variations in number and in detailed proportions in the components, and in bulk size are reflected during the period of Doric temple building, but no organic departure from the central type is shown. It is apparent that the greater unity which the temenos group represented could not permit an unlicensed virtuosity in temple construction which would tend to disrupt the general framework. Exposition of Greek architecture has too often tended to regard the temple as an isolated structure, aesthetically measurable in terms of its own form. Such an estimate is quite alien to the evidence of the temple group, and grants the temple only the significance of a traditionally repeated form with a low index of vitality.

Mere change in shape or in the disposition of the parts of a single architectural entity cannot offer more than an extremely limited range of plastic expression, and continued and arbitrary variation is more likely to result in loss of identity and amorphousness than in renewed strength. Even more serious from the point of view of universal significance, the organic modification of recognisable visual or space-defining standard elements will lead to visual confusion, since the measuring and repeating function of the elements of a formal system of building is the basis on which classical architecture is constructed.

Two contributory factors of prime importance in Greek volume arrangement in the temple sanctuary may now be discussed :

(1) THE ARTICULATION OF THE CONSTITUENT ELEMENTS;

(2) THE RANGE OF FORMAL COMBINATION OF THESE ELEMENTS

(1) The term articulation implies continuity or system, and the practical methods by which this condition was obtained in the temenos have been suggested earlier in this section. The geometric aspects of an articulated system, however, require some elucidation.

Formality in architecture is commonly assumed to be derived from axial and symmetrical arrangements of elements but it was induced in the temenos scheme by a wider interpretation of the term than a simple linear system (with its two-dimensional basis) was capable of providing. The discussion on the sanctuary at Sunium on page 136 though undertaken with a view to estimating the experience of a spectator within the system, may be recalled at this stage insofar as it postulated an absolute relationship between the components. It will be remembered that irrespective of movement each wall, building, terrace and flight of steps appeared to bear an organic relationship to the whole, and that the situation and balance of each element were such as to suggest the " interlocking " of the parts of a mechanism. If we substitute for the words wall, building, terrace, etc., the abstract terms plane, volume and surface ; the organic sufficiency of the scheme may be generalised by stating that the interrelated components are not only of " regular " shape but regarded as constituents of a Euclidean space complex they maintain an undeformed identity, as well as fulfilling a contributory rôle in the complete framework.

The dimensions of these components (whether significant as surfaces or volumes) can be directly computed, and the rectangular basis of the system renders it stable and finite.

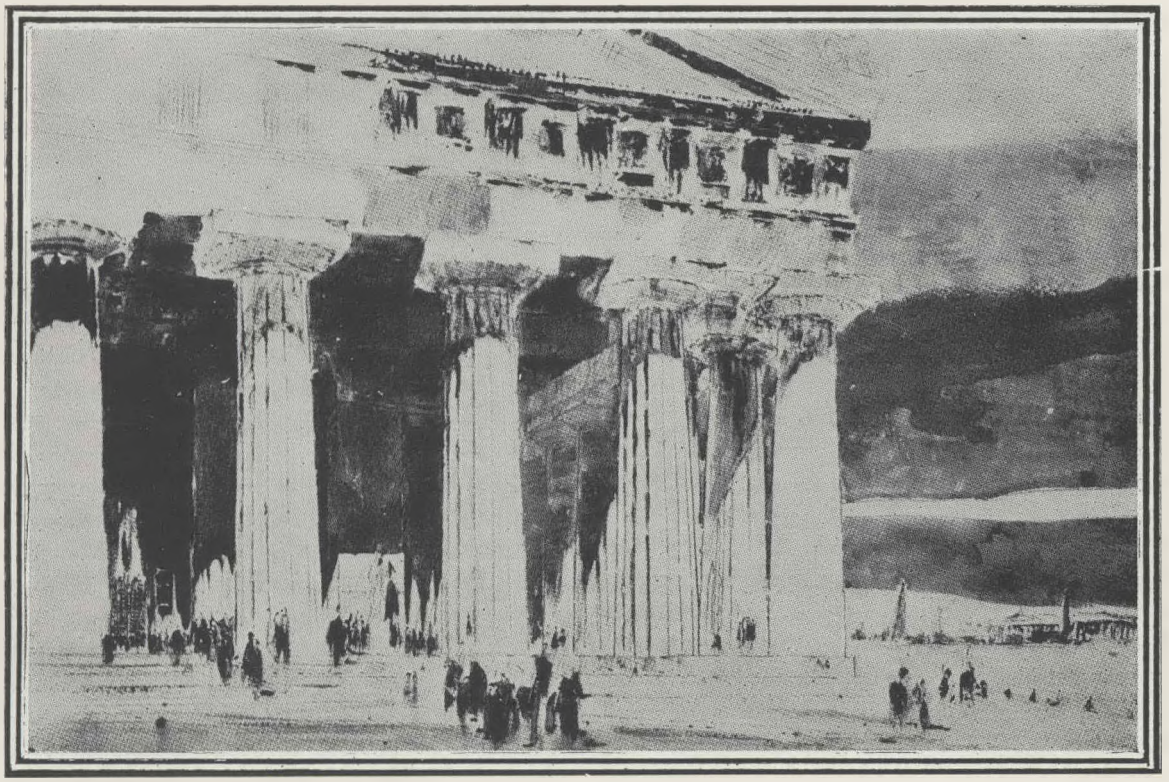
(2) The flexibility of a space system of three or more components is governed only by the demands of formal relationship, and is such as to allow an infinite number of schemes that will maintain the characteristics of these " standard " and recognisable elements. This flexibility enabled the Greek architect to exploit sites of widely differing scope, and neither variations in situation and size, nor surface peculiarities were able to destroy the central theme of the temenos arrangement.

In the course of our inquiry we have examined the enclosures at Delphi, Sunium and Epidaurus, each being regarded from the spectator's point of view. In the present section a general statement has been attempted to assess the significance of the temenos as an abstract arrangement. We may conclude this part of the discussion by a brief summary of the achievement of these examples in terms of spectator reaction and absolute value.

DELPHI. At Delphi the arrangement is especially notable for the vigour and range of plastic experience offered the spectator, and on the scale of spectator-reaction this sanctuary accentuates, perhaps more than any other group, the temple as a key element and visual climax. The space occupied by the approach does not conform to a geometric pattern of the regular or undeformed type, but the treatment of the enclosure is such as to underline heavily the movement and direction factors. The arrangement at Delphi reflects too closely the infusion of topographical characteristics into the system to achieve a high degree of abstraction. The unity of the scheme, however, has been maintained in terms of the basic principles of temenos arrangement.

SUNIUM. The sanctuary at Sunium represents, perhaps, the highest achievement of the Greek architect in striking a just balance between the attributes of regulated movement in the spectator, and the purity of abstract geometric arrangement. In this example the intrinsic repose of an absolute construction is not distorted to meet the " force " imposed by a participant within the scheme, but the combination of practical and abstract values is here shown to be feasible on a scale compatible with human experience.

EPIDAURUS. In this example visual experience is not directed so rigidly as in the two preceding arrangements, nor is the " geometry " so expressly delineated as that of Sunium, but the abstract factor is subtly fused in the whole. The principal components achieve a full spatial relationship through the medium of their peristyle penetration, and the free disposition of Temple and Tholos allows a full realisation of their volumes within the peribolos. The beauty and grace of the Asclepian temple suggest a more humanistic atmosphere than that reflected by the Sunium group, when we recall the offsetting informality of the adjacent grove. In the group at Epidaurus there must have been a fine harmony of form and space, a lyrical freedom in the broad disposition of disciplined units.



"The Archaic Temple of Apollo at Selinunte in Sicily, Built about 600 B.C. A drawing by William Walcot."

From the "Sphere" of Feb. 4 1922

To reproduce a Walcot study in monochrome appears a negation of the very quality that makes his reconstructions so vivid and fresh. For nowhere can his particular talent be better demonstrated than in the archaic splendour of early Greek temples. Even in black and white there remains a grand suggestion of scale, of solid building, of movement and of space. For that reason I have included his drawing of the great temple at Selinus. It may be regarded as complementary to the drawing by Jean Hulot which was reproduced in the March issue of the "Record". Mr. Walcot is a rare delineator of the classical spirit in architecture and perhaps we shall one day be privileged to reproduce one of his reconstructions in full colour. In the meantime sincere acknowledgments are offered for the reproduction that appears above.

7. THE GREEK MODE IN SPACE CONSTRUCTION

Our survey has revealed the nature of the elements that make up the characteristic architectural arrangement of the Greek epoch, as well as indicating the many detailed constituents which in turn add special significance to those elements. The limitations of structural method and available material, the influence of natural conditions and economic trends, the demands of human habit and human scale—all these factors played a defining part in the search for architectural standards, and for the solution of problems generated by the civic consciousness of the people. Each of these contributory forces is reflected in the final structure of the temple, house or city ; but the thesis which alone gives plastic unity to all these undertakings, the common factor whose essence is not susceptible of material modification or practical variation, is the system of space structure which underlies every manifestation of formal architecture in Greece.

The range displayed in Greek architecture between 600 and 200 B.C. reflects a complexity of forms and arrangements which is not a product of confused purpose or arbitrary method. The variation in type and size and organisation that we see in Greek work is rather the rich pattern of application of a generalised space system to the specific requirements of a civic structure. The fusion of absolute or abstract values with local and human is a process that must ultimately furnish us with a series of joint values in respect of the separate manifestations that we have examined.

Abstract plastic arrangement unrelated to human participation, whatever other significance it may attain, must yet remain beyond the sphere of practical architecture. On the other hand the mere conjunction of protective elements without system cannot approach the condition of pure architecture, even though the human scale is recognised. In Greek architecture the absolute is not sacrificed to practical expediency, nor does it dehumanize the local attributes of appropriate scale or repudiate functional efficiency. The simultaneous satisfaction of an abstract condition together with a local material demand implies a flexibility of solution between wide limits. The process has as constants the established elements of space measure, and as variables the requirements of special purpose.

If we turn once again to the temple groups it will be apparent that in general the abstract value is maintained at a high pitch through selective standardisation and a broadly valid system of defining elements. The repetition of such units maintains the identity of the separate components, while the spatial interlocking of these components assures an overall stability and unity in the system.

So, too, is unity in the domestic dwelling attained, and so too does its unity partake of the greater system that we term a city. The house with its peristyle, the city with its agora, the temple with its interpenetrating pattern of colonnades in the temenos—each subscribes to the dominant space ideal that embraces them. The fusion of absolute with local takes place in such a manner that the house is yet habitable and monumental at the same time ; there is no devaluation in the system in spite of the fact that the scale of the house is directly attuned to the needs of private life. Again, so justly balanced is this fusion that the agora in satisfying the expanded function of the civic meeting place approaches a high absolute value without destroying " the common touch." Finally, the temenos with its temple, though it moves still further towards the purely abstract (having a low index of practical function), also shares the common visual measure that ennobles the house and humanizes the civic building.

No direct summation can capture this subtle grading of the abstract as a constituent of the architecture of Greece. Although the elements are measurable, and their effect computable, the balance between absolute and local is so delicate and so carefully attuned to function that one must not be tempted to frame a categorical equation in explanation of the phenomenon. To do so would be to reduce to rigid terms something whose essence lies in the infinite variety that springs from the classical notation. We must recognise rather, the formalisation of visual experience that such a system engenders, and with this abstract term as an evaluator equally applicable to each manifestation, allow the wide lyricism and immediacy that characterised Greek architecture.

The visual unity which the Greek system offered is a factor which the uncontrolled development of our own cities has ill-fitted us to appreciate. Unfinished, amorphous, are terms that can be appropriately applied to the general condition of the towns that rose from the decay of Greece and Rome ; and only in rare instances do we find some reflection of the order and measure that was the true heritage of Greek architecture.

Architecture in the Greek scheme of life is symbolic of the wider framework about which a manifold code of perception was constructed. For as Jaeger[1] says :

" The literary forms used by the Greeks, with all their manifold variety and elaborate structure, grew organically out of the transference of the bare simple forms in which men express themselves in language, to the ideal sphere of art and style. In the art of oratory, too, their ability to carry out a complex plan and create an organic whole out of many

parts proceeded purely and simply from a natural perception, increasingly sharpened, of the laws which govern feeling, thought, and speech—the perception which finally (grown abstract and technical) created logic, grammar, and rhetoric."

And again,

"In philosophy the force which produced the forms of Greek art and thought is most visibly displayed. It is the clear perception of the permanent rules which underlie all events and changes in nature and in human life. Every people has produced a code of laws; but the Greeks always sought for one Law pervading everything, and tried to make their life and thought harmonize with it . . . The theoria of Greek philosophy was deeply and inherently connected with Greek art and Greek poetry; for it embodied not only rational thought, the element which we think of first, but also (as the name implies) vision, which apprehends every object as a whole, which sees the idea in everything—namely, the visible pattern."

To-day one can still see "the organic point of view" in the ruins of Greece, for even these vulnerable and perishable projections of the Greek mind retain sufficient of their identity to enchant the eye and refresh the mind with their deathless inspiration. Amedée Ozenfant, with the trained perception of the abstract painter, has given us a sympathetic record[2] of the extent to which we can experience the ethos of the material surroundings of the Greeks. On revisiting Delphi he focuses his attention on the Athenian Treasury.

"I looked at the harmonious building from every side—far off, close up, closer still. I climbed the side of the hill to see it from another point of view. Everything was changed, yet everything remained beautiful, right. Everything worked together . . .

"As far as the eye could see everything was coherent, unanimous and necessary, existing in a sort of total symbiosis.

"But I was not a passive spectator . . . By my movements, which altered the relationships of the building and of the near and distant objects, I was endowing the view with movement. And all the while there sang a mighty chorus of shapes, each indispensable to each—those contrived by the architect, and those that were formed by the lovely place itself. When I stooped down, the architrave was knit closely to the vigorous angle of the walls. When I stood up, everything rose with me, and the whole of great Delphi accompanied my movement. Design followed design, and from each there arose chants, heroic cries, hymns of praise, soaring melodies. When I stopped, they fell again into serenity, which is a state of expectation, not an end . . . .

"Everywhere in Greece nature takes an interest, a share in the works of man, and men take her into account. Nature commands, but so does man. Everything in Greece commands —literally each thing. From the smallest to the greatest, every element is distinct, and appears proud of itself, aware of its necessity to the whole."

[1] **Jaeger:** Paideia, The Ideals of Greek Culture; p. xx and xxi.

[2] **Ozenfant:** Journey Through Life; pp. 394-396.

Note.—The paper above and the supplementary general note which follows are both extracts (with slight modifications) from a thesis which was presented in 1941 *for the degree of Doctor of Literature in the University of the Witwatersrand. A brief analysis of the possible range of spatial experience in the sanctuary at Delphi was printed in the "Record" in June,* 1935. *The substance of this analysis is by implication contained in the present inquiry, but a further five years of study of the problem has enabled me to augment the material and to attempt greater precision in definition and finding. The present paper was completed in March,* 1941.

SUPPLEMENTARY GENERAL NOTE ON THE ELEMENTS OF SPACE CONSTRUCTION.

The technique of spatial definition on a scale commensurate with human needs imposes two conditions that have to be satisfied within the single framework that we term architecture. The first is the satisfaction of the claims of order and system, of a recognisable and measurable arrangement that will demarcate the activities of man from the existing surroundings in which he plans to lead his life. The second condition is the formulation of a structural vocabulary that will enable him to give practical expression to such space concepts as he postulates for the creation of shaped surroundings. The earliest manifestations of such a vocabulary in a durable medium such as stone took the form of crude arrangements in which the material intractibility of the building medium resulted in an extremely high ratio of volume of material employed to volume of enclosed space. For the use of units of material that were too large in relation to their purpose naturally brought about an over-emphasis on structure and limited the flexibility of plan-shape and plan combinations that could be formulated without reference to actual construction.

The elements of enclosure—walls and openings for doors and windows; roofs and floors—accordingly underwent an empirical development where constant endeavour to effect a feasible rapprochement between space and structure was the occupation of the builder. The shaping of building units and the tendency to standardisation of size and pattern in those units, opened up new vistas in the path towards formalism in building, while the parallel evolution of a systematic constructional idiom enabled the builder to follow out a consciously pre-determined plan of action to which material and constructive methods were made to conform. This process of conceiving a structural arrangement as something complete in the mind's eye, or expressed more formally, as a projected undertaking whose full terms are stated without reference to "practical" effort, but which is capable of conversion into the medium of material actuality, contains the germs, not only of architecture, but of what is generically known as "classical" architecture.

Construction that is undertaken without method and without fore-knowledge can be shown through the lack of centrality of idea, and through lack of deliberate control, to induce in general a state of amorphousness or incompleteness in the appearance of the resulting synthesis. Such a result cannot be termed an "arrangement," nor can we refer to it is a "complete work" where the term complete implies more than the mere cessation of applied effort. The notion of architecture, then, implies a pre-determined end, a conceptual origin, of which the material expression is only the completing process. The fulfilment of stated concepts must, as we have seen, depend ultimately on the practical technique and the mastery of material that are available for the completing process.

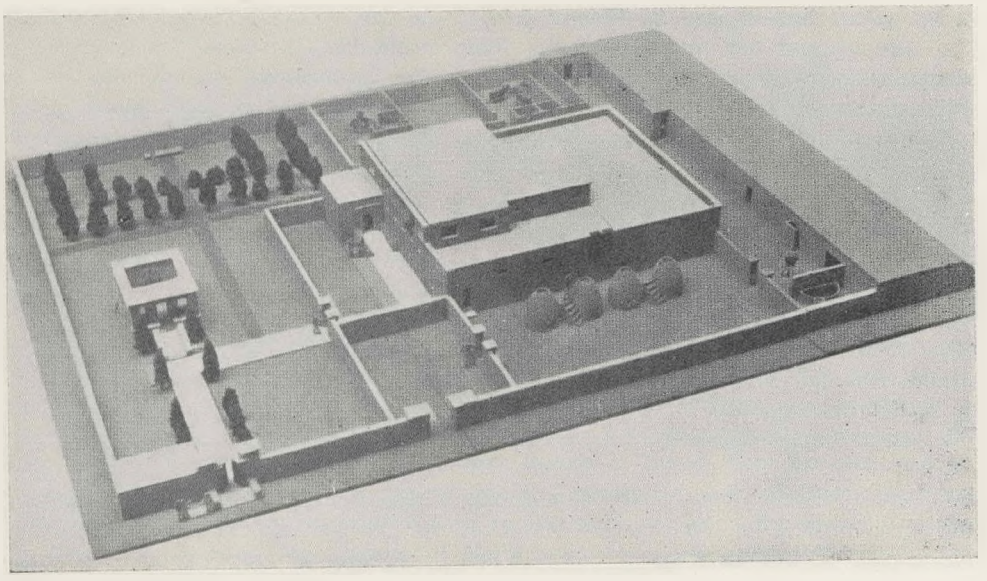
Let us consider the constituent elements of the masonry system that was the initial structural basis of architecture. These elements were the terrace; the wall; the column and lintel.

PAVEMENT OR TERRACE

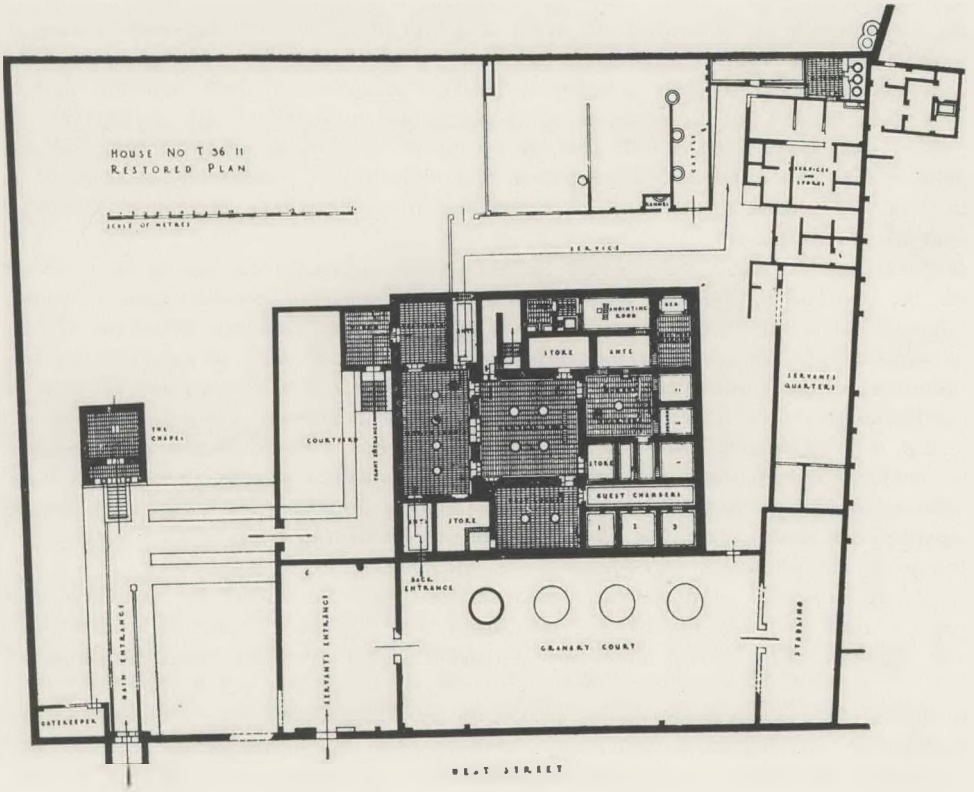
The creation of a level plane of reference in a practical context has a wider significance than that of its purely "useful" aspect in an architectural arrangement.

A horizontal plane, or a series of related horizontal planes, is the first essential in any system of formal arrangement intended to embrace the activities of organised or collective life. The sensory equipment of man is such as to demand the visual stability which level surfaces only are capable of offering; and even in the least complex definition of usable space —that is, usable by man as a moving as well as perceiving entity—the generator of the system is a plane surface which by deliberate structural means negates the irregularity of existing topographical conditions.

Such a terrace occurs in Minoan Crete in the form of the great "Theatral Place" at Phaestos which lies to the west of the main entrance to the palace. This is bounded to the north by a flight of steps (a possible prototype of the Greek theatre arrangement of historical times) and to the east by the palace walls. The south side is open, and it is from this direction that the palace is approached. Additional significance is given to this generous terrace by a slightly raised pathway that cuts diagonally across the "Place" from the south-east corner to a point on the theatral steps some distance from the main entrance to the building, and this suggests a ceremonial purpose for the whole arrangement which probably provided a setting for displays and functions outside the palace.



TEL-EL-AMARNA — A TYPICAL HOUSE
Model by W. Aumonier; drawing by Seton Lloyd. With acknowledgments to the Architectural Association Journal, August, 1933.



In historic times the paved terrace was an integral part of the Doric temple setting, and, indeed, contributed largely to the plastic unity of the separate but related elements that constituted the temenos or enclosure.

In the above brief statements the terrace has been stressed as an external or extending element in the conscious arrangement of structural forms for spatial definition. The demand for horizontal surfaces naturally includes their provision as basic elements in roofed structures, and what holds good in a general sense for external conditions applies internally also.

THE WALL

The wall, in general terms, is the counterpart of the terrace or pavement, and an architectonic system can be postulated whose constituents are restricted to these two elements alone. In its simplest form (that is, without the added function of supporting a roof) the wall may be regarded as a screen, and consequently in conjunction with a paved surface it is capable of providing definition. Its vertical characteristic not only suggests measure *but also implies enclosure, although by enclosure it is not intended to convey the idea of a continuously walled area. Complete definition, for example, of a rectangular area by four adjacent walls is only a special case of the general function of the wall, although such a system usually springs to the mind when the term "enclosure" is mentioned. We have seen that a formally constructed horizontal surface of finite dimensions provides the material basis for an architectural arrangement, but as yet such an element though complete in a practical sense still lacks the component which is visually necessary for any form of space construction. This component is provided by the wall, which by virtue of its opacity obscures the extension of views beyond the area it defines, and thus "reflects" the perception of the spectator (as we may conveniently term the participant in any space arrangement) and holds it within the arrangement.*

The geometrical implications of the wall add a further term to the available experience. The abstract quality of a rectilinear surface of walling with the rigid horizontality and consequent parallelism of its upper edge to the basic plane of reference prevents the intrusion of the normally visible and accidental surfaces of natural surroundings within the range of vision. This type of restriction—that is, by opposing constructed planes with an assessable index of geometrical finiteness and regularity against the apparent irregularity of existing topographical conditions—offers a key to the general problem of adjusted surroundings, and further, directly evidences a fundamental and predominant geometrising tendency; a tendency to envelop activities in a framework of visual stability, of known and expressed dimensions.

The obscuring function of the wall is important, but this purely restricting purpose must not be allowed to overshadow the function which grows out of this primary condition. A system of wall surfaces, that is, an arrangement in which the vertical screening is made up of separate components (not necesarily in the same plane) immediately postulates a dual function of control *and* release. *Thus it is possible by means of such elements to vary the degree of visual restriction at any given point within the construction—to induce where desired a deliberate intrusion of external attributes or to grade the "penetration" (in visual terms) of such attributes—in other words to control the relationship between the space construction and its surroundings.*

A house at Tel-el-Amarna (c. 1400 *B.C.) offers an interesting demonstration of the space-defining, as opposed to the "practical" or protective, function of the wall in a domestic context. In the reconstruction model we can see the general arrangement. A main wall about* 10 *feet high encloses the whole complex, and this is pierced at two points, for the main entrance and for the service entrance. Within the enclosure is situated the main structure of the house with its secondary elements—servants' quarters, stables, grain towers, etc. Between the forms of the house and the boundary wall, a secondary wall system defines a forecourt to the house, a "service" court, and a granary court. Thus the visitor who enters the main gateway (virtually a propylaeum) enters a space which contains a small chapel and is defined by main walls and secondary walls. A further doorway leads into a walled forecourt, which in turn gives on to a porch and so into the house. The diminution of implied volume which such an arrangement affords—the grading of space—reflects a dominant sensibility to space construction, and indeed the science of geometry with the origin of which the Egyptians are traditionally associated shows clearly in the deliberate "artificiality" of this scheme.*

Regarded from the point of view of a spectator who sets out from the house, the expansion from the relatively small space of the house rooms, through the forecourt and the chapel court, to the "undefined" outer space which contains the whole complex, shows the same relationship with the movement factor (and its visual implications) functioning in the opposite direction.

Considered as a whole, the Tel-el-Amarna house admirably exemplifies the joint proposition of terrace *and* wall. *One need only draw attention, in this respect, to the careful defining of paths by paving; the emphasis on vertical and horizontal* surfaces, *the predominance of the right-angle; and the organic or unified nature of the whole scheme.*

THE COLUMN AND LINTEL

So far in our inquiry the wall has had a simple function in that its stability was dependent only upon the forces generated by its own structural system. For an extension of purpose—whether in the realms of visual definition or of practical usefulness—the wall assumes a complex role for such an extension involves the supporting of further elements outside its own structural unity. The wall in combination with the terrace can provide horizontal definition but only suggest vertical restriction. The inclusion of a horizontal plane of opaque material at a distance above the original plane of reference encloses a volume, and thus contributes the necessary term for a completely controlled or regulated space system. Thus a terrace, four walls and a roof slab comprise an example of volume construction.

We have seen, however, that walls need not necessarily be continuous to maintain their essential function as defining elements, and it is therefore possible (if the materials are structurally adequate) to arrange for complete enclosure in a vertical direction while allowing release and restriction at will in a horizontal direction. That is to say, no visual experience is possible upwards because the whole system is covered by an opaque horizontal plane, but lateral experience is dependent upon the judicious arrangement of walls and the "openings" which result from non-continuity in the wall system. Where the slab has to span from one section of wall to another a lintel is formed, and in the limits the size of openings so formed is dependent upon the strength of the material employed.

We can assume a hypothetical arrangement in which a rectangular "plan" is completed by walls and roof. Openings to the system are now defined at bottom, sides and top, and the sections of walling that define such openings bear an intimate relationship, a complementary role, to these. So long as the frontal area of the wall clearly exceeds that of the openings which it contains we tend to regard the wall as the major element and the openings as secondary. If we increase the size of the openings until their frontal area dominates the wall area, the identity of the wall and its traditional character as "surface" are inevitably reduced and the opening assumes the major role. When the predominance is immediately apparent, or when the intermediate sections of wall tend towards a minimum area consistent with structural stability, they can be said to approach the condition of columns.

The column, then, is from the point of view of visual cognisance, a special case or development of the wall, and it is characterised by being arranged in a system of repeated units. The lintel is the completing element in a column system, and such a system is thus composed of two columns with a connecting member. The full intent of the alternating column and opening arrangement which is usually designated as typically classical is only given adequate expression when a considerably greater number than two columns is employed. A "series of columns" is the general expression that corresponds with a terrace and with a wall system.

ACKNOWLEDGMENT OF ILLUSTRATIONS.

Frontispiece from "In Greece"—Quarterly publication of the Ministry of Tourism and the Press, No. 4: Drawings on pages 124, 133, 137, 141, and opposite p. 134, from D'Espouy—Monuments Antiques (Massin): Plan on p. 127, Guide Bleu—Grèce: photo on p. 127, from Retour en Grèce by A. Bon: Drawings on pages 128 and 129, from Russell Sturgis—A History of Architecture: photos on pages 130 and 131, from Picard—L'Acropole (Morancé): photo on page 142, by Topographical Service of the Ministry of Communications of Greece, from "Greece and Rome," October, 1936 (Oxford): Line drawing on cover from Choisy—Histoire de l'Architecture: Rendered drawing on cover from D'Espouy—Monuments Antiques (Massin). I must express special indebtedness for the pleasure and enlightenment I have gained from the superb production—Monuments Antiques (four portfolios) of reconstruction drawings of buildings on classical sites under the editorship of D'Espouy and published by Ch. Massin, Paris. This work has been an invaluable aid to the study of Greek remains, for in South African libraries there is little material available for a detailed study of Greek architecture.

PROFESSIONAL NOTES AND NEWS

Transvaal Provincial Institute, Committees for 1942

PROVINCIAL COMMITTEE:

W. Gordon McIntosh, D. M. Cowin, S. C. Dowsett, N. M. Eaton, A. C. Fair, A. S. Furner, D. S. Haddon, N. L. Hanson, Dr. R. D. Martienssen, W. A. Macdonald, Prof. G. E. Pearse, R. Howden (elected and since resigned).

ELECTION OF PRESIDENT:

Mr. W. Gordon McIntosh was elected President for the ensuing year, and thereupon took the chair.

ELECTION OF VICE-PRESIDENTS:

Mr. Norman Hanson was elected Senior Vice-President, and Mr. A. C. Fair Junior Vice-President.

ELECTION OF MEMBERS OF THE CENTRAL COUNCIL:

The following were elected: Mr. W. Gordon McIntosh, alternate: Mr. N. M. Eaton; Mr. A. Stanley Furner, alternate: Professor G. E. Pearse; Mr. S. C. Dowsett, alternate: Mr. D. M. Cowin; Mr. D. S. Haddon, alternate: Mr. A. C. Fair; Mr. N. L. Hanson, alternate: Dr. R. D. Martienssen.

ELECTION OF SUB-COMMITTEES:

The following were elected to the several Sub-Committees:

FINANCE COMMITTEE:

Messrs. D. M. Cowin, S. C. Dowsett, A. C. Fair, A. S. Furner, N. W. Gallagher, D. S. Haddon, N. L. Hanson, W. A. Macdonald, C. D. St. Leger, I. Smail, Dr. R. D. Martienssen, Professor G. E. Pearse.

PRACTICE COMMITTEE:

Messrs. D. M. Cowin, S. C. Dowsett, N. M. Eaton, A. C. Fair, D. S. Haddon, N. L. Hanson, A. J. Marshall, C. D. St. Leger, I. Smail.

JOURNAL COMMITTEE:

Messrs. D. M. Cowin, S. C. Dowsett, N. M. Eaton, A. C. Fair, A. S. Furner, D. S. Haddon, N. L. Hanson, C. D. St. Leger, Dr. R. D. Martienssen, Professor G. E. Pearse.

ACADEMY COMMITTEE:

Messrs. W. W. Battis, D. M. Burton, E. Byrd, F. L. H. Fleming, A. S. Furner, J. Gardiner, P. A. Hendriks, Wm. Hendrikz, V. S. Rees-Poole, C. D. St. Leger, H. E. Winder, Dr. Woolf, Professor G. E. Pearse, Mrs. C. D. St. Leger.

PROVINCIAL C.P.S. COMMITTEE:

Messrs. D. M. Cowin, S. C. Dowsett, N. M. Eaton, A. C. Fair, A. S. Furner, D. S. Haddon, N. L. Hanson, R. Howden, W. A. Macdonald, Dr. R. D. Martienssen, Professor G. E. Pearse; Messrs. I. Smail, C. Bristol (with power to co-opt).

ELECTION OF REPRESENTATIVES ON OTHER BODIES:

The following were elected:

ASSOCIATED SCIENTIFIC AND TECHNICAL SOCIETIES:

Professor G. E. Pearse, alternate: Mr. C. D. St. Leger; Mr. A. Stanley Furner, alternate: Mr. R. Howden.

S.A. STANDARDS, CIVIL ENGINEERING, ARCHITECTS AND BUILDING SUB-COMMITTEES:

Mr. S. C. Dowsett, alternate: Mr. P. J. Hill.

STANDING COMMITTEE ON EDUCATION AND EXAMINATIONS:

Mr. A. S. Furner, alternate: Mr. A. J. Marshall; Mr. D. S. Haddon, alternate: Mr. W. G. McIntosh.

LOCAL ADVISORY COMMITTEE TO THE CONTROLLER OF INDUSTRIAL MAN-POWER:

Witwatersrand: Mr. F. L. H. Fleming, alternate: Mr. N. L. Hanson.

Pretoria: Mr. V. S. Rees-Poole, alternate: Mr. W. G. McIntosh.

ANTI-WASTE COMMITTEE:

Mr. C. D. St. Leger.

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