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COVER : A black-figure vase from Rhodes ; now in the British Museum. Reproduced from Hans Schaal, Griechische Vasen (Schwarzfigurig) Leipzig.

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SOME ASPECTS OF DORIC TEMPLE ARCHITECTURE

by R. D. Martienssen, D.Litt.

Some time ago a paper was published in the "Record" in which a broad integration of the town-planning elements of the Greek City was attempted. In the study that follows, one unit in the city, the temple, is discussed at some length, and examples in Greece, Magna Graecia and Sicily are illustrated. In many ways one of the most significant expressions of the Greek attitude to plastic art, the Doric temple has, during the past hundred years, been the theme for many works in the principal European languages; but a brief survey of its most important aspects not merely echoing the judgments of nineteenth century scholarship does not appear to be available. Brilliant comments on the systems and formal values of Doric architecture have, however, been made by two historians—Benoit and Choisy—and the cool, logical expositions of these French scholars may well be considered a suitable point of departure for fresh analyses. It is hoped that the subject is not too specialised or too remote from daily practice to warrant printing in a professional journal, but rather that it will find a response in those who look with wonder at the great architectural epochs of the past.

ORIGIN AND PURPOSE OF THE TEMPLE

The basic prototype of the Doric temple was in essence a simple shrine consisting of a single roofed cell with a doorway in the east wall, and from this primitive form of enclosure or protection developed the succession of temple types which have been classified by Vitruvius according to their columnar arrangement. Before the establishment of this idea of a "house" as a setting for the plastic symbol of an anthropomorphic concept, however, there was in the Mycenaean era an earlier stage at which the focal point of religious ceremony did not take the form of a temple building but consisted of an open-air altar at which sacrifices were offered. This is an important point, because the significance of the altar was never lost sight of even in the fully developed temple complex, and its position and function were defining influences in the design and arrangement of the temple when the altar-temple duality replaced the single element of the sacrificial altar.

Linked with the idea of the open-air altar, and in fact providing the raison d'être of the temple itself was the Greek attitude to the plastic representation of the gods which had its origin in a strongly anthropomorphic imagination. It is beyond the scope of the present paper to comment upon the extremely complex problems arising from the whole structure of Greek ritual and belief, but we may broadly assume that the anthropomorphic conception of the gods was a developing process which involved a change from the recognition of the mysterious and implacable forces in nature, to a belief in certain "definite and personal" gods. In other words there was a change from fetishism to polytheism which in turn was positively reflected in the conscious arrangement of sacred places of worship.

The worship of sacred stones and trees indicates the belief that these had some magic properties in themselves, and later it is likely that they came to be regarded as deities. The sacredness of certain places traditionally associated with specific gods would tend to localise and concentrate the ritualistic and civic ceremonies to such specific spots. The early choric dances in honour of Dionysos for instance, would be held near his sacred precinct, and this fact in combination with a suitable topographical situation would in turn provide the basis for a formally shaped theatre[1]

The earliest chthonic ceremonies, then, were held in the open-air, probably in some form of enclosure suggested by the natural conformation of its surroundings or by a clearing in a grove, and such rites as were performed in sacrifice or other demonstration took place before the symbol, external to it and only in an implied (not constructed) enclosure. The substitution of an anthropomorphic symbol for a purely natural or non-representational object may be assumed in principle to be the starting point for providing a constructed protection or "house" for the deity symbol. This change over from a chthonic to an Olympian form of religion thus becomes closely associated with the deliberate creation of a formal architectural framework for the whole procedure of religious ceremony.

The protective dwelling for the god afforded no space for the worshippers, and, from the point of view of the per-

The "Basilica" at Paestum from a photograph by the writer

ceiving spectator, had an essentially external significance. Internally such special treatment as it may have received must have been of a limited type and of a degree considered to have been in accord with the statue—if such were the symbol—to be enshrined. Externally, however, the architectural envelope became in turn a symbol of the splendour and greatness of the deity, and in this process was established the particular form of treatment that was destined to play an integral part in temple design throughout the long history of its development. For the temple, unlike the dwelling constructed for human habitation, is primarily significant as seen from the outside. The dwelling, having satisfied the requirements of accommodation and arrangement which are the generators of its plan and volume, may (without appreciable lessening of its amenities and practicability) offer externally nothing but an unenhanced envelope. Such openings and other attributes as are reflected there are merely the externalisation of internally generated functions. In a word the dwelling must start from interior arrangement. The temple (as we may term the general structure from its beginning as a cell to its final expression) has fundamentally no internal complexity and thus starts from a basis of exterior effect or appearance. This is a fundamental proposition and one which must not be lost sight of in the consideration of the forces that shaped and modified the treatment of the temple during the span of its growth and approach to perfection.

Let us remember also that the temple was never at any stage of its development a place of assembly. It offered accommodation only sufficient for the purposes of ritual, and no matter what changes took place with regard to size (and great size was achieved in some examples) this attitude was never relaxed nor was its external significance lessened.

II. THE DEVELOPED TEMPLE

Perhaps the most important link known to us between the dwelling place built for the gods and that built for man himself in Greek lands is that afforded by the megaron arrangement exemplified in the palace at Tiryns. Here we have the pattern of the temple type, and although the domestic complex at Tiryns is hemmed in by other elements leaving only a frontal aspect and an interior importance (which is consonant with our proposition for the emphasis on internal generation of the plan arrangement) the exclusiveness provided by porch and vestibule lent itself admirably to the effort to create a specially enhanced setting for the deity symbol when the time arose for such a construction.

The megaron at Tiryns had an ante-room between porch and main room, and although this element is not reflected in the temple until the advent of the peristyle when the pronaos assumed the position of a vestibule or ante-room, the general sequence of elements shows a strong link between megaron and temple. In considering the architectural treatment of the megaron we may note that the walls were of sun-dried brick, the inner surfaces of which were stuccoed and frescoed;[2] floors were of concrete and the columns of the entrance porch in wood. It is not absolutely certain what roof type was employed. Myres[3] argues the likelihood of a pitched roof with gabled ends; Perrot and Chipiez[4] show a flat roof in their reconstruction. At any rate the "inorganic" building-in of the megaron at sides and back does not foretell the clear-cut and three-dimensional form of the temple as an isolated structure. The temple as such was an independent creation and owed only the genesis of its plan to its distant prototypes in Homeric times.

The altar in the columned forecourt at Tiryns is worthy of note. At this stage of our investigation it may be more fitting to enumerate the clearly established types of temple rather than to trace the occurrence of single examples over a wide-spread area. Robertson[5] does this admirably in his chapter on "The Earliest Temples," and for this aspect the reader may refer to his findings.

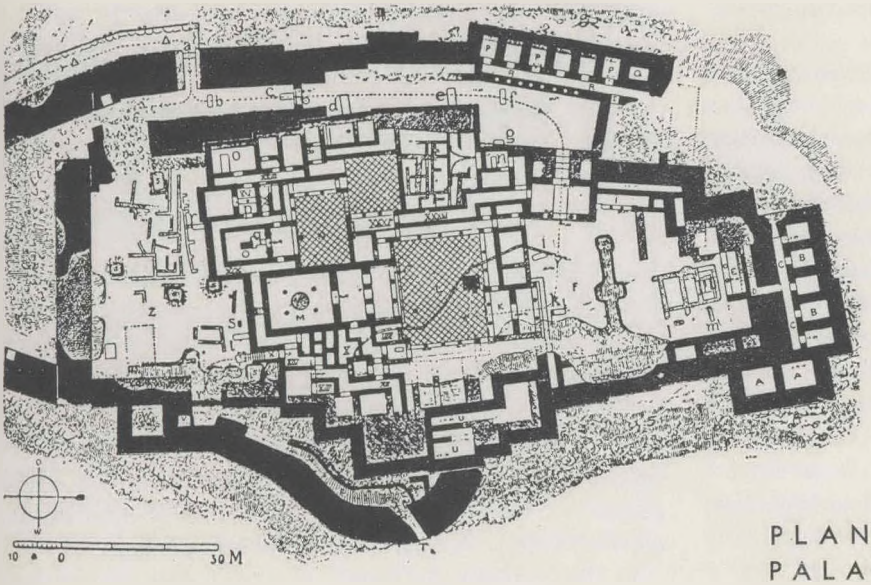
The four general types that must be recorded are as follows:

1. The temple in antis, where the side walls of the cella project so as to enclose two columns and thus form a porch.

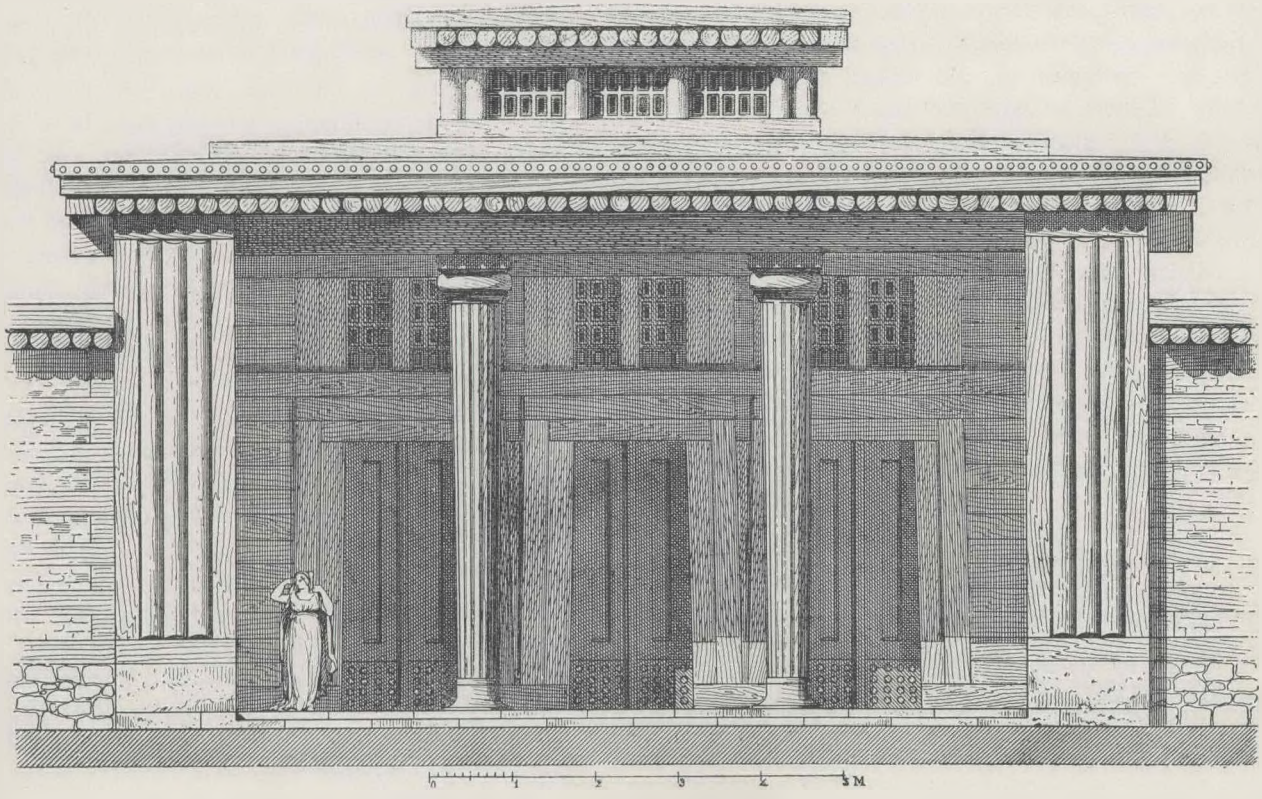
2. The prostyle temple in which four columns at the entrance end form a bold porch, though the latter is now of a more open type. Temple "B" at Selinus was of this type.

3. The amphi-prostyle temple in which the prostyle portico is repeated at the back. The best known example of this type (though not Doric) is the little temple of Niké Apteros on the Acropolis at Athens.

4. The fourth and "standard" type is the peripteral temple, in which the naos with its porches is completely surrounded by a colonnade or peristyle. This is a development and a great advance on the previously enumerated types, and is in fact the type of Doric temple that we shall examine later. Within this main classification are many variations two of which may be noted where (a) the pronaos and epinaos have columns in antis—such as in the Theseum at Athens, and (b) where these porches are formed by a prostylar



PLAN OF THE FORTIFIED PALACE OF TIRYNS
Note the Megaron arrangement



THE COLUMNED PORTICO OF THE MEGARON AT MYCENAE
(from Perrot and Chipiez "Art in Primitive Greece" vol. 2)

arrangement within the main peristyle, as in the case of the Parthenon at Athens.

The common factor in each of these types is the rectangular naos which remained basically unchanged throughout the history of the temple. The introduction of internal columns at a comparatively early stage (as in the so-called Basilica at Paestum) and at a later date (as in the Parthenon) cannot be regarded as an organic modification. The Temple of Apollo at Bassae with its ten engaged Ionic columns internally may be regarded as having an exceptional treatment although externally it presented the normal fifth century Doric ordinance.

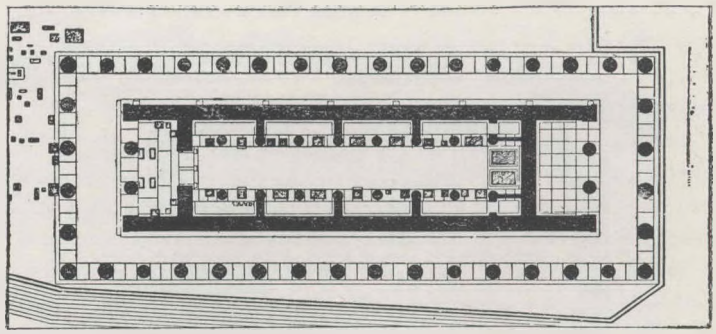
The temples are further classified according to the number of columns that appear on end elevation ; thus the peripteral temples are designated hexastyle, octostyle, etc., according to the system ; hexastyle being the common standard (and minimum) for the peristyle type. The octostyle arrangement of the Parthenon is a notable exception.

●

The peripteral temple type was not an obvious or immediate outcome of the earlier cellular shrine, nor are we entitled to assume an unbroken tradition which included the megaron plan of Mycenaean times and the naos complex of the mature temple. Such an hypothesis did indeed seem feasible when the Temple of Hera at Olympia[6] was thought to date from 1000—900 B.C. which would have brought it within range of the megaron influence, but the generally accepted date of c. 600 B.C. renders such a direct link untenable. Between the megaron with its columns in antis and the established temple with a similar columnar arrangement there appeared an elementary form of temple such as that at Selinus[7] which in turn seems to have had its basis in a pre-megaron and primitive building-type. This intermediate temple arrangement had internal columns as additional supporting elements for the roof but no colonnaded pronaos. The addition of a peristyle to this simple nucleus is shown in the early (c. 600 B.C.)



TEMPLE OF APOLLO AT THERMUM



TEMPLE OF HERA AT OLYMPIA

Temple of Apollo at Thermum in Aetolia, where the extremely narrow cella is divided by a central row of columns, and is entered directly without an intermediate pronaos.

In this example the cella walls were probably of unburnt brick, the column bases of stone, and the columns themselves with their crowning entablature in wood, with painted terra-cotta metopes introduced between the wooden triglyphs. It has been suggested that the introduction of the external peristyle may have been to provide a protective surrounding to the perishable brick walls of the cella, or that it was introduced to overcome structural difficulties arising from the outward thrust on the cella walls from the roof members—but whatever the literal origin may have been, it is important that, once this particular arrangement was established, it remained as an unchangeable and essential element in the Doric temple. Although the purpose may at the outset have been that of expediency, the resulting structure took on, in maturity, an entirely aesthetic or spatially significant aspect.

There would be little purpose in arguing whether this spatially defining aspect was in fact appreciated at the genesis of the peripteral type and whether the " practical " explanation is adequate to account for a notation that was to become so firmly part of a standard architectural system. What we may note at this point is the fact that the wooden columns and entablature and the unburnt brick walls were replaced at the beginning of the sixth century B.C. by a stone architecture, and in this unifying and formalising process was born the phase of Doric temple design that was to continue into the fourth century B.C.

In general terms the peripteral temple consisted of a rectangular cella containing within its volume an arrangement of apartments which varied in size and disposition according to date and situation. Surrounding this was the Doric screen of columns which together with its entablature constituted the " order." The whole was covered by a pitched roof,

pedimented at each end; and the structure of cella walls and colonnade was carried on a stone pavement of three steps, the top one of which was known as a stylobate. (Where overall dimensions are given of a temple, these will refer to the length and breadth of the stylobate.)

Here in essence is the Doric temple, and it must be our task to examine its different manifestations in a manner that always relates to these common characteristics.

With the Temple of Hera at Olympia and the Temple of Apollo at Thermum we may assume a starting point towards the end of the seventh century of a great succession of peripteral temples. We are not closely concerned with these particular examples, but they are important as representing the point achieved on the mainland of Greece at a time when the great wave of colonisation was at its height. The foundation of colonial towns in Sicily and Magna Graecia brought about an epoch of temple building in these new centres which, based on models in existence in Greece, transcended these in vigour and splendour, and marked a significant stage in the clarifying and consolidating of standards that so far had been indicated but not fully realised in plastic form. The wooden columns of the Heraion at Olympia were replaced by stone as they rotted, but the process was one of reparation, a tentative move in the direction of permanence, rather than a fresh construction on a pre-determined plan.

We can see this fresh construction in its most vital form in a building such as the Temple "C" at Selinus, product of a fully established technique yet demonstrating a new confidence, a new-found strength in aesthetic expression. Is it possible to define this regeneration, if regeneration it can be termed in an occurrence so close in time to the original models? A short description may help us to visualise this building, and in doing so, to establish the pattern of the elements of the Doric temple.

Temple "C" was situated on the Acropolis of Selinus and adjacent to the main east-west street, although as we have seen in a previous paper there is a strong possibility that this relation was the outcome of an imposed town-plan of considerably later date. The Acropolis of Selinus follows a gradual and constant slope for the greater part of its length, and then shelves down to the sea from north to south; but along the main cross street the ground is level from the west as far as the east front of Temple "C" where it slopes fairly rapidly for some distance down to the sea. Thus on the north, west, and south fronts of the temple the approach is level and direct but on the east or principal side the falling ground gives added accent and perspective to the building. This is reflected in the additional steps on the east front. In comparison with later examples Temple "C" appears to have been almost casually situated, and

Jean Hulot's Reconstruction of Temple "C" at Selinus; Product of a fully established technique yet showing a new confidence, a new found strength in aesthetic expression





SELINUS

photo / R.D.M.

The remains of the temples of Selinus, Sicily, like those of Olympia on the mainland of Greece are evidence of the havoc of earthquakes which have tumbled the fluted drums into positions of despairing horizontality

bears an intimate relation with the surrounding city which is perhaps unique. From the east, however, it must have appeared as a boldly silhouetted and dominating mass. On the north-east, too, a great open space lent a valuable horizontal foreground to the temple, and processions and ceremonies must thus have been enacted in a splendid spaciousness.

The plan arrangement of Temple " C " shows an extremely narrow cella isolated from the column screen by a wide pteron. The column system—6 x 17—represents an extreme proportion that was gradually diminished until in the fourth century B.C. we find the Temple of Asclepios at Epidaurus having the most compact form achieved, 6 x 11. At Selinus the " canonical regularity " of the established Doric system is not yet evident, and the lack of alignment between the side cella walls and the second and fifth columns on end elevation (the normal arrangement in later hexastyle temples) is an archaism that imparts a strongly individual character to the building. The lack of a pronaos and the unusual porch effect of the second row of columns on the east front further exhibit a colonial independence of mainland types.

Bagenal[8] has drawn attention to peculiarly Sicilian variations in regard to the treatment of triglyph and metope in the Doric temple—the setting back of architrave and triglyph face, for example, apparently to obviate the excessively heavy effect on the angle view of overhang beyond the upper column diameter which is so noticeable in later mainland temples ; and these factors in combination with the points already enumerated indicate the existence of what the same writer terms a " Sicilian Doric School."

To-day there is a single row of re-erected columns standing along the north side of the stylobate. These redeem something of the original appearance of the temple, and provide at least a measure of its height and length. To fill out the picture we have to examine the metopes now housed in the museum at Palermo, and finally, perhaps the greatest aid to architects for an understanding of the whole building, Hulot's reconstruction in Monuments Antiques.

His drawing of the east front (reproduced on page 59) catches the special atmosphere of archaic freshness that is still capable of delighting us whether it is enshrined in the cheerful obscenity of a Black-figure vase painting, in the enigmatic smile and poise of an early sculptured Kouros, or, as in the present instance, where it emerges through a sheer joyousness of new-found plastic power. To whatever detailed analyses we may subject this temple, the fact remains that it is fundamentally the result of a vividly creative impact against the forces of inertia—against the timeless anonymity of durable material. The Greeks who built this temple can be studied through the medium of their other arts, and we must inevitably lose the greater part of its meaning (and our own chance of understanding) if we do not keep the human dimension constantly before us. We are too prone to consider that the dead cities we study were always dead. The ruins that tell of wanton destruction or of the ravages of earthquakes still hold some knowledge for us. Laboriously, men like Koldewey, Puchstein, Wiegand and Schrader have pieced together the disjecta membra so that we can have a picture of their original shape and splendour ; but it is only in the mind's eye that we can carry the process a stage further, and see the buildings tenanted. To re-create them thus we must recall their essential Greekness and historical vitality, and bring into focus their material significance.

The east front of Temple " C "—about 79 ft. 0 in. across—presents a column system of relatively short and rapidly tapering shafts carrying a deep entablature which in turn is surmounted by the polychrome terracotta casings of the pediment. The rich and full curve of the echinus, the sharply modelled outline of abacus, architrave, triglyph and cornice, and the bold effect of the slender rectilinear volume of naos, cradled within a widespread screen of fluted columns, are all attributes of the archaic spirit. The elements have elasticity and articulation, and are as yet free of " refining " influences.

The metopes which are still preserved offer a valuable comment on the general mood in which the temple was designed.

The strong architectonic scheme on which the figures were arranged, the rigidity and weight, show a sense of unity and continuity of structure impossible of achievement where naturalistic forms are built into an architectural frame. The problem of framing groups of high relief sculpture between the regular and strongly accented triglyphs and the dominant horizontality of architrave and cornice was an acute one, and the estimate that finds the broad handling of these metopes crude and immature does not take into account the factor that visual interest—that is, independent pictorial quality—had of necessity to be subordinated to the main lines of the enclosing structure. Picard[9] rightly allows the archaic Greek sculptor to prefer " la robustesse à la recherche du détail trop menu," when his work was part of a larger scheme.

Mention must be made at this stage of the application of colour to this temple, although we shall be concerned more appropriately with this factor as a general proposition when we have gathered evidence over a wider range of examples.

The rough and uneven surface of the limestone was covered with a layer of stucco which made perfectly smooth surfaces and sharp angles possible. This process was invariable and formed the basis for polychrome application. In addition such terracotta revetments as were applied to the superstructure of the temple were richly painted in strong colour. For the moment we may picture Temple " C " as having its " broad brow " boldly coloured in yellow, black and red—its metopes also in colour, and its triglyphs in blue. Other details—taenia, guttae, and antefixae are in red or yellow, and architrave, column shafts, and steps in the self-colour of the stucco. That the whole effect was an extremely vivid one there can be little doubt, and although we shall not attempt at present to establish greater exactness in regard to zones of application, colour is such an integral component of the temple that we cannot regard it as a mere appendage.

Concerning other temples of the same period in Sicily one need mention only the Temple " D " at Selinus which adjoined the example we have just discussed, and which dated from

Remains of the Peristyle of Temple "C" at Selinus Photo/R.D.M.



560 B.C., and had similar dimensions and columnar arrangement ; and the Temple of Apollo at Syracuse built in 575 B.C., also 6 x 17 on plan but slightly smaller than the former examples.

The parallel example in Magna Graecia is the Temple of Demeter and Kore (commonly known as the Basilica) built about 565 B.C. at Paestum. Here the nonastyle column system obviates any direct comparison. Such a drastic departure from the now firmly established hexastyle standard confuses the recognisable integration which is rendered lasting and significant only by repetition and concentration. In detail, however, we may note the same fulness of profile in the echinus of column capitals, the vigorous cuboid form of the abacus. The column shafts diminish rapidly as in the Selinus examples—there is the same weight and insistent articulation in the components. Whatever indecision may have led to the plan of the Paestum temple there is no doubt that the order itself is by now analytically and categorically established.

III. TECHNIQUE AND MATERIAL

It is now necessary to examine the position on the mainland of Greece to see what the succeeding centuries produced either in continuation of the recognised "ordonnance" or in modification of it. A significant fact that should be recorded at this point is that no major change in building technique is evidenced throughout the period under consideration. The Greeks must, at an early stage, have perfected the means of setting out plans, cutting and fitting together the members of stonework, and finishing the visible surfaces of their constructions within close limits of accuracy. As far as the mechanical side of building is concerned, no entirely fresh problems presented themselves at later stages. The giant Temple of Zeus at Acragas (470 B.C.) and the great Temple "GT" at Selinus (of even earlier date) must have offered in sheer practical exertion the greatest test of endurance and ingenuity that the temple builders encountered in their long history.

One may reasonably assume that in the field of craftsmanship as opposed to the technique of mass structure, the fifth century saw, particularly on the mainland, a progressive refinement of technical process which must either have followed or influenced the growing refinement of contour and relative proportion that characterised the temples of this century. The marbles of Greece must have played a considerable part in modifying detail technique, for where the material is friable and incapable of taking an exact or sustained edge, and the mason knows (as he must have in the examples we have discussed) that a final surface of hard stucco has to be imposed on his work, a certain coarseness, such as we find in rough-core work to-day must be inevitable.

An examination of the limestone used in the temples of Acragas or Himera in Sicily ; or of the shell conglomerate of the Temple of Zeus at Olympia, indicates that a primary technique suitable to such a material could never meet the needs of the mason dealing with Pentelican or Parian marble. Marble was by no means the universal material for fifth and fourth century temple buildings in Greece and the islands, nevertheless it must have been widely known and mastered by craftsmen, and thus able to influence current technique in masonry.

Let us list the important buildings that were of marble construction :

- Temple of Apollo, Delos (450 B.C.)
- Parthenon, Athens (447 B.C.)
- Temple of Poseidon, Sunium (425 B.C.)
- Theseum, Athens (428 B.C.)
- Tholos, Delphi (400 B.C.) note[10]
- Temple of Athena Alea, Tegea (355 B.C.)
- Tholos, Epidaurus (350 B.C.), note[11]

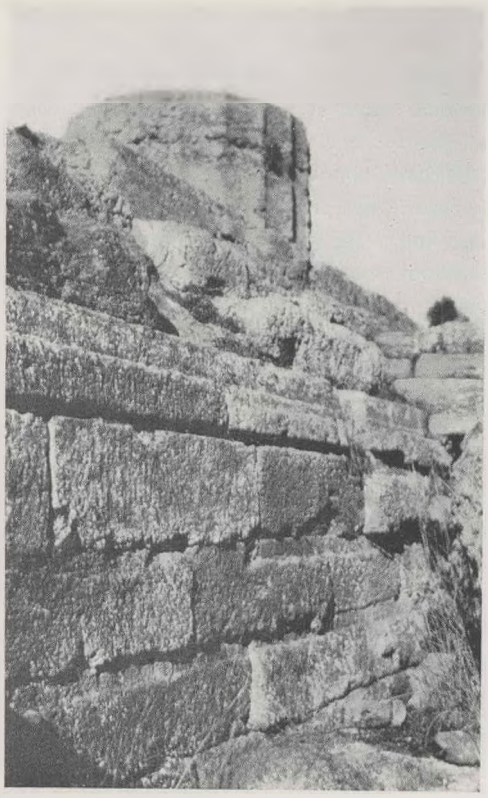
Contemporary with these, but not of marble, were :

- Temple of Aphaia, Aegina (490 B.C.)
- Temple of Zeus, Olympia (460 B.C.), note[12]
- Temple of Apollo, Bassae (420 B.C.)
- Temple of Asclepios, Epidaurus (380 B.C.)

The most important colonial examples (non-marble) were :

- Temple of Poseidon, Paestum (450 B.C.)
- Temple of Concord, Acragas (440 B.C.)
- Temple at Segesta (unfinished) (430 B.C.)

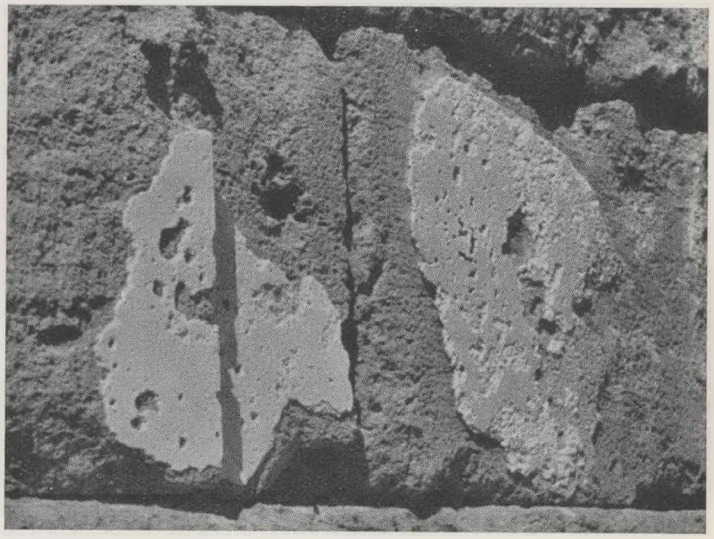
The position broadly, then, is that there were no marble temples built in the western colonies at any date ; and no marble temples in Greece proper before the construction of the Temple of Apollo at Delos, and the Parthenon, about the middle of the fifth century. Also, that parallel with the building of marble structures between 450 B.C. and 350 B.C. (seven well-known examples) there were constructed non-marble temples on the mainland and in Sicily and Magna Graecia. Closer scrutiny of the materials available to the Greek temple



OLYMPIA

Left: Portion of sub-structure of Temple of Zeus at Olympia showing nature of shell-conglomerate.

Below: Remains of stucco on Temple "B" at Selinus, also on a basis of shell-conglomerate. Photos/R.D.M.



SELINUS

builder shows that the predominant and most widely distributed of these was the so-called Poros stone or shell conglomerate, which, with its cavities and roughness, offered an excellent key for plaster.

Limestone was the natural building material throughout Magna Graecia and Sicily, and despite local variations the Poros character was common both to Greece and her western colonies. Marble was produced from the famous quarries of Hymettos and Pentelicos, and from the islands of Poros and Naxos which gave their names to further varieties.

Dickins[13] has some comments on the material of the sculptures of the Acropolis which are interesting from the point of view of character, and also in a descriptive sense. Discussing the limestone rock of the Poros sculptures he says: "Of varying quality, one block may be full of air-holes or fossilized shells, while another presents the limestone in a pure state . . . This comparatively soft stone offered much less resistance to the sculptor than marble, and there was no need for the use of saw or drill."

Frazer[14] in his notes on the Temple of Zeus at Olympia refers to the "coarse, gritty, dull-coloured conglomerate to which Pausanias gives the name of "poros," and quotes Washington[14a] and Philippson[14b] on the subject of what actually can be accepted as Poros.

The former remarks:

"There is a great lack of definiteness in the use of the word poros, which is made to include almost all soft, light-coloured stones, not palpably marble or hard limestone. In the majority of cases it is a sort of travertine, again a shell-conglomerate, and occasionally a sandstone or some decomposed rock containing serpentine or other hydrated minerals."

The latter defines Poros as:

". . . a coarse, granular, calcareous sandstone, of a grey or yellowish colour, easily wrought, and quarried in large blocks, much used as building material both in antiquity and at the present day."

We may conclude this brief summary of materials and their properties by noting a few characteristics of Greek marbles, once again quoting Dickins. "Naxian marble betrays itself by its coarse crystals; Pentelic is distinguishable by its minute ones.[15] Discussing the premises of two general periods in Attic art (a "Poros" period extending into the second half of the sixth century, and a succeeding "Marble" period lasting until 480 B.C.) Dickins refers to the use in the

second period of " the inferior marble of Hymettos, the hard Parian, and the softer coloured Pentelic."[16]

The use of marble for sculpture was thus inaugurated about one hundred years before it was employed in the general construction of temples, and it is noteworthy that in two cases at least (Aphaia Temple, Aegina ; Zeus Temple, Olympia) the coming use of marble was heralded by its appearance as the material for pedimental figures and metopes in Poros temples before the middle of the fifth century.

The first move away from the attributes commonly associated with archaism in the Doric temple is discernible in the Temple of Aphaia at Aegina, built in 490 B.C., and in size considerably smaller than its forerunners. Thirty years later the Temple of Zeus at Olympia was begun, and here a greater magnitude was achieved. This temple is, in fact, the largest Poros example on the mainland. By the mid-century the stage was set for the great effort to surpass all previous buildings, and in the light of garnered experience the building of the Parthenon was begun. The Temple of Zeus had been constructed entirely of Poros stone, only the pedimental sculptures and metopes had been carved out of Parian marble, but now a whole temple was to be wrought in Pentelican marble, and all that skill and accumulated technique could offer was directed towards the making of a crowning masterpiece. As yet there was little indication what influence the material was capable of exerting in a strictly architectural sense. The sculptor had long been familiar with the properties of marble, but the mason, the carpenter and the architect who had evolved a " Poros " technique must have been keenly conscious of a new force towards refinement—towards even greater precision and finesse than had been thought desirable or even possible with the old method.

We may at this stage consider the range of experience possible to the masons employed on the building of Greek temples, as well as the extent of the influence likely to have been imparted to Poros buildings by the contemporaneous erection of marble temples.

The temples at Athens, Sunium and Tegea for example, had been completed in marble many years before the building of the Temple of Asclepios at Epidaurus was undertaken, so that in the latter example we have a case of the employment of the coarser material following the extended use of the " refined " material. The Temple and Tholos at Epidaurus are particularly interesting in this respect as we have records of the contractors engaged on these buildings, together with the names of their home towns.[17]

The inscription discovered near the temple in 1885 gives not only " full details of the cost of construction " but mentions among the contractors (supply, transport and executive) men from Corinth, Argos, Stymphalia and Crete. Similarly we learn that connected with the building of the Tholos were men from Athens, Paros, Troezen and Tegea.[18] The recruiting of craftsmen from such a wide field implies considerable movement by individuals connected with the building industry, and it is not unreasonable to infer from the information that Epidaurus provides, that local traditions and local conservatism must have taken second place to a broadly valid technique having its bases in a general, rather than restricted conception of the problem of temple building.

One of the most obvious conclusions that we must draw is that the masons from Tegea and Athens, for instance (even supposing that this were the only other centre at which they had worked) would be familiar with the appearance of, and the technical methods reflected by, the marble temples in their respective cities, and would therefore be in a position to apply such lessons as the marble technique offered.

Briefly, a general distinction can be made between the Poros temples built prior to the middle of the fifth century and those built after the wide use of marble technique. In the former the stucco was used as a refining agent without knowledge of the appearance of an integral marble structure with its capacity for receiving extremely delicate cutting ;[19] in the latter the marble structure existed as a model and a standard to be emulated in a combination of rough core and smooth stucco. Our knowledge of the buildings at Epidaurus (from fragments) indicates that the precept of marble technique induced great refinement in finished effect ; the Temple of Asclepios, in fact, seems to have been a building of outstanding harmony and poise when considered as a plastic whole.

It is significant that the general masonry technique was fully capable of meeting the added demands of a meticulous finish. The move towards more slender proportions and less articulation in the parts of the temple had obviously made rapid strides in the first half of the fifth century, and it did not require the change over to a more refined material to render such development possible. That such a stage of development is peculiarly a mainland phase may be due to many causes outside the realm of purely architectural change, but the vigour and genius for imaginative construction that produced the early Sicilian temples on a basis of dim mainland prototypes seem to have passed in a wave back to Greece. It is now Greece that carries forward the search for perfection—the colonies naturally reflect some of this activity, but on the whole the evidence seems to point to a falling back, a " failure of nerve " as Gilbert Murray might put it.



The Temple of Poseidon at Paestum (450 B.C.) an example that suggests that the main stream of plastic evolution no longer flowed through Colonial Greece at the time of its construction Photo/R.D.M.

In this connection it is instructive to record a single instance of the parallel activities of Magna Graecia. The Temple of Poseidon at Paestum, only a few years older than the Parthenon and built ten years after the Temple of Zeus at Olympia, still carries the general atmosphere of an archaic structure. Dinsmoor, in fact, remarks that the column proportions " might seem at first glance to suggest an earlier date " but attributes the " heavy proportions " to the great diameter of the columns. " The other details," he adds, " are thoroughly developed."[20] The fact that development (or at least, change) was not uniform in the same structure certainly suggests that the main stream of plastic evolution no longer flowed through colonial Greece. What had been, a century before, a spirit of bold experimentation seems now to have been replaced by an attitude of careful conservatism. The Poseidon temple indeed shows a closer affinity with the temple of Selinus of 570 B.C. than with its own contemporary building at Olympia ; but as always in archaising art the later example that hesitantly follows an old mould lacks the flamboyant youthfulness, the resilience and freshness of the earlier model.

IV. STANDARDS AND VARIATIONS IN TEMPLE DESIGN

The fifth century sees the hexastyle arrangement maintained as the standard system, but the lateral column number is still subject to fluctuation. The Temple of Aphaia (Aegina) is 6 x 12, the Temple of Poseidon (Paestum) 6 x 14, the Temple of Zeus (Olympia) 6 x 13. The last combination may be taken as the " final " fifth century standard. Although this arrangement is shared with other and later mainland temples, and with colonial examples, there is a notable variation in the Temple of Apollo (Bassae) which is planned on a 6 x 15 system. The fourth century temple of Asclepios (Epidaurus) records the limit of compactness achieved, with 6 x 11.

It was remarked earlier that the Temple of Aphaia at Aegina marks a break with the archaic conditions, and it may be as well to record what changes are noticeable in plan and general arrangement in this transitional example. Dinsmoor[21]

considers this example " the most perfectly developed of the late archaic temples in European Hellas," and with its strong polychromy and disciplined marble sculptures there is little doubt that it represents a key point in the progressive refinement which the new century was destined to display. Plastically the Aphaia temple exhibits a new compactness, not only of overall proportion but also in the relationship of structural minutiae. From an architectonic point of view there is a corresponding precision in the arrangement of plan forms that distinguishes the building clearly from the group that includes the archaic Temple " C." The deliberate alignment of cella walls with peristyle columns, and the resulting change in reciprocal value between cella and pteron (both on plan and in volume) have more than an incidental significance.

Where one could attribute to the archaic temple a quality of bold articulation, it is now necessary to recognize that the predominant note of the transitional type, far from reflecting a basic separateness of elements brought together in a plastic unity, actually echoes the postulate of a primary unity to which the constituent parts subscribe in a maintained subordination.

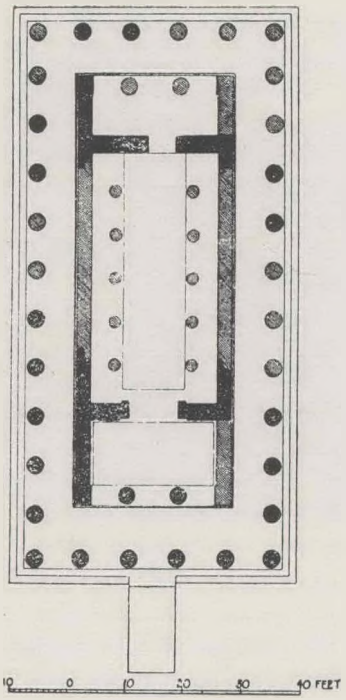
In general, in a newly established building type the process of shaping and constructing inevitably throws a strong light on the individual parts. Each element holds the stage in terms of its own specific attributes, each carries with it a special series of problems both aesthetic and practical, and it is axiomatic that the visual and manual emphasis that it receives at every stage of the formulating and constructing process will be clearly reflected in the final synthesis. The articulation that occurs in the archaic temple with the accent on structural adequacy is fundamentally the reason that such a building appears crude to the spectator to-day. The sense of achievement, of creating a new order of space structure, is too patent and too self-conscious to be accepted as a definitive statement. The gradual dissolution of that self-consciousness coupled with the increasing complexity of the temple surroundings (in which there was a tendency for the temple itself to become in turn a contributory unit and not an isolated self-contained structure) expedited the new plastic unity that we have seen demonstrated in the Temple of Aphaia.

The most obvious gain from structural confidence and from deliberate subordination of individual emphasis is one of visual continuity in the structure as a whole, of easily apprehended rhythm between void and solid, and of the reduction of effort in establishing for the spectator the singleness of the conception. The offsetting disadvantage, which under some conditions can be a serious one, is the loss of modulation in plastic effect, and consequently the failure to stimulate the vision. For whatever advantages may accrue from merging different functions in common forms, this usually involves a corresponding loss of identity in the structurally significant elements. Such a proposition cannot be given a finite evaluation, nor is it possible to offer a scale against which the developing temple can be measured, but the tendency to surface unity if isolated from compensating factors is a devitalising one and contains the germ of decadence.[22]

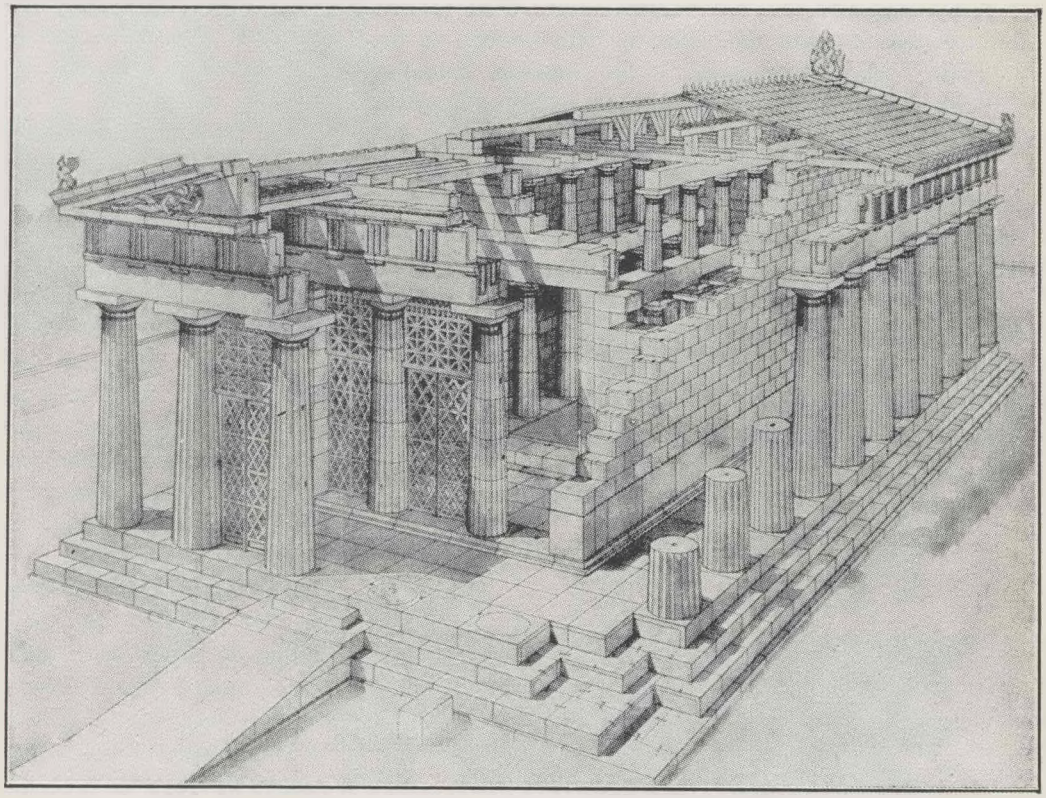
Perhaps the present point is the most appropriate at which to examine variations of the standard type, departures from established columnar notations, and modifications other than those arising from gradual change in detail technique or refinement.

The Aphaia temple dates from 490 B.C., and the next great temple in Greece—that of Zeus at Olympia—which followed thirty years after, marks no organic change but only a substantial increase in size. Specified in a notational manner it indicates a continuance of the " new " standard. There is every indication that the hexastyle system is in no risk of being abandoned either in Greece or the colonies, but in 447 B.C. with the construction of a new Parthenon at Athens, the drastic decision to employ an octostyle treatment is made. Speculation on the reasons for such a decision cannot be very fruitful, but one may be forgiven for wondering why a system that had been maintained for nearly two centuries was suddenly overthrown. The most obvious conclusion is that the sheer intellectualism and discipline that had produced a type which eschewed the temptation of change for the sake of change, had, under the stress of culminating political power, been forced to make of the new temple something more than another building in the succession of temples to the gods. The Parthenon had to exceed its forerunners in splendour and complexity (not necessarily in size, for the fever of megalomania cannot be said to have touched Athens) but the reconstruction programme of the Acropolis was symbolic of wider spheres of activity, of greater civic aspirations, and the Athena Temple thus became the focal point of a new order. In this violence of civic creation the old Delphic maxim appears to have faded. " Nothing too much " had always been the code of temple building, but in the effort towards grandeur too much was attempted and although everything that was essentially Doric was infused into the structure, the departure—the overweening turning aside from the perfect mean—brought only overstatement and relapse.

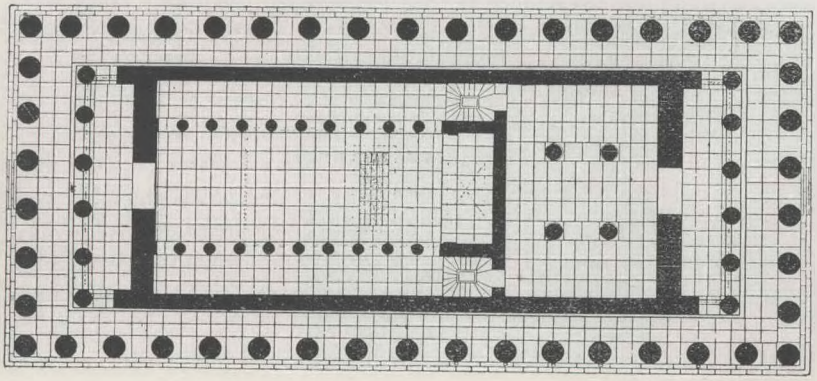
Whatever the reason for the decision, it was an unfortunate one, and the continuing history of the Doric temple shows no repetition of the experiment. In close succession came the Theseum at Athens, the temples at Sunium, Bassae and Epidaurus, but in no instance did the architect depart from the hexastyle standard—the standard of " nothing too much."



Plan of the Temple of Aphaia at Aegina



THE TEMPLE OF APHAIA AT AEGINA
(After Fiechter)



Plan of the Parthenon, Athens

The plastic loss caused by the 8 x 17 arrangement of the Parthenon was twofold. In the matter of articulation the addition of two columns to the short side of the temple brings about a corresponding decrease in the visible separateness of these elements—a blurring and continuity. This is a state that may be desirable in other contexts, but in the case of the Doric temple it raises the index of subordination to too high a level. The second factor is the apparent extension given to the short side. The use of eight columns diffuses the sensible difference between an easily apprehended short side of six columns, and the less obvious but considerably greater number of columns on the long side. The loss in this respect is a directional one and although in actual dimensions the octostyle temple may be in length more than twice its width (as the Parthenon was) on the human scale there must be a tendency to render the spectator unaware of the sharp distinction between short and long side. Once again the question of visual separation is closely connected with the establishment of individual identity.

V. THE PROPORTIONS OF THE PERISTYLE, AND THE SIGNIFICANCE OF THE CREPIDOMA

The archaic Doric temple was characterised by a peristyle of relatively short, and rapidly diminishing, columns, carrying a deep entablature. In comparison with the lower diameter of the columns the intercolumniation was small, and the great overhang of abacus and echinus brought each set of these elements into close proximity with those on either side. According to Durm's drawing of the Apollo temple at Syracuse the intercolumniation in this example varies from $\frac{2}{3}$ lower diameter to $1\frac{1}{3}$ lower diameter, while the abacus is separated from those on either side by a distance which ranges from $\frac{1}{3}$ to $\frac{3}{4}$ lower diameter. The depth of the entablature is $\frac{1}{2}$ the total column height. In the case of Temple "C" at Selinus the intercolumniation measure $1\frac{1}{2}$ lower diameter, the column height approximately $4\frac{2}{3}$ lower diameters, and the entablature just over $\frac{1}{2}$ column height. In this example the spread of the abacus is close on $1\frac{1}{4}$ lower diameter, and the inter-abacus space slightly less than this dimension.

The ratio of entablature to column height of 1 : 2 in archaic work was progressively diminished, until by the early fourth century B.C. we find a ratio of 1 : 3 with a corresponding increase of slenderness in the columns to a general ratio of diameter to height of 1 : 6. In combination with a tendency to greater regularity in intercolumnar spacing, and the narrower pteron, this brought about a marked change in the distribution of the structural mass as well as presenting a virtually new relationship of visible surfaces.[23]

The rigidly prismatic form of the Doric temple, and its overall compactness, render its direct relationship to site and the mode of such transition an extremely important factor in the design as a whole. In this connection an examination of the crepidoma treatment as a basic element between the existing irregularity of the site and the finished horizontality of the superstructure shows an adherence to general type but modification in proportion during the development of the temple from early to post-Periclean times. The main substructure (stereobate) showed above ground level a stepped outer edge (crepidoma) beyond the peristyle and uniformly surrounding the temple. The top step was known as the stylobate. In general the crepidoma consisted of three steps, and these, in the sixth century, appear to have been proportioned to serve in addition the purpose of ordinary steps up to the temple. This practical aspect, however, was subsequently abandoned in the necessity of proportioning the crepidoma to the height of the temple itself, and in giving added force to the horizontal lines of the substructure. Thus the stylobate in the fifth century was a considerable height above surrounding ground level (see photographs on opposite page), and approach was provided by the introduction of intermediate steps proportioned to the human scale. A modification of the three-stepped crepidoma can be seen in the case of Temple "C" at Selinus where the rapid sloping of the site necessitated additional steps at the east end of the temple; the remainder of the crepidoma had the usual number of steps.

During the fifth and fourth centuries secondary steps were not always employed to compensate for the increased height of crepidoma. In the Temple of Zeus at Olympia, in the Temple of Aphaia at Aegina, in the Temple of Asclepios and in the Tholos at Epidaurus, the main entrance was approached by a ramp, an element of great interest since its form does not reflect the rectangular quality of the substructure but provides by its gradually sloping plane an intimate and almost imperceptible transition between ground level and temple level.

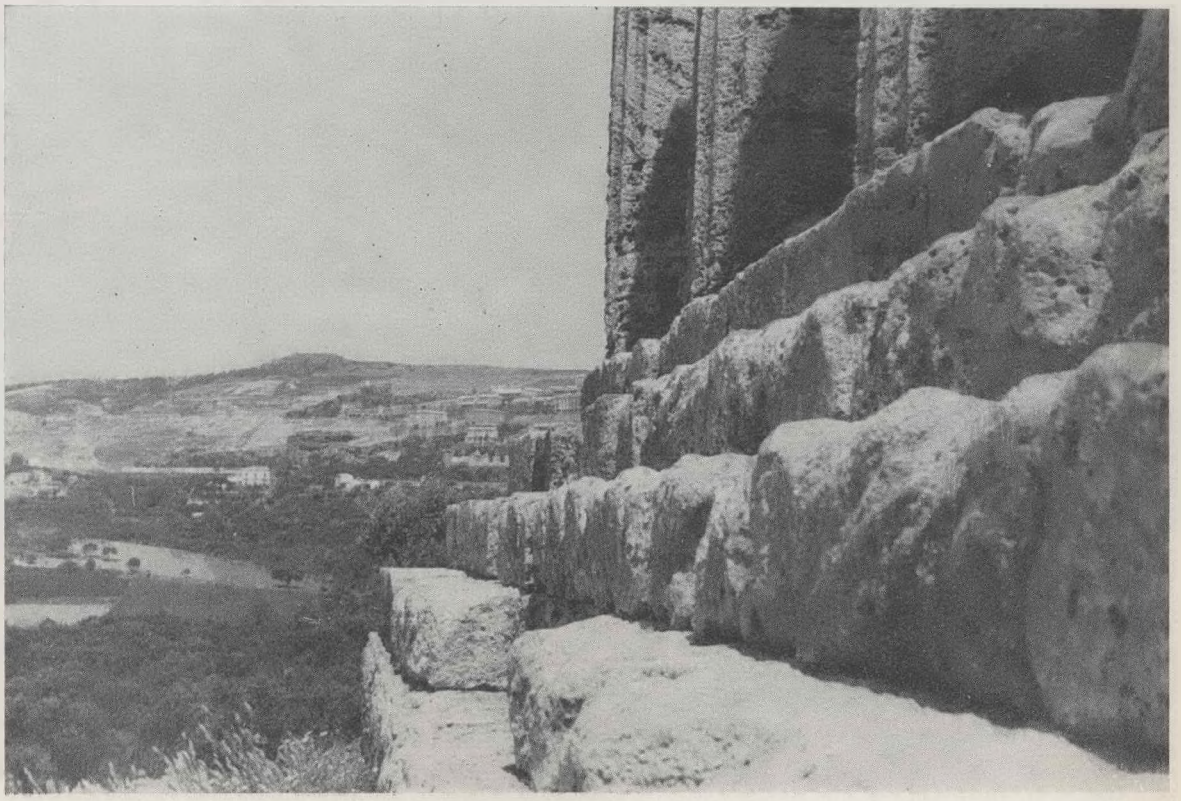
The visitor to the temple remains of Greece to-day must be keenly aware of the importance of the temple platform, because where all else has been destroyed this element remains



Above: The Temple of Concord, Acragas

Below: A detail of the bold stereobate of the Temple of Juno Lacinia, Acragas. Note how the surfaces have weathered Photos/R.D.M.

The rigidly prismatic form of the Doric temple, and its overall compactness, render its direct relationship to site and the mode of such transition an extremely important factor in the design as a whole. In this connection an examination of the crepidoma treatment as a basic element between the existing irregularity of the site and the finished horizontality of the superstructure shows an adherence to general type but modification in proportion during the development of the temple from early to post-Periclean times.





photo/R.D.M.

Landscape from the Acropolis of Acragas, Sicily

to give us the configuration of the plan and its essential relation to the site. At such sites as Himera and Selinus in Sicily, and at Delphi and Olympia, where destruction is almost complete, the steadfast formality of the temple base recalls for us the vigorous stereometry of the temple forms. Where the temple stands clear of its surroundings such as on the Acropolis at Athens or on the rocky spine at Acragas, one is even more acutely conscious of the bold measure of the great steps as they cut in perspective across the undulating lines of the embracing countryside. The form of the structure provides a frame to the landscape—though relatively small and isolated, the Doric temple demands homage of its surroundings.

VI. POLYCHROMY

In the foregoing analysis we have examined the temple only in its isolated and self-contained form. It will be our task (in a future issue of the "Record") to review the greater unity of the temple within its constructed surroundings—as part of its corporate enclosure; but before we move to that consideration there is one general factor that has a bearing on the spatial characteristics of the Doric temple and which must occupy our attention at this point; polychromy.

The study of polychromy in Doric architecture presents many difficulties, since literary references are scanty and the possibility of colour remaining on architectural members through centuries of exposure and destruction is a remote one. Occasionally the colour application has amazing longevity, and sufficient traces remain for direct observation. At other times, as in the Temple at Himera, excavation revealed colour that rapidly disappeared in contact with the atmosphere—but here fortunately modern archaeology was equipped to record immediately and save for us the knowledge if not the actuality of its findings. Not all the colour disappeared at Himera, however, because even in 1938 clear remains of red were still visible on fragments of the entablature when the writer visited the site. The section of entablature from Temple "B" at Selinus, now in the Palermo Museum, is a most valuable demonstration of colour usage, and in Athens we may gain some idea of the polychrome range of the Greeks from the vivid colours of the Archaic Sculpture in the Acropolis Museum.

As far as the archaic temples of Sicily are concerned we may note that:

(1) The Temple "B" entablature referred to above had taenia in red ochre, triglyphs ultramarine, grooves indigo, guttae and cyma white, and an ochre wash on the main field.

(2) The colours recorded by Carta at Himera in 1931 are ultramarine and red ochre.

(3) The background of the Perseus and Gorgon metope from Temple "C" shows traces of red.

For later times the evidence of Athens, Delphi and Olympia points to an extensive use of polychromy in architecture and sculpture. One of the problems that has been debated is whether the Greeks applied colour to major surfaces such as those of column or architrave. Penrose believed that the marble of the Parthenon was treated in flat colour to lessen the glare. D'Ooge[24] recalls the opinion of Dörpfeld who considered "that the custom . . . was to leave plain surfaces of marble buildings untinted in distinction from those built of poros, and also in contrast with other . . . parts of the architecture which even where their material was marble, were treated with color."

D'Ooge summarises the position as follows:

"All are agreed that the architectural members that project from the plain surfaces, and those that are in profile, such as mouldings, cornices, triglyphs, mutules, soffits, and the capitals of antae, are as a rule colored, and so also those flat surfaces, like the tympana of the gables, that form the background of sculpture."

The evidence of the Parthenon led Penrose and Fenger to arrive at the following conclusions:[25]

Triglyphs blue.
Background of metopes possibly red.
Edges and soffits of mutules red.
Guttae probably red.
Soffit of cornice blue.
Coffers of peristyle ceilings (e.g., Propylaea) gold and blue.
Planes of colour separated by white or gilded fillets.

On the Athenian Propylaea we may note that the colouring appears to have been more "subdued" than that of the Parthenon. Magne[26] in his monograph on the Parthenon states his belief that colour had never been applied to column or architrave in that building. He confirms from observation the application of colour as listed above. Robertson[27] notes that in addition to the widely used red and blue, Doric architecture employed green, yellow, black, brown and gold "chiefly for the delicate patterns of cornice and sima mouldings."

The remains at Olympia render valuable detailed evidence, and in addition to that recorded above in connection with archaic colour treatment we have in the Temple of Zeus and in the Hellanodikeon further confirmation of generalised schemata in Doric architecture. In the temple red was found between the mutules, while mutules and triglyphs were blue.

The ground of the sima was light blue. From the Hellanodikeon we learn " that the shafts of the columns, the echinus, and abacus of the capitals, were not decorated with painted patterns, though possibly tinted with yellow or some light colour. The cornice . . . was painted with a band of bright blue leaves and red spines on a yellow ground. The mutules were very dark blue, the spaces between them red. The triglyphs were also dark blue, the metopes being merely coated with white stucco.[28] The terracotta sima had brightly painted patterns on a black ground.

At Delphi the chief evidence is given by the relief sculptures from the Siphnian and Sicyonian treasuries, and in this connection Poulsen[29] describes the sculptured frieze of the former building as having a background of blue.

" The figures are treated in blue, green, and red, the last colour in two shades, light red and golden red. The clothes are red with blue borders . . . the helmets are blue, with red ornamental stripes on the edges, to pick them out from the blue background . . ."

Poulsen describes a metope in the Sicyonian treasury as having the background uncoloured ; that is, in the natural white or yellow hue of the stone. This is an interesting parallel to vase painting of the sixth century, for " highly polychrome figures, with prominent black and dark red colours, stand out from the neutral lighter surface of the limestone, as the figures of black-figured vases with white and red detail are silhouetted against the natural yellow or yellowish-red ground of the clay." Later, as in red figure vase painting, " light or red figures are set off against a dark background."

In the field of polychrome application to free-standing sculpture we must turn to the archaic examples in the Acropolis Museum at Athens. Dickins[30] provides a valuable summary of the colours and painting technique as applied to the Poros figures.

" Two shades of red, dark blue, green, black, and white tints were used, and the entire surface of the statue was covered, except where the natural colour might be used in contrast . . . The backgrounds are usually blue, but are sometimes left plain, the flesh rose, eyelids and brows black, pupils black, red or blue, hair blue, red or white, and the garment entirely covered with various hues."

For marble statues, too, red and blue predominate, but other colours are also found, including black, rose, light blue, light green, and yellow ochre. " It is hardly necessary to add " states Dickins " that the use of colour is still conventional . . . The whole theory underlying the ancient painting of sculpture rests on the assumption that the colour is not naturalistic, but chosen primarily with a view to harmony in the whole colour scheme."

We have from this activity which is closely allied to architecture data that substantiates the view that colour played a vital part in the creation of significant form in Greece. The conventional aspect which Dickins stresses (and which indeed is most clearly proclaimed by the colours themselves), is a valid indication of the integral nature of colour and form. Because the vividness and primary quality of Greek colour are startling to our eyes, or more exactly to the eyes of the late nineteenth century, the view has often been expressed[31] that the Greek sense of colour was poorly developed compared with the superb appreciation of form and formal relationships that the Greek sculptor and architect displayed. Is it not more likely that the Greeks showed a stronger and more widely embracing attitude towards visual unity than we who have come upon their work in a fragmentary state can ever fully apprehend ?

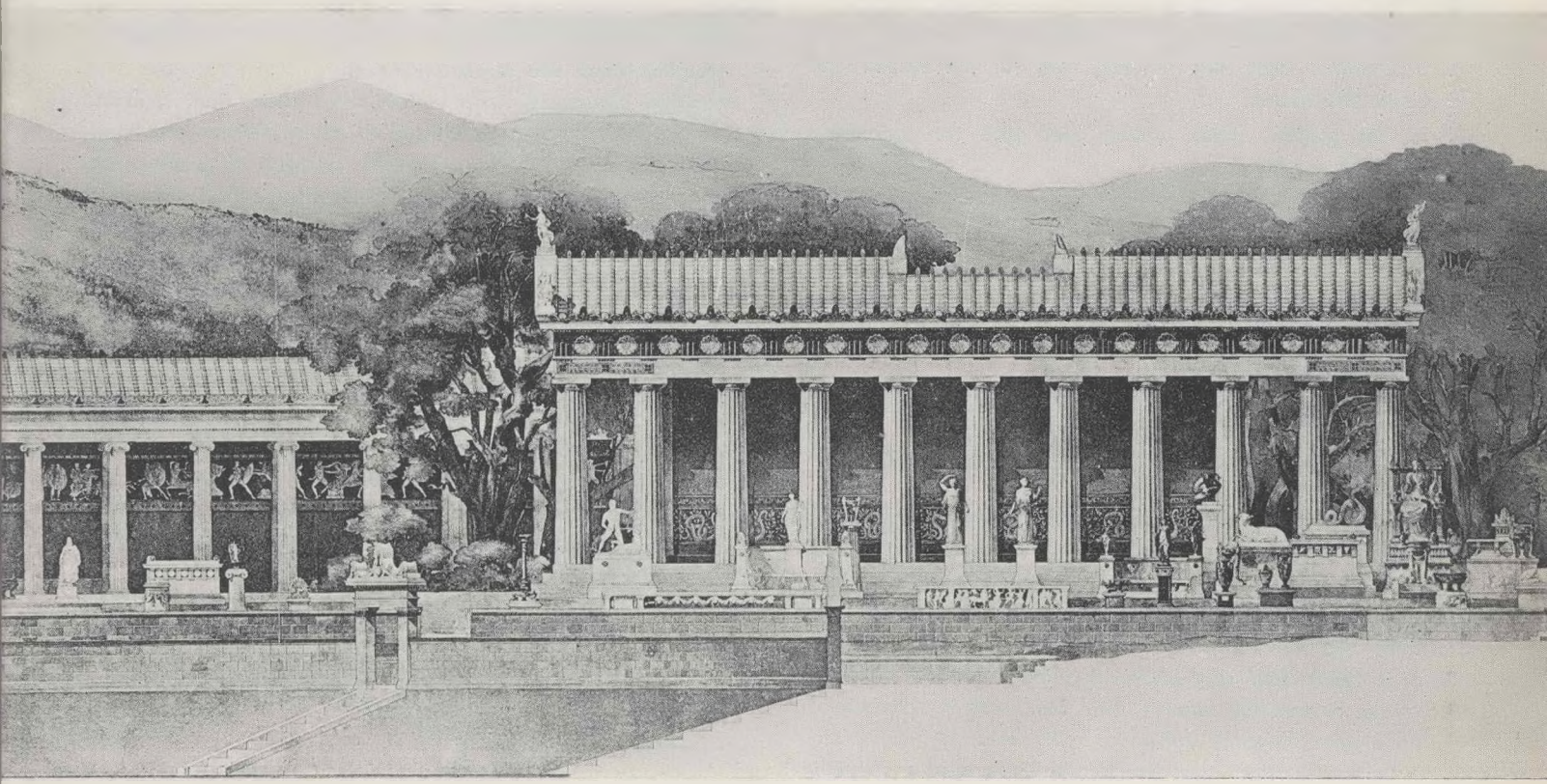
One may well ask why " the bright intellectualism " that Gardner finds enshrined in the Greek temple should break down so completely when the final dimension to plastic creation was envisaged as colour. When Gardner suggests that the Greeks, though masters of form, were not sensitive to colour he imposes a prejudice on work that united processes (shaping of solid form, colouring of solid form) which we now separate in terms of the visual experience and intellectual attitude that have been built up in the past twenty centuries. One of the reasons for the prejudice is that our attitude to material tends to be sentimental ; the Greek regarded his Parian or Pentelican marble as valuable for its purpose ; there is every indication that intrinsically it had no charm for him, but to succeeding cultures the marble took on a beauty of its own, and any idea of applied colour was therefore repugnant. Greek " taste " is thus questioned on this point, and must be either censured or condoned. That marble, as such, did not appeal to the Greeks is evidenced by the fact that they left untouched rich seams of coloured stone which was subsequently used by the Romans. Even where visual requirements did not demand colour application the marble was toned down by a waxing process to dull its brightness.[32]

In general the evidence shows a controlled and formal use of colour in architecture, and in the matter-of-fact summary of Choisy[33] we see the same degree of standardisation that characterises the juxtaposition and inter-relation of capital to shaft—of triglyphs to metope. " Les couleurs de l'époque archaïque," he writes, " sont, pour les grandes surfaces, le blanc, l'ocre clair, le rouge et le bleu ; pour les détails, le vert, le bleu, le jaune franc et le noir."

The results of our enquiry may be tabulated in condensed form, for there is sufficient widely separated evidence to establish the general use of the following colours:

RECONSTRUCTION OF THE TEMPLE OF ASCLEPIOS AT EPIDAURUS

(from Monuments Antiques)



A general distinction can be made between the Poros temples built prior to the middle of the fifth century and those built after the wide use of marble technique. In the former the stucco was used as a refining agent without knowledge of the appearance of an integral marble structure with its capacity for receiving extremely delicate cutting; in the latter the marble structure existed as a model and a standard to be emulated in a combination of rough core and smooth stucco. Our knowledge of the buildings at Epidaurus (from fragments) indicates that the precept of marble technique induced great refinement in finished effect; the Temple of Asclepios, in fact, seems to have been a building of outstanding harmony and poise when considered as a plastic whole.

(1) Pale yellow or other light colour, or waxing process to reduce glare, for column shafts and architraves. The former for Poros which was stuccoed, the latter for marble.

(2) Blue for triglyphs, sometimes with a darker shade of blue in the grooves.

(3) Red for edges and soffits of mutules, with spaces between, blue ; or blue mutules with red space.

(4) White, bright blue, or blue for the sima.

(5) Dark red or dark blue for the surface of the tympanum.

(6) Self-colour, dark blue or dark red, for the background of metopes and friezes.

(7) Green, yellow, black, brown, and gold for secondary elements of the cornice.

Note: The vigorous red and black on yellow ground of the terracotta cornices of the Geloan treasury at Olympia and of Temple " C " at Selinus, with their strong affinity to vase firing and painting technique do not appear to have continued as a colour combination in the stucco on Poros treatment and later marble constructions.

Our examination of colour as applied to the Greek house showed a predominantly planar and interior use ; let us now consider in some detail the use of colour in the context of the Doric temple.

Strong colour as applied to the temple covered a relatively small proportion of the frontal area of the structure, and in the portion so treated no single colour was used over a large area. We have seen that the pale tints on columns and architraves did not fundamentally change the tones of the material to which they were applied (stuccoed Poros or Marble) and we can reasonably assume that the vertical surfaces of crepidoma were finished uniformly with columns and architraves. Externally, therefore, the temple presented a virtually uniform tone from its base to the upper edge of the architrave which was only modulated by the shadows in the column flutes, and by the shaded wall surface of the cella behind the column screen.

At frieze level the rhythmic alternation of modelled forms is heavily accentuated by bold colour, and above this, further colour enriches the cornice. On the short sides of the temple the vertical plane of the tympanum with its deep colour serves as a background for coloured free-standing sculptures. The effect is of vigorous modulation and animated repetition of a " quicker " order than that of the separate and clear standing supporting columns which carry this superstructure.

The repetition of forms induces visually an effect equivalent to that of resonance in sound, and the application of colour strengthens this attribute. For example the deeply recessed triglyphs, though considered by some to be important in carrying the verticality of column shaft upwards, serve what is perhaps a more urgent optical function by providing a " chain " of stability in a horizontal direction. For though vertical in effect if considered as individual units, it is by their repetition that they are significant in the frieze. The " working " member of this supported construction is the architrave which through its own strength carries from column to column. It is noteworthy that this member appears to have been left virtually unaccentuated, while in the frieze above (which was comparatively free of structural duty) a deliberate scheme of optical effects was arranged.

Had this treatment been merely decorative, that is, in the form of a continuous frieze without structural division or accent, the final resolution of the order—the carrying of cornice, etc. —though feasible in a practical sense (the actual stonework of the frieze would be substantially the same as it is in the metope-triglyph system) would have been visually weak and unsatisfactory. The lack of formality which would have resulted from an intermediate and continuous surface " swimming " between architrave and cornice would have been inconsistent with the studied architectonics of the Doric scheme. From a visual point of view the triglyphs are satisfactory in that they support the members above, while they rigorously restrict the area of non-structural sculpture within controlled areas. The essentially rhythmical nature of the whole structure, established in the peristyle system of columns, is maintained in a minor, though not weaker scale.

●

Colour as an added " dimension " consequently plays an extremely valuable role. The architect has achieved by formal plastic means the degree of accent separation and structure that he deems necessary for aesthetic unity ; what light is capable of affecting as modeller he has used as a constituent in his design. But the uniformity of the material with its continuous tones tends to merge the individual forms even if rhythmically arranged, and modulated in plane, so that only in strong sunlight or under favourable conditions of aspect can the full intention of his scheme be realised. Colour as applied to the elements of Doric architecture thus has primarily an extending function in rendering this modulation independent of transient light conditions. Even when the light is thin, forms that are strongly coloured and separated by complementary colours between become immediately apprehensible by the spectator. Colour provides additional freedom and



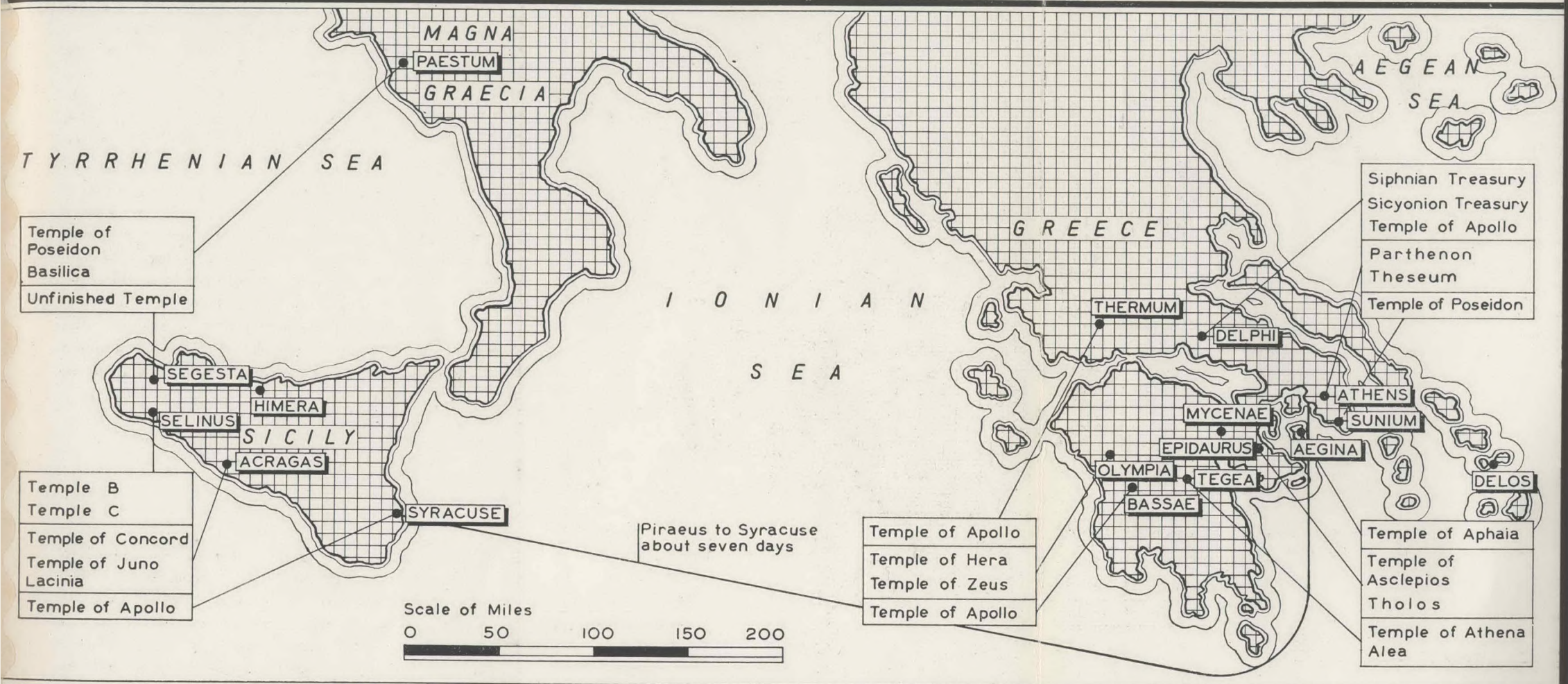
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2

Map showing the Temple sites mentioned in the accompanying paper

(Drawn by H. M. Martienssen)



3

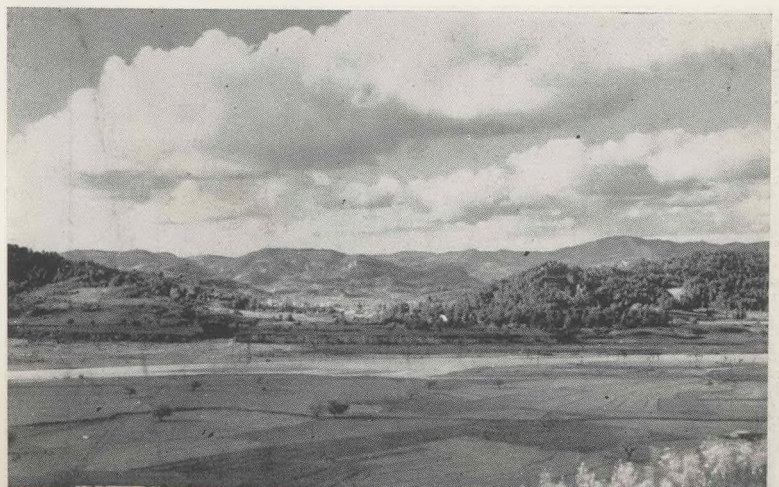
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1. Temple of Juno Lacinia, Acragas—Photo H.M.M.

2. Delphi—Photo Hürlimann.

3. Olympia—Photo Hege

4. Temple of Aphaia, Aegina—Photo Bon





articulation to the shapes that the sculptor and architect have been at pains to express as sharp and distinct within the limits of material technique and unity.

Hence one colour is never continued over the surfaces of differing units, but each similar unit bears a common colour. Red mutules are separated by blue areas ; blue triglyphs are separated by the polychrome patterns of metopes. Even within the area of the blue triglyphs, as we have seen, there is sometimes a further modulation given by the use of dark blue in the channels where the form naturally suggests shade.

VII. OPTICAL REFINEMENTS IN THE FIFTH CENTURY B.C.

It has been suggested above that the architect of the Doric temple achieved the degree of accent, separation and structure that he considered necessary for aesthetic unity within the restrictions of practical technique. Let us now examine some of the factors involved in the design of a temple at a time when the architect with the accumulated experience of centuries is richly equipped to meet the problems attendant upon the production of spatial harmony and unity.

On the Parthenon was lavished all that Periclean Athens could command in the way of designing talent, craftsmanship and material. In this single building, by common consent the crowning achievement of Doric effort, we are able through the many studies that have been undertaken to probe the minutest details and gain an insight into the resources that went to its making.

The Parthenon measured on the stylobate 101 feet 4 inches x 228 feet 2 inches, and was carried on three steps, the two lowest of which were 1.69 feet and the upper 1.81 feet in height. The columns measure 34.22 feet in height, and have a lower diameter of 6.23 feet. The intercolumniation is 7.78 feet at sides and ends, but less at the angles of the peristyle. The end width of the pteron is 15 feet, and at the sides it measures 13·9 feet.

The intention of the architect that the forms of the building "be adapted to the eye of the spectator"[34] broadly explains the modifications from parallelism and rectilinearity that were observed by Cockerell in the Parthenon in 1810, and which were measured by Penrose in 1846. The changes from the basically established shapes of the Doric temple may be summarised as :

(1) A slight upward curvature of the stylobate and entablature.

(2) A slight inward inclination of the column axes.

(3) An entasis or swelling in the diminishing columns.

(4) A slightly increased diameter for the angle columns of the peristyle.

(5) A deviation from the vertical in surfaces such as that of the architrave.

All these refinements entailed, according to Dinsmoor[35] ." a mathematical precision in the setting out of the work and in its execution which would have been impossible in any other material than the Pentelic marble with which it was built."

Following the order of the list above we may consider these points in more detail.

Curvature of stylobate and entablature.—Penrose was of the opinion that the curvature was initially formed in the entablature to counteract a sagging effect arising from the sloping form of the pediment, and that to maintain uniformity in the column height the stylobate followed the line thus established. Vitruvius[36] states that " the stylobate should be so adjusted, that . . . it may be highest in the middle. For if it be set out level, it will have the appearance of having sunk in the middle." Dinsmoor considers it likely that the Greek architect started, as Vitruvius implies, with the stylobate and adjusted the superstructure afterwards to comply, rather than by the reverse procedure suggested by Penrose.

The rise of the stylobate in the middle of the short sides was 3.0 inches, and on the long sides just over 4.0 inches." D'Ooge[37] comments on the optical illusion by which a long horizontal straight line with a number of vertical lines resting upon it appears to sink in the middle and rise towards the ends. There seems little doubt that such curvature as was included was intended to give elasticity to the structure, and to prevent the " deadness " that might have been a bye-product of the rigidly geometrical and complex arrangement of steps, columns and entablature.

Inclination of columns.—The inclination of the peristyle columns to aid the visual stability of the building, or to provide a so-called pyramidal effect, called for minute adjustments in the structure. The angle columns for instance which were inclined inwards on the bisecting line of the angle between long and short sides, rested on a stylobate that sloped in two directions and at two rates of slope. The intermediate joints of the column drums were maintained horizontal, while the upper surface of the abacus had to follow the curving soffit of the architrave. This column inclination (about 7 cms. in the whole height of the column, and slightly more in the angle columns) has the effect of preventing an outward falling



The boldly jutting abacus and bowl-shaped echinus of the archaic capital are well shown in the remains of the "Basilica" at Paestum (565 B.C.)
Photo/R.D.M.

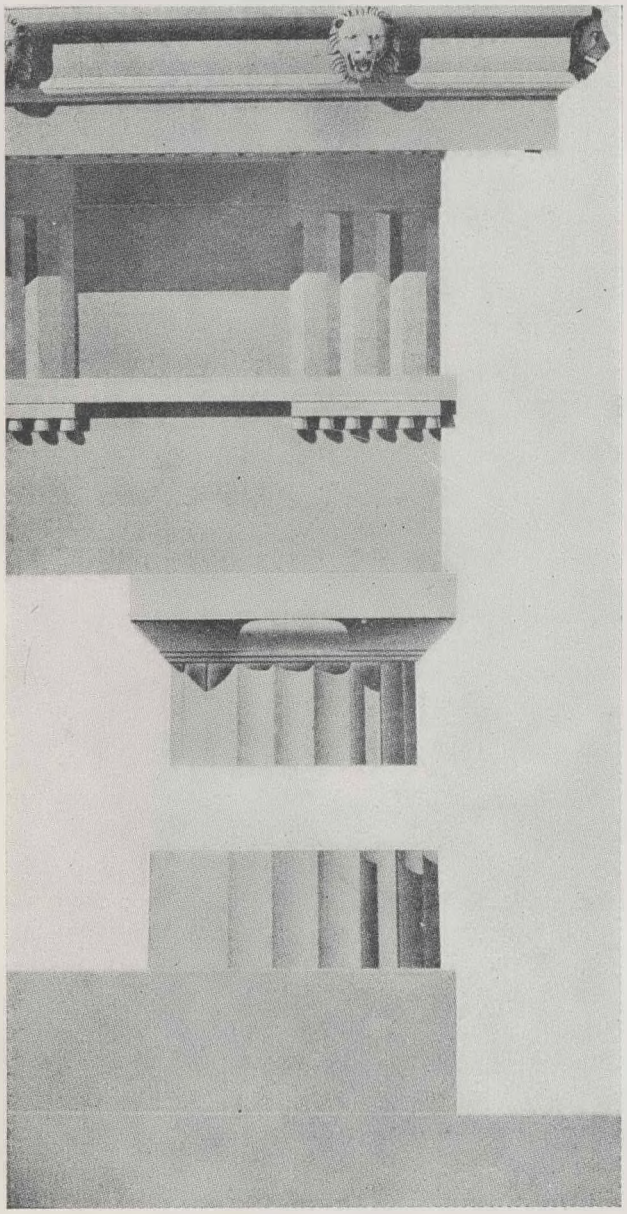
appearance which the individual diminution of the shafts may be insufficient to counteract.

Reference to the characteristic archaic column arrangement where the face of the architrave tends to be flush with the upper surface of the column shaft, and not to overhang so boldly as it does in the Parthenon and Propylaea orders, suggests that this particular refinement was a compensatory device which was necessitated by the gradual change in relationship between the elements of the peristyle. However heavy the superstructure of Temple "C" at Selinus may have been in comparison with later examples, there does not appear to have arisen the need for an "all-over" tightening or strengthening of the silhouette by such a device as that resorted to in the case of the Parthenon. In the case of the earlier temple the visibly limiting lines of the entablature did not override the supporting columns, and therefore did not suggest strain or disrupture in the composition.

Entasis in Columns.—The acknowledged purpose of this modification to column shape is to offset the possible concavity of effect which tends to accompany a straight-sided column. According to Penrose's finding the total increase (at the maximum point about 2/5 the height of the column) amounts to about 1/55 the lower diameter.

Increased diameter of Angle Columns.—The increased girth of the angle columns appears to have been a device to avoid an effect of weakness where the columns are often seen in silhouette against the sky, in comparison with the remainder of the peristyle which is "read" against the opaque walls of the cella. If this explanation is the correct one, the change in diameter is a matter of direct optical correction, and an understandable one in view of the siting of the temple which stresses the oblique viewpoint, and which in turn renders an impeccable three-dimensional harmony essential in the total structure.

In contrast with the Archaic capitals shown opposite, the 3rd C. order from the Stoa at Cnidus shows a tight silhouette, a noticeable delicacy in all the component parts.
Drawing from Stratton—"The Orders of Architecture."



Inward slope of Architrave, etc.—The inward slope of the architrave echoes the "pulling in" of all principal vertical surfaces, and their final resolution (on the end elevations) in the rapidly converging lines of the pedimental mouldings.

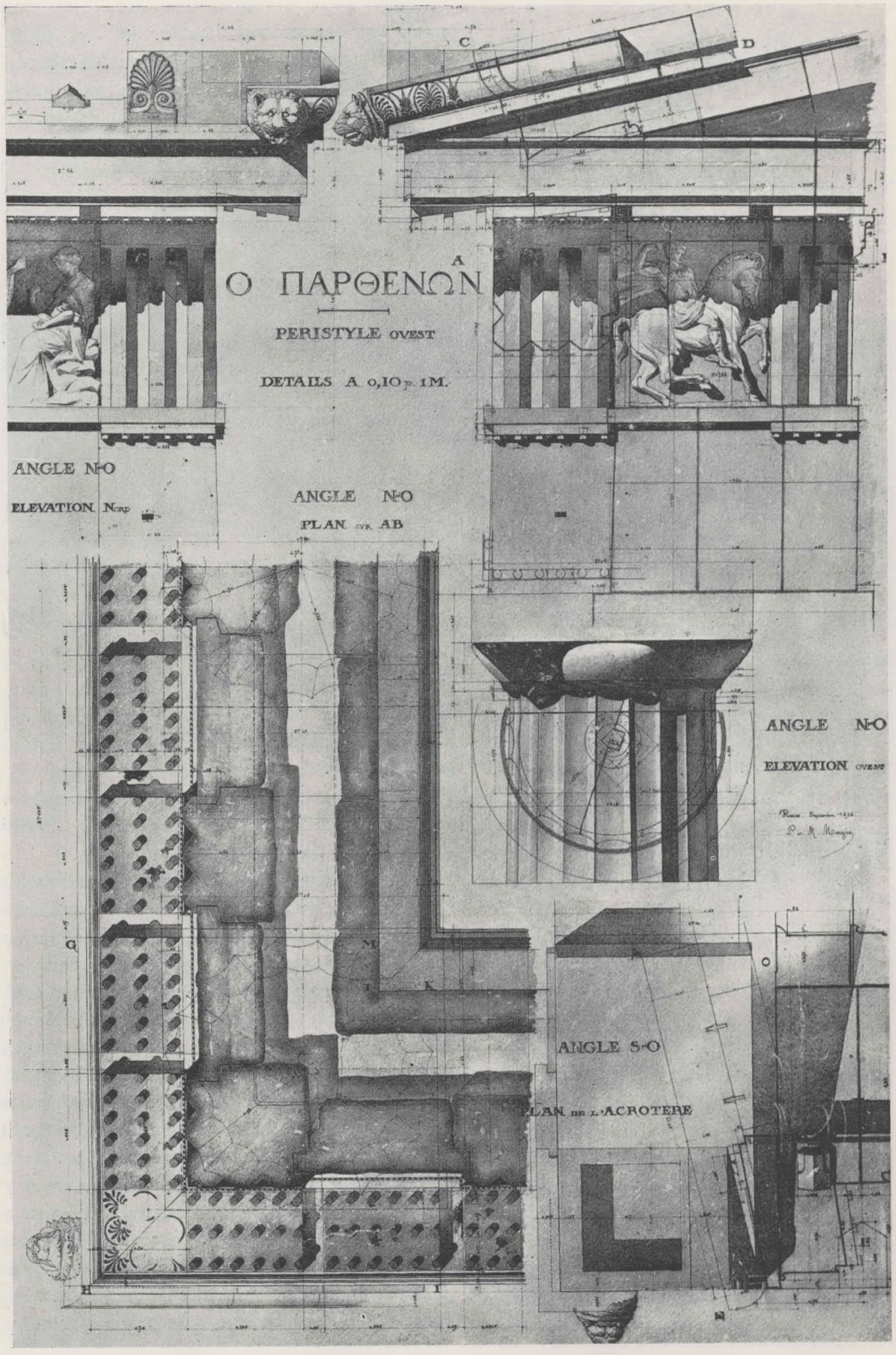
The technical achievement is impressive, and so also is the unrelenting search for perfection in relationship and completing unity. We must ever be amazed at the singleness of purpose and the idealism that made such an undertaking practicable. For here is no utilitarian project, no state construction for defence or public welfare, but a demonstration of human inventiveness in the satisfaction of aesthetic demands. The Doric temple approaches universality and sublimity in its high degree of abstraction, and in Blomfield's felicitous phrase "It is (the) abstract quality which lifts Greek Doric so far above the ambitious art of later ages, and indeed above all but the very finest work of any period of architecture."[38]

VIII. TEMPLE SCULPTURE

General.—There has been reference to sculpture in the discussion on colour in the Doric temple, and we may conclude this section on the temple by a brief statement on the characteristics and placing of sculpture in that context. Three zones were employed for specific application: (1) The Metopes; (2) Continuous friezes (such as that representing the Panathenaic procession on the outside of the Parthenon cella wall), and (3) The Pediments.

Free-standing statues such as those representing the god to whom the temple was dedicated, and which stood in the cella, do not form a structurally unified part of the building; and cult statues placed outside the temple but within the temenos do not come within our present survey. The latter, however, played in many cases an important part as accents in the general grouping of forms within the temenos, and as such we may have occasion to discuss them later. At present we may note the dominant statue of Athena Promachos on the Acropolis at Athens, which was an entity of sufficient bulk to constitute a focal point within the sacred enclosure.

(a) Metopes.—Metopes commonly took the form of sculptured panels set between the triglyphs, and achieved at different periods a varying degree of architectonic unity with the outer elements of the Doric temple. We have seen that a high standard of unification was attained in the metopes of Temple "C" at Selinus, where the geometry of the temple


C
D
A
Ο ΠΑΡΘΕΝΩΝ
PERISTYLE OVEST
DETAILS A 0,10 p. 1M.
ANGLE N-O
ELEVATION N-O
ANGLE N-O
PLAN SUR AB
ANGLE N-O
ELEVATION OUEST
G
M
K
ANGLE S-O
PLAN DE L'ACROTERE

design was strongly echoed in the formalism of the figure treatment in these panels. Lawrence[39] places these metopes close to 500 B.C. although he quotes the opinions of Studniczka and Langlotz as suggesting 540 and 520 B.C. respectively. Charbonneaux[40] places them in the first half of the sixth century, and suggests the Perseus and Medusa metopes as "le meilleur exemple . . . d'une scène théâtrale incluse dans un cadre architectural . . ." Fougères[41] sees in the group depicted an action that is as "rapide comme une scéne eschyléenne." The arrangement of the figures in this metope shows a close approach to the isocephalism of the vase painters, in that the raised hand of Perseus is placed so as to bring the Medusa form level with the heads of Perseus and Athena.

An example from Delphi (mentioned earlier in the discussion on colour) is worthy of note. The "Cattle-raid" fragment of the Sicyonian treasury lacks what Charbonneaux calls "la rudesse presque brutale" of the Temple "C" metope, and though dating from about the middle of the sixth century displays a sense of movement that contrasts strongly with the atmosphere of tension and suspended action that marks the Perseus and Medusa metope.

Picard and de la Coste-Messelière[42] describe this movement of the marching figures—"ils vont d'un pas cadencé, dont le rythme militaire s'impose curieusement aux animaux escortés . . . ." Removed from its setting this small panel (only $22\frac{1}{2}$ inches in height) with its ambitious and complex arrangement of human and animal forms offers within the depth of its modelling (about $2\frac{3}{4}$ inches) a small-scale demonstration of spatial control and formal rhythm that is symbolical of the whole range of Greek plastic art. It should be remembered that this sculpture was much closer to the spectator than the

Opposite: A measured detail of the Parthenon drawn by Magne, from Fougeres—Le Parthenon (portfolio of photographs and drawings, Morancé, Paris)

Below: The Parthenon to-day as seen from the direction of the Propylaea (English Photographic Co., Athens)



Selinus example owing to the smaller dimensions of the treasury, and therefore a finer scale was not only commensurate with its setting, but from a purely pictorial point of view, justified.

Especially significant in relation to the spectator is the great complexity of form, and the bold essay at internal rhythm. At Selinus there was, in the three salient figures, a static arrangement whose rigidity contributed to the collective rhythm of repeated metope and triglyph ; in the example from Delphi there is a sign that the sculptor is not always willing to subordinate his art to the dictates of an architectural framework, and the work of succeeding centuries will show the effects of this independence. One hundred years later the Parthenon metopes recorded the degree of freedom reached by the sculptor, and here naturalism and suggested movement are such as to negate all idea of formal rhythm.

(b) Frieze.—The frieze in Doric architecture[43] is of secondary importance, and in the present survey we need mention only one example (actually Ionic) which is interesting from the point of view of spatial treatment. The Treasury of the Siphnians at Delphi, built about 525 B.C. though only a small building " is one of the most richly decorated of such buildings that ever existed . . . The whole (being) built of Parian marble and brilliantly coloured . . ."[44] In the fragment illustrated opposite (25 inches in height) there is a notable display of vigour and brilliant arrangement within the small compass of $2\frac{1}{2}$ inches depth of carving. Seven or eight planes are defined within this depth, and the square cutting back from these almost flat surfaces imparts a precision and austerity that accord well with an architectural setting.

(c) Pediment.—The free-standing sculptures of the pediment presented a peculiar problem to the sculptor. At first glance the horizontal and raking cornices appear to offer an admirable framework for a group of statues, but the exacting nature of the space so defined, and the rapid diminution of practicable volume towards the outer edges imposed an acute restriction on the grouping and scale of the enclosed and separate forms.

As one may expect the development of pedimental treatment echoes that of the metope, and in a parallel sense reflects the changes that occurred in the relationship between the purely architectural forms as they were modified during the period 600 to 400 B.C. For our present purpose it is proposed to examine four arrangements distributed over this period, and in so doing, to attempt an estimate of the spatial effect achieved in each case. The examples are as follows :—

(1) Pediment from the Temple of Artemis, Palaeopolis, Corcyra : about 580 B.C.

(2) Pediment from the Temple of Aphaia, Aegina : sculpture c. 480 B.C.

(3) Pediment from the Temple of Zeus, Olympia : 460 B.C.

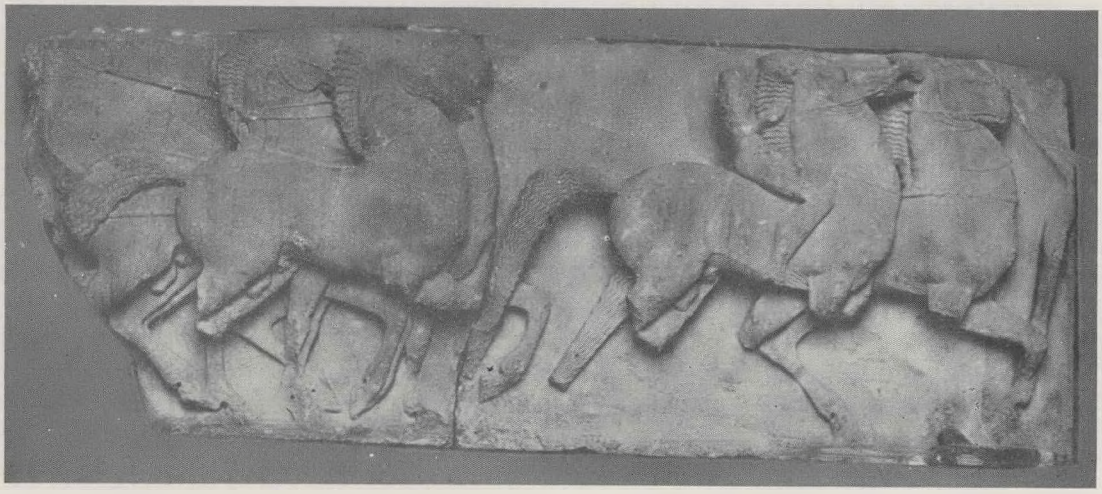
(4) Pediment from the Parthenon, Athens : 447 B.C.

Temple of Artemis, Palaeopolis.—The pediment of this temple has been restored by Buschor from fragments found in 1910.[45] The scheme is an extremely direct one, boldly articulated, and powerful in effect through the restricted number of elements in its composition. The focal point is provided by a large Gorgon over 9 feet 0 inches in height, and flanked by her attendant animals (lions or leopards) and by her offspring Pegasus and Chrysaor. To a smaller scale battles between the gods and giants are portrayed towards the angles. The handling of the main elements, particularly of the large animals is masterly in its adjustment to the sloping shape of the leopard backs, and the dramatic closeness with which the whole animal form fits the lines of the pediment once more demonstrates the peculiarly archaic vitality to which reference has been made earlier.

The complete change of scale for the groups of gods and giants is a daring device that results in a note of visual tension. The method of filling the greater part of the space with a large-scale group rather than dissipating the interest over a multiplicity of smaller forms is an early triumph of space arrangement in this exacting context. We may note in this example that " In all the human figures there prevails a heavy rectangular structure, due to the flat, broad surfaces by which the body is rendered . . ."[46] This attribute accords with the treatment of the Selinus metopes, and offers an interesting forecast of the technique of the Siphnian frieze.

To summarise, the Artemis pediment shows (a) a minimum number of elements ; (b) a bold separation of these elements which thus retain their individuality within the frame, and (c) a strong rhythm that carries, however, little suggestion of potential movement within the figures themselves.

Temple of Aphaia, Aegina.—The " transitional " temple of Aphaia shows a considerable change in attitude to the treatment of pedimental sculpture. The remains of the sculptures of this temple were discovered amongst its ruins in 1811, and are at present in Munich. The west pediment was first reconstructed by Thorvaldsen, later by Furtwängler (with additional material and still further modified by Schrader). Lawrence[47] refers to the west figures as being " thinner, harder, more compressed " (than those of the east pediment) the facial treatment still showing the " archaic smile " while the east figures " are more contoured, of greater fullness and softness of form . . ." A figure from the west pediment is " still of conventional construction . . ."



Fragment of the Frieze of the Siphnian Treasury, Delphi, about 525 B.C.

PHOTOGRAPHS BY THE WRITER, DELPHI MUSEUM 1933



Fragment of a Metope from the Sicyonian Treasury, Delphi, about 550 B.C.

Frazer[48] finds that "Their style is on the whole hard, stiff, and wanting in idealism." On the contrary one must suggest that this "hardness" and "stiffness" betokens a realisation of the primary restriction of architectural sculpture—that the architectonic mood of the whole shall not be weakened by misplaced naturalism. It is true that the grouping and scale of the figures indicate the growing desire for suggested action and greater strain in the positions assumed by the figures. What Frazer (and many of the critics of the 19th century) felt to be an inadequacy is more justifiably to be explained in terms of the aesthetic intention of the Greek Doric temples as a whole rather than from the standpoint of later naturalism which has always offered a tempting standard by which to measure earlier work.[49]

The west pediment at Aegina[50] shows thirteen figures of which the central figure is upright, the remainder being in various positions dictated by the exigency of their settings. Immediately on either side of the centre line are two balanced groups of three, each containing two opposing figures in combat with one reclining between them. In the next zone there are again three figures on either side—two kneeling or crouching and one reclining. The greater number of elements produces greater continuity of pattern, and consequently rhythm of a smaller measure than that which we have seen in the Artemis temple in Corcyra. We are not conscious in the present scheme of boldly carved "objects" set in a frame in such a manner that their own identity is clearly maintained within the greater unity of the temple fabric. Within their smaller pattern, however, the figures are carved with a degree of formal organisation that is consistent with the lessened archaism of the temple itself.

Temple of Zeus, Olympia.—The pediments of the Temple of Zeus—only a few years later than those of the Aphaia temple—show a considerable increase in the number of figures and a greater degree of "realism" than appear in the earlier example. The generally accepted reconstruction of the west pediment by Treu[51] with its strong triangulation and rhythmical grouping (the figures are arranged on a system 1, 3, 2, 3, 1, 3, 2, 3, 1) achieves a greater compactness than was possible with the fewer figures and less flowing relationship of the Aphaia pediment.

The Parthenon, Athens.—The evidence for the arrangement of the pediments of the Parthenon is provided chiefly by Pausanias's description, and the drawings attributed to Carrey and made before the explosion of 1687.[52] The style of the individual figures has been summarised by Lawrence in the following statement "A discreet naturalism, in which the sense of pattern is never overwhelmed, marks the rendering of the nude, while richness is the prevailing quality of the drapery." The definition of pattern must be a wide one to embrace the disconcerting richness of the treatment, for in these figures there are only softness and flow that border on the amorphous, and one seeks in vain some of the structure and firmness of "archaic" work that legitimately relates the sculpture to its setting. Gardner[54] refers to the Parthenon arrangements as "the acme of pedimental composition" but fails to convince one by his cursory example of "subtle balance and rhythm" in the east pediment.

It is only too apparent that the rich verisimilitude of drapery, and the technical mastery of free form have become desirable conditions in themselves with an incalculable loss of meaning in the architectural sense. Examination of free-standing sculpture of the second half of the fifth century and of the fourth century confirms a steady decline in formal significance which was inevitably reflected in temple sculpture.

IX. CONCLUSION

A few of the significant aspects of Doric temple architecture have now been covered, but in this paper the temple has been regarded only as an isolated entity, and we may ask what was its broader meaning architecturally—what function did it fulfil in the architectural scheme of the Greek city or sanctuary.

This aspect is a large one, and the foregoing analysis may be regarded as the groundwork for a discussion which will deal with the arrangement of characteristic sanctuaries in Greece and Sicily. The subject is too wide to compress into a single paper and it has seemed to me advisable to establish the appearance and contributory forms of the temple before proceeding to a consideration of the spatial attributes of the temple in its setting. It is hardly necessary to stress the Greek achievement in architecture, though perhaps one may note the changing attitude in interpreting its meaning and interest for us.

The buildings that sprang from a so-called Greek revival reflected an overwhelming preoccupation with the minutiae of the Greek "style," and the transcription of Greek forms into contemporary contexts was a dubious method of recognising the heritage of Greece. To-day we search a little deeper to interpret the lesson of Greece, and the fact that we do not copy must not be thought to indicate lack of either understanding or appreciation. This paper and the one that will follow are attempts to integrate the knowledge we have, and draw some fresh conclusions from it.

NOTES.

1. See E. A. Gardner : **Mythology and Religion**, Chap. V, in Cambridge Companion to Greek Studies.
2. Rodenwaldt: **Die Kunst der Antike**, illustrates the decoration of Tiryns in colour: plates 3 and 4. See also Bossert : **An Encyclopaedia of Colour Decoration**, Figs. 49—52, for colour decoration at Tiryns and Mycenae.
3. Myres: **Who Were the Greeks ?** pp. 270 ff.
4. Perrot and Chipiez : **Art in Primitive Greece**, vol. 2, see Fig. 298 for reconstructed elevation of the megaron at Mycenae.
5. Robertson : **A Handbook of Greek and Roman Architecture**, pp. 62 ff.
6. Robertson : **The Background of Greek Architecture**, in Proceedings of the Hellenic Travellers' Club, 1932. An interesting discussion on the Temple of Hera from historical and technical points of view is given in this paper.
7. See Anderson, Spiers and Dinsmoor : **The Architecture of Ancient Greece**, pp. 62, 63 for description and illustration of the "Megaron" at Selinus.
8. Hope Bagenal : in **Journal of the Royal Institute of British Architects**, for June 6th, 1936.
9. Picard : **Manuel d'Archéologie Grecque**, p. 353.
10. See **Bulletin de Correspondance Hellénique**, vol. LXII (2) 1938, pp. 370 ff. for an illustrated paper on the reconstruction of the Tholos at Delphi.
11. See Frazer : **Pausanias's Description of Greece**, vol. 3, p. 245 for a detailed description of the materials employed in the Tholos at Epidaurus.
12. The pediment figures and metopes were of Parian marble.
13. Dickins : **Catalogue of the Acropolis Museum**, vol. I, Archaic Sculpture, p. 35.
14. Frazer : op. cit. vol. 3, pp. 502, 503.
    14a loc. cit.
    14b loc. cit.
15. Dickins : op. cit. p. 37.
16. Dickins : op. cit. pp. 10, 11.
    See also generally Casson : **The Technique of Early Greek Sculpture** ; and Payne and Young : **Archaic Marble Sculpture from the Acropolis.**
17. Frazer : op. cit. vol. 3, pp. 240, 241.
18. Frazer : op. cit. vol. 3, p. 248.
19. See Picard : **L'Acropole, L'Enceinte, Les Propylées**, Portfolio and text ; and
    Fougères : **Le Parthénon**, Portfolio and text, 2 vols. for large photographs of architectural details of the Acropolis buildings.
20. Anderson, Spiers, Dinsmoor : op. cit. p. 92.
21. Anderson, Spiers, Dinsmoor : op. cit. p. 88.
22. Actually the incipient decadence finally "matured" in Rome, where the pseudo-peripteral temple (that is the temple **apparently** surrounded by columns) marked the close of the long march of cella wall towards peristyle, screen and wall merging in a mutual loss of identity and meaning.
23. Comparative analysis of measured drawings of archaic and late Doric temples shows the nature of this redistribution of mass.
24. D'Ooge : **The Acropolis of Athens**, p. 169.
25. D'Ooge : op. cit. p. 170.
26. Magne : **Le Parthénon, Etudes faites au cours de deux missions en Grèce (1894-1895)**, pp. 93, 94.
27. Robertson : op. cit. p. 50.
28. E. N. Gardiner : **Olympia**, p. 277.
29. Poulsen : **Delphi**, p. 141.
30. Dickins : op. cit. p. 36.
31. See for instance Percy Gardner : **Principles of Greek Art**, pp. 47, 48.
32. Dickins : op. cit. p. 40.
    With reference to Greeks not using coloured marbles see Hope Bagenal : **J.R.I.B.A.** for August 5th, 1933. "They mined beneath them for the white Pentelic."
33. Choisy : **Histoire de l'Architecture**, vol. I, p. 296.
34. Percy Gardner : **Grammar of Greek Art** (1905), quoted by Anderson, Spiers, Dinsmoor : op. cit. p. 119.
35. Anderson, Spiers, Dinsmoor : op. cit. pp. 119, 120.
36. Vitruvius : **Architecture** (Gwilt's translation) ed. 1874, p. 73.
37. D'Ooge : op. cit. p. 118.
38. Blomfield : **The Touchstone of Architecture**, p. 154.
39. Lawrence : **Classical Sculpture**, p. 145.
40. Charbonneaux : **La Sculpture Grecque Archaïque**, p. 23.
41. Fourgères : quoted by Charbonneaux, loc. cit.
42. Picard and de la Coste-Messelière : **La Sculpture Grecque à Delphes**, p. 10.
43. See Picard : **Manuel d'A. Grecque**, Chap. VII generally, and Fig. 107 for arrangement of frieze on five Doric temples.
44. Anderson, Spiers, Dinsmoor : op. cit. p. 106.
45. Two excellent photographs (plates 24 and 25) appear in Charbonneaux op. cit. showing details of leopard and Gorgon. Robertson : **Gr. and Roman Arch.** shows Buschor's restoration, p. 70, also Lawrence : op. cit. Fig. 19.
46. Lawrence : op. cit. p. 110 and p. 112.
47. Lawrence : op. cit. p. 149.
48. Frazer : op. cit. vol. 3, p. 271.
49. See Martienssen : **The Changing Generator in Greek Sculpture**, in South African Architectural Record for September, 1936, on this question.
50. See Charbonneaux : op. cit. pp. 20, 21 for reconstruction drawing of West Pediment, Temple of Aphaia, Aegina.
51. See E. N. Gardiner : op. cit. Fig. 83, for Treu's reconstruction ; also Percy Gardner : op. cit. pp. 119-121 for discussion on this example.
52. See Fougères : **Le Parthénon** for photographs of pediment remains, also reproduction of drawings attributed to Carrey (Plate 46) vol. I, 2nd album.
53. Lawrence : op. cit. p. 203.
54. Percy Gardner : op. cit. p. 123.

LE CORBUSIER AND THE U.S.S.R.

The Editors,

The South African Architectural Record,

Sirs,

Twice during the last six months the architect Le Corbusier has been attacked in the pages of your journal; the first time, briefly by Mr. Delbridge; the second time, at slightly greater length by Mr. Kantorowich. I say "the architect" has been attacked and not "his work" deliberately, for both Messrs. Delbridge and Kantorowich have couched their criticisms in an extremely personal manner. The outcry of the former contributor savoured too much of uninformed facetiousness to warrant a serious reply in these pages, but the article of the latter writer, which appeared in your January issue, seems to be a misinterpretation of available data, rather than an expression of complete ignorance, and as such must be answered lest any unwary reader be misled by so spurious an array of arguments.

I should like to state at the outset that this letter is not written in defence of M. Le Corbusier. It would be grotesque to suggest that he or his work needs defence against the kind of argument contained in the article under discussion. In spite of the fact that Mr. Kantorowich has drawn up his sentiments in the form of a Prosecution rather than of a serious investigation, I shall not play the rôle of Counsel for the Defence, but merely review the case he presents, clause by clause.

Mr. Kantorowich has called his paper, "The Modern Theorists of Planning; Le Corbusier, Frank Lloyd Wright, Etc." Since he deals only with the two architects named, and takes the trouble to point out that he does only deal with those two, may we take it that the etc. represents merely a quick flip to his Ego before embarking on the task ahead of him? He tells us at the outset what his article is about: "a discussion of the writings and works of the modern theorists in City Planning, and an attempt at an evaluation of their work." Implicitly in the phrase quoted here, and specifically later on he tells us that Le Corbusier and Frank Lloyd Wright are the only contemporary city planners: that is why they alone are mentioned. The inclusion of Frank Lloyd Wright, who according to Mr. Kantorowich has designed only "one theoretical city" in a discussion of which the other subject is an urbanist of such international standing as Le Corbusier, seems a trifle arbitrary, especially as the writer views Wright's contribution with such apparent contempt. I am not concerned, however, at the moment with the work of Mr. Wright, defensively or otherwise; his inclusion in the article of Mr. Kantorowich appears at the present juncture merely a reflection on the sense of values of its author. It is Mr. Kantorowich's "case" against Le Corbusier that I propose to consider.

There appears at first glance nothing very new in Mr. Kantorowich's belittlement. We have heard all the old phrases so many times before in the general conservative reaction to modern architecture and town-planning: "inhumanity," "megalomania," "monotony," "lack of individuality,"—all of them are old and wearying acquaintances. But as we read on, the truth emerges—Mr. Kantorowich is not a reactionary of the old type, in spite of the stale flavour of his appellations. Words like "Bourgeois," "Capital," "Fascist," catch our eye: the truth dawns: Mr. Kantorowich's stand is a political one. The article may well purport to be "A discussion of the writings and works . . . . etc.," and "an attempt at an evaluation." What it turns out to be on reading to the end is "A superficial glance at the writings and works . . . . etc.," and "an attempt" to show that the architects considered are failures architecturally because of their political affinities, and possibly vice versa. Considering only the case of M. Le Corbusier, Mr. Kantorowich would have us agree, in the final analysis:

(1) Le Corbusier is a fascist, apparently because his schemes are designed to be practical under a capitalist system.

(2) He is an utopian because they are not designed to be practical under a capitalist system.

(3) He is a typical bourgeois anyway.

These appear (as far as one can gather amid the general clamour of Mr. Kantorowich's literary denunciations) to be the main findings of the Prosecution. Let us investigate these findings, and their "proofs."

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In his introduction Mr. Kantorowich briefly outlines the growth of the evils afflicting present-day Capitalism, and the dawning of modern architectural consciousness. His tendency

to over-dramatise the effect on artists of the last war leads him a little astray on one point at least : Cubism, for instance had its origin as a movement about 1908, and reached its climax before the war started. It was obviously not a post-war movement, and therefore cannot be interpreted as having arisen out of the disillusionment consequent on war.

The second part of the article is headed " Le Corbusier," and consists first of a summary of Le Corbusier's modern City, as outlined in his work " Urbanisme," and second of a short reference to the various books and schemes produced by Le Corbusier since that time. Although Mr. Kantorowich tells us he has " refrained patiently from comment so far," we are favoured at various points in this section of the article with jibes which the author evidently felt were too rich to suppress. One of these accompanies the summary of the last chapter of Le Corbusier's " Urbanisme." Mr. Kantorowich cannot resist referring to this chapter as " pathetically naïve," because Le Corbusier lightly suggests that foreign capital invested in Paris property would prevent the city being bombed by that foreign power. Mr. Kantorowich is evidently not so ironically aware as was M. Le Corbusier twenty years ago, of the factors that govern the conduct of warfare between Capitalist governments ! In any case this chapter was obviously not designed to bear the weight of such humourless intellectual searchings as have been brought to bear upon it by Mr. Kantorowich. Le Corbusier himself has anticipated criticism. " To suggest the demolition and reconstruction," he writes " of the centre of Paris may seem to many a joke in rather bad taste. But if a succession of considerations has shown, again and again, from many angles and many points of view, that such action is inevitable, what does that mean ? " He says, too, in stating the need for solution, to be offered by the economist, " to start him off there must always be some flash of thought, which must be true in a general sense, and of general significance." Again Le Corbusier says of his Paris scheme, " The Voisin scheme does not claim to have found a final solution to the problem of the centre of Paris ; but it may serve to raise the discussion to a level in keeping with the spirit of our age, and to provide us with reasonable standards by which to judge the problem. It sets up principles as against the medley of silly little reforms with which we are constantly deceiving ourselves."

Mr. Kantorowich deals very briefly with the development in attitude as manifested in Le Corbusier's " La Ville Radieuse," and contents himself with merely naming certain others of that architect's works. He tells us in a passing reference to Le Corbusier's Village Co-operatif that " The latter is in my opinion the finest community scheme he has yet produced." Yes, and probably the finest of its kind ever produced—if not the only one of its kind ever produced. But if Mr. Kantorowich does approve of this scheme, why does he not tell us about it, since " this essay is a discussion . . . . of the works " of Le Corbusier, and he obviously approves of nothing else ? Has not Mr. Kantorowich a tendency to leave out of his " discussion of the works " details which might tell against his final denunciation of Le Corbusier ? Again, more the attitude of an attorney than of a student of City Planning.

A friend of Le Corbusier, an agricultural labourer (ouvrier agricole) wrote to him :

" You have created the ' Ville Radieuse ' admirably. Now design for us the Village, the Farm."

Out of this suggestion grew Le Corbusier's scheme for the co-operative village, a brilliantly conceived unit designed from a basic desire to bring order to such a community, out of a fundamental regard for their needs as human beings ; a practical plastic conception—a monument to the idea of collectivisation.

Mr. Kantorowich, after his fleeting acknowledgment, " sums up " Le Corbusier's " stand-point." He finds surprise that Le Corbusier " brings no criticism of the city's right to continuing existence," and that he " accepts the present economic system." Surely any architect who is designing for the present, that is any architect who is not an " Utopian " is forced to design in a manner that will comply with present conditions, whether he approves of those conditions or not ? The architect cannot change the system by means of his designs, as Mr. Kantorowich loses no opportunity of telling us. He may be happier under a new system, less frustrated ; he may even produce better work under encouragement than under the prohibition of all he believes important. But if he is a " creator " he must create for the present, and therein lies his greatness. If Le Corbusier had decided twenty years ago that the social system under which he was living forbade any attempt at serious work, the gap in the world's significant architecture would have meant something more than that Mr. Kantorowich would have had nothing at all to criticise under the heading of " Modern Theorists . . . ."

For a man to contribute a revaluation of the whole significance of architecture and urbanisation to humanity, and to evolve principles and generalisations on such a gigantic scale as has Le Corbusier, is enough achievement for one great life. His achievement in the realm of architecture is at least as great as that of say Engels in political theory—probably greater since he stands more completely alone.

Nothing would be easier than for Socialism to claim Le Corbusier for its own. The basis of his whole attitude, every

truth he utters, every icon he destroys, every prejudice he seeks to eradicate in the name of humanity and progress, might have been the word and action of a present day political revolutionary : might have been, but were not. Le Corbusier has evidently preferred to carry on his work in an atmosphere which could not be disrupted by party squabbles, and the temporary and arbitrary rulings of short term party policies. Twenty years ago the French Socialists hailed and discussed his scheme for the New City. They were rather more generous than Mr. Kantorowich in recognising it as the expression of the new social consciousness : they acknowledged and accepted its technical brilliance, but wanted to label it as their own, to use it, as Le Corbusier tells us, as a grand justification for the " nationalisation of all property."

Le Corbusier refused to take a political stand. " I am an architect " ; he wrote, " no one is going to make a politician of me."

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The last section of Mr. Kantorowich's article is called " Criticism and Evaluation," and this is the section in which we are presented with his conclusions as to the political vagaries of his subject.

One of Mr. Kantorowich's main objections to Le Corbusier as a town-planner seems to be that he thinks Le Corbusier attaches too great an importance to architectural reform as a factor in improving the conditions of the people. A strange reaction for an architectural graduate ! He would have Le Corbusier humbler ! He denies the validity of the " Great Idea " in history. What about the " Great Idea " of Marx ? Surely the idea of the regeneration of architecture by means of the reconstruction of the architectural constitution of the city is no more "megalomaniac" than the idea of the regeneration of the people by means of the reconstruction of the constitution of society ?

One of the most difficult facets of Mr. Kantorowich's inexplicable attitude to Le Corbusier, is his shuddering reaction to Le Corbusier's use of the word " humaine." Not only the word, but all it signifies, is the keynote of Le Corbusier's architectural integrity. Mr. Kantorowich seeks passionately to deny this, and we cannot help wondering why. In the first place he mocks—though without offering a single reason for his mockery—at Le Corbusier's attitude, when he emphasises the purely aesthetic, formal, or abstract aspects of his designs. He does not like Le Corbusier's praise of geometry, though he again offers no reason for his dislike. Yet when Le Corbusier explains any conclusion on humanitarian grounds, this provokes even more frenzy from Mr. Kantorowich. And all this time Mr. Kantorowich offers not one word of explanation of the respect in which Le Corbusier manifests his inhumanity, nor any indication as to what lines Mr. Kantorowich's own ideas on humanity may take.

He obviously regards M. Le Corbusier as an impractical theorist. One of the reasons he gives for this appears to be that Le Corbusier first designs the City, and then justifies it economically. This seems a small issue on which to base so large a grievance. How, in any event, does one set about first finding an economical solution to a problem which has not yet been postulated ? At any rate Mr. Kantorowich finds this situation sufficient proof that Le Corbusier's " basic approach is wrong from the start," though again he neither enlarges on this statement, nor refers in any way to what would have been the correct " basic approach."

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So far Mr. Kantorowich has dealt only with M. Le Corbusier's theories. Now, he triumphantly offers, as " evidence " for his denunciation, an illustration of Le Corbusier's reaction " when faced with a practical problem." The crux of his whole case is the rejection by the Soviet Government in 1931 of Le Corbusier's suggestions for the replanning of Moscow. They justified the rejection by calling the scheme " Bourgeois " and " Capitalist." Since capitalist committees have also rejected Le Corbusier's schemes, calling them " revolutionary " and " Bolshevik," the terms of this reproof cannot be taken too seriously. The Bourgeoisie would be the last group to claim Le Corbusier as its white-haired boy ! The reasons for Moscow's rejection of Le Corbusier's proposals, were if we may summarise Mr. Kantorowich.

1. Their technical resources were not adequate to cope with a scheme of the nature proposed.

2. They did not feel economically justified in destroying usable buildings to replace them by new ones.

3. Socially, Le Corbusier's scheme did not seem to them to reflect the nature of their revolution, nor to be an expressive monument to their past struggles.

What makes Mr. Kantorowich's arguments somewhat misleading, is that he gives the impression that the authorities at Moscow were surprised at Le Corbusier's proposal. On the contrary, Le Corbusier's scheme for the redesign of the centre of Paris had been produced nearly ten years previously ;

in the interim his theories of the "Green City" had become more and more widely known. It was obviously on the grounds of these early radical designs that the Soviet Government approached Le Corbusier to obtain his suggestions, and it must have been with a full knowledge of his general far-sighted slogan—"surgery, not physic"—so opposed to the cautious methods and half measures familiar to us under present non-socialist conditions. The fact that the committee concerned with the proposals decided later that the scheme was not technically or economically possible is hardly a proof of Le Corbusier's "bourgeois" affinities.

We do not need to be told at this stage that Le Corbusier's City Planning projects are usually turned down as "impractical." That is the initial fate of every radical or revolutionary proposal to spring from a great creative mind. Le Corbusier was naturally, as Mr. Kantorowich tells us (and as he tells us himself) "bitterly disappointed" when the Soviets rejected his proposal. After years of frustration under the social and economic system of his own country, he probably pinned a stronger faith in the far-sightedness of a country which had shown the courage to face the implications of modern industrialised society, and set up for itself a new framework in face of the opposition of the rest of the world. What he had probably not counted on was the fact that the committee supervising the replanning of Moscow was trained in political but not architectural vision. The plan that was finally adopted by Moscow is not discussed by Mr. Kantorowich. It is noteworthy that its designer is not included by him among the "modern theorists of planning," whereas Le Corbusier is. The Soviet was possibly quite justified in rejecting the Le Corbusier plan; but rejection on the grounds that their technical resources were not advanced enough to meet his requirements, does not justify the attempt to stamp him as a reactionary! In fact we have some evidence to support the very opposite view. In the first place in 1928 Le Corbusier designed for Moscow the Centrosoyus building, or Palace of Light Industries. This was accepted (with no reference to Capitalism or the Bourgeoisie) and in 1930 came the invitation to tackle the redesign of Moscow. In spite of the "summary rejection" of this scheme (of which Mr. Kantorowich makes so much) Le Corbusier was invited in 1932 to submit, in competition with other architects, a design for the Soviet Palace, intended to "Crown the Five-Year Plan." In the terms in which this building was rejected we are shown the true reasons for the hesitation of the assessing committee. The Palace was intended to be a backward, not a forward looking monument. Le Corbusier expressed himself as being in complete understanding of the motives which prompted the final choice of a building designed on Italian-Renaissance lines. In spite of this second rejection the Centrosoyus building was subsequently completed in Moscow. If we were still in any doubt of the consciousness of the Soviet Policy at this stage, we have as reference an interesting item of information offered by Frank Lloyd Wright in his book "An Organic Architecture." He tells us that the deliberate policy of the Soviet Government was to design its monumental building in a style which could be easily appreciated by the older revolutionaries. The younger architects speaking to Mr. Wright in Russia quoted Stalin as saying:

"Yes, we want simplicity in building for a better life, but remember that this generation fought the war of the revolution; give them what they want now. We will tear it all down again in ten years."

If this report can be accepted as accurate, it reflects several things. First that Russia does recognise that what Le Corbusier stands for (in general) is the truth. Second, that it admits that it had not yet reached the state to accept modern planning and all that it involves, and not, as Mr. Kantorowich would imply, that the scheme itself was at fault. And thirdly it shows that Le Corbusier's basic assumption was justified, and that Stalin for one would be quite prepared to justify economically the intention to "tear it all down" in order to rebuild. This readiness to sacrifice material at great economic loss when necessity arises has been shown during the present war by the magnificent destruction not only of crops but of such great structural achievements as the Dnieprostroi Dam. The only factor of disagreement between Le Corbusier's proposal and what would be possible under Soviet Socialism, proves to be a time factor; in which case it was Moscow that miscalculated in approaching him in 1930, and not Le Corbusier, who has maintained an unswerving attitude since his first radical thesis.

Perhaps it is easy to justify an architectural compromise on the part of a political party—although Mr. Kantorowich would not allow the reverse, that an architect may indulge in political compromise! But within his own sphere a man must retain his integrity, or earn the contempt of his opponents. The Communist Party is probably the most uncompromising organ politically that is to be found to-day. Their respect for Le Corbusier's uncompromising architectural integrity should be correspondingly profound. I do not mean by architectural compromise that practical adaptation to economic and material restrictions which is the basis of practical architecture; I mean rather the temporary rejection of formal "ethics" to win popular approval. Does Mr. Kantorowich seriously mean to imply that a man of Le Corbusier's stature is mentally incapable of designing a run-of-the-mill "solution" to Moscow's problem that would have appeared "practical" to

the Russian assessors ? I have heard of architectural schemes entered in competitions and deliberately designed " down " to the supposed level of appreciation of the assessors in an attempt to win the prize. Le Corbusier's record is a proud tabulation of lost competitions—no design of his has ever wavered from his own brilliant self-designated standard.

A sufficient number of Le Corbusier's projects has been carried out to show that he is more than " practical " in the technical issues, and his work has covered such an unusual y wide range that we are left in absolutely no doubt that he is capable of " adapting " his solutions in the strictly material sense.

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Le Corbusier tells us that he has been dubbed " Bourgeois " in Moscow, " Bolshevik " in Geneva. Mr. Kantorowich widens the range further, by calling him a Fascist ! Let us again examine his evidence. He begins very modestly by telling us " there is no direct evidence," but suggests that there is " plenty of hearsay."

He first tells us that Le Corbusier has " endorsed the organisation of the notorious Bata shoe factory in Czecho-Slovakia." Mr. Kantorowich does not explain precisely what he intends by the word " endorsed." I take it he does not suggest that an architect signifies " endorsement " of his client's policy merely by accepting a commission ? For in that case surely Le Corbusier may be said to have " endorsed " the Soviet policy by preparing designs for its government, just as he prepared designs for M. Bata. Further, if Mr. Kantorowich regards " endorsement " of the Bata organisation as a manifestation of fascist sympathies, how does he correlate this with the fact (announced a while back in a Guardian pamphlet) that M. Bata was expelled from Czecho-Slovakia as soon as the Nazis took control of that country ? Le Corbusier has also " endorsed " (according to Mr. Kantorowich) the Italian Fiat factory, and the " Fascist " Ford factory in the United States (presumably in the same way that many local motorists have " endorsed " the Ford factory by owning Ford cars). Let us examine some of Le Corbusier's views on the latter, as a key to his general attitude, in an attempt to plumb Mr. Kantorowich's suspicions.

In his book " Quand Les Cathèdrales Etaient Blanches," written on the occasion of his visit to the United States in 1937, Le Corbusier gives us some " Thoughts on Ford." He contrasts production efficiency of the modern assembly line with the inefficiency still existing in the contemporary building trade. Organisation and a programme are essential if the production of buildings is to be on a par with that of modern industry. Le Corbusier writes :

" This is the dramatic conflict which holds back architecture and keeps it out of the main line of progress. In Ford's factory everyone works to one end, all are in agreement, all have the same objective and all their thoughts and actions flow along the same channel. In the building industry there is nothing but contradiction, hostility, pulling in opposite directions, differences of opinion, working at cross purposes and marking time. We pay dearly for all this—to build is a luxury and consequently society is badly housed."

Le Corbusier here obviously takes the Ford works as representative of modern industry at its most efficient. He concludes his remarks on the revolutionising of the building industry with the following summary :

" The achievement of Ford—an achievement repeated in a thousand industries in the modern world—points its lesson. Let us take that lesson to heart. Let us work usefully and profitably for the good of man."

The short passages quoted above will serve to indicate the main lines of Le Corbusier's interest : his preoccupation here—as often elsewhere—is with technical efficiency. It is certainly not easy to detect in his attitude any gloating over the oppression of workers ! Mr. Kantorowich seems to have used the word " endorsed " loosely, and without qualification.

The next item on his list of accusations is one of the most fantastic of all. He says of Le Corbusier, " in la Ville Radieuse, he quotes with approval statements on national organisation made by none other than Marshal Petain, and others of the same order." This alarming statement can be answered under three heads :

1. Le Corbusier's La Ville Radieuse was published in 1933, hardly a year after Hitler assumed control of the German State machine. It is just possible that Le Corbusier knew very little more than Mr. Kantorowich at that time about the future trend of French politics ; particularly in respect of Petain's probable attitude in the war of 1939.

2. The only reference of the kind mentioned by Mr. Kantorowich that I know of in La Ville Radieuse, is not to Petain at all, but to his " Etat-Major," Lieutenant-Colonel Vauthier, of the department of aerial defence.

3. The ominous-sounding passage proves to consist of a statement of approval made by Vauthier on Le Corbusier's theories of danger from possible aerial attack. Even the fact that Petain to-day appears to admire Le Corbusier's vision to the extent of promising him some future opportunity of

realising his projects does not justify Mr. Kantorowich's interpretation of Le Corbusier's architectural attitude.

Mr. Kantorowich concludes this list of offences with the remark, " There is enough evidence to depict a distinct trend towards the Fascist camp." If so, then Mr. Kantorowich has kept this evidence from us entirely.

" In any case," he goes on, in what can only be described as a testy manner, " the majority of his city plans exhibit just that attitude to the people, that arrogant contempt for their individuality which is so typical of Fascism." This represents the reactionary attitude that I have referred to earlier. Since Mr. Kantorowich has not managed to outline the respects in which Le Corbusier shows his contempt for individuality (a factor, by the way, which Le Corbusier constantly considers in his writings) he has given us nothing against which to argue, so we may dismiss the remark. Mr. Kantorowich, like Mr. Delbridge, does, however, introduce the bees, that never-failing analogy from the insect world to confound the modern flat-planners. But alas for Mr. Kantorowich's fascist parallel ! If he had paused to consider the functioning of the society of those remarkable little creatures he would realise that the beehive is virtually a classless state, with no dictatorship of any kind, and in which the workers represent the elite and conduct a periodical " purging " of the drones !

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Mr. Kantorowich relents magnanimously towards the end of his article. The " tragedy," he tells us, " in the development of such undoubted genius as possessed by both Wright and Le Corbusier . . . reflects far less on their personal limitations than it does upon the objective state of the society in which they work." That, at least is a crumb, in spite of the patronage which presumes to conceive Le Corbusier's development as partaking of " tragedy." Mr. Kantorowich does not tell us specifically what this tragedy is, just as he has withheld all explanations of what he means by inhumanity, megalomania, impracticality, and the rest. Mr. Kantorowich's resentment against Le Corbusier seems to recognise neither reason nor consistency. On the one hand Le Corbusier is a " megalomaniac " ; on the other, Mr. Kantorowich pleads (using the form of Le Corbusier's own plea), for " City Planning . . . that involves more than the niggardly reforms that are the total extent of City Planning activity under Capitalism." (And yet did not Mr. Kantorowich himself seem to favour a system of " niggardly reforms " in Moscow, rather than the large-scale surgery advocated by Le Corbusier ?)

Mr. Kantorowich regrets the fact that Le Corbusier's " demonstrations were often mechanical abstractions." The view is, in common with the greater part of Mr. Kantorowich's article, undocumented and unexplained. But let us accept it at simple face value. Is it not something to have achieved the vision to demonstrate a thesis by means of " mechanical abstractions " as well as a range of practical constructions of consistently brilliant standard ? Perhaps the greatest truths become, in their vast capacity for generalisation, abstractions.

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Many of your readers may wonder whether an article such as that by Mr. Kantorowich warrants so lengthy a rejoinder as I have given. In justification I must point to the unique rôle played by M. Le Corbusier as architect and teacher. In recognition of the great debt owed to him by the contemporary architectural world, I feel it impossible to allow unjustifiable and ill-considered comments on such a man to stand in the pages of your journal without protest.

May I conclude by quoting from " Oeuvre Complète: 1934-1938," Le Corbusier and P. Jeanneret. Le Corbusier writes of the inefficiency of the modern city :

> " Our great cities are so atrocious that a natural instinct for safety compels everybody to escape from them in the endeavour to save themselves as best they can by getting far away from their fellow men. This is the mirage of liberty. There are millions who want to feel nature's green grass anew under their feet. Millions who want to see again the clouds and the blue sky. They want to live near trees, those friends of man from time immemorial. These millions go out to the country only to find their dream shattered. Nature dissolves before them, for everywhere there are roads, railway stations, shops and houses.
>
> These houses are the homes of these same millions. They are the garden-cities—that idea belonging to the end of the nineteenth century and approved, promoted and blessed by capitalism. The garden-cities are a dam holding back the accumulated indignation against a flood of injustices. By means of them an egoistical and unjust social order has prolonged its life. This social order has reduced to dust the multitude of claims and demands of our city populations and has brow-beaten the town-dweller into a state of indifference and inertia. Ultimately there comes the dis-

illusionment—the awakening from the dream. When the workers reach their homes in the garden-cities at eight o'clock in the evening they are utterly exhausted in mind and body. They are silent and still like animals that have gone to earth.

The truth is we have completely destroyed the collective energy of the community. It is this collective energy which gives force to action, stirs enthusiasm and creates civicism. Society is depressed, exhausted and devitalised. The promoters of our garden-cities and those responsible for the disorder of our great towns have loudly proclaimed : ' Philanthropy above all. For everyone his little house, his little garden and the assurance of his liberty.' This is nothing but lies and betrayal of truths. There are only twenty-four hours in the day and our day is ill-organised. The whole of life is poisoned by the disorderliness of our cities."

This is the writing of a man who Mr. Kantorowich would have us believe has shut his eyes to " the harsh realities of a maladjusted social order." In the same publication Le Corbusier writes further :

" To examine the problem well let us first remember that Chicago has a waterfront and possesses some splendid ' drives ' flanked with fine apartment houses which look on to the parks and the lake. Let us also remember that New York has some magnificent apartment houses in various districts and some delightful villas in distant and inaccessible suburbs.

We must bear in mind that these villas are the houses of those who have something to say and of those who have managed to do well for themselves and who therefore find that things aren't so bad. As for myself, I give a lot of thought to those crowds who have to return by metro in the evening to a home which is anything but a paradise. Those millions who are condemned to a life without hope, without a resting place—a life bereft of sun and sky and the green of nature.

On behalf of these millions I declare that things aren't at all good. At present these masses are silent. How long before they raise their voices in protest ?

Immediately behind the ' drives ' of Chicago are slums. Terrible slums—limitless slums—an entire world.

The suburban development makes necessary the hours spent daily in the metros, buses and pullmans and causes the destruction of that communal life which is the very marrow of a nation."

This is the writing of a man whom Mr. Kantorowich has accused of " making the scantiest references to the people for whom (he is) designing," and of exhibiting " that arrogant contempt for their individuality which is so typical of Fascism."

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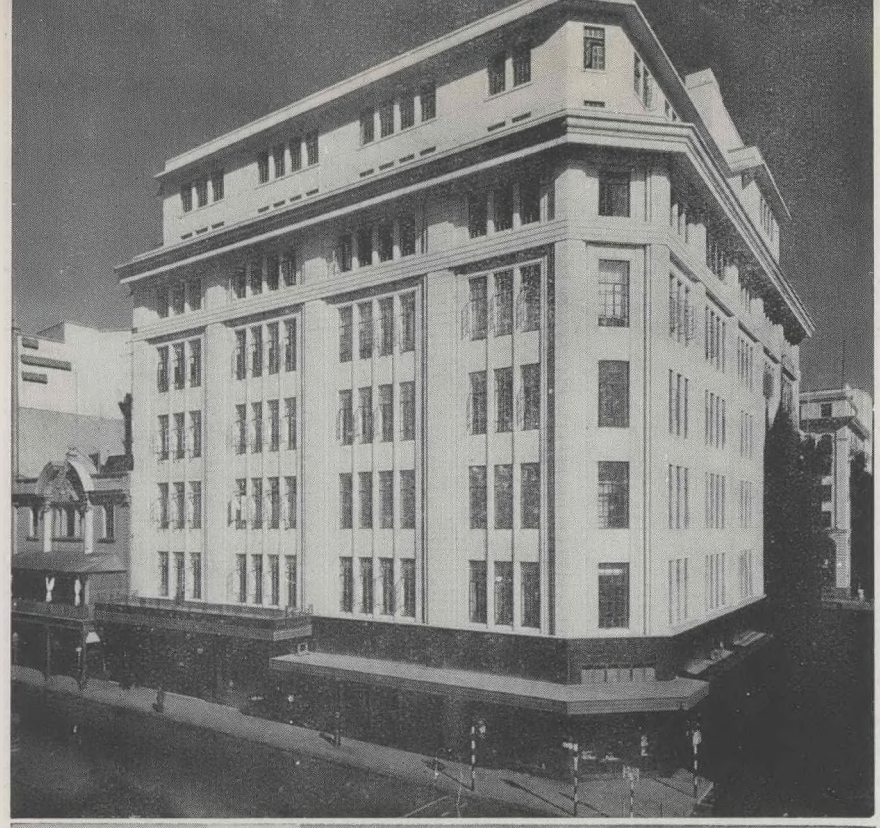
Max Bill's introduction to the same work shows that Le Corbusier is fully aware of the limitations of the system under which he works.

" Le Corbusier," he writes, " is essentially different from the traditional architect who is solely concerned with the putting up of conventional and well-constructed buildings. His interests are far wider than that . . . He philosophises on the principles of architecture, on spatial planning and all aspects of human life . . . His reflections and conclusions are the crystallisation of architectural principles by which there is opened up a new vision of architectural reality. Here the personal element is transcended . . .

It must be borne in mind that the essential conditions of realisation are lacking, for the system of ownership of property which would make realisation possible is not yet in existence. Unless the necessary modifications in the system of ownership are made the ideal city or, indeed, any other attempt to solve the problem must remain unrealisable.

However some progress has been made in work for private clients . . . The essentially human quality which comes out in these small creations is the best answer to the accusations of inhumanity and over-scaling which are levelled against his big projects. For both in the small and large designs it is the same spirit which manifests itself—the desire to create by the use of all means at hand cities and homes wherein men of all different kinds can work and live, find recreation, edification and improvement under the best possible conditions."

Heather Martienssen



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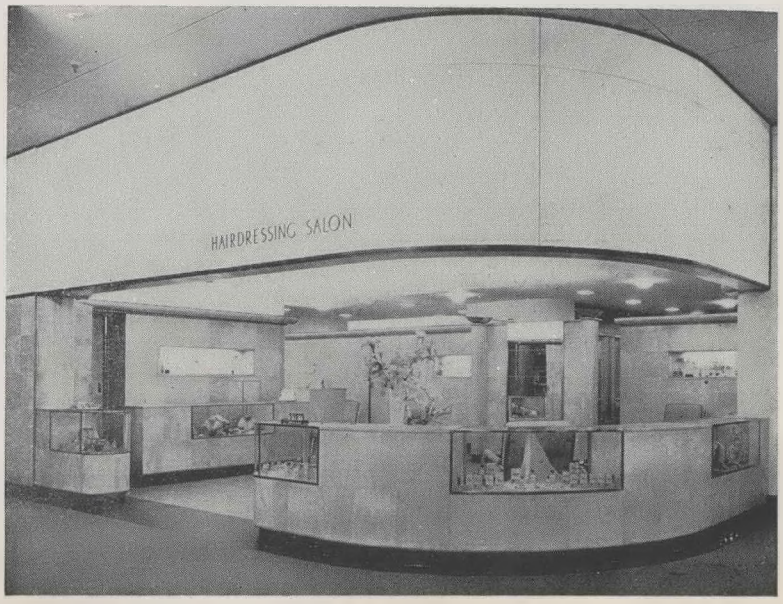
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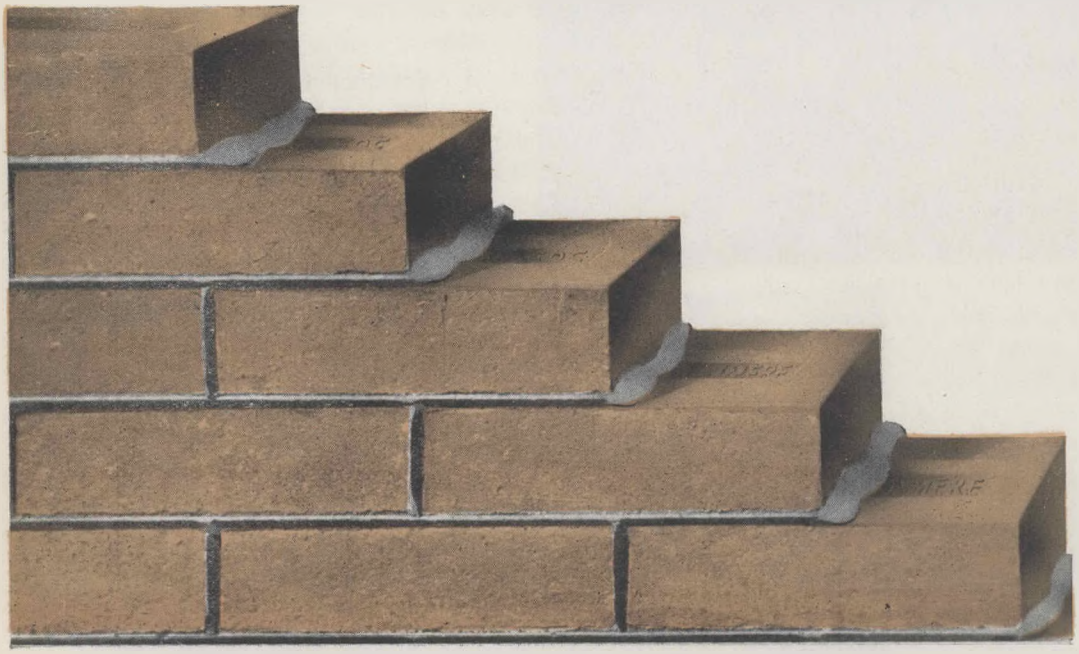
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