Greek

Architecture of Ancient Greece
approx. 16 million people
Origins
Chronology

• The ancient Greek period is subdivided into four periods on a pragmatic basis of pottery styles and political events:

• The **Greek Dark Ages** (c.1100-c.750 BC) feature the use of **geometric** designs on pottery.

• The **Archaic period** (c.750-c.480 BC) follows, in which artists made larger free-standing **sculptures** in stiff, hieratic poses with the dreamlike '**archaic smile**'. The Archaic period is often taken to end with the overthrow of the last tyrant of **Athens** in 510 BC.

• The Classical period (c.500-323 BC) is characterised by a style which was considered by later observers to be exemplary (i.e. 'classical')—for instance the **Parthenon**.

• The Hellenistic period (323-146 BC) is when Greek culture and power expanded into the near and **middle east**. This period begins with the death of Alexander and ends with the Roman conquest.
Introduction

• **Architecture** was extinct in **Greece** from the end of the **Mycenaean** period (about 1200 BC) to the 7th century BC, when plebian life and prosperity recovered to a point where public building could be undertaken. But since many Greek buildings in the colonization period (**8th** - 6th century BC), were made of **wood** or **mud-brick** or **clay**, nothing remains of them except for a few ground-plans, and almost no written sources on early architecture or descriptions of these embryonic buildings exist.

• Common materials of Greek architecture were **wood**, used for supports and roof beams; plaster, used for sinks and bathtubs; unbaked brick, used for walls, especially for private homes; **limestone** and **marble**, used for **columns**, walls, and upper portions of temples and public buildings; **terracotta**, used for roof tiles and ornaments; and metals, especially **bronze**, used for decorative details. **Architects** of the Archaic and Classical periods used these materials in their buildings.
History

• Around 600 BC, the wooden *columns* of the old *Temple of Hera* at *Olympia* underwent a material transformation, known as "petrification", in which they were replaced by *stone* columns. By degrees, other parts of the temple were "petrified".

• Most of our knowledge of Greek architecture is of the late archaic period (550 - 500 BC), the *Periclean age* (450 - 430 BC), and the *early to pure classical* period (430 - 400 BC). Greek examples are considered alongside *Hellenistic* and *Roman* periods (since *Roman architecture* heavily copied Greek), and late written sources such as *Vitruvius* (1st century). This results in a
Like Greek painting and sculpture, Greek Architecture in the first half of classical antiquity was not "art for art's sake" in the modern sense. The architect was a craftsman employed by the state or a wealthy private client. No distinction was made between the architect and the building contractor. The architect designed the building, hired the laborers and craftsmen who built it, and was responsible for both its budget and its timely completion. He did not enjoy any of the lofty status accorded to modern architects of public buildings. Even the names of architects are not known before the 5th century. An architect like Iktinos, who designed the Parthenon, would be considered a craftsman.
Greek public architecture

- The **temple** was the most common and best-known form of Greek public architecture. The temple did not serve the same function as a modern church, since the altar stood under the open sky in the **temenos** or sacred fane, often directly before the temple. Temples served as storage places for the treasury associated with the cult of the god in question, as the location of a **cult image**, and as a place for devotees of the god to leave their **votive offerings**, such as statues, helmets and weapons. The inner room of the temple, the **cella**, served mainly as a strongroom and storeroom. It was usually lined by another row of columns.
• Other architectural forms used by the Greeks were the **tholos** or circular temple, of which the best example is the **Tholos of Theodorus** at **Delphi** dedicated to the worship of **Athena Pronaia**; the **propylon** or porch, forming the entrance to temple sanctuaries (the best-surviving example is the **Propylaea** on the **Acropolis of Athens**); the fountain house, a building where women filled their vases with water from a public fountain; and the **stoa**, a long narrow hall with an open **colonnade** on one side, which used to house rows of shops in the **agoras** (commercial centers) of Greek towns. A completely restored stoa, the **Stoa of Attalus**, can be seen in **Athens**. Greek towns of substantial size also had a **palaestra** or a **gymnasium**, the social centre for male citizens. These peripterally enclosed space open to the sky were used for athletic contests and exercise. Greek towns also needed at least one **bouleuterion** or council chamber, a large public building which served as a court house and as a
Finally, every Greek town had a theatre. These were used for both public meetings as well as dramatic performances. The theatre was usually set in a hillside outside the town, and had rows of tiered seating set in a semi-circle around the central performance area, the orchestra. Behind the orchestra was a low building called the skene, which served as a store-room, a dressing-room, and also as a backdrop to the action taking place in the orchestra. A number of Greek theatres survive almost intact, the best known being at Epidaurus.
Orders of Greek architecture

• There were two main styles (or "orders") of early Greek architecture, the **Doric** and the **Ionic**. These names were used by the Greeks themselves, and reflected their belief that the styles descended from the Dorian and Ionian Greeks of the Dark Ages, but this is unlikely to be true. The Doric style was used in mainland Greece and spread from there to the Greek colonies in **Italy**. The Ionic style was used in the cities of Ionia (now the west coast of **Turkey**) and some of the **Aegean** islands. The Doric style was more formal and austere, the Ionic was more relaxed and decorative. The more ornate **Corinthian** style was a later development of the Ionic.

These are the main styles that set the tone for the three orders of Greek architecture.
Most surviving Greek buildings, such as the Parthenon and the Temple of Hephaestus in Athens, are Doric. The Erechtheum and the small temple of Athena Nike on the Acropolis are Ionic however. The Ionic order became dominant in the Hellenistic period, since its more decorative style suited the aesthetic of the period better than the more restrained Doric. Records show that the evolution of the Ionic order was resisted by many Greek States, as they claimed it represented the dominance of Athens. Some of the best surviving Hellenistic buildings, such as the Library of Celsus, can be seen in Turkey, at cities such as Ephesus and Pergamum. But in the greatest of Hellenistic cities, Alexandria in Egypt, almost
Roof tiles

- The earliest finds of roof tiles in archaic Greece are documented from a very restricted area around Corinth (Greece), where fired tiles began to replace thatched roofs at two temples of Apollo and Poseidon between 700-650 BC.\textsuperscript{[2]} Spreading rapidly, roof tiles were within fifty years in evidence for a large number of sites around the Eastern Mediterranean, including Mainland Greece, Western Asia Minor, Southern and Central Italy.\textsuperscript{[3]} Early roof tiles showed an S-shape, with the pan and cover tile forming one piece. They were rather bulky, weighing around 30 kg apiece.\textsuperscript{[4]} Being more expensive and labour-intensive to produce than thatch, their introduction had been achieved with the implicit belief...
The spread of the roof tile technique has to be viewed in connection with the simultaneous rise of monumental architecture in Archaic Greece. Only stone walls, which were replacing the earlier mudbrick and wood walls, were strong enough to support the weight of a tiled roof. As a side-effect, it has been assumed that the new stone and tile construction also ushered in the end of 'Chinese roof' (Knickdach) construction in Greek architecture, as they made the need for an extended roof as rain protection for the mudbrick walls obsolete.
**HISTORY AND CULTURE 1 (INTERIOR DESIGN)**

**AEGEAN**

- 2500 B.C.
- Minoan—Crete

**HELLENIC**

- 775/6 First Olympiad
- 650 Archaic period

Establishment of Greek city-states along the Mediterranean and Black Sea

- 1500
- 1184
- Mycenaean
- c. 835 Homer

- c. 582 Pythagoras
- c. 510

**Greek colonisation 8th-6th centuries B.C.**

**The Greek invasions**

**Dorians c. 2000**

- Achaeans c. 1550
- Ionians c. 1100

**Troy**

**Crete**

**Tiryns**

**Mycenae**
The Aegean Period. No records survive of the Minoan sea-kings of Crete except remains of palaces, e.g. Cnossus. The Mycenaean built massive citadels with Cyclopean masonry and domed tholos tombs on the mainland. The Aegean civilization fell before the Homeric Greeks.

The Hellenic Period. The Greeks called themselves Hellenes (Hellas was called Graecia by the Romans). They formed numerous small city states in which primitive houses surrounded a citadel and later a temple built on an acropolis or upper city. National unity was achieved by pan-Hellenic festivals held at Olympia, Delphi, Argos and Corinth every few years.

The Hellenistic Period began with the Empire created by Alexander the Great when many new cities were founded with monumental buildings.

The Greek temple developed from the Mycenaean megaron built of sun-dried brick, stone and timber to house a deity and to be looked at from outside, not to contain a congregation within. The arch was known to the Greeks, but they based their temples on the column & beam. These developed from the 6th-4th centuries B.C., each with its own ratios of proportions established by experience. Columns were often placed closer than necessary to support the entablature in order to create a repetitive rhythm of solids and voids. Optical refinements displaying an appearance of vitality and strength have been measured in a number of them. Many architects wrote treatises about their buildings, cited by Vitruvius (1st cent. B.C.) who classified their plans and proportions.
The Palace of King Minos (restored), c. 1800-1600 B.C.

1. The King and Queen’s apartments
2. Great staircase
3. Hall of the Colonnade
4. Hall of the Double Axes
5. Queen’s Megaron or Hall 6
6. Construction: A timber framework
   or rubble masonry
   B sun-dried brick
   or plaster painted with
   frescoes
   E plinth and floor of gypsum or limestone
   F ceiling beams
7. Cypress columns
'TIRYNS of the Great Hall'  
(Homer)  
(restored) c. 1400-1200 B.C.
on a limestone ridge above the  
The great wall from 24 to 27 ft  
Cyclops. The palace built of timber  
bricks and columns of wood  
1 Main gateway  2 Greater propylæum  
4 The men's Megaron or Great Hall  
3 Lesser propylæum  5 The women's Hall  

plain of Argos, wide ascribed to the  
framework, sun-dried
THE AEGEAN

MYCENAE (restored), c. 1350 B.C.
The citadel palace of Agamemnon,
Cyclopean walls of boulders weighing 5 to 6 tons were eased into alignment on pebbles

Lion Gate, Mycenae, c. 1200 B.C.

Cyclopean wall, Tiryns  Polygonal, Mycenae  Curvilinear, 7th cent.  Rectangular, 5th cent.
MYCENAE, The Treasury of Atreus, 1330-1300 B.C. One of some 40 beehive or tholos tombs on the Greek mainland. Built of horizontal overlapping courses of lime-stone or corbelling without centering. The door-way flanked by 2 green sandstone half-columns with a relieving triangle above.
COLUMN AND BEAM

Stone beams of great span are liable to fracture, therefore columns were placed close together.
TIMBER construction, c.620 B.C.
Doric temple of Apollo, Thermum.
Wooden entablature and columns

MARBLE construction, c.477-438 B.C.
The Parthenon, Athens
BUILDING METHODS

LIFTING DEVICES

tongs
rope
loops
lewis

tongs

MASONRY
Fine squared ashlar bedded and jointed without cement
LIFTING DEVICES

METAL CRAMPS set in molten lead

ERECTION OF A COLUMN

Stone left undressed to avoid damage in transport
Heraeum, Olympia, c. 649 B.C.
Walls sun-dried brick. Stone replaced wood columns as they decayed. Gable roof with terracotta tiles

Temple of Apollo, Syracuse, c. 575 B.C.
Monolithic stone columns

Sanctuary of Thermum, Aetolia
Megaron A, c. 2000-1500 B.C.
Small stones carry walls of wood and clay, roof thatched with reeds

Megaron B, c. 1000-800 B.C.
House or Temple. 18 posts formed the first known Greek peripteral temple scheme

The Temple of Apollo, c. 600 B.C., built over Megaron B. Columns and entablature of wood

Temple F, Selinus, c. 560 B.C.
Stone screens join the columns
Archaic Temple of Artemis, Ephesus, c.560 B.C. Burnt down and rebuilt, 356 B.C. Designed by Chersiphron of Cnossus and his son Metagenes who wrote a work on the temple, now lost, cited by Vitruvius. Appearance conjectural, columns of marble, walls of limestone faced with marble.
Temple of Zeus Olympius, Agrigentum, c. 480 B.C.
Built of coarse stone faced with marble dust cement; position of figures conjectural

Temple of Aphaia, Aegina, c. 490 B.C.

The Parthenon, Athens, 447-432 B.C.
Ictinus and Callicrates architects, Pheidias master sculptor; built of white marble

The Doric Temple of Athena Alea, Tegea, c. 353 B.C.
Designed by the sculptor Scopas, the interior had 14 Corinthian engaged columns
Doric temple of Apollo Epicurius, Bassae, c. 430 B.C.

By Ictinus, architect of the Parthenon, Athens. The Corinthian order used for the first time Built of fine-grained, brittle grey limestone; details in marble, roof of thin marble slabs.

Ionic temple of Athena Polias, Priene, c. 334 B.C.

By Pythios, architect and sculptor of the Mausoleum, Halicarnassus, who wrote a book on the temple, since lost.

All the measurements are in multiples of the Ionic foot, i.e. 11.587 inches.
Ionic and Corinthian; 24 flutes separated by fillets

Temple of Demeter, Paestum

Theatre of Marcellus, Rome

Thermae of Diocletian, Rome

Capital, angle column

Temple of Aphaia, Aegina

A method of setting out a volute

echinus

annulets

trachelion

hypotrachelion
HISTORY AND CULTURE 1 (INTERIOR DESIGN)

CORINTHIAN

Egypt, Dynasty XIX

Tower of the Winds, Athens, c. 334

The Tholos, Epidaurus, c. 360 B.C.

Greek

Roman

Virilis, Rome

Choragic Monument, Athens

The Pantheon, Rome

Arch of Severus, Rome

Roman Vitruvius (IV, 7)

TUSCAN

COMPOSITE

COMPOSITE

TUSCAN
Ilissus, Athens
Erechtheum, Athens
Temple of the Olympieum, Athens, c. 174 B.C.
Fortuna Virilis, Capitals taken to Rome, 86 B.C.

Temple of Castor and Pollux, Rome, A.D. 16
Arch of Titus, Rome, A.D. 81

From The Five Orders of Architecture by Vignola (A.D. 1569-73)
pediment, acroterion, tympanum, cornice, frieze, metope, regulæ, tenia, guttae, architrave, triglyph, abacus, echinus, annulets, trachelion, hypnotrachelion, shaft, column, capital, stylobate, half elevation of facade, half transverse section.
THE DORIC TEMPLE

THE TEMPLE OF APHAIA,
AEGINA, c.490 B.C.

Built of soft, yellow local sandstone, coated with a thin layer of stucco and coloured. Sculpture and tiles on pediments of Parian marble, other tiles of terracotta.
Between the Greeks’ defeat of the Persians in 479 B.C. and the Peloponnesian War (431-404 B.C.), Athens rose to her zenith; under the leadership of Pericles, buildings were erected on the Acropolis:

1. The Parthenon
2. The Propylaea
3. The Erechtheum (restored)

**THE PROPYLAEA**, entrance to the Acropolis, 437-432 B.C.
Mnesicles, architect. Built of marble
THE PARTHENON, 447-432 B.C. Doric temple dedicated to Athena. Ictinus and Callicrates, architects; Phidias, master sculptor. Optical refinements p. 38
BUILDINGS ON THE ACROPOLIS

THE ERECHTHEUM, 420-406 B.C.
A. Sanctuary of Athena Polias
B. Sanctuaries of Erechtheus and Poseidon
Possible architect Mnæsicles. The caryatids and column capitals may have been designed by Callimachus, inventor of the Corinthian capital. Built on 4 levels, irregular in plan to preserve places sacred to Athens; built of white marble.
City state of PRIENE, c.350 B.C.; about 5000 inhabitants

The Bouleuterion or Council Halls of Miletus (restored), c.175-164 B.C.

House, Priene, c.350 B.C. Built of stone and sun-dried bricks (restored)

House, Delos, c.250 B.C. Built of stone (restored) Introduction of the Peristyle
GREEK

Entasis (Gk: distension) designed to counteract the illusion of the outline of a column curving inwards.

Angle columns look thinner seen dark against light and are thickened by 1/8 in.

OPTICAL CORRECTIONS, THE PARTHENON, ATHENS

Proportions of height, thickness & distance apart of columns according to Vitruvius (11,3)
The Tholos,
Epidaurus, c. 360 B.C.
by the sculptor-architect
Polycleitus the Younger;
built of sandstone and marble
The Choragic Monument of Lysicrates, Athens, c. 334 B.C.
Podium of limestone, upper part white marble, Corinthian order used externally for the first time

The Tower of the Winds, Athens, c. 50 B.C. Clock-tower built of marble