



**2nd year Architecture – 2nd semester
2022-2023**



**History of architecture
Lecture(8 & 9)
Greek architecture**

By : Gulistan Ahmed Argushi

Course name	History of architecture
Lecturer	Gulistan Ahmed Argushi
Course information	This course will be about the history of architecture from early stone age to the Greek
The objective	<ol style="list-style-type: none">1. Understand the Egyptian architecture, the goal and the factors that make up this architecture.2. Identify the main types of buildings that the Egyptians were famous for

Course marks division

Quiz	1	15%
Midterm	1	25%
Report	1	10%
Homework	2	10%
Final	1	40%



Ancient Greece Timeline



Neolithic

- Earliest human remains
- Neolithic Revolution (agriculture)
- Development of pottery (Black and Red)
- Introduction of the wheel (around 3500 BC)
- First written records (Linear A and B)

Minoan

- First Civilization in Europe
- Development of writing (Linear A and B)
- First Olympic Games (776 BC)
- First Olympic Stadium (776 BC)



The Dark Ages

- Introduction of the alphabet (around 800 BC)
- First Olympic Games (776 BC)
- First Olympic Stadium (776 BC)
- First Olympic Games (776 BC)

Classical

- Development of democracy (around 500 BC)
- First Olympic Games (776 BC)
- First Olympic Stadium (776 BC)
- First Olympic Games (776 BC)



Early Bronze Age

- Introduction of bronze (around 3000 BC)
- First Olympic Games (776 BC)
- First Olympic Stadium (776 BC)
- First Olympic Games (776 BC)



Mycenaean

- First Civilization in Europe
- Development of writing (Linear A and B)
- First Olympic Games (776 BC)
- First Olympic Stadium (776 BC)

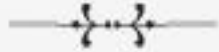


Archaic

- Introduction of democracy (around 500 BC)
- First Olympic Games (776 BC)
- First Olympic Stadium (776 BC)
- First Olympic Games (776 BC)

Hellenistic

- Development of democracy (around 500 BC)
- First Olympic Games (776 BC)
- First Olympic Stadium (776 BC)
- First Olympic Games (776 BC)



Greek architecture

Greek

- Classical Greek was concentrated in what is today Greece and along the western coast of Turkey.
- ancient Greek colonists established cities all around the Mediterranean and along the coast of the Black Sea.
- Classical Antiquity or the Classical Age, this term is used to describe a period in the history of human culture or knowledge extending between the (eighth century BC and the fifth or sixth century AD)
- Civilizations of the ancient Greeks and ancient Rome flourished in this period, sometimes known as The Greco-Roman world, which led the cognitive and cultural development in those times and left a great influence throughout Europe, North Africa and Western Asia



- The Greek poetic epics written by Homer are considered the actual beginning of the classical eras (appeared between the eighth to seventh century BC) and continue with the emergence and spread of Christianity and the decline of the Roman Empire (5th century AD)
- end with the beginning of the Middle Ages (sixth to tenth centuries AD).



Factors affecting Greek architecture

- 1. Geographical factor**
- 2. Geological factor**
- 3. Climatic factor**
- 4. Religious factor**

Geographical factor

- Greek civilization started from group of islands in the Mediterranean Sea.
- Greece has a broken coast line with about 3000 islands, which made the Greeks into a sea-faring people.
- Greek civilization was in the area around the peninsula that extends into the Mediterranean Sea.
- Greek civilization expanded by The colonization of neighboring lands and In the Hellenistic period, Greek civilization spread to other far away places including Asia Minor and Northern Africa (Libya and Egypt).
- Because of there expansion, Greece and her islands became the controller on the sea trade route and extended to along the whole eastern Mediterranean seaports .



Geological factor :

- Most of the Greek mainland was rocky therefore bad for agriculture, Most Greeks therefore lived along the coastline or on islands where the soil was good for farming .
- The chief mineral wealth of Greece was her **marble** .
- This material is found in various parts of Greece, in the mountains of Hymettus and Pantelakos .
- The country also was also rich in silver, copper, and iron.



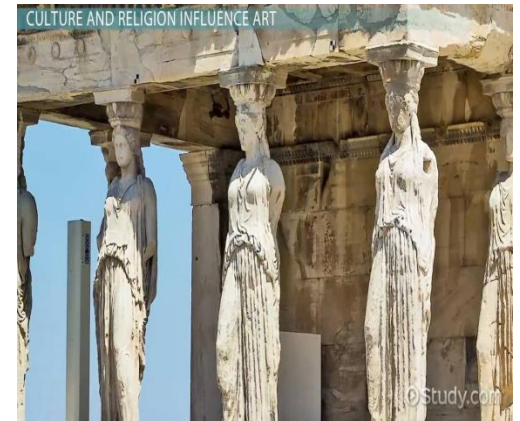
Climatic factor

- The Greek climate is a pure Mediterranean type of climate(the nice sun and the heavy rains) that encouraged outdoor activity and made the architecture type opened to outside.
- made the Greek structures tried to be in harmony with the natural landscape .
- most public ceremonies took place in the open air, which resulted in building types such as the Greek theatre.
- Greece enjoyed a position intermediate between the Northern nations and Eastern life, That give Greek character combined the activity of both of them that lead to the growth of a unique civilization .



Religious factor

- Greeks people considered as a religious people, That's appeared by the Worship centered on:
- Sacrificial Altars in open-air enclosures, small chapels or household shrines, and countless temples.
- The Greek religion was in the main a worship of natural phenomena .
- Gods were conceived in human form, and represented by small idols, rocks and stone pillars.
- When temple architecture began, the Greeks began to represent their gods by large statues
- The religious ceremonies of classical Greek included sacred games, ritual dances, athletic contests and arts.
- each town or district has its own local preferences, ceremonies and traditions.



Greek history can be divided into three periods each period

1. Early period (2700-700 BC): Minoan & Mycenaean Architecture

Communities developed on small islands in the Aegean Sea, on the larger island of Crete and on the mainland of Greece beginning around 2000 BC. It is a rough and massive Architecture, Cities: Knossos, Troy, Tiryns, Mycenae.

2. Hellenic Period (800 to 323 B.C.): Greek Architecture

- Building system is (column) system.
- City-states developed on the plains between mountains, Delphi, Sparta and Athens were most important cities.
- Each had its own ruler, government and laws.
- Mostly religious architecture (because of the emergence of Temples).
- Alexander the Great of Macedonia conquered.

3. Hellenistic Period (323 to 30 BC): **Secular Architecture**

- Hellenistic Empire established, Greek civilization extended .
- Not religious in character, but civic- for the people. Provided inspiration for Roman building types, Dignified and gracious structures .
- Symmetrical, orderly.
- Ended by the Roman conquest.



Architectural characteristics

Walls

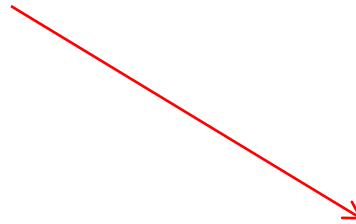
The building system was massive and Thick walls, they have (three) kind of masonry for walls:

1. **Cyclopean** : roughly stones piled on each other, The interstices between the larger stones were filled with smaller blocks.
2. **Rectangular** : carefully rectangular blocks arranged in regular courses, but the joints between stones in the same course are not always vertical. used in Mycenaean Architecture the entrance passage in beehive-tombs.



3. **Polygonal** : many sided blocks accurately worked so as to fit together.

4. **Corbels** : horizontal courses of stones were laid, projecting one beyond the other till the apex was reached.



Polygonal

20



orders in Classic Greek Architecture

- The Greek orders were Introduced by a Roman architect, **Marcus Vitruvius**, by (De Architectura , or Ten Books on Architecture), he believed Builders used mathematical principles when constructing temples .
- The use of the orders also provided a means for the Greeks to design buildings to meet their ideals of harmony, balance and symmetry .
- Without symmetry and proportion, no temple can have a regular plan.

Columns were understood by the Greeks to be representative of the body of a human .

- **An Greek column order consist of:**

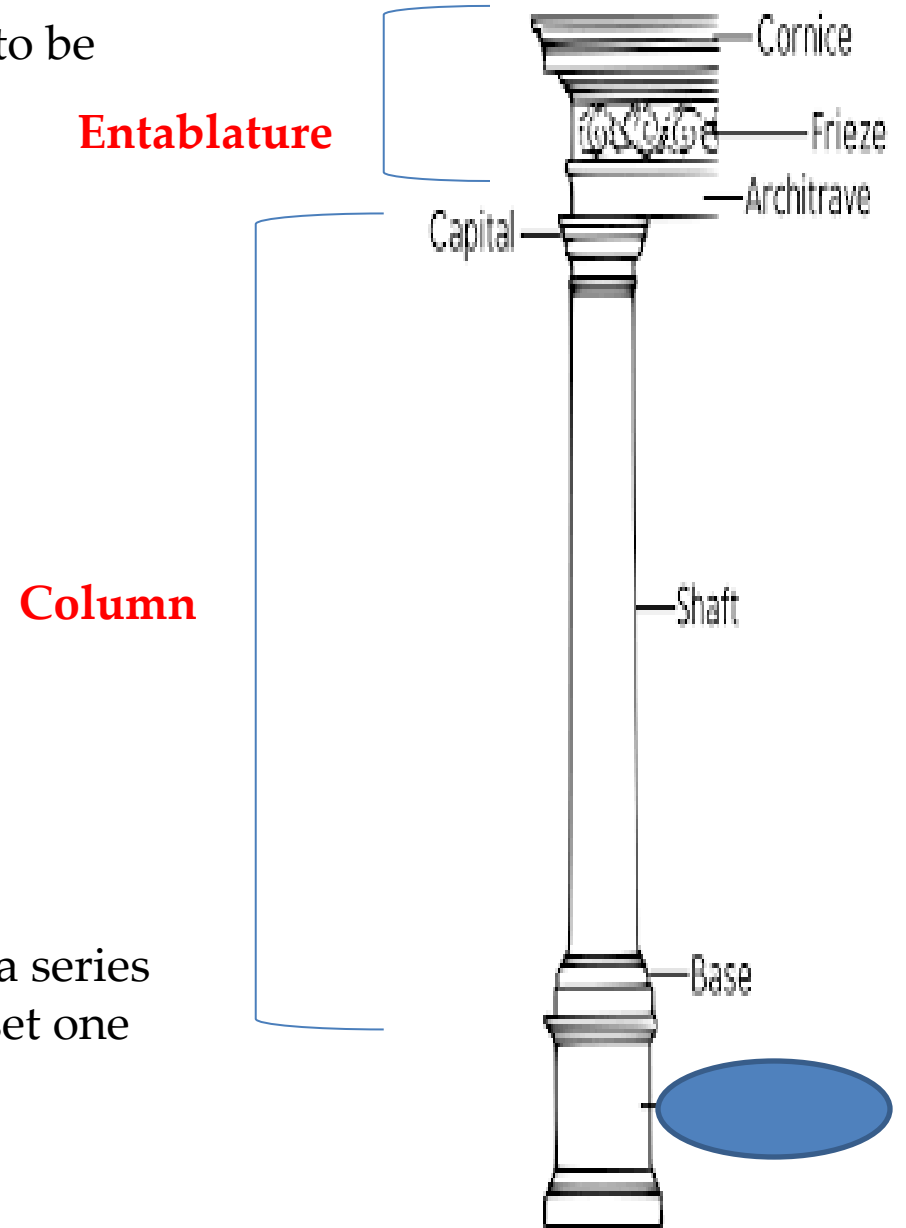
1. Column

- Base
- Shaft "Body"
- Capital

2. Entablature :

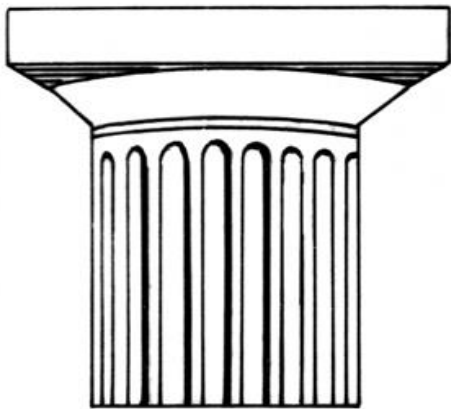
- Cornices
- frieze
- architrave

- The column it self consist of usually of a series of solid cornice frieze stone "drums", set one up on the other, without mortar .

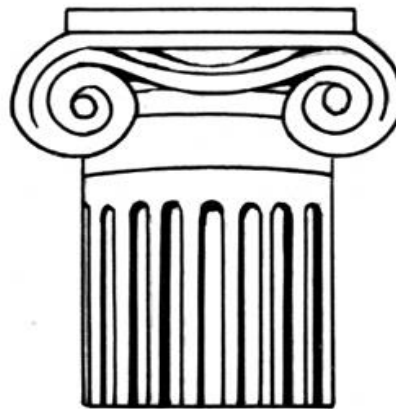


There are (three) distinct orders in Classic Greek Architecture:

1. Doric.
2. Ionic .
3. Corinthian.



DORIC



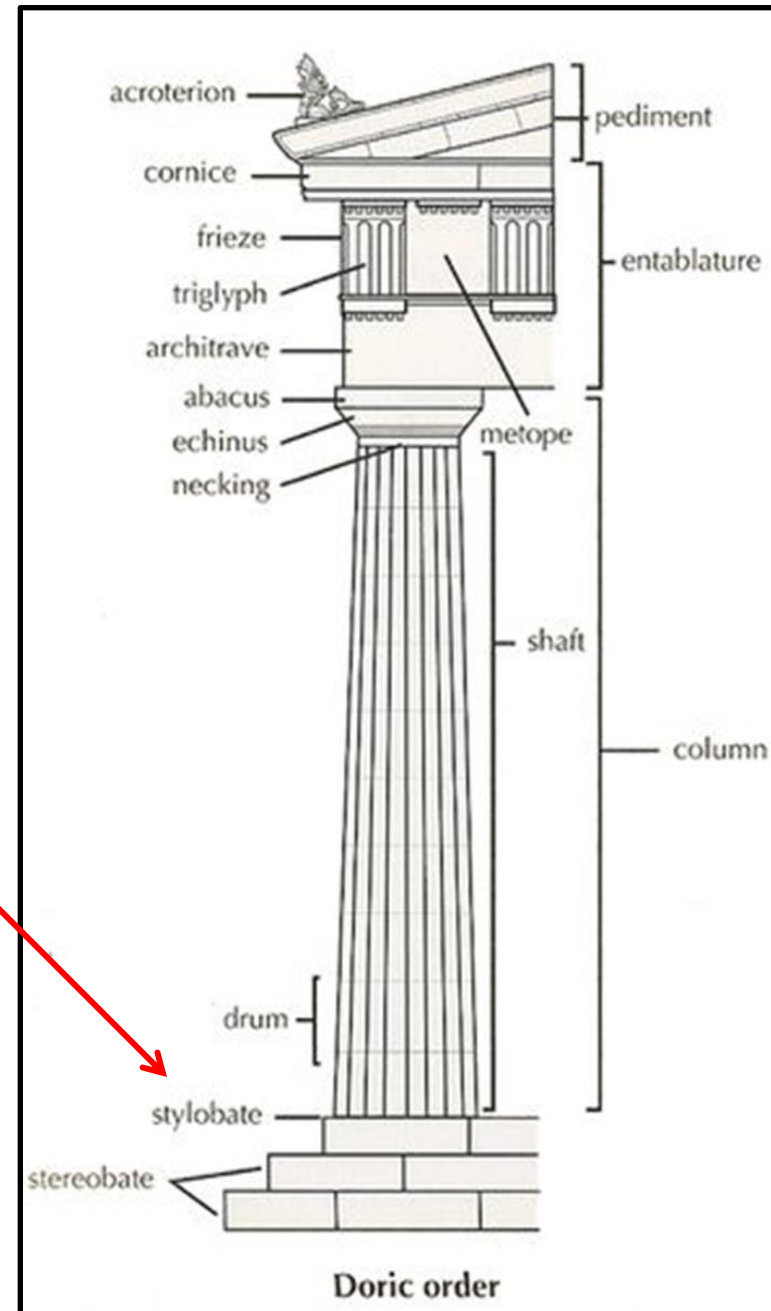
IONIC



CORINTHIAN

Doric order

- The Doric order was the earliest to be developed By the 6th century .
- The Doric order is made up of three elements:
 1. **stylobate**
 2. **Column**
 3. **entablature.**
- Doric order generally is directly sits on a **(stylobate)** is a raised three steps on which the temple sits. (without base).
- It had a height of between 5 and 6 times its diameter .



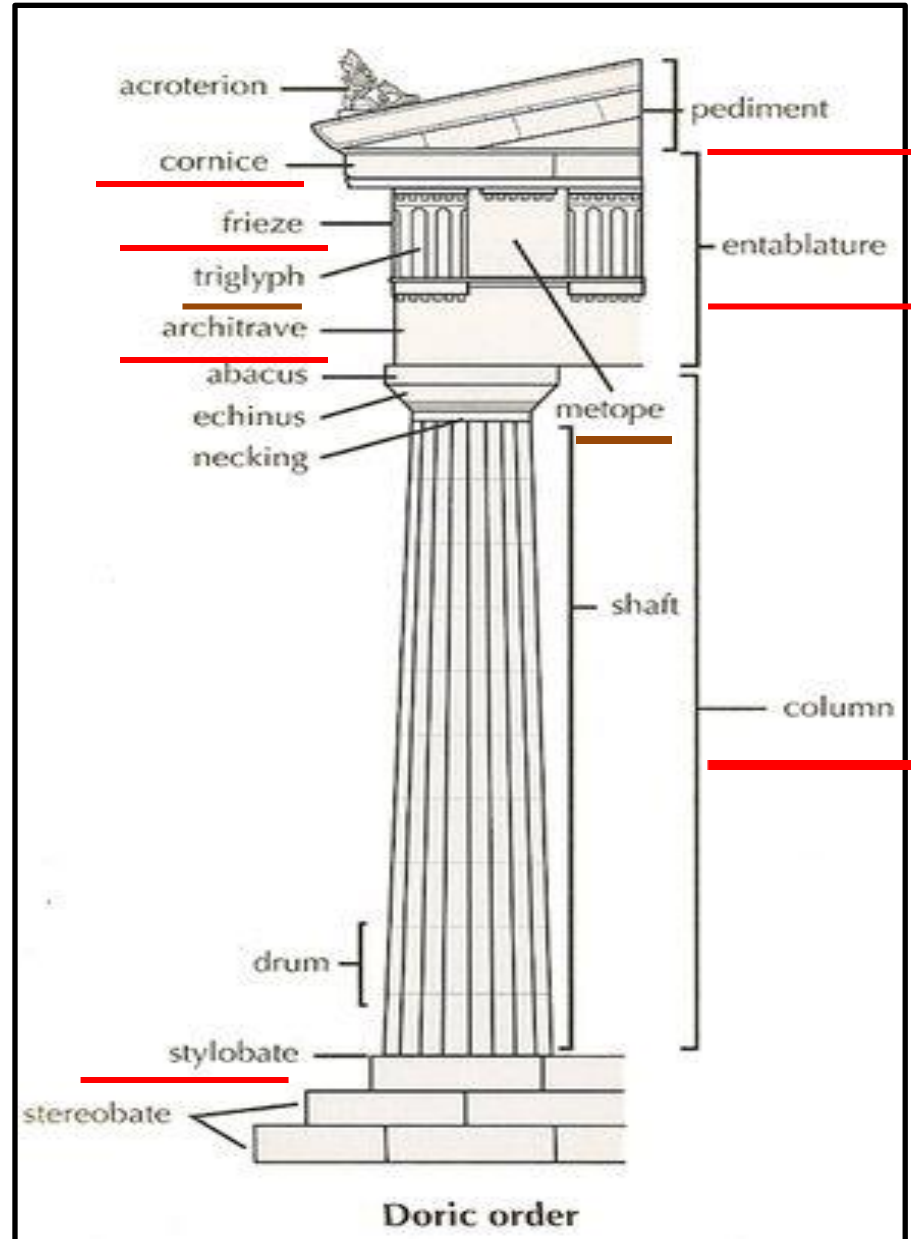
- The Doric column (**The shaft**) is made to bulge slightly to provide correction for optical illusion, is usually divided into 20 shallow flutes.

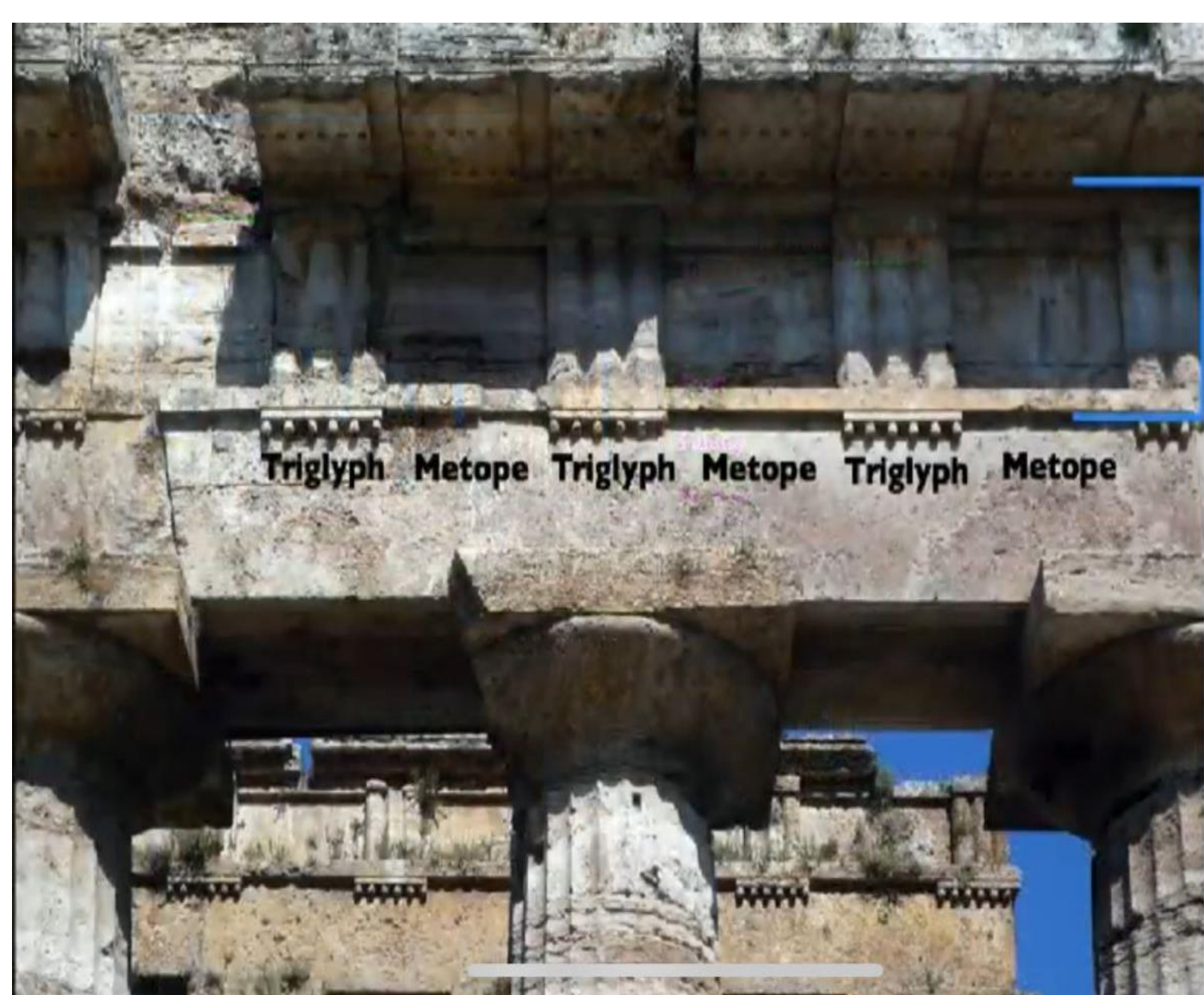
- **Doric entablature is divided into :**

- architrave
- cornice
- frieze (triglyph , metope)

And also pediment

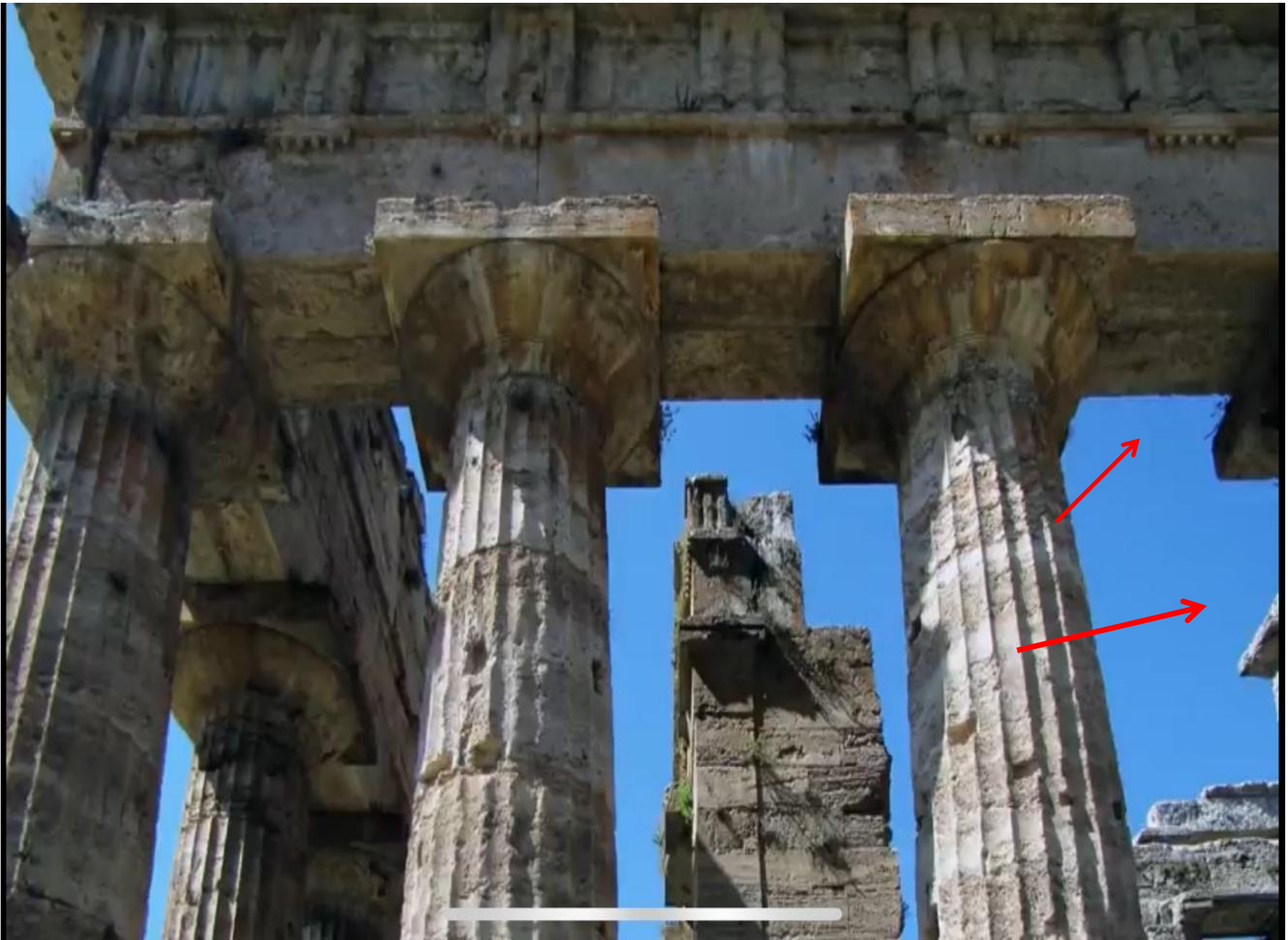
- represents the proportions of a man's body .
- Parthenon temple, Hephaestus temple in Athens.





Frieze

Triglyph Metope Triglyph Metope Triglyph Metope



The Doric Order



Temple of Hera II, Paestum, c. 460 B.C.E. (Greek)

Pediment

Frieze (Triglyphs & Metopes)

Entablature

Capital

Shaft

Fluting

No Base



- A characteristic of the Doric order is the use of **entasis**.
- Entasis refers to the practice of **optical correction** in Greek Doric temples.
- All buildings are arranged with a slight curve to correct for optical illusion when they are viewed.
- This is done to counteract the concave appearance produced by straight edges in perspective.
- The shaft of the column is built to be slightly convex in shape for optical correction.
- Columns were also built with a slight tilt.
- The best example of the application of entasis is found in the **Parthenon**.

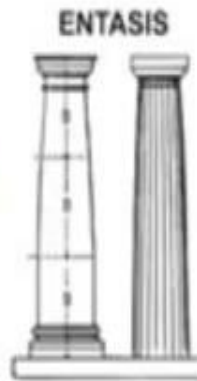


Diagram 1

The temple as it visually appears with correction



Diagram 2

The temple as it would appear without correction



Diagram 3

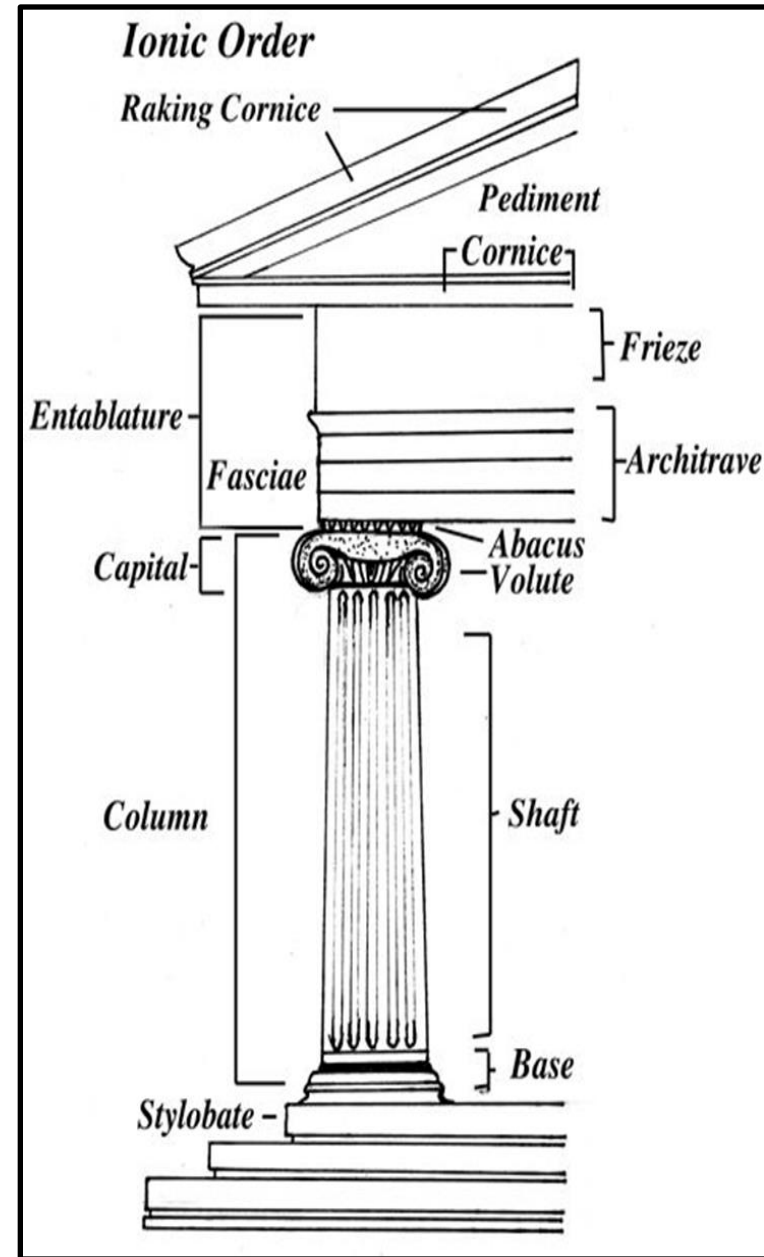
The temple as it is actually built with Correction



Optical Correction (Entasis) In Doric Temples

The Ionic order

- evolved and took its name from Ionia in modern day Turkey.
- **Ionic capital :**
- pair of Volute or scroll capital (derived from Egyptian lotus and Aegean art), Ornaments are used to decorate the area between the capital and the volute.
- One of the limitations of the Ionic Capital is that it is designed to be seen from the front only
- **Ionic column :**
(the shaft) It had 24 , it is smaller in **diameter** , it is more slenderer from the Doric.
- **base :** to spread load.

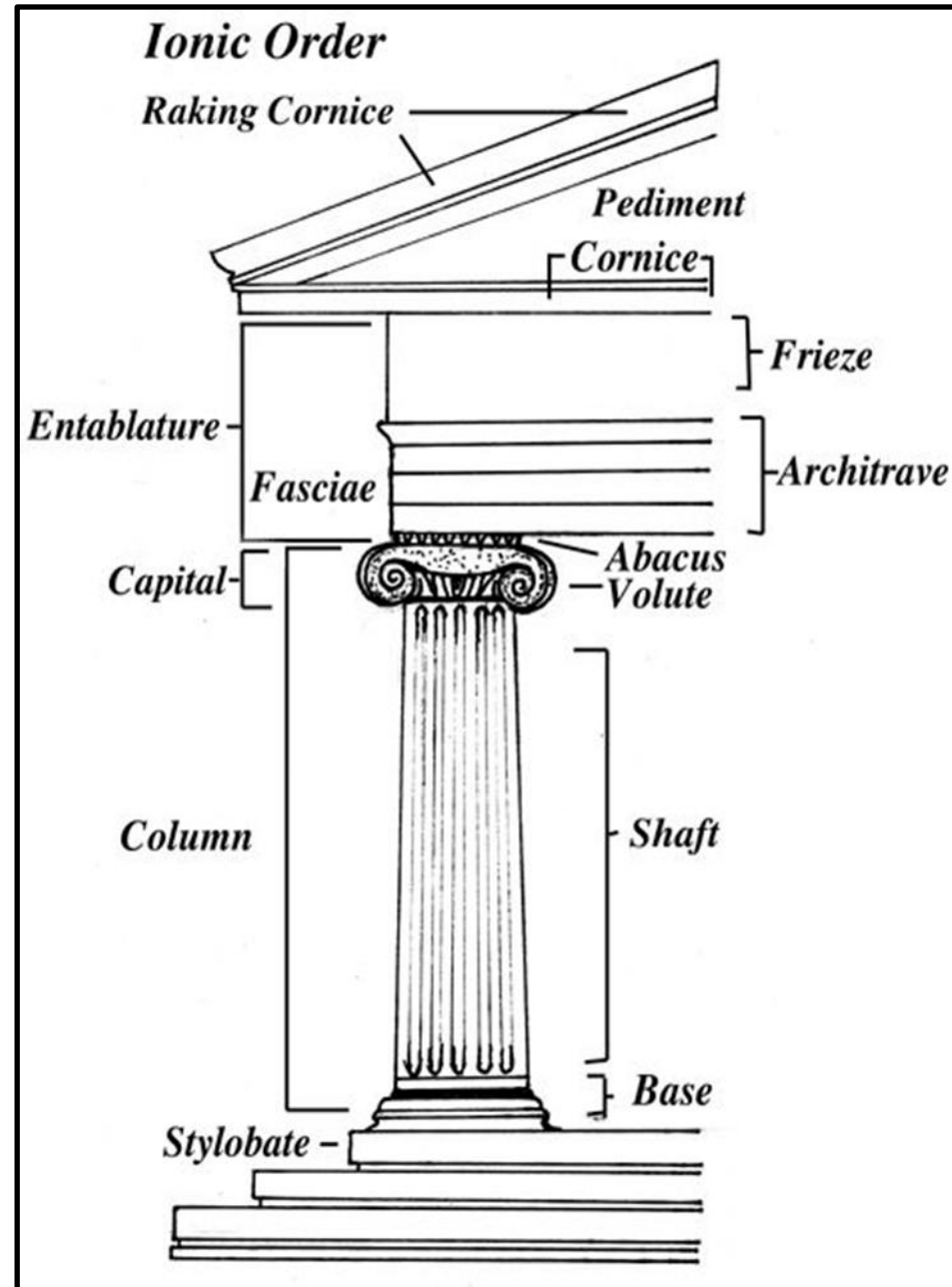


- **Ionic entablature is divided into (three) parts:**

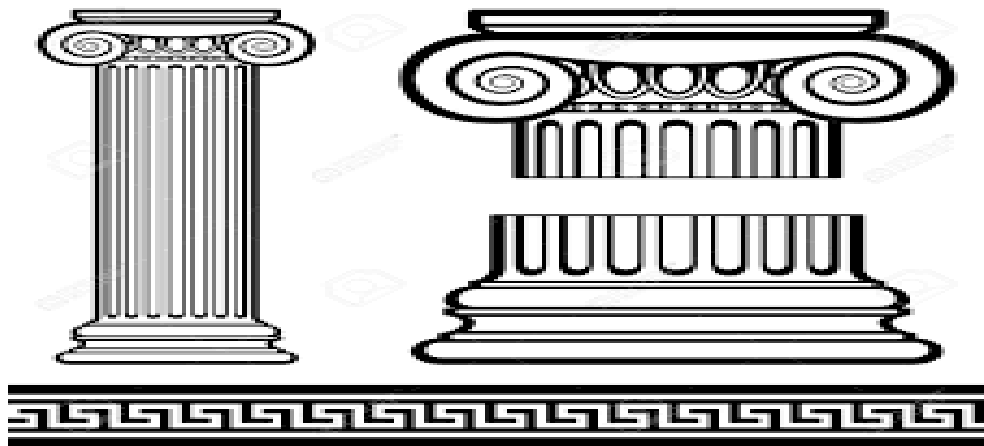
- architrave
- cornice
- frieze

- The Ionic is has a height of 10 times the base diameter.

- shape of a women with to delicacy and feminine slenderness
- example : Temple of Athena Nike Athens



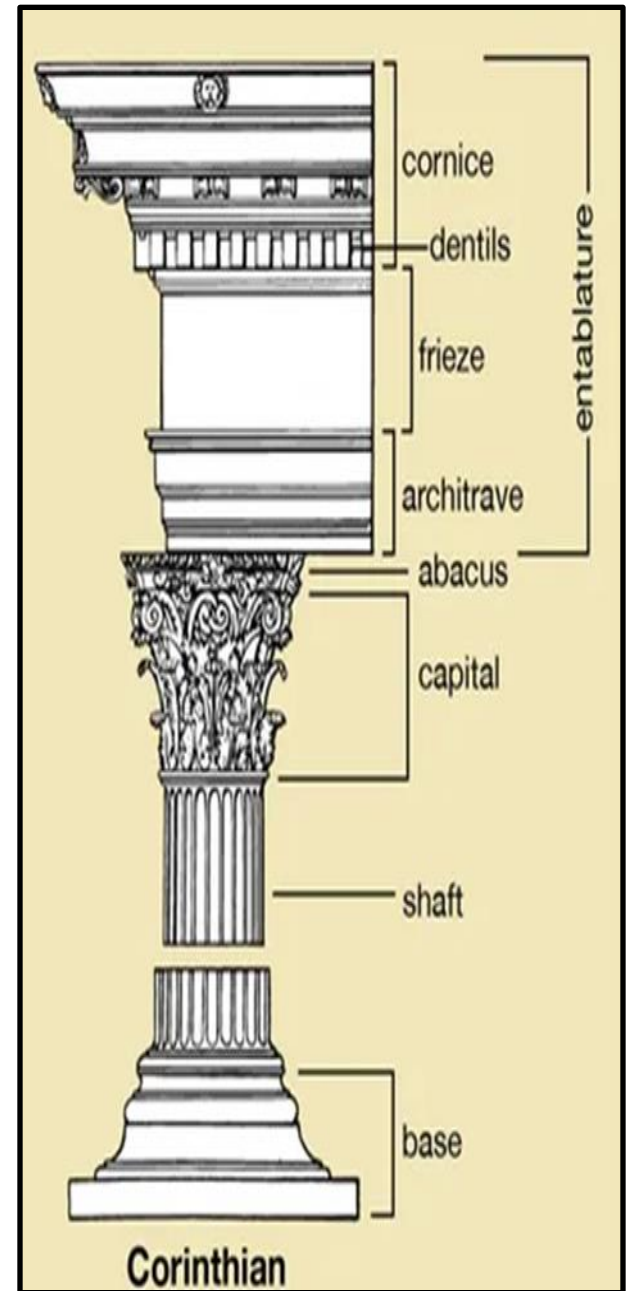




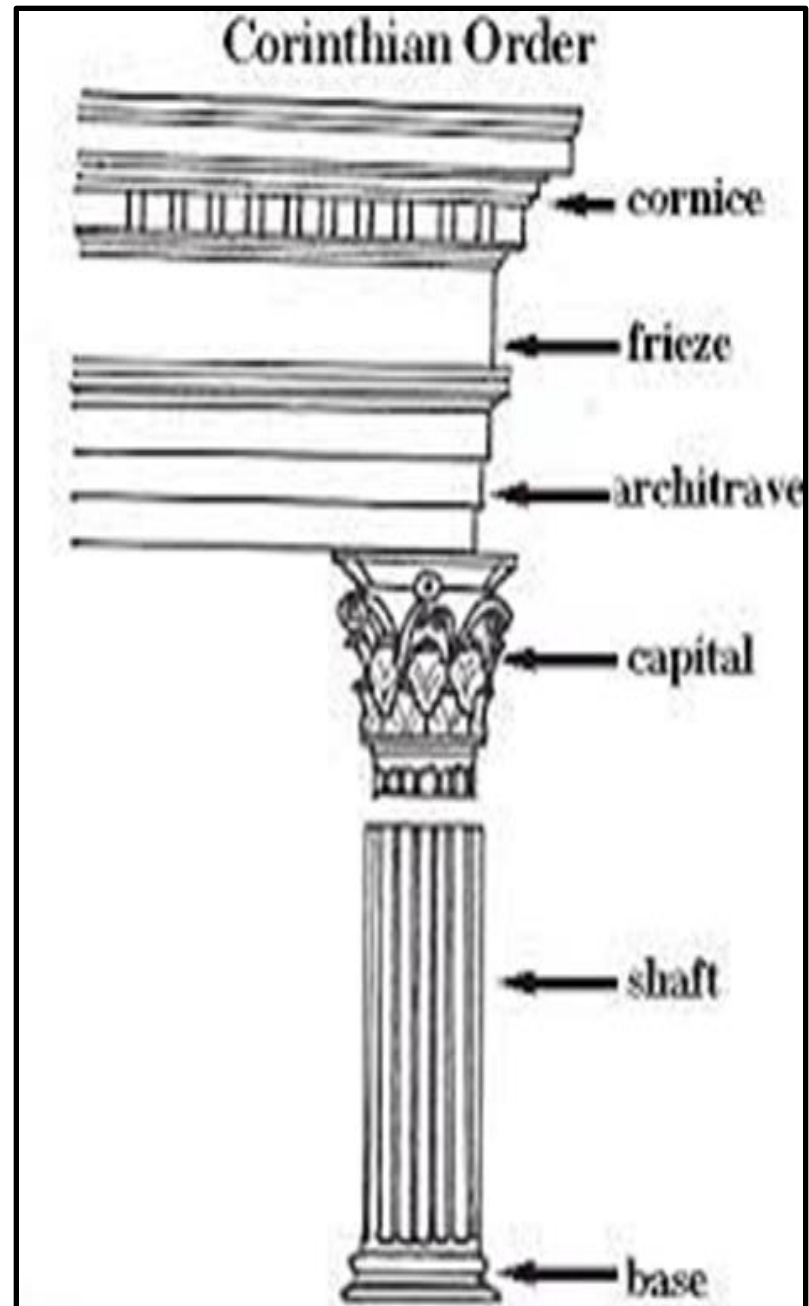
shape of a women with to delicacy and feminine slenderness
Temple of Athena Nike Athens

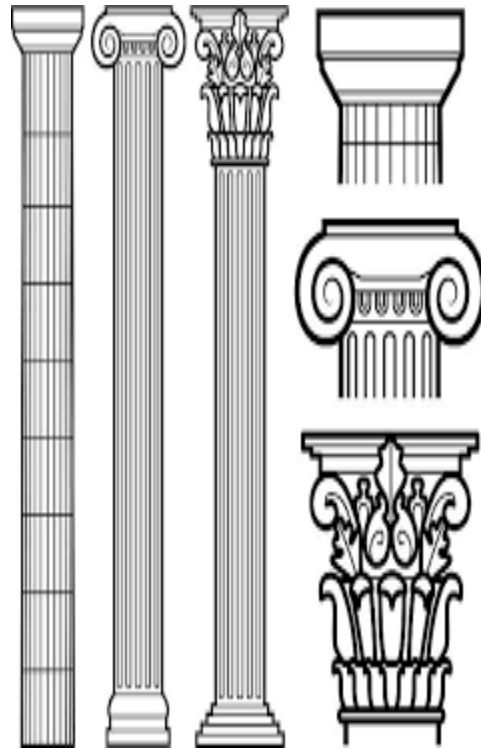
Corinthian order

- The Corinthian order takes its name from the city of Corinth in Greece, It however appeared to have been developed in Athens in the 5th century BC.
- This order is similar in its proportions to the Ionic order but has a different capital.
- **Corinthian capital** : decorated with rows of carved acanthus leaves, This rich decorative effect made it attractive.

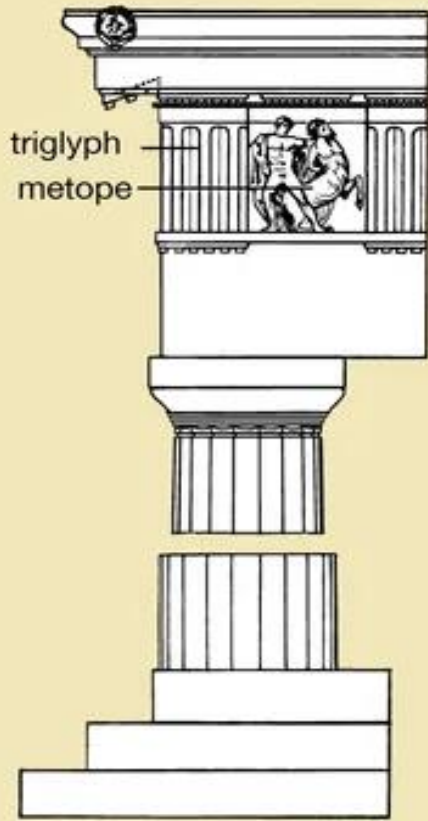


- **Corinthian column :**
- the most beautifully ornate of the three orders.
- Height of 10 diameters .
- **Corinthian entablature :**
Is divided into (three) parts :
 1. an architrave .
 2. frieze
 3. cornice developed type with (dentils) .
- Because of its symmetry, the Corinthian capital unlike the ionic capital is designed to be seen from all directions
- The Corinthian column is said to represent the shape of a women with its delicacy and feminine slenderness.
- examples: Temple of Zeus, Athens .



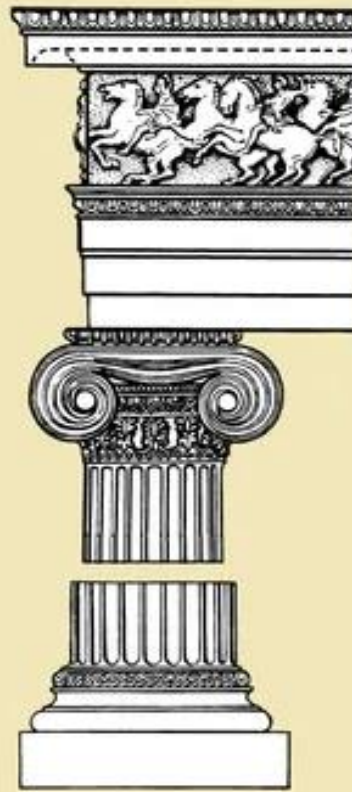


The Corinthian column is said to represent the shape of a women with its delicacy and feminine slenderness.
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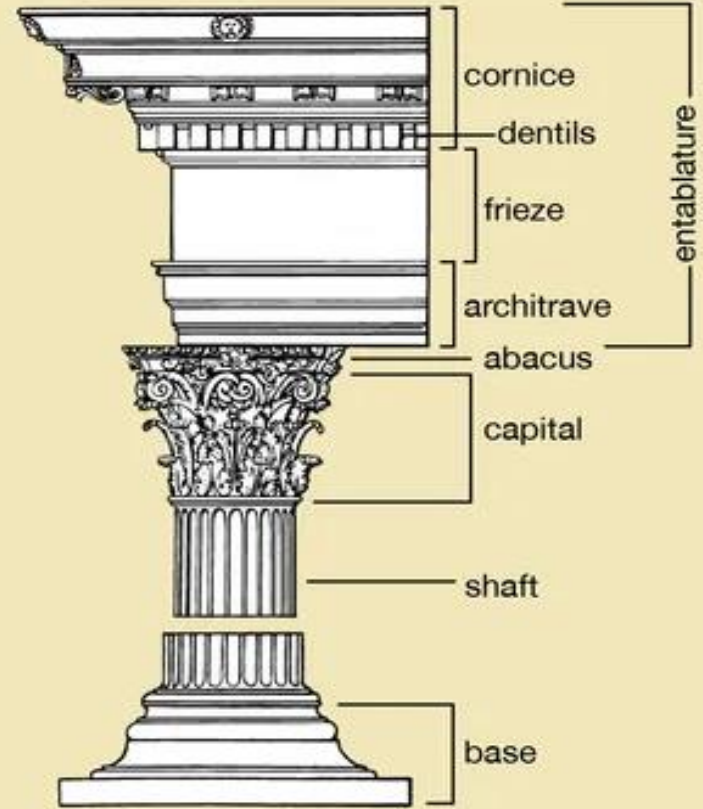


triglyph
metope

Doric

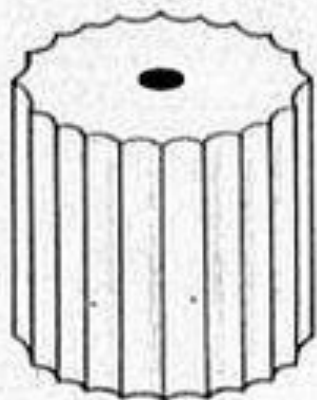


Ionic

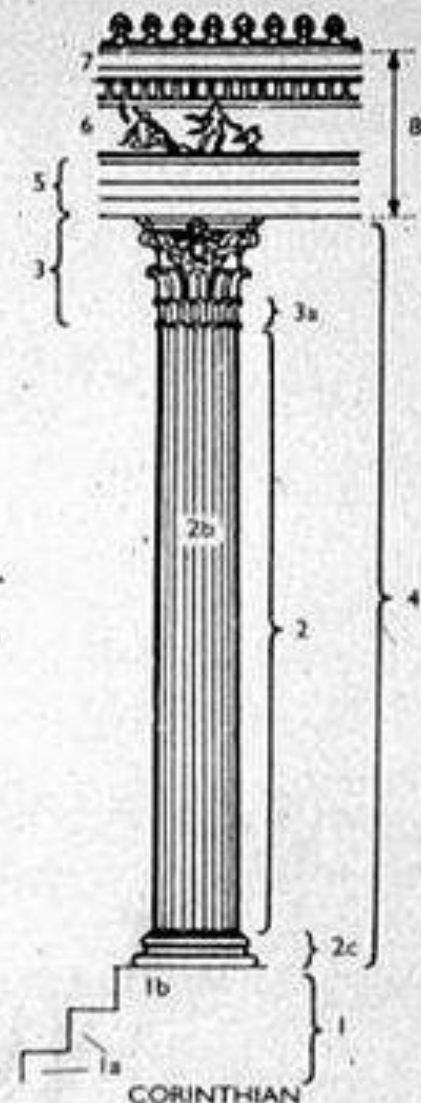
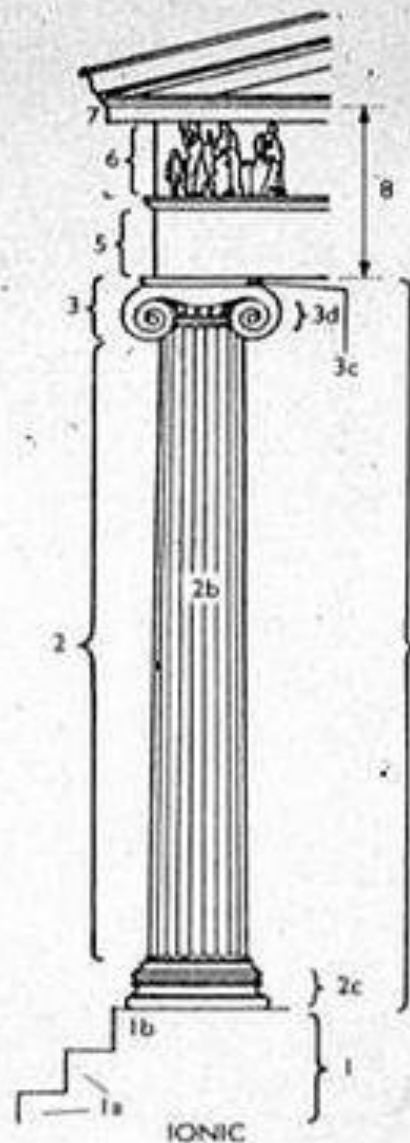
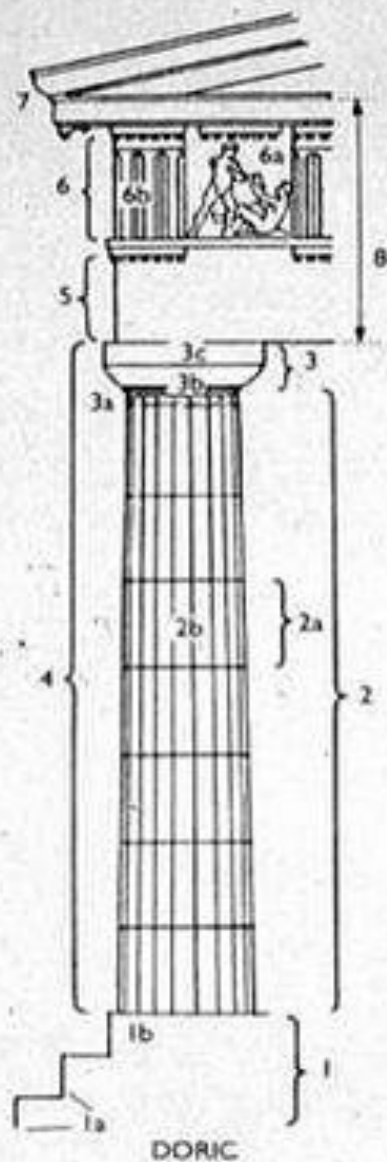


Corinthian

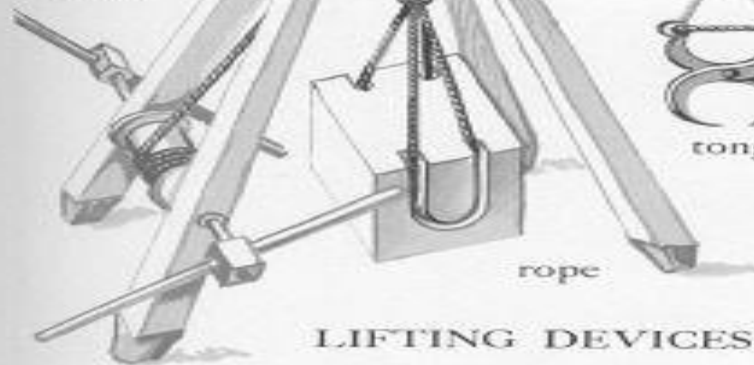
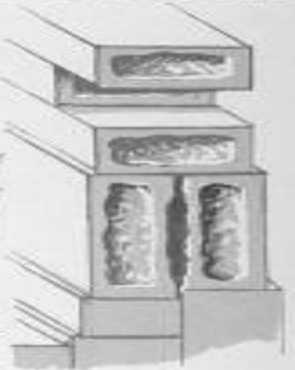
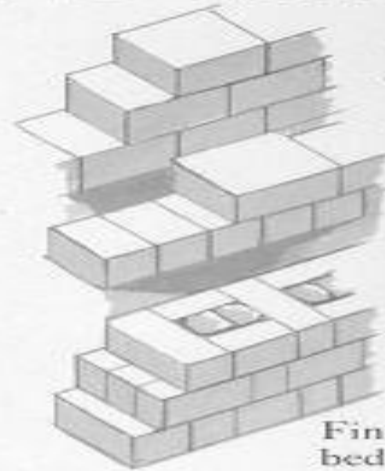
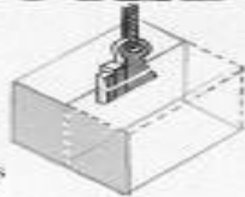
- 1 Steps
 - (a) Stereobate
 - (b) Stylobate
- 2 Shaft
 - (a) Doric drum
 - (b) Flute
 - (c) Base
- 3 Capital
 - (a) Necking
 - (b) Echinus
 - (c) Abacus
 - (d) Volute
- 4 Column
- 5 Architrave
- 6 Frieze
 - (a) Metope
 - (b) Triglyph
- 7 Cornice
- 8 Entablature



Doric drum

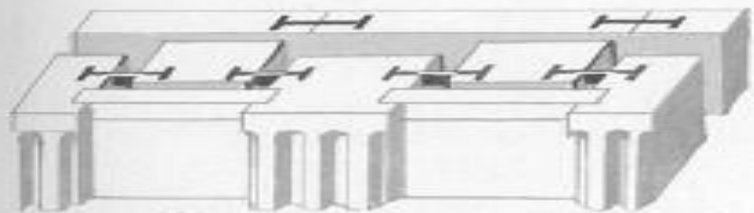


BUILDING METHODS



MASONRY
Fine squared ashlar
bedded and jointed
without cement

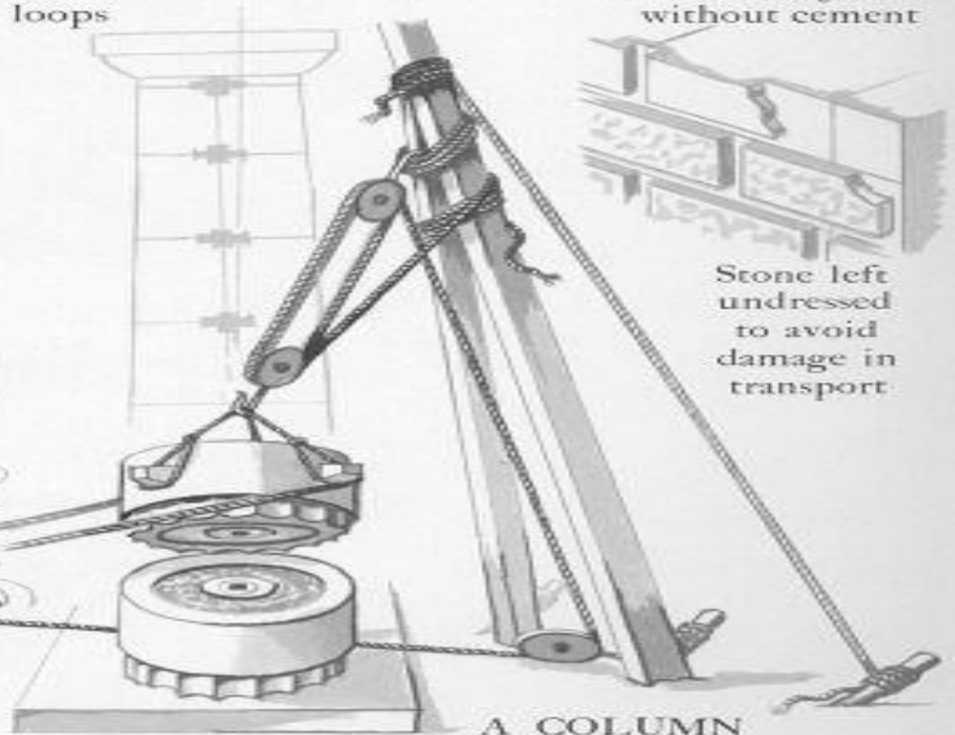
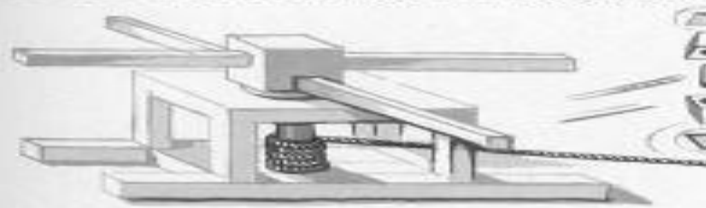
LIFTING DEVICES



METAL GRAMPS set in molten lead



Stone left
undressed
to avoid
damage in
transport



ERECTION OF

A COLUMN

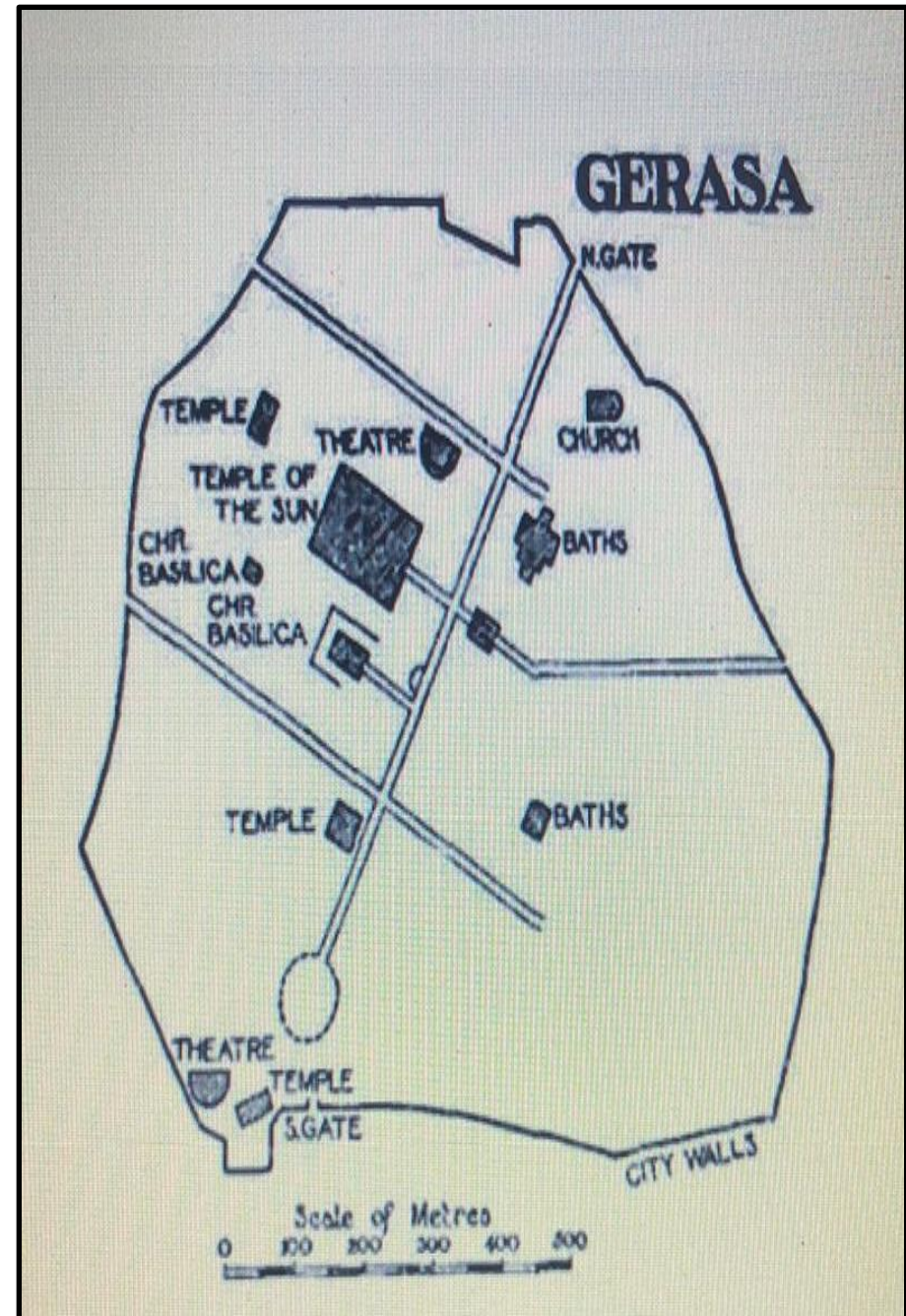






Greek city planning

- Ancient Greeks not only develop ideals of architectural aesthetics, but they also developed principles for the design and Greek Principles of City Planning as location for architecture.
- The ancient Greek city states developed a standard plan of the city. Acropolis.
- Principles were developed for organizing each element of the city based on activities and its symbolism.



- **The city consisted of four defined elements :**

- 1. the town :**

It was composed of simple courtyard houses separated by streets, It could either be organic or grid-iron layout.

- 2. Acropolis :**

was the city of the gods, it has isolated objects arranged in open space(temples).

- 3. Agora :**

was a meeting place for social, commercial and political activities, The principle of its design centers on creating boundaries to contain space for activities.

- 4. stoas :**

and other civic buildings are used to define the space. These are usually treated with continuous colonnades or porticoes along the side of the court with occasional penetrations by footpaths .

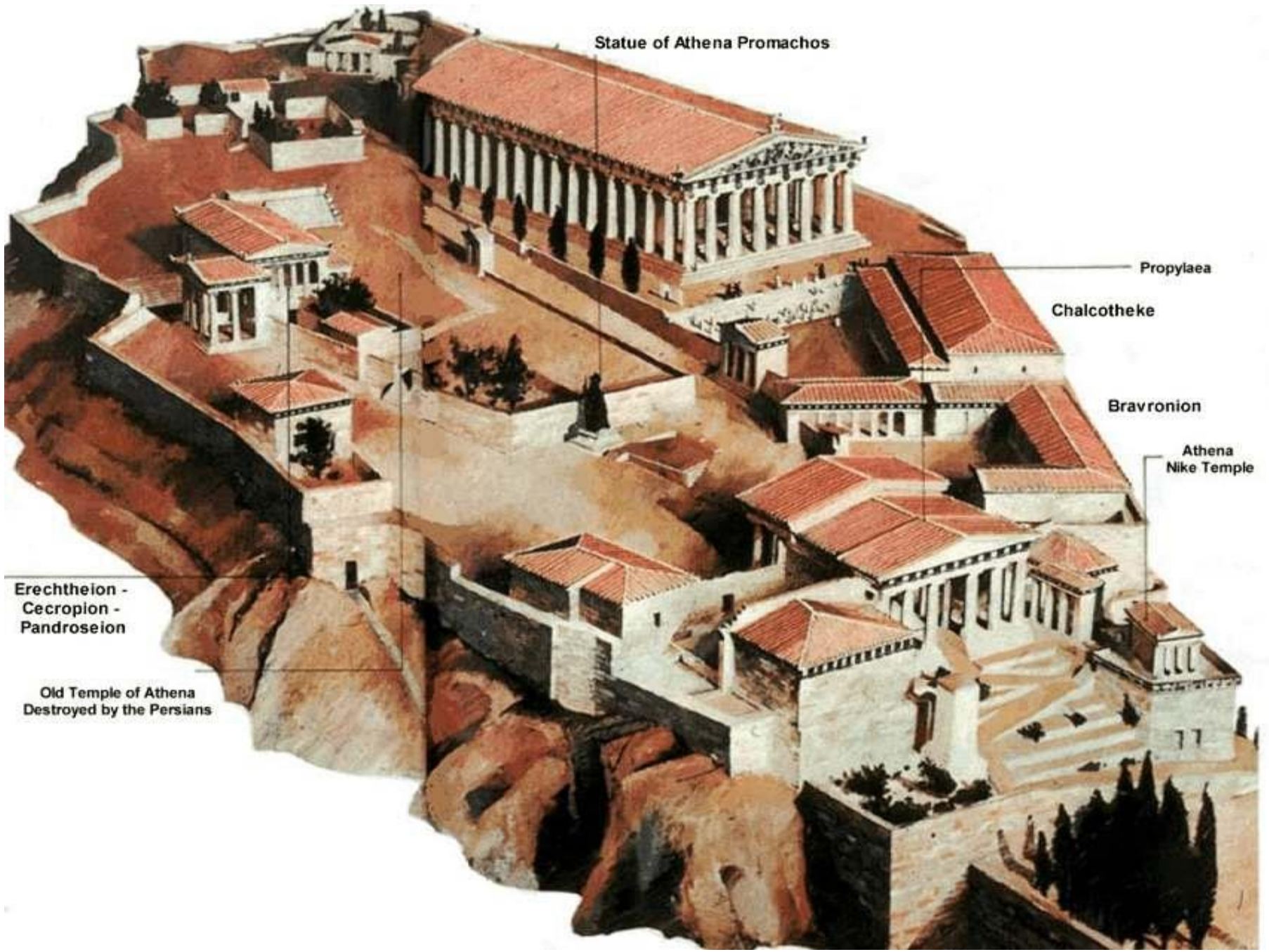
There are 7 types of Greek Architecture Buildings :

- 1. Acropolis (a sacred hill contains Temples)**
- 2. Agora.**
- 3. Sota**
- 4. Temples.**
- 5. Theaters.**
- 6. Bouleuterion**
- 7. Stadium.**
- 8. Houses, palaces (both periods).**
- 9. Tombs.**

1. The Acropolis

- The high points of the city were treated as sacred .
- A powerfully assertive landscape influenced the Urban planning .
- The Acropolis: is the general term for the original defensive hilltop of the older Greek cities .
- The site for the temples of Gods, their treasures and artifacts.
- If the acropolis is at the center then, there were no need of city wall .
- In case of Athens, the high place was originally a fortified hilltop which became the Acropolis.





Statue of Athena Promachos

Propylaea

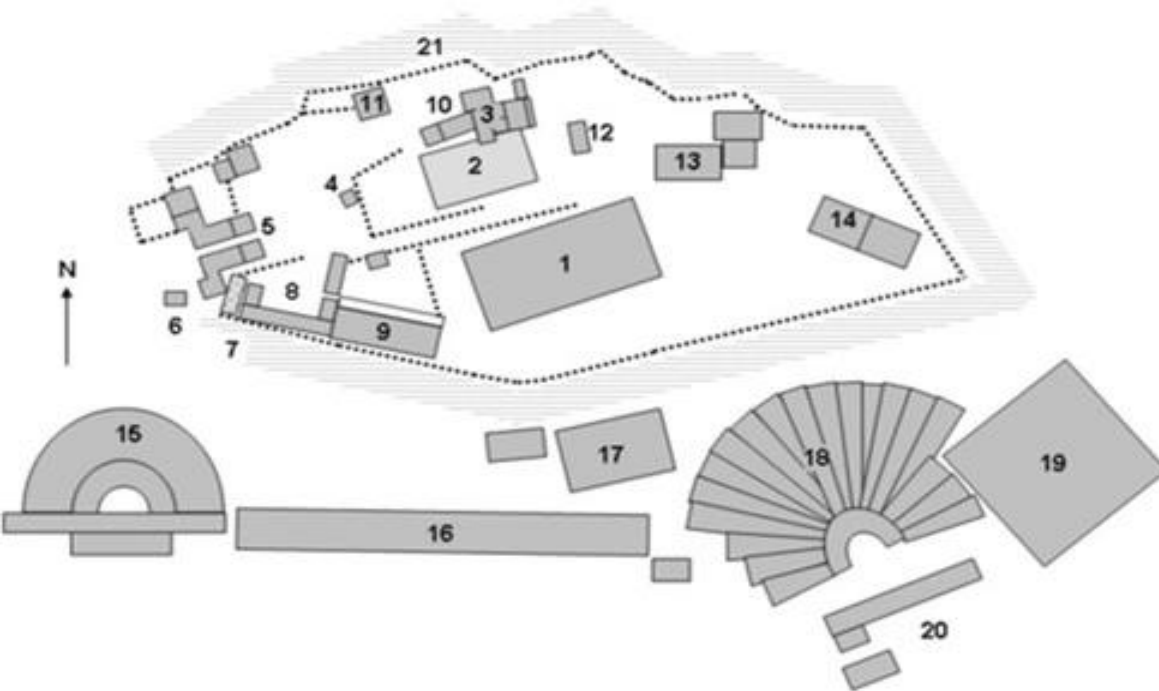
Chalcotheke

Bravronion

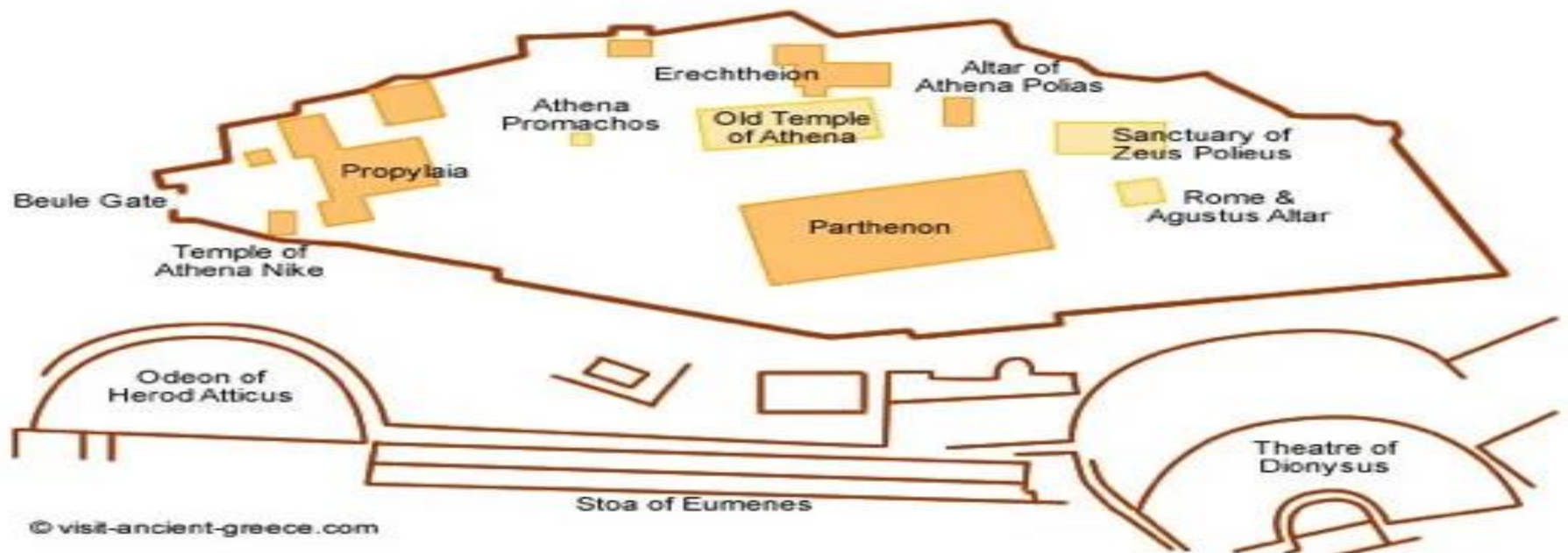
Athena Nike Temple

Erechtheion -
Cecroplon -
Pandroseion

Old Temple of Athena
Destroyed by the Persians



1. Parthenon
2. Old Temple of Athena
3. Erechtheum
4. Statue of Athena Promachos
5. Propylaea
6. Temple of Athena Nike
7. Eleusinion
8. Sanctuary of Artemis Brauronia or Brauroneion
9. Chalkotheke
10. Pandroseion
11. Arrephorion
12. Altar of Athena
13. Sanctuary of Zeus Polieus
14. Sanctuary of Pandion
15. Odeon of Herodes Atticus
16. Stoa of Eumenes
17. Sanctuary of Asclepius or Asclepieion
18. Theatre of Dionysus Eleuthereus
19. Odeon of Pericles
20. Temenos of Dionysus Eleuthereus
21. Aglaureion

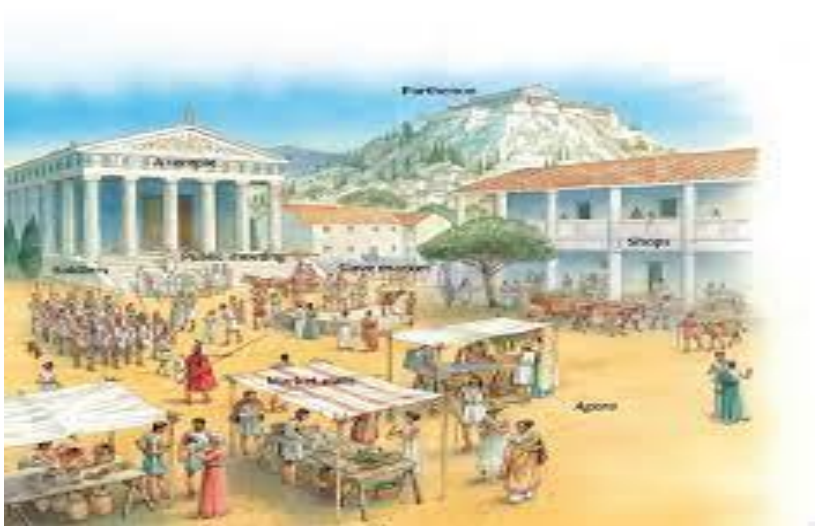


2. The Agora

In ancient Greece, an Agora was a central location in a city used as a gathering place or an assembly. The most well known Agora of ancient times is the Agora of Athens which was located just below the Acropolis.

The Greek Agora helped change city planning and is still used in some capacity today.

- In ancient Greece, an Agora was a central location in a city used as a gathering place or an assembly.
- The agora was a central spot in ancient Greek city states .
- The literal meaning of the word is" gathering place".



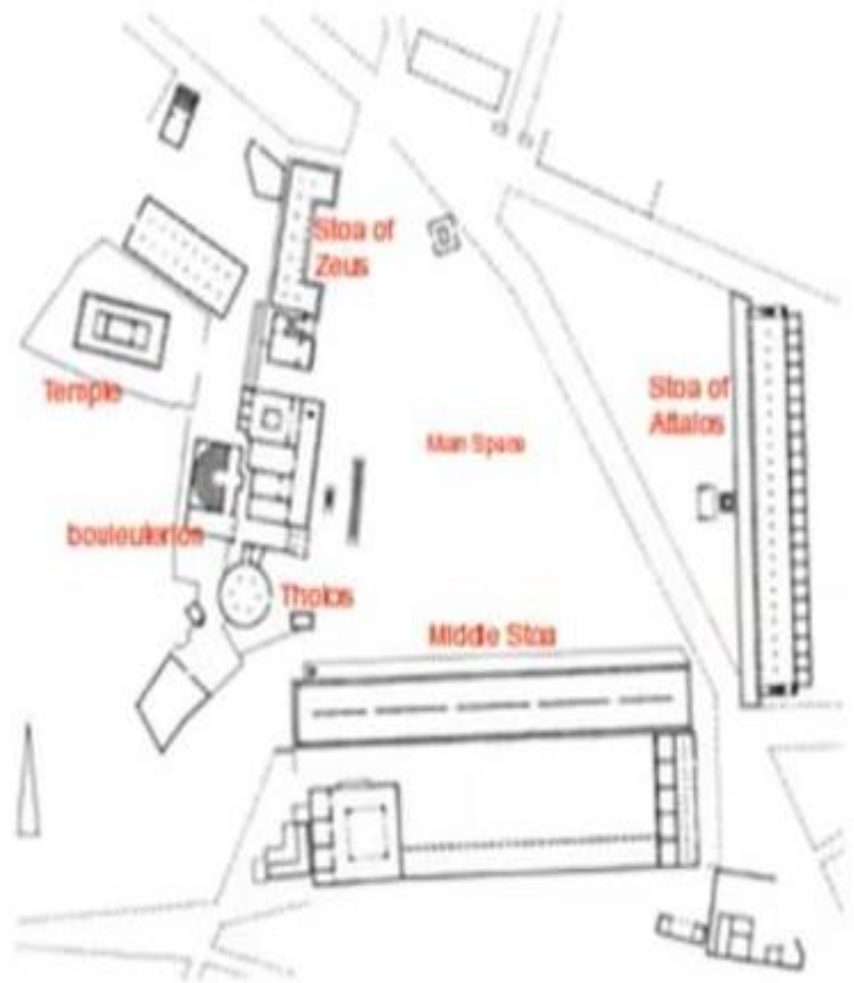
- The agora was the center of athletic, artistic, spiritual and political life of the city also, Served as marketplace for merchants.
- The Agora was an open air meeting place, the Greek equivalent of the town square.
- It was enclosed by Stoa or colonnades giving access to public buildings all around such as temples, etc.



AGORA (MARKET PLACE)

commercial centre of the city

- The Agora in Athens was a space used for social, commercial and political activities.
- Civic and religious buildings were progressively erected around the perimeter of the Agora space

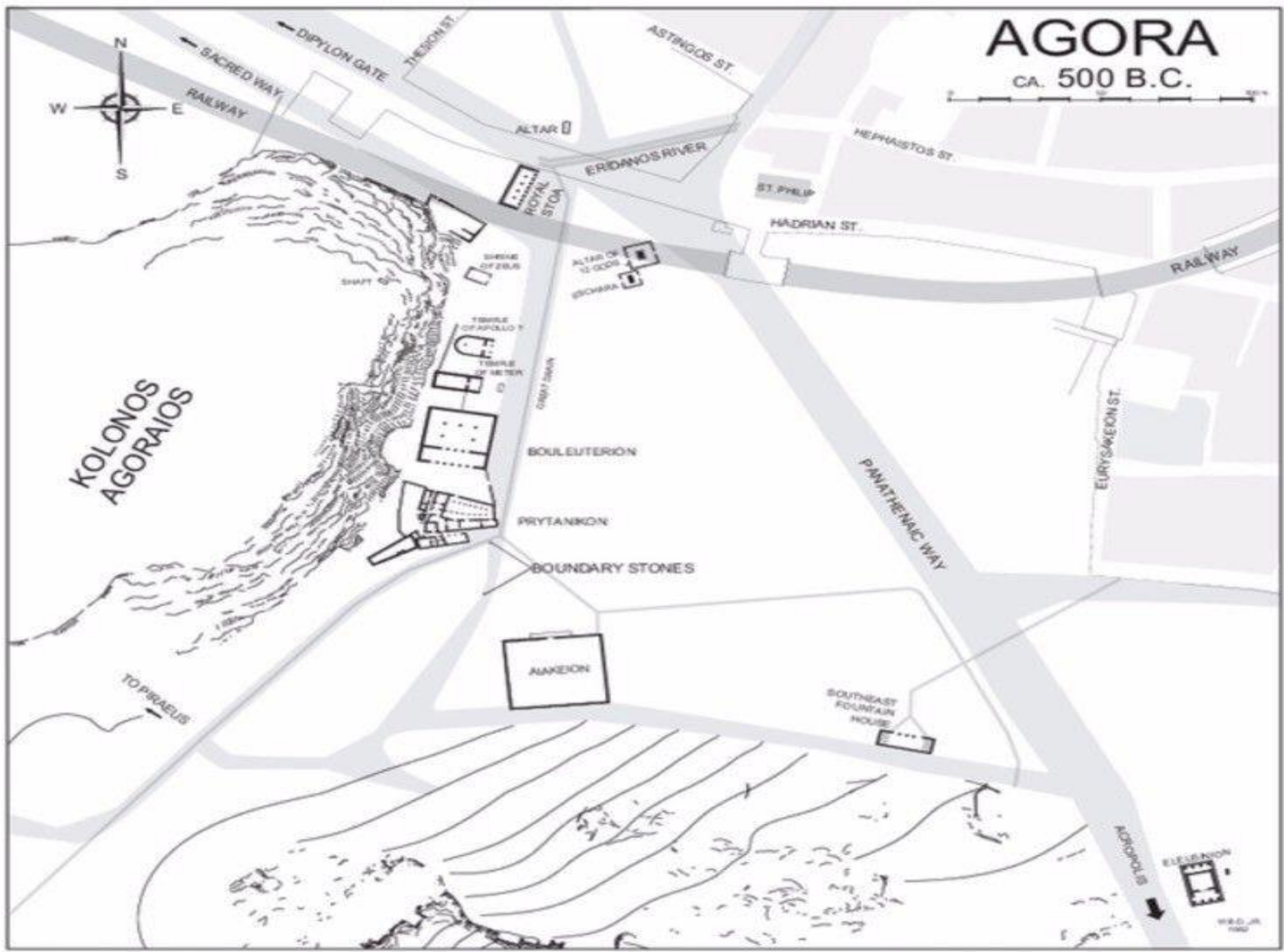


The Agora, Athens Plan

Source: unknown

AGORA

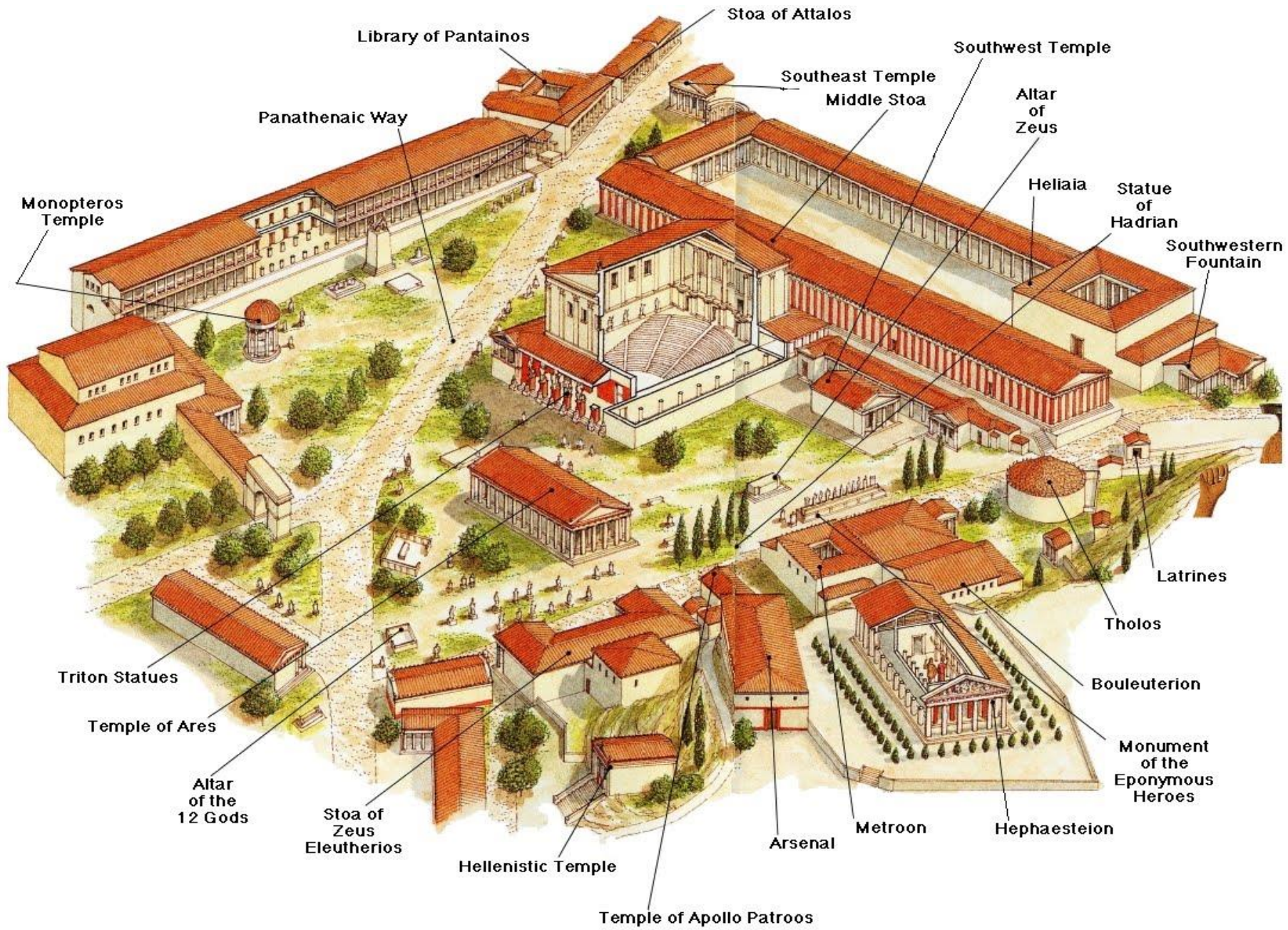
CA. 500 B.C.



KOLONOS AGORAIOS

TO PIRAEUS

1:500



Library of Pantainos

Stoa of Attalos

Southwest Temple

Panathenaic Way

Southeast Temple
Middle Stoa

Altar of Zeus

Monopteros Temple

Heliaia

Statue of Hadrian

Southwestern Fountain

Triton Statues

Temple of Ares

Altar of the 12 Gods

Stoa of Zeus Eleutherios

Hellenistic Temple

Temple of Apollo Patroos

Arsenal

Metroon

Hephaesteion

Latrines

Tholos

Bouleuterion

Monument of the Eponymous Heroes

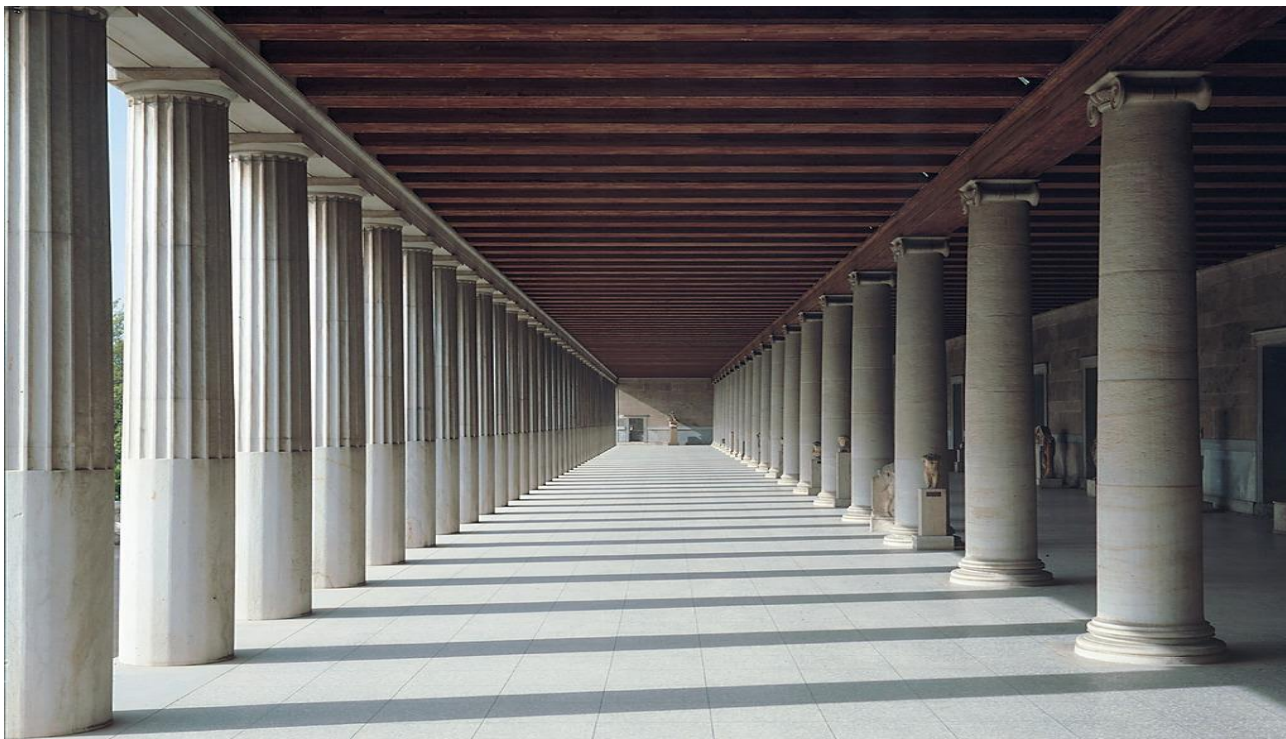
3. The Stoa of Attalos

The Stoa of Attalos was a stoa (covered walkway or portico) in the Agora of Athens, Greece. The Stoa became the major commercial building or shopping center and was used for centuries, from its construction in around 150 B.C.

- The Stoa of Attalos was originally built by King Attalos II of (Pergamon) (159–138 B.C.), as a gift to the Athenians in appreciation of the time he spent in Athens studying under the philosopher Carneades .
- What he gave the city was an elaborate stoa , a large two- storied double colonnade with rows of shops behind the colonnades.



- The building was made of local materials, marble for the facade and columns, and limestone for the walls .
- The building skillfully makes use of different architectural orders .
- The **Doric** order was used for the **exterior** colonnade on the ground floor with **ionic** for the **interior** colonnade .
- it measures 116 meters long and had 42 shops in all.
- until its destruction at the hands of the Herulians in A.D. 267.



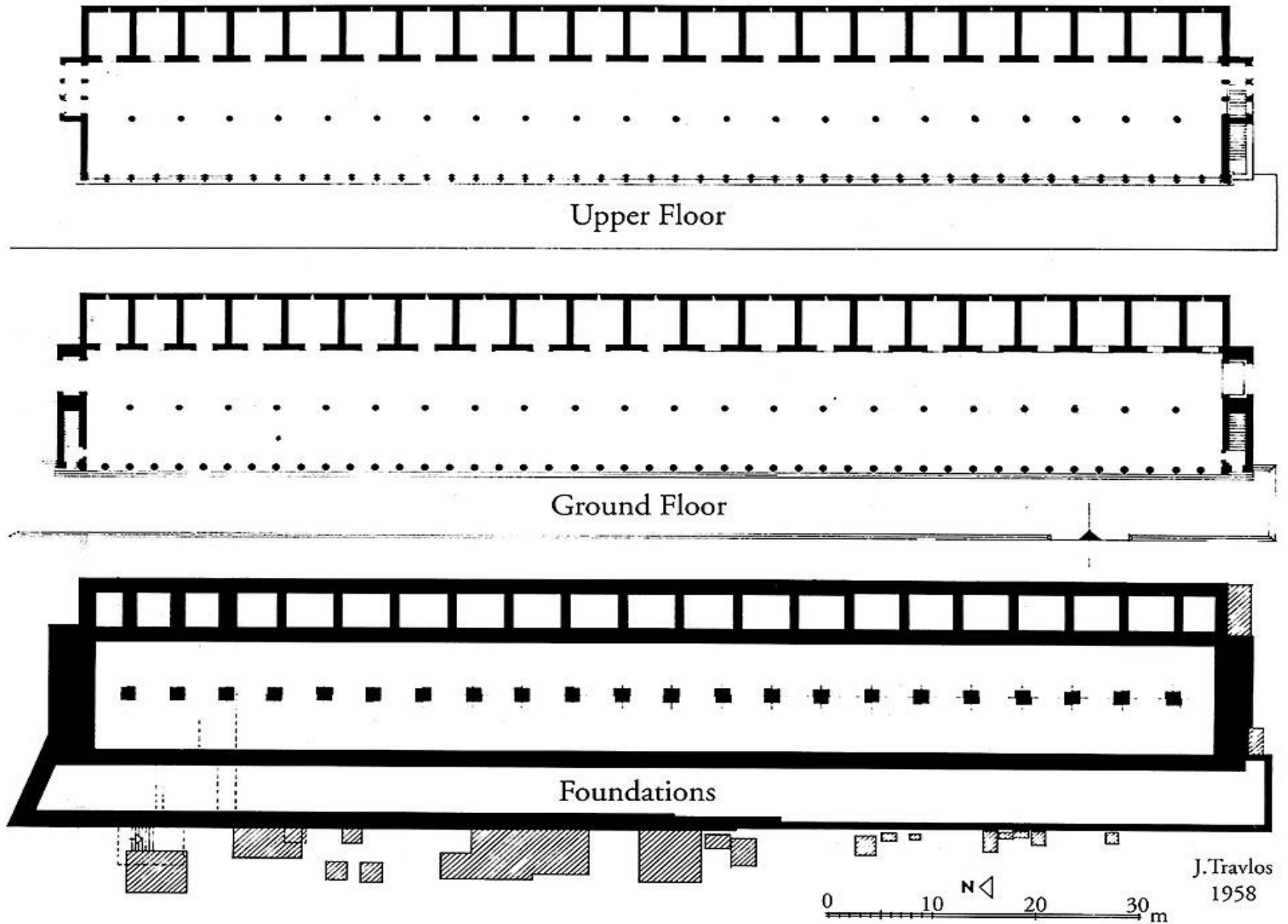
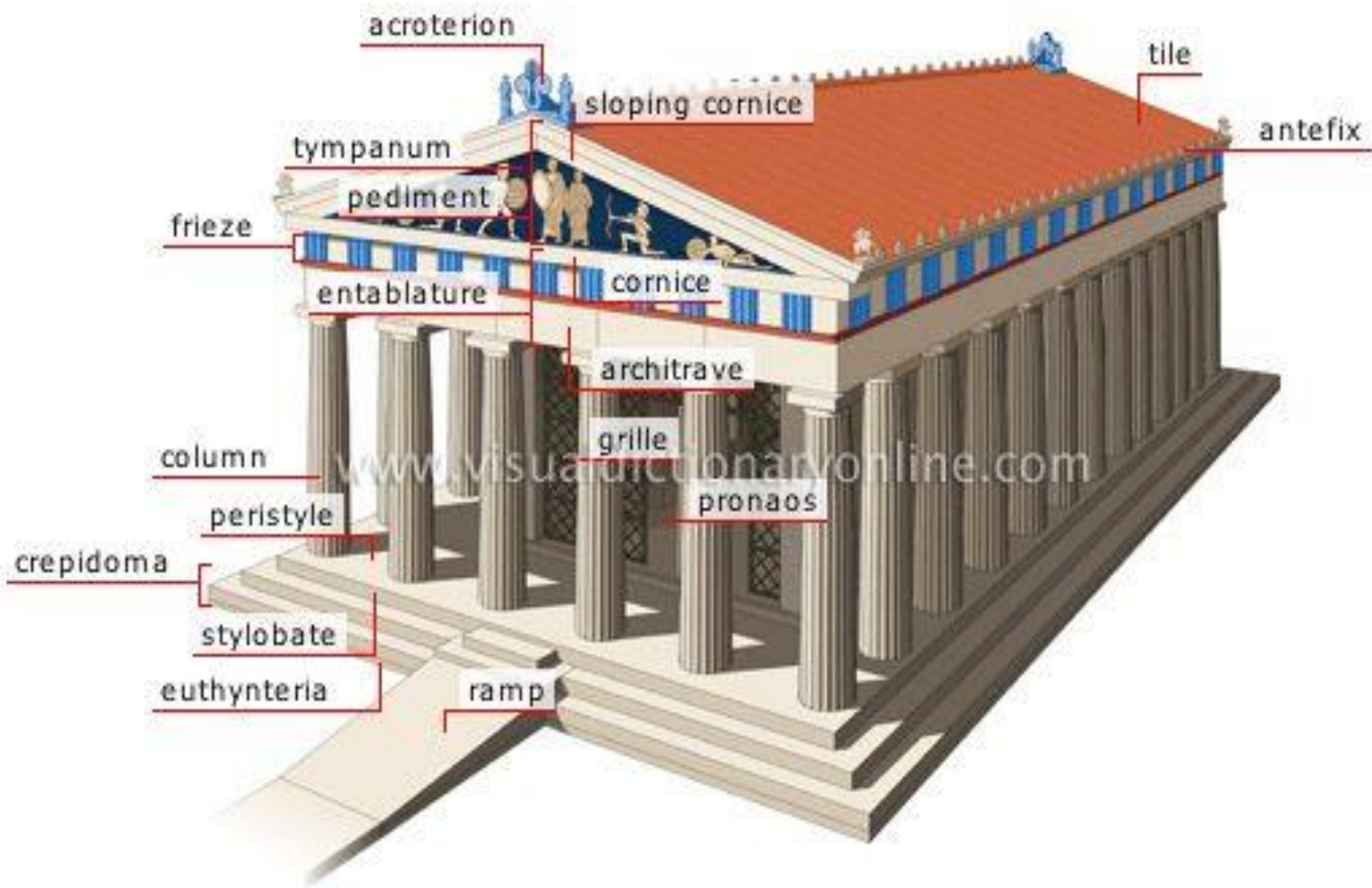


Figure 47. Plans of the Stoa of Attalos, 159–138 B.C.

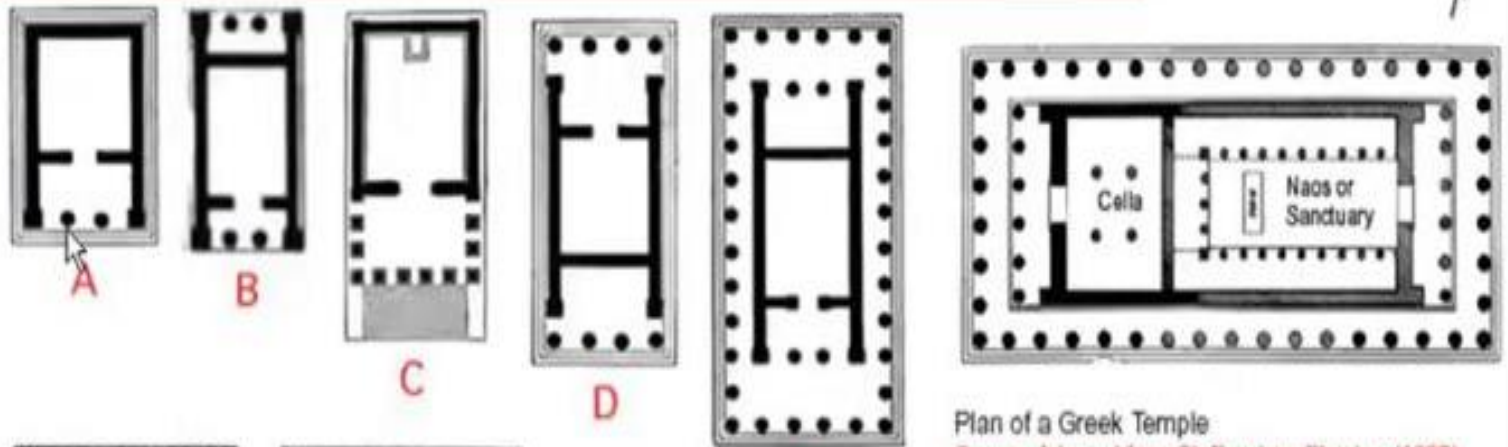
4. Temple

Chief building type in Greek Architecture, Structures built to house Gods statues within Greek sanctuaries in ancient Greek religion,
The temple interiors did not serve as meeting places since the sacrifices and rituals dedicated to took place outside .



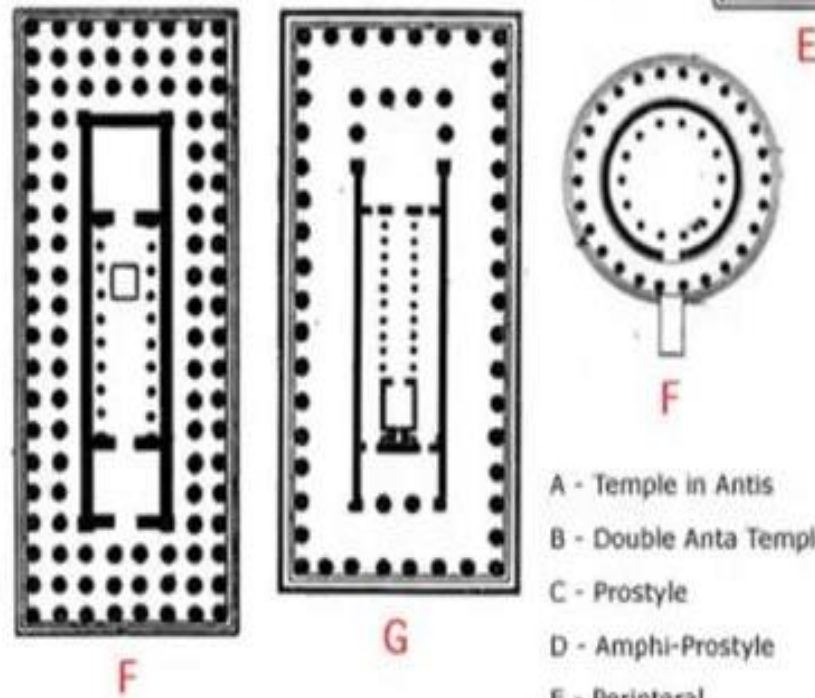


Temples



Plan of a Greek Temple

Source: Adapted from Sir Barrister Fletcher (1996)

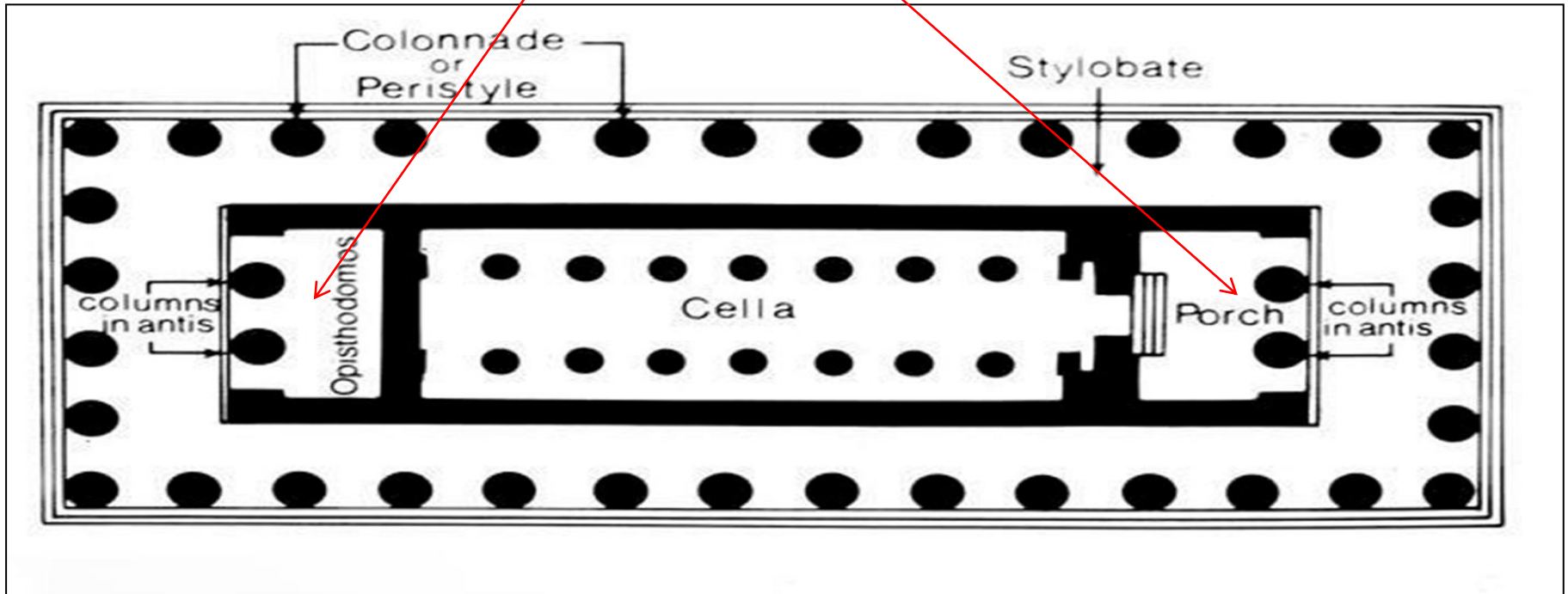


- A - Temple in Antis
- B - Double Anta Temple
- C - Prostyle
- D - Amphi-Prostyle
- E - Peripteral
- F - Dipteral
- G - Pseudodipteral
- F - Monopteral / Tholos

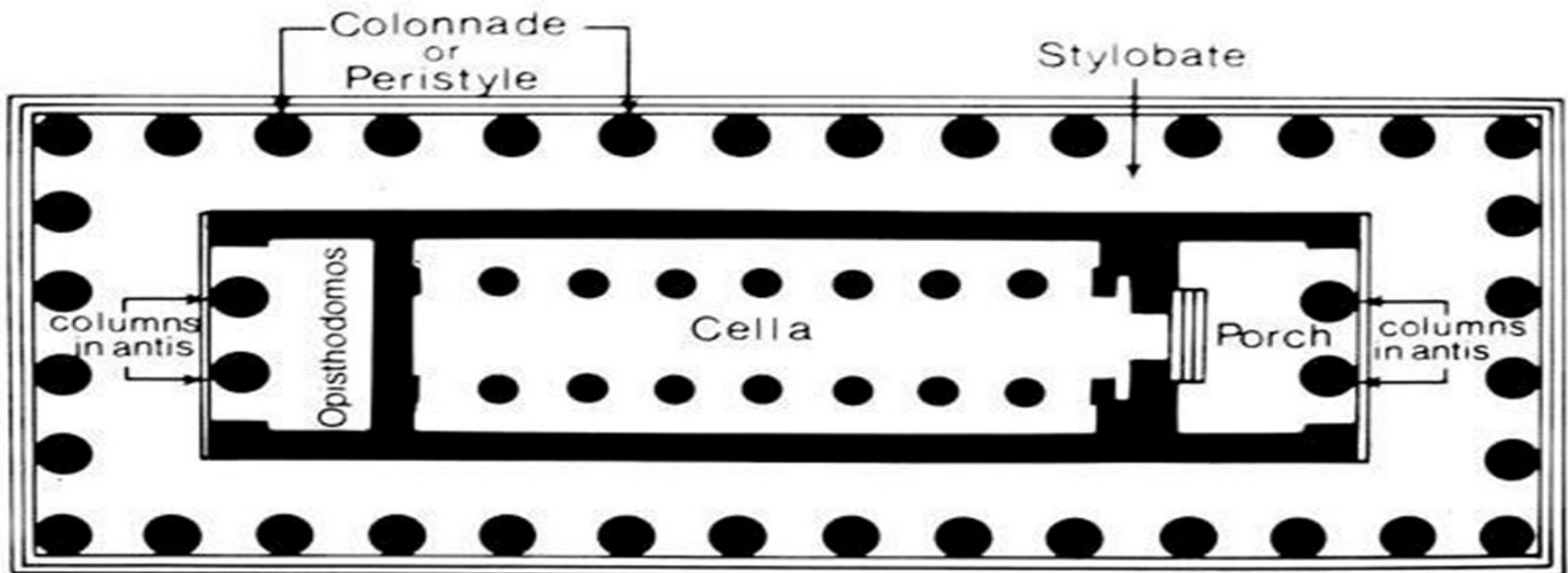
- The temple interior was generally dark, with only the entrance as a source of light.

plan of the temple

- It began with regularizing the **rectangular** shape as the main plan.
- The inner rectangular structure is called the **CELLA**. The cult statue is housed here.
- Around the cella , there is a colonnade or **peristyle** which is a row of columns.
- There are both front and back **porches**. The front is called the **PRONAOS**, while the back is called the **OPISTHADOMOS**. These were formed by the extending and thickening the walls of the cella.



- The columns around the perimeter of the entire building also had a formal design.
- The number of columns on the flank numbered two times plus one of the number of columns on the front. The ideal ratio was 6:13.
- The two columns in the front and back which are side by side are known to be in **antis**.
- There were two styles that temple architecture fell under: Doric order and Ionic.



Temple Plans classification

Temples has 6 typed, and that based on their ground plan and the way in which the columns are arranged:

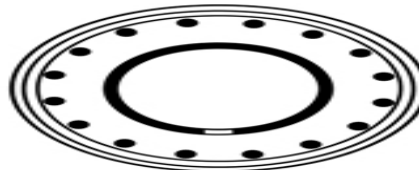
1. **Prostyle temple**: is a temple that has columns only at the front
2. **Amphiprostyle**: temple has columns at the front and the back. One of the more unusual plans is the tholos , a temple with a circular ground plan.
3. **Peripteral**: Temples with a colonnade arrangement have a single line of columns arranged all around the exterior of the temple building.



anta



double anta



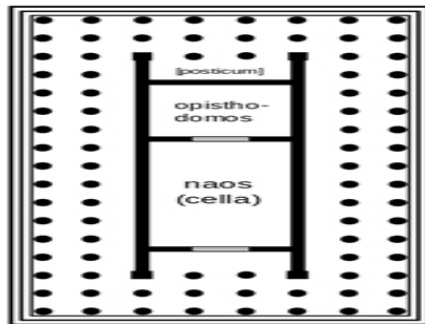
tholos



prostyle



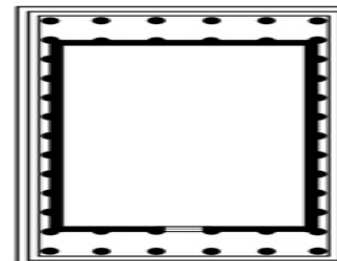
amphiprostyle



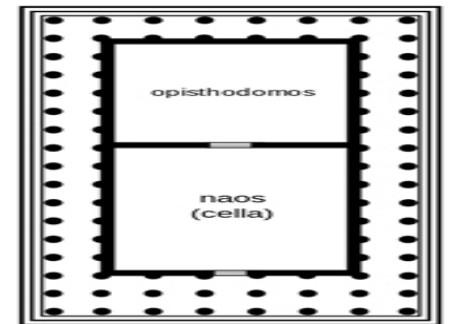
dipteral



peripteral



pseudoperipteral



pseudodipteral

4. **Dipteral temples** : simply have a double row of column surrounding the building.

5. **Pseudodipteral Temples** : with a room behind the naos (cella).

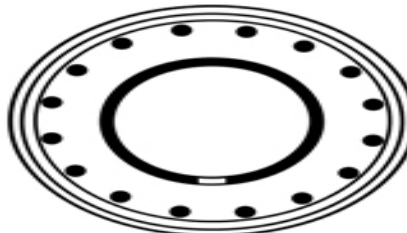
6. **Pseudoperipteral temples** : the naos room is closed by walls from four sides.



anta



double
anta



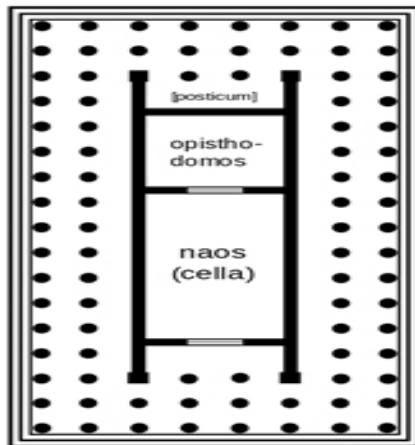
tholos



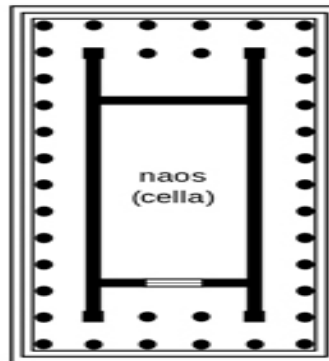
prostyle



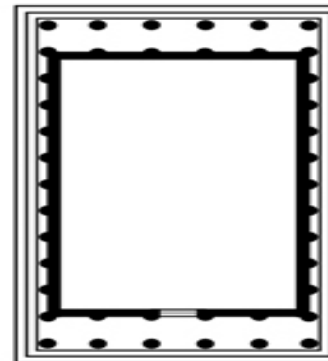
amphiprostyle



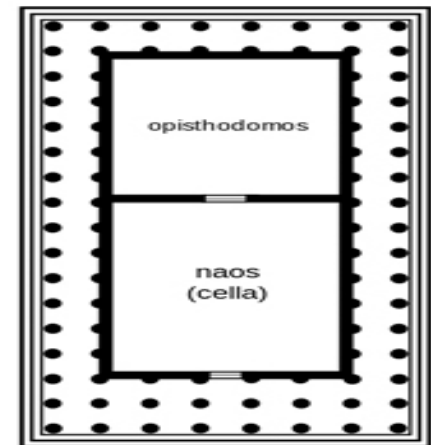
dipteral



peripteral



pseudoperipteral



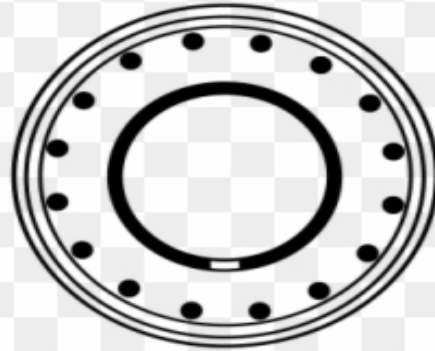
pseudodipteral



anta



double
anta



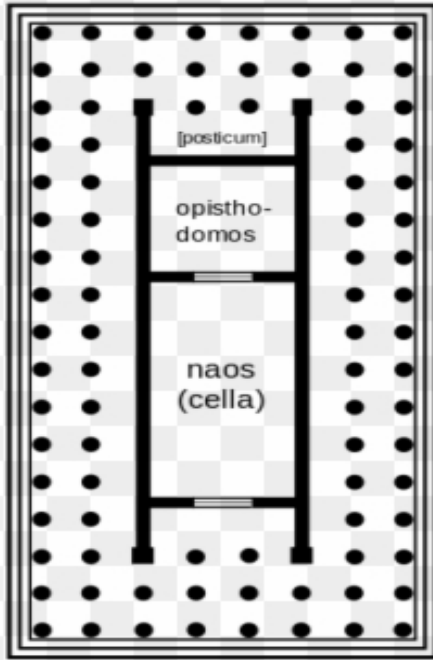
tholos



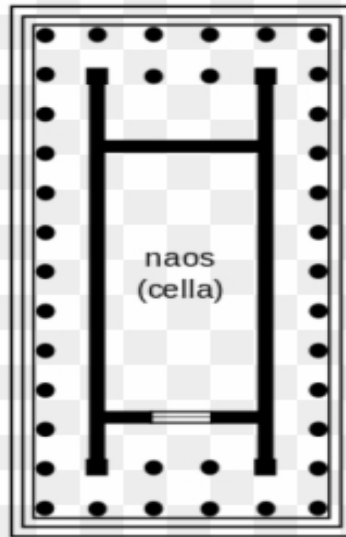
prostyle



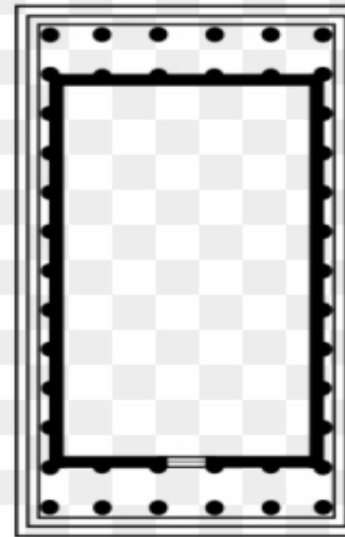
amphiprostyle



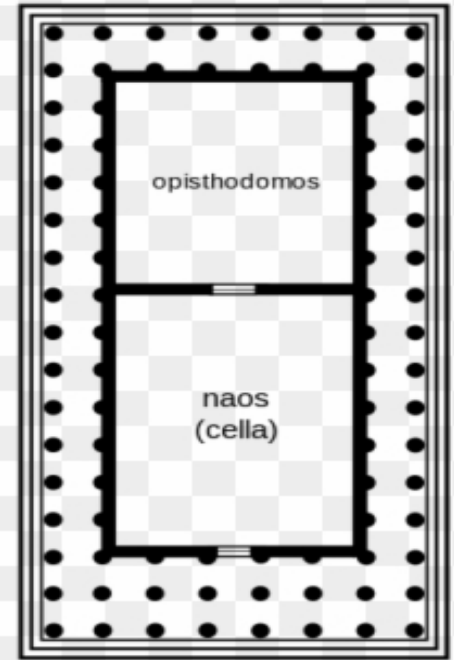
dipteral



peripteral



pseudoperipteral



pseudodipteral

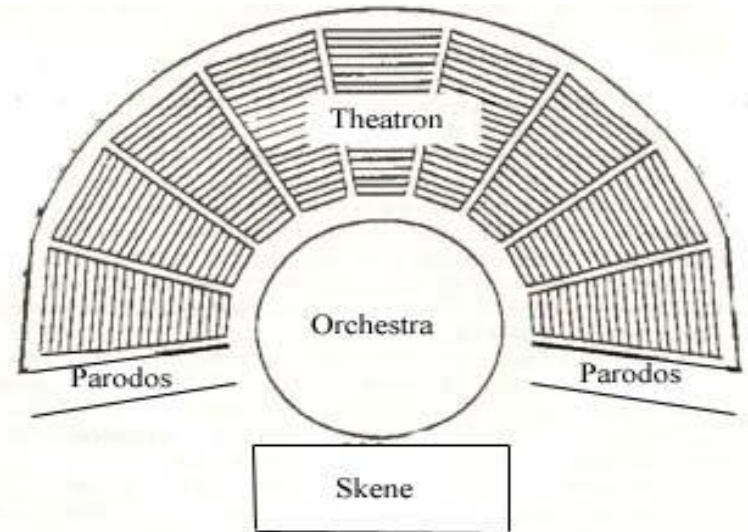
5. Greek Theater

The second important type of building that survives are the open-air theatre . The Greeks invented the theater design that is still used in movies and auditoriums today.

- Every important Greek city had a theater
The theater had a bank of seats steps created from the landscape.
- It would usually commands a view to the land scape

The main elements of the Greek theater are :

1. cavea (Auditorium).
2. Orchestra.
3. Skene (stage building).



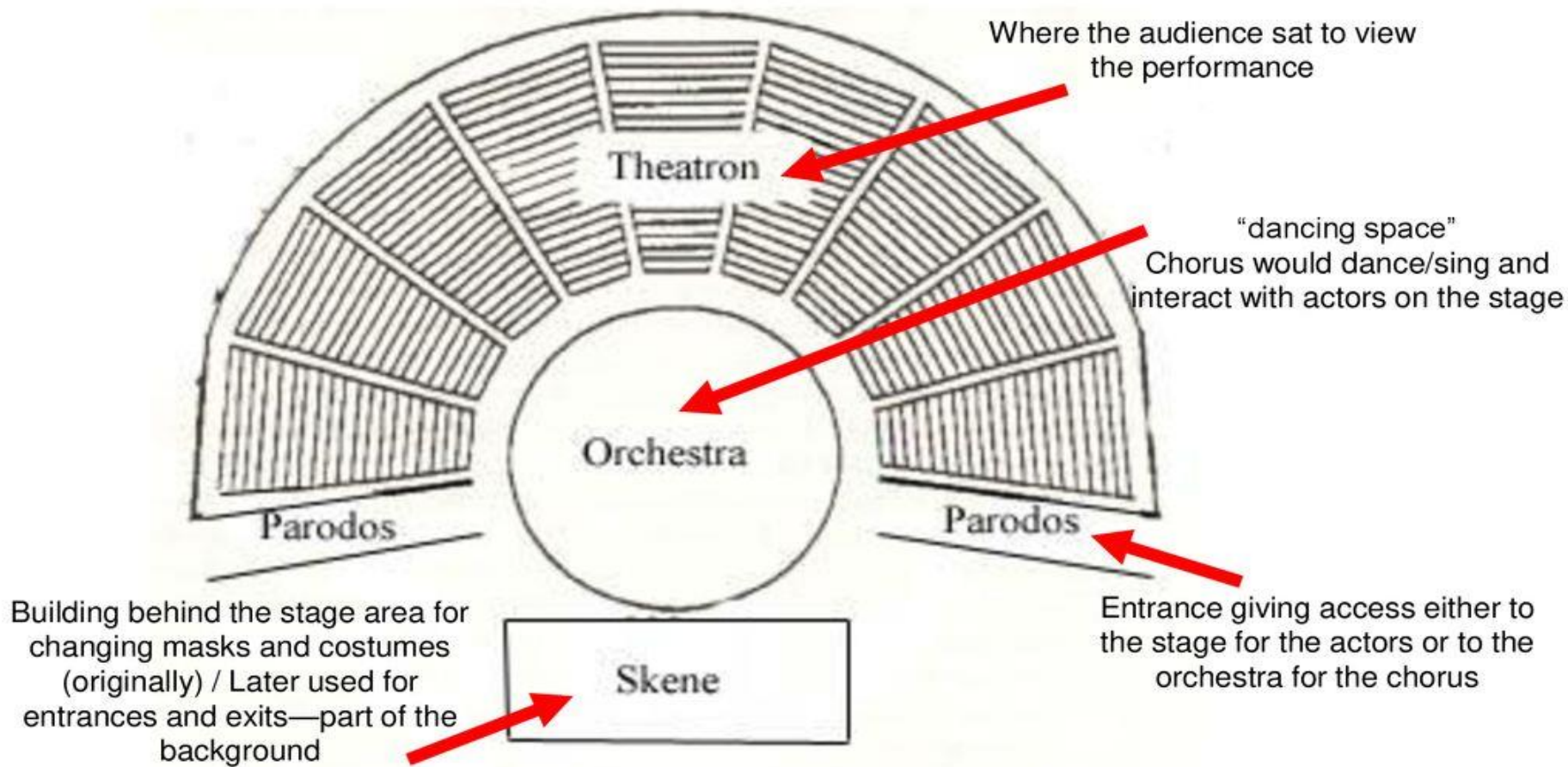
Parts of a Greek Theater



- **Main characteristic :**

1. Often built into a hill side.
2. It has a circular Orchestra .
3. Not enclosed on all sides Spectators can see "outside world" The original 34 rows of the Auditorium and more.
4. Capacity: 14,000 person and more
5. Theater Epidaurus it was the largest theater in ancient Greece It is still in use today.

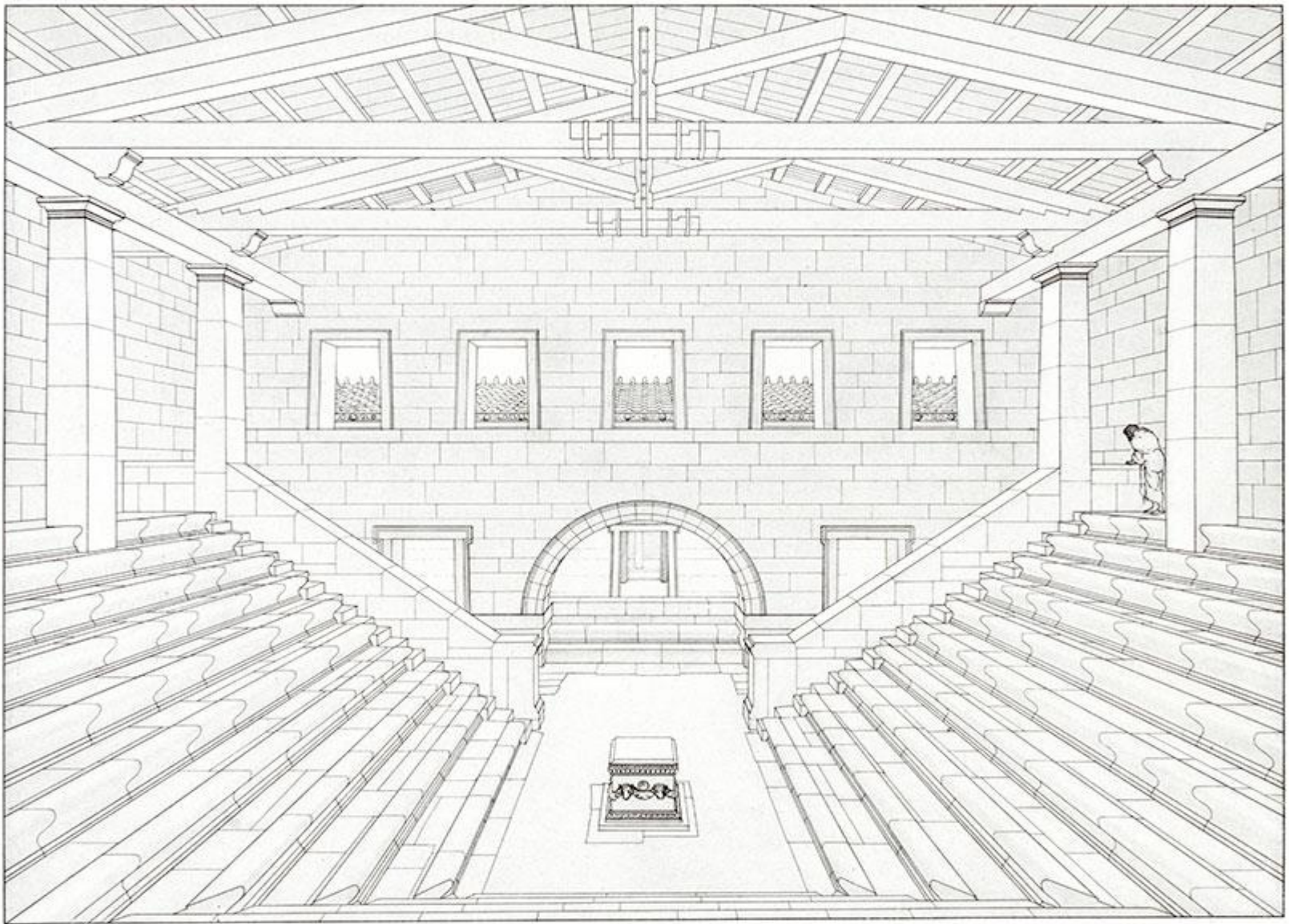




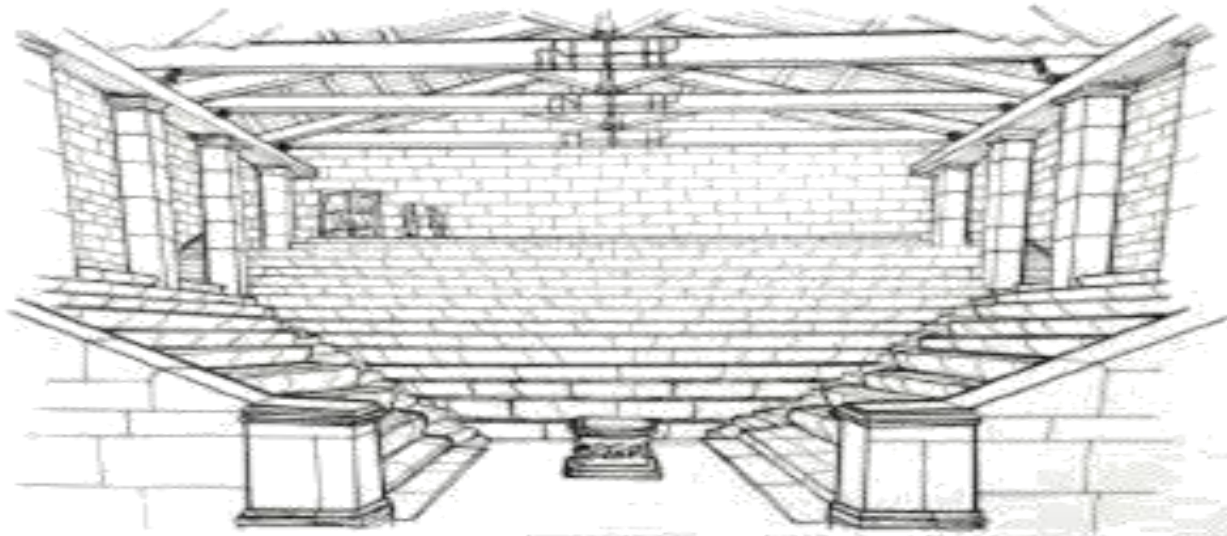
Parts of a Greek Theater

6. Bouleuterion (boule)

- It is the town council building, was an important civic building in a the Greek city .
- It was a covered meeting place for the democratically- elected councils (citizen council) of the city.
- Small with many columns .
- These selected representatives assembled to handle public affairs and represent the citizenry of the polis(in ancient Athens the boule was comprised of 500members).
- The boule generally was a covered, rectilinear building with stepped seating surrounding a central speaker's well in which an altar was placed.



Priene, restored view of bouleuterion, looking south, drawing by Fritz Krischen. From Fritz Krischen, *Antike Rathäuser* (Berlin: Gebr. Mann, 1941), Taf. 19



E

Thanks