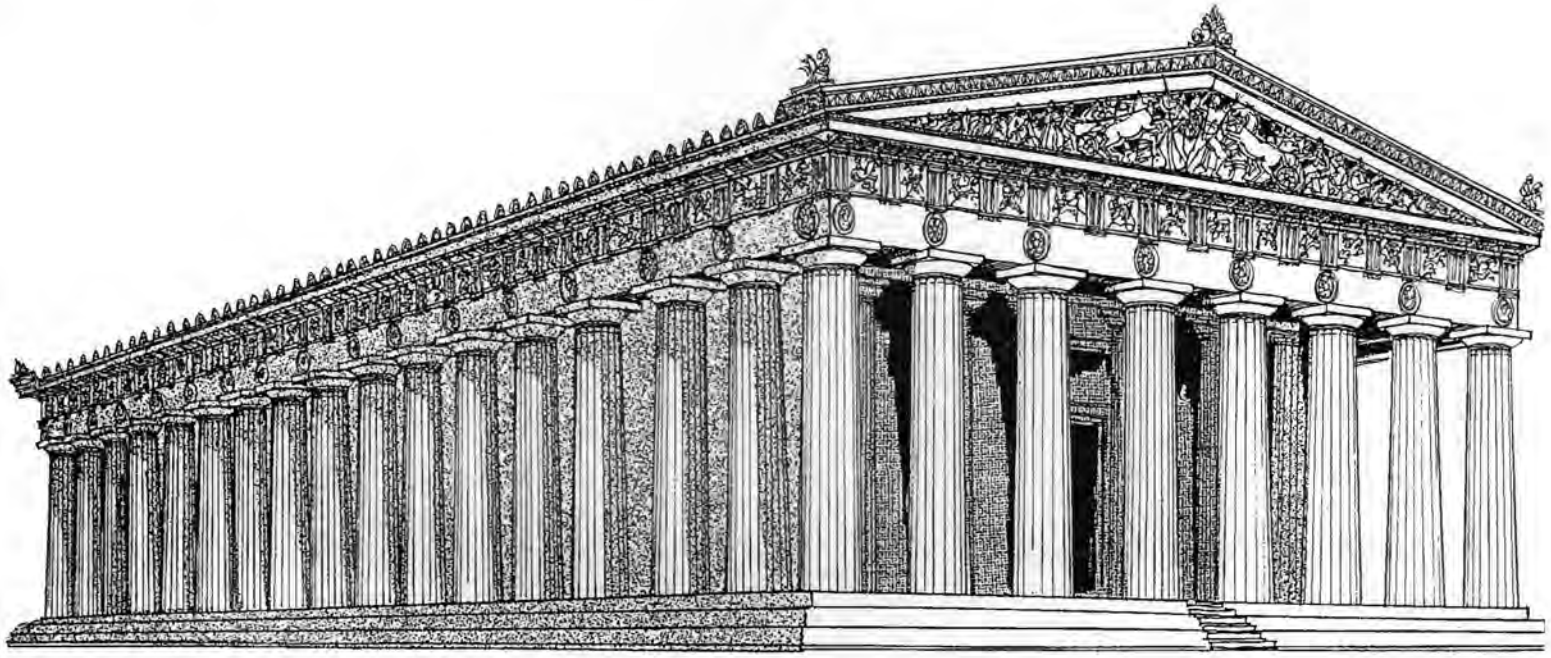
Ancient Greek Architecture



HYPOTHESIS: Fifth century Greek temples reflect an architectural quest for perfection.

Lucas Wyte
11 Ancient History
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From the early designs of the Minoan *megaron* to the splendour of the world's greatest architectural achievement, the Parthenon, it can be seen that the Ancient Greeks sought to improve the materials out of which their religious buildings were made and to define the ideal ratios, proportions and angles that their temples should be constructed with. After all, these buildings were to be the homes of gods and as a result, fifth century Greek temples reflect an architectural quest for perfection.

Why construct a temple? Perhaps it is due to the fact that people living in pre-technological societies are very conscious of their weakness in the face of catastrophes of nature, such as storms, earthquakes, famines and epidemics, and of their dependence on the fertility of their flocks and fields. It was easy for the Greeks to feel that behind their experiences of pain or joy lay the activities of beings with needs like their own, but invisible and immortal and gifted with superhuman power. This led the Greeks to wish to express by acts of worship their feelings of gratitude and reverence towards the gods who they believed controlled nature. The best way of worshipping they knew was to offer the gods the things they themselves took pleasure in - beautiful sculpture, splendid buildings and delicious feasts.

For a Greek city to worship its gods, three things were important: a sacred precinct, a temple and an altar. The precinct was a piece of ground marked out in such a way that anyone would know when he was stepping onto land that belonged to a god. The temple was simply a house for the god to live in. The public did not enter the temple to worship, though they may have gone inside to admire the statue. In fact, very little happened inside a Greek temple; all the important ceremonies and sacrifices were performed outside at the altar. An altar could be very simple, such as a turf mound or a slab of natural rock (like the one on the Athenian Acropolis). Or it could be a slab of carved marble with steps and a platform. An altar was a specially sacred object, and for this reason, at the solemn moment during a religious sacrifice, there was a strong feeling that the god *was* there.

Yet, the temple was the home of the deity - the most important building in the city - so much care was taken over its construction. The earliest examples of Greek temple construction were based upon the design of the Minoan megaron in the palaces of the Bronze Age. Kidson (1991, p.58) has recognised that,

> "The development of Greek temple design shows a conservative attachment to this early type, combined with a restless quest for perfection, leading to endless changes in materials, proportions and ornament".

Memories of the great palaces of the past that had once looked down on the Minoan and Mycenaean towns from their citadels were kept alive by the songs and stories that passed down from generation to generation during the Dark Ages of Greece. One of the first temples built after that period, the Temple of Hera at Samos (600 BC), resembled these early building examples. It was 21 feet wide and 100 feet long. One end was quite open, the other end and the two sides were built of sun-dried bricks. Down the

middle there was a row of wooden columns which supported the roof. In front of the open end stood the altar (fig. 1). Later, the worshippers had a colonnade of wooden columns added around the outside (fig. 2), in order to look more impressive. Half a century later, the temple was destroyed by unknown causes and a new temple was built on the same site. In the new temple, the line of columns that went down the middle of the old temple was not rebuilt. Instead, the roof was supported by two rows of wooden columns set against the inside of the side walls (figs. 3 and 4).

From early Greek temple architecture, such as the Temple of Hera, the familiar design began to emerge (fig. 5): a rectangular hall, surrounded by an outer *colonnade* (fig. 6) on a stepped base; slabs of stone resting on the *capitals* to form a continuous *entablature*, divided into formally decorated sections; at each narrow end, a low triangular *pediment*, also decorated, often with elaborate sculptures, dictated the slope of the roof, which was of tiles laid over a timber framework. Despite these developments in design, it is understood (Yarwood, 1974, p.15) that

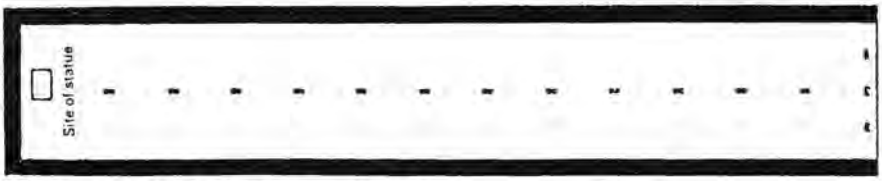
> "even in the fifth century, the variation in temples was not so much in form as in detail; they remained rectangular in shape, containing *naos* and treasury and with a *portico* each end and a surrounding colonnade".

The most important innovation, however, was the replacement of wood by stone.

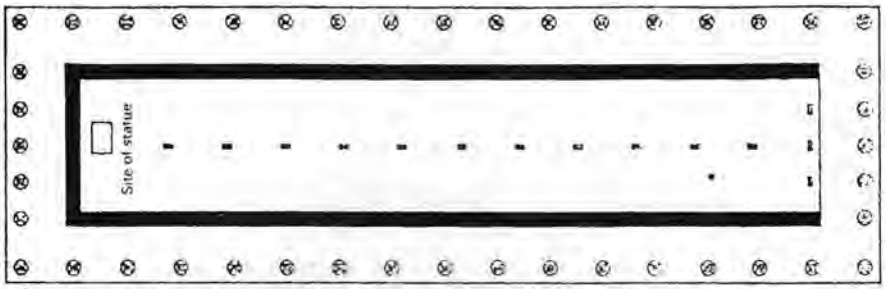
In early times, the Greek temples were constructed from sun-dried mud brick and reinforced by a timber frame with rubble or crude stone foundations. Simply a room with an entrance porch, its roof was probably thatched and therefore pitched (or sloping). During the seventh century BC, the Greeks began making roof tiles of terracotta (fig. 7), a far more satisfactory and permanent roofing material than thatch, but far heavier also. This extra weight prompted the change to carved stone and marble as the primary building material for temples. In construction of the new stone temples themselves, the Greeks rarely used *mortar* but fitted their blocks with meticulous care, using metal *dowels* and cramps of bronze or iron to hold the blocks in position. Although the Greeks had knowledge of the arch used in Egyptian architecture, few details of layout or construction were altered by the use of the new material. The wooden building was simply recreated in stone, this also being the only plausible explanation for the *triglyph* and *metope* sequence of the *frieze* - a petrified, much enlarged and structurally meaningless version in stone of a series of timber *trusses*. It can be clearly seen (Yarwood, 1974, p.14) in Greek temple architecture that

> "the Greeks were slow or unwilling to develop new structural methods: they preferred to perfect their existing ones".

Following their improvements in materials and components of the seventh and sixth centuries, the fifth century saw the implementation of refinements in line, mass and curve. The mathematical ratios and proportions developed are the factors that undoubtedly prove that fifth century Greek temples reflect an architectural quest for perfection. The refinements used in this, the greatest period of Greek architecture, are so subtle as to be barely visible to the casual eye. In fact, this is their chief purpose - to make the building appear correctly delineated and not curved. The Greeks discovered that a horizontal or vertical line, especially when silhouetted against a cloudless sky,

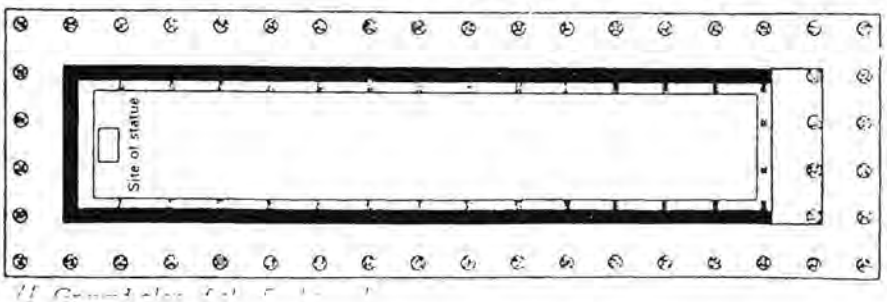


1 *Ground plan of the first temple of Hera.*

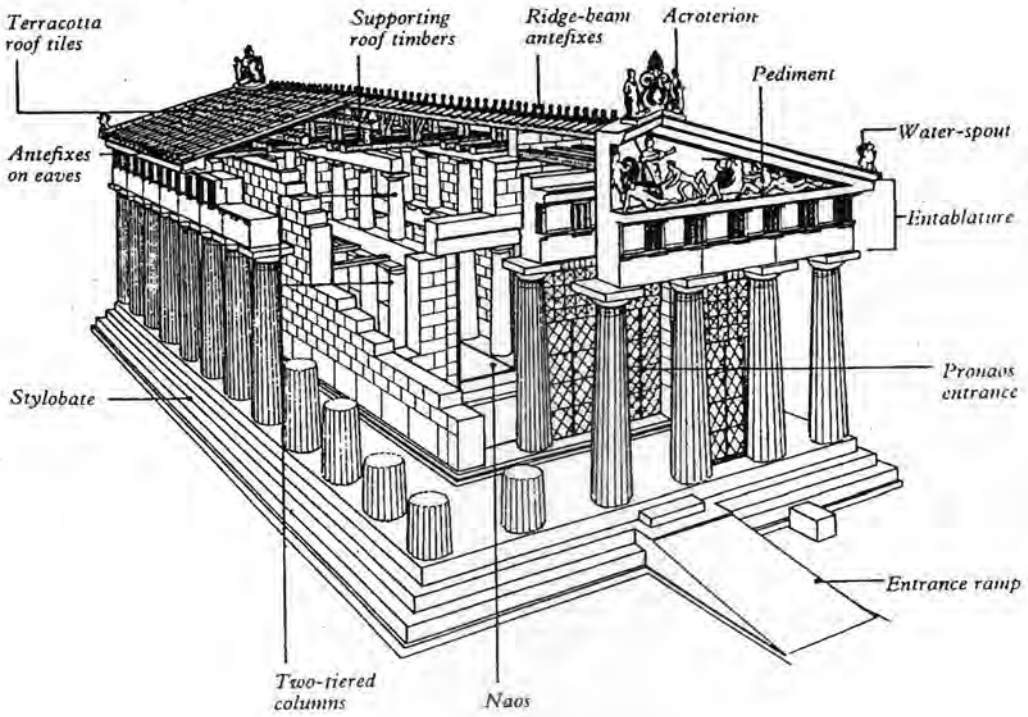


2 *Ground plan of the temple of Hera with columns added.*

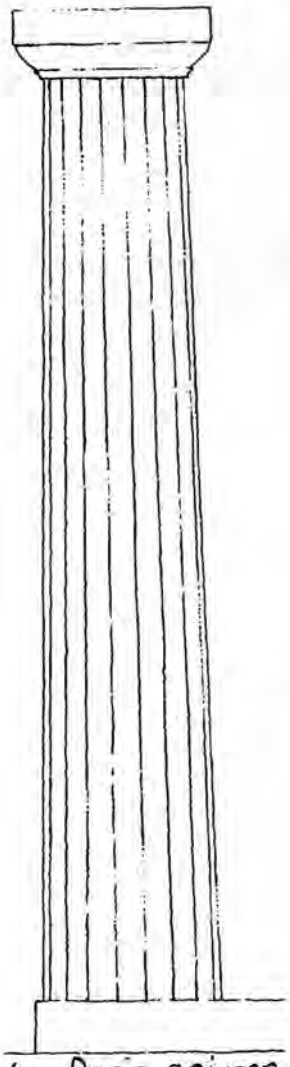
3 Temple of Hera, Samos, today.



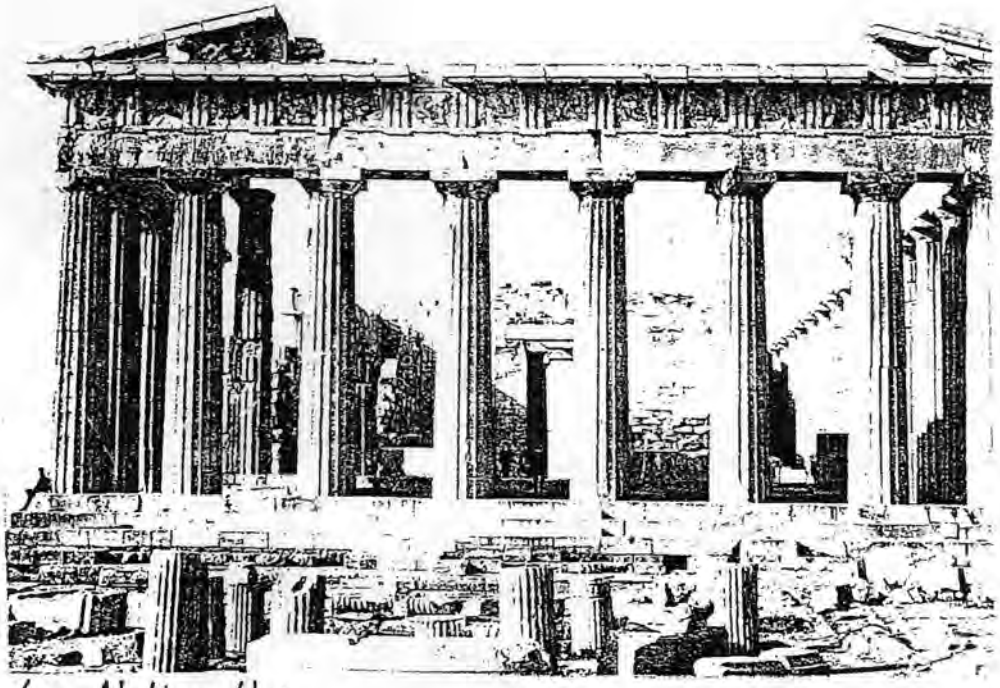
4 Ground plan [illegible]



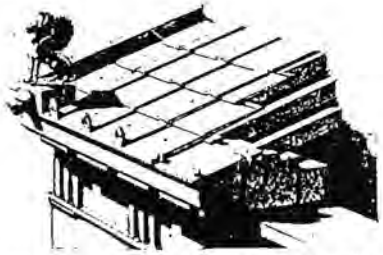
5 The familiar temple design.



6a Doric column



6c Notice the colonnade.



7 *These two pictures show how the tiles fitted onto the rafters. They also show the terracotta*

appears *concave* to the human eye. To offset this illusion, they created a *convex* line and form so subtly and meticulously worked out so as to appear to create a straight horizontal or vertical. Blomfield (1962, p.409) has found that,

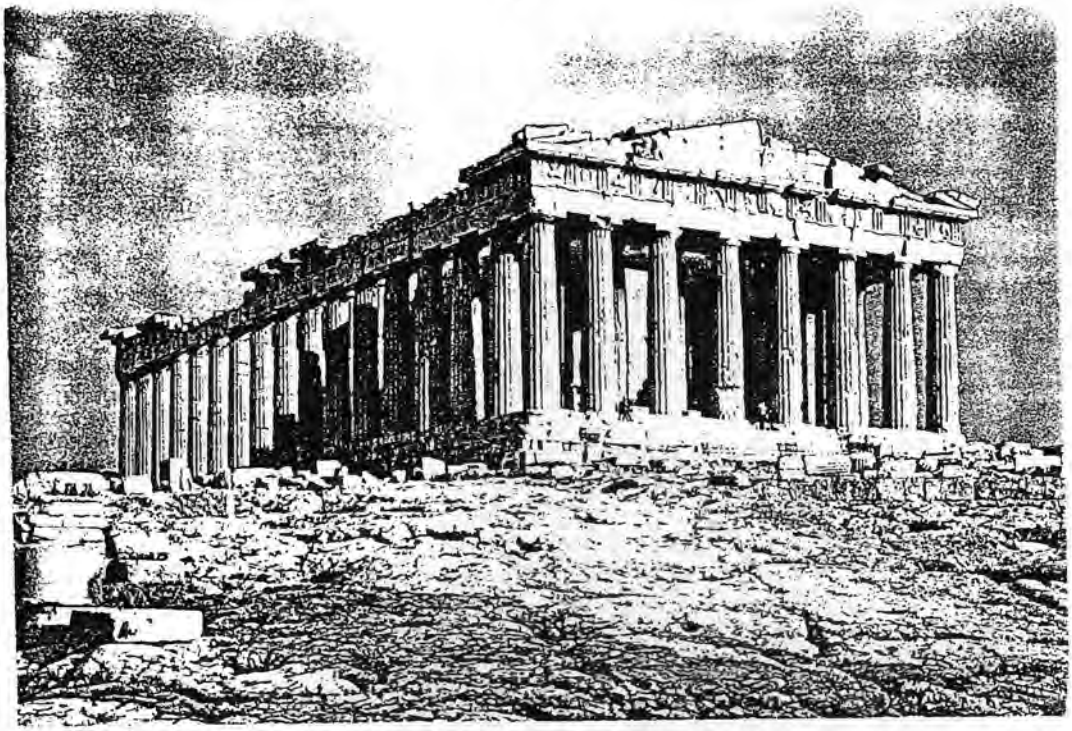
> "As in many great art forms, perfection was obtained by minute "bending" of the rules to achieve complete harmony".

This "bending of the rules" can be seen in most Greek temples but are at their subtle best in the most famous of all Greek buildings, the Parthenon.

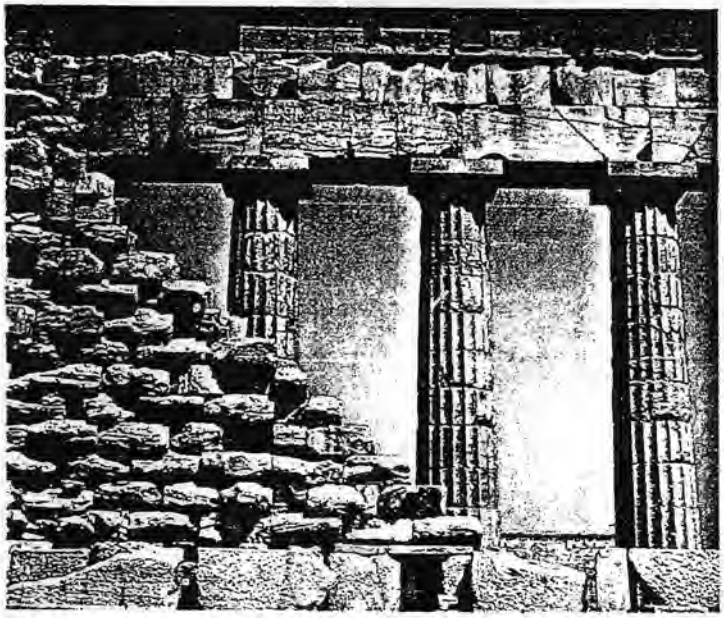
The Parthenon (447-432 BC) was erected for Athena, patron goddess of Athens, as an expression of thanks and gratitude for her 'assistance' to the Athenians in defeating the Persian invasion in 480 BC They believed that their magnificent victory was due to her, therefore the temple to be constructed in her name must be equally magnificent. The architects Ictinos and Kallikrates, under the direction of Athens' leader Pericles, ensured that the Parthenon achieved complete harmony with its surrounds by having all its vertical and horizontal lines curved to counteract any optical illusion (figs. 8 and 9). This curvature applies to the *stylobate* (rise of 4.5 inches in a length of 228 feet), the entablature (curve 1 in 600), the columns (slanting inwards 1 in 150) and the pediment. Columns diminish in diameter from bottom to top and have an entasis whose widest point is about one third the way up from the base. Each *flute* curves in tune with the general entasis, which is to the order of about three-quarters of an inch to a height of 34 feet. All the columns incline slightly inwards, as do the faces of the entablature and pediments. Raeburn (1983, p.25) has recognised that,

> "With all this, the Parthenon is a building of outstanding beauty with the most harmonious proportions, and as such a magnificent justification of the Greek's obsession with perfection rather than originality".

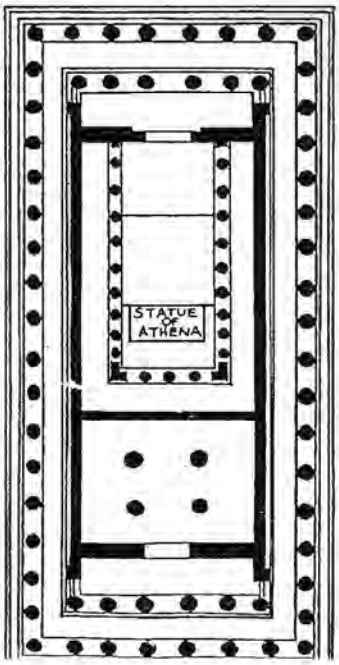
Clearly, in Ancient Greek architecture, nothing was left to chance. Every block of stone, every column, every measurement, every aspect of the building was designed and refined, from the early mud-brick attempts to the achievements of the temples of the Acropolis, so that there should be no hesitation in believing that the Greeks had come close to reaching the ideal. Whether or not they in deed ever reached this objective, fifth century Greek temples undoubtedly reflect their architectural quest for perfection.



8a *The Parthenon*



8b



9 **Left:** An exaggerated view of how the Parthenon would appear without optical correction. **Below:** An exaggerated version with optical corrections. **Right:** The Parthenon as it appears to the eye

Above: Detail of the Doric columns of the Parthenon

GLOSSARY

capital:	the head, or top part, of a pillar.
colonnade:	a series of columns set at a regular distance apart, usually supporting a roof.
concave:	curved like the inside of a circle.
convex:	curved outwards.
dowel:	a pin, usually round, fitting into corresponding holes in two pieces of wood (or stone), to join them or to prevent them slipping.
entablature:	the upper part of a classical order, between columns and pediment, consisting of architrave, frieze and cornice.
entasis:	the slight swelling given to a column shaft to counteract the optical illusion that it is thinner in the middle.
flute:	vertical groove on column.
frieze:	the middle section of an entablature; also the continuous band of relief around the top of a room or building.
megaron:	the principal hall of a Mycenaean palace.
metope:	the space between two triglyphs on the frieze of a Doric entablature.
mortar:	a mixture of lime, cement, sand and water, etc., used for binding bricks together.
naos:	the sanctuary of a Greek temple; where the statue was housed.
pediment:	a low triangular gable crowned with a projecting cornice.
portico:	a colonnaded entrance to a building.
stylobate:	the top step of the platform on which a colonnade is placed.
triglyph:	the fluted block between two metopes in a Doric frieze.
truss:	a combination of beams arranged so as to form a rigid framework, as in a roof.

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