

Introduction to Western Architecture

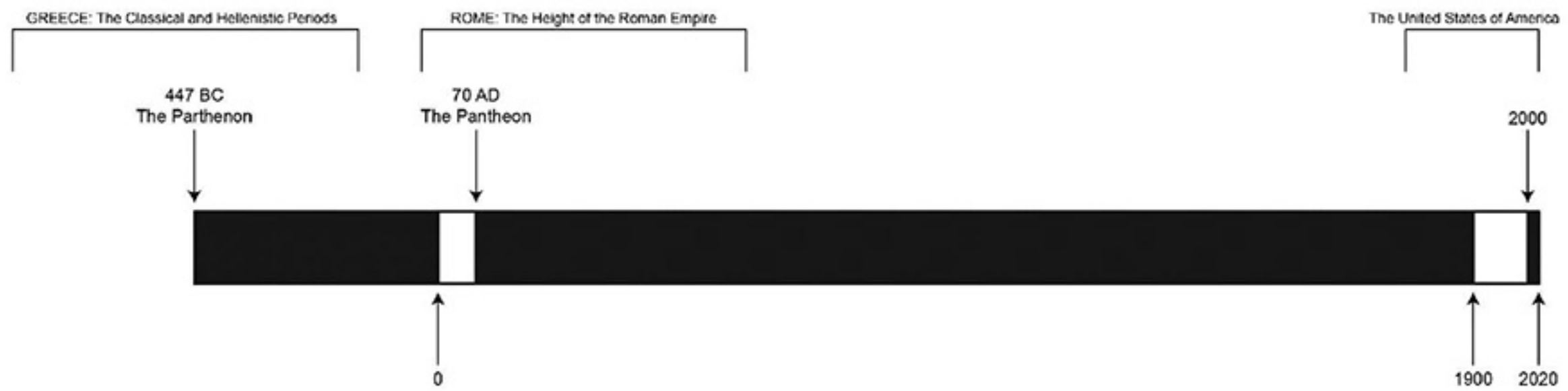
ARCH002

Introduction to Western Architecture
Eugene Han
Spring 2021, 7.15 – 8.30pm
Remote Instruction

ANTIQUITY

Ancient Greece and Rome, Byzantium

- **By Antiquity, I'm referring to Ancient Greece and Rome, followed by the Byzantine Period.**
- Supplies Architecture with a **formal grammar that has lasted over 2,000 years.**
- Another term is '**Graeco-Roman**'
- Greek classical architecture preceded Roman, yet the Roman can be thought of as a continuation/evolution of the Greek prototype



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A rough timeline of the period we're talking about.

- **The Parthenon, 447 BC**
- **The Pantheon, AD 70**



GREEK



ROMAN

*Left: The Parthenon [Greek] (447 BCE)
Right: The Pantheon [Roman] (AD 113 – 125)*

Examples of the **two canons**, almost **600 years** between them

ANCIENT GREECE



Alexander the Great
356 – 323 BC

ROMAN EMPIRE



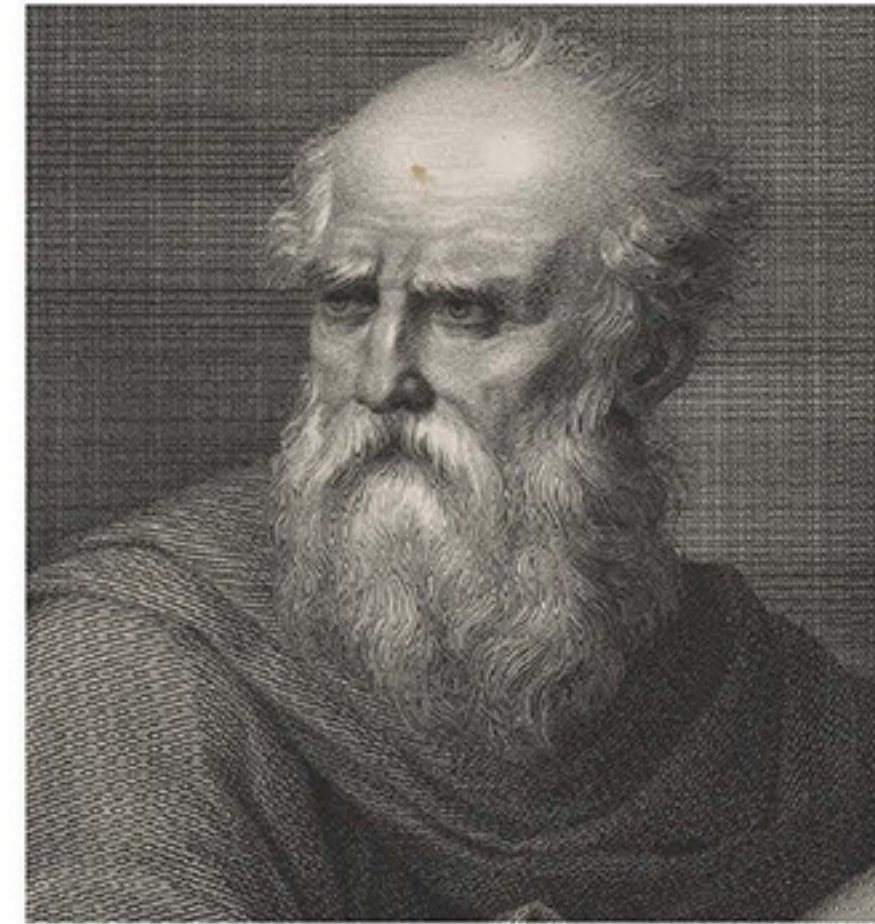
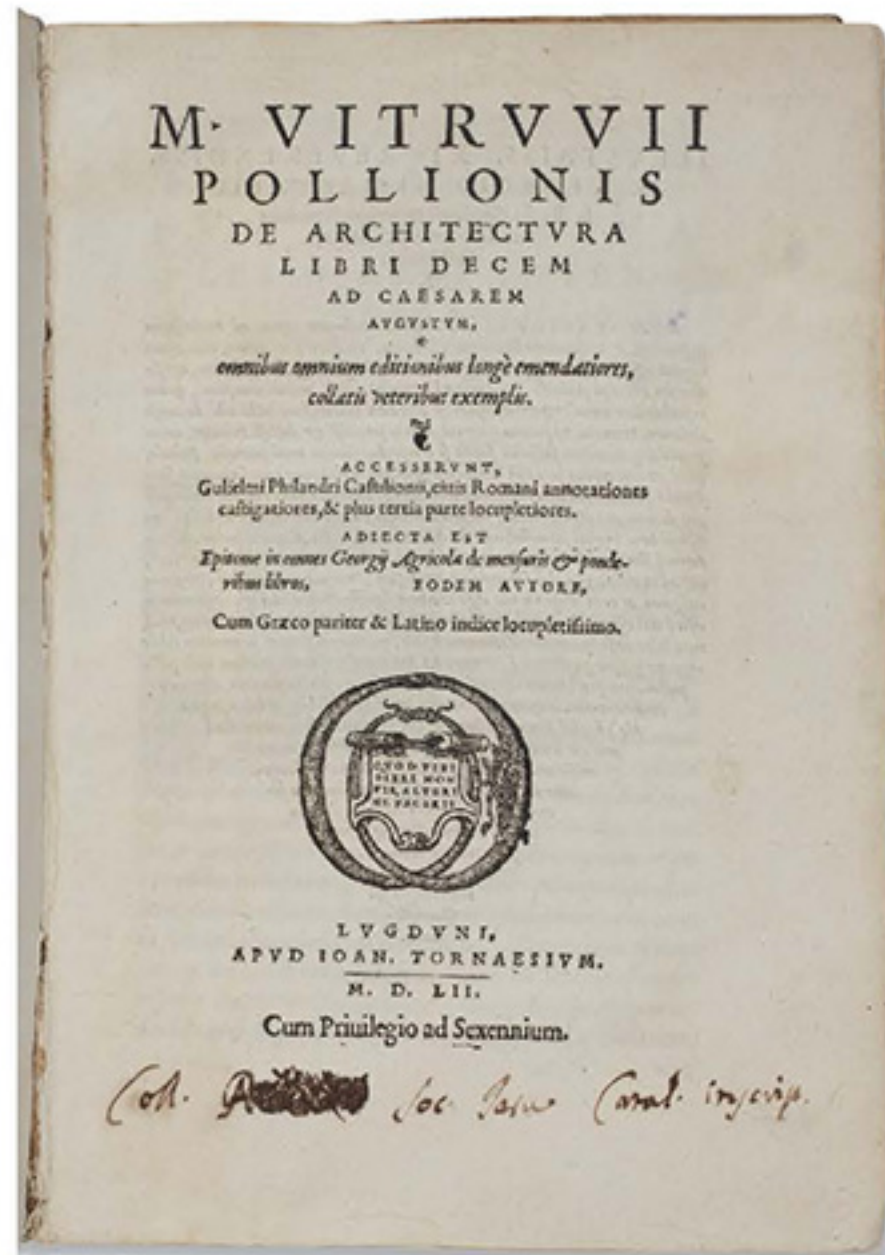
Augustus Caesar
64 BC – AD 14

BYZANTIUM



Constantine the Great
AD 272 - 337

- Many major works in antiquity were places of religion
 - **Before Christianity → Temples**
 - **After Christianity → Churches**



Marcus Vitruvius Pollio
[80 – 15 BCE]

Vitruvius, *De architectura* (*Ten Books on Architecture*) [ca. 30-15 BC]
Left: Edition Cesare Cesariano 1521

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- Written around 30-15 BC
- Very little is known about Vitruvius
- Roman architect (not Greek)
- Much of what we know of it is in pieces or through second hand, namely because there isn't a single complete copy of it today, but the historical examples that we do have are
 - Above copy 1552

- i. Town planning, architecture, or civil engineering in general, and the qualifications required of an architect or the civil engineer
- ii. Building materials
- iii. Temples and the orders of architecture
- iv. Continuation of Book III
- v. Civil buildings
- vi. Domestic buildings
- vii. Pavements and decorative plasterwork
- viii. Water supplies and aqueducts
- ix. Sciences influencing architecture – geometry, measurement, astronomy, sundial
- x. Use and construction of machines – Roman siege engines, water mills, drainage machines, Roman technology, hoisting, pneumatics

Vitruvius, *De architectura* (*Ten Books on Architecture*) (ca. 30-15 BC)

Have to remember that 'Architecture' as a discipline still wasn't established yet

- He proposed what an architect should be, and what architecture should concern itself with.

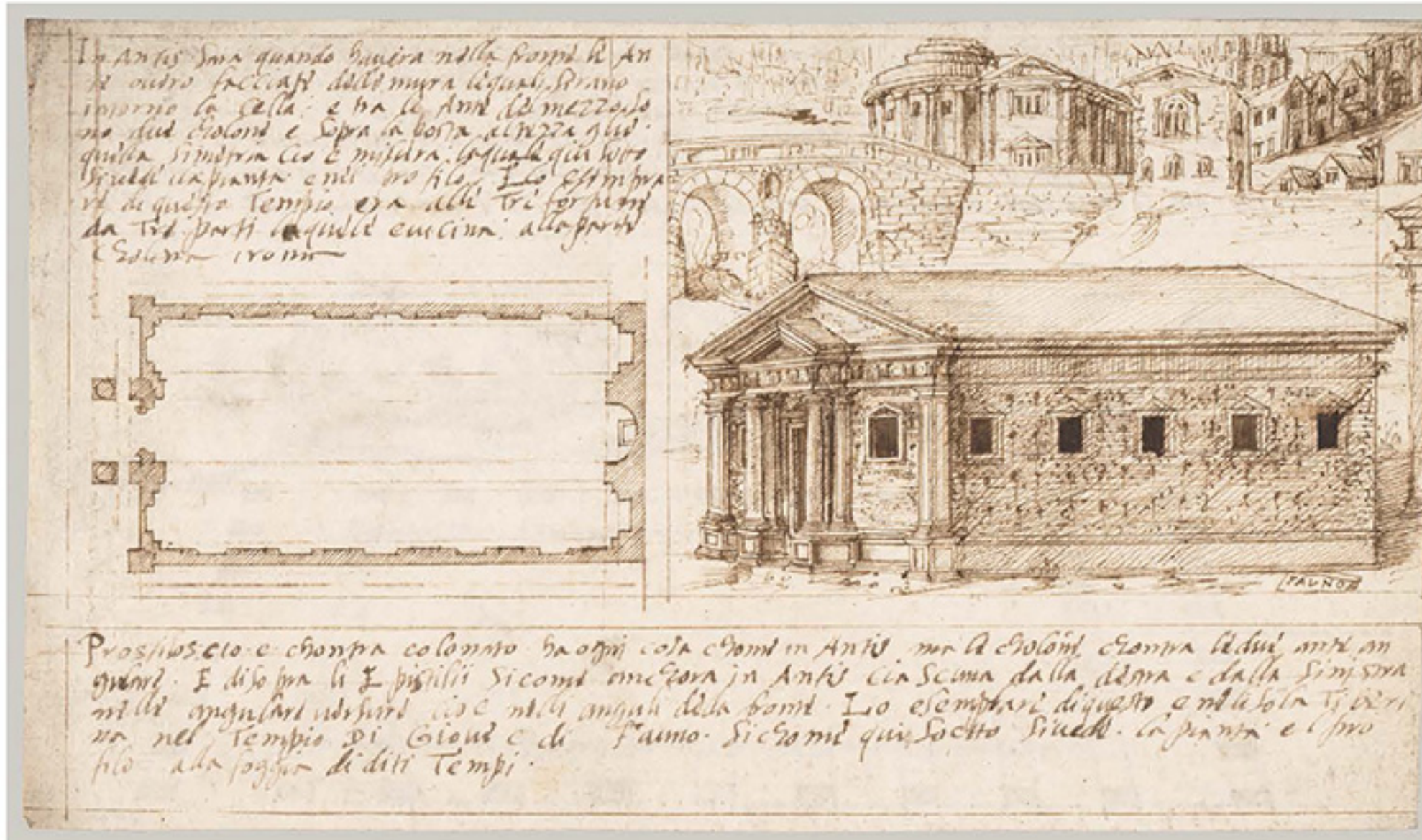


Illustration of temple type from later edition (Sangallo) (ca. 1530 – 45)

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- 16th century Sangallo republication, illustrating Vitruvius' ideas on proper proportions and styling of a temple.

Firmitatis

Utilitatis

Venustatis

Vitruvius, *De architectura* (*Ten Books on Architecture*) (ca. 30-15 BC)

Vitruvian Triad – what architecture should be constituted of, and most importantly, that these span both functional and extra-functional characters.

Firmitatis

Utilitatis

Venustatis

Vitruvius, *De architectura* (*Ten Books on Architecture*) (ca. 30-15 BC)

Firmitatis → *Stability*

Utilitatis → *Utility*

Venustatis → *Beauty*

Vitruvius, *De architectura* (*Ten Books on Architecture*) (ca. 30-15 BC)

- *Firmitatis*: Durability / Stability
- *Utilitatis*: Convenience / Utility
- *Venustatis*: Beauty

architect

Vitruvius, *De architectura* (*Ten Books on Architecture*) [ca. 30-15 BC]

architect

arkhos — ekton

Vitruvius, De architectura (Ten Books on Architecture) (ca. 30-15 BC)

architect

arkhos — ekton

first / principal — builder

Vitruvius, De architectura (Ten Books on Architecture) (ca. 30-15 BC)

architect

arkhos — ekton

first / principal — builder

‘master builder’

Vitruvius, *De architectura* (*Ten Books on Architecture*) (ca. 30-15 BC)



The Acropolis, Athens, Greece [ca. 535 BC]

No single better exemplar of this than The Acropolis in Athens.

- The name Acropolis itself refers to 'Highest Point of the City'
- Evidence that buildings were constructed on the Acropolis since the 6th millennium BC, yet those buildings are no longer standing.
- Most buildings that we know of and see today were built during the 400s BC



PARTHENON



PROPYLAEA



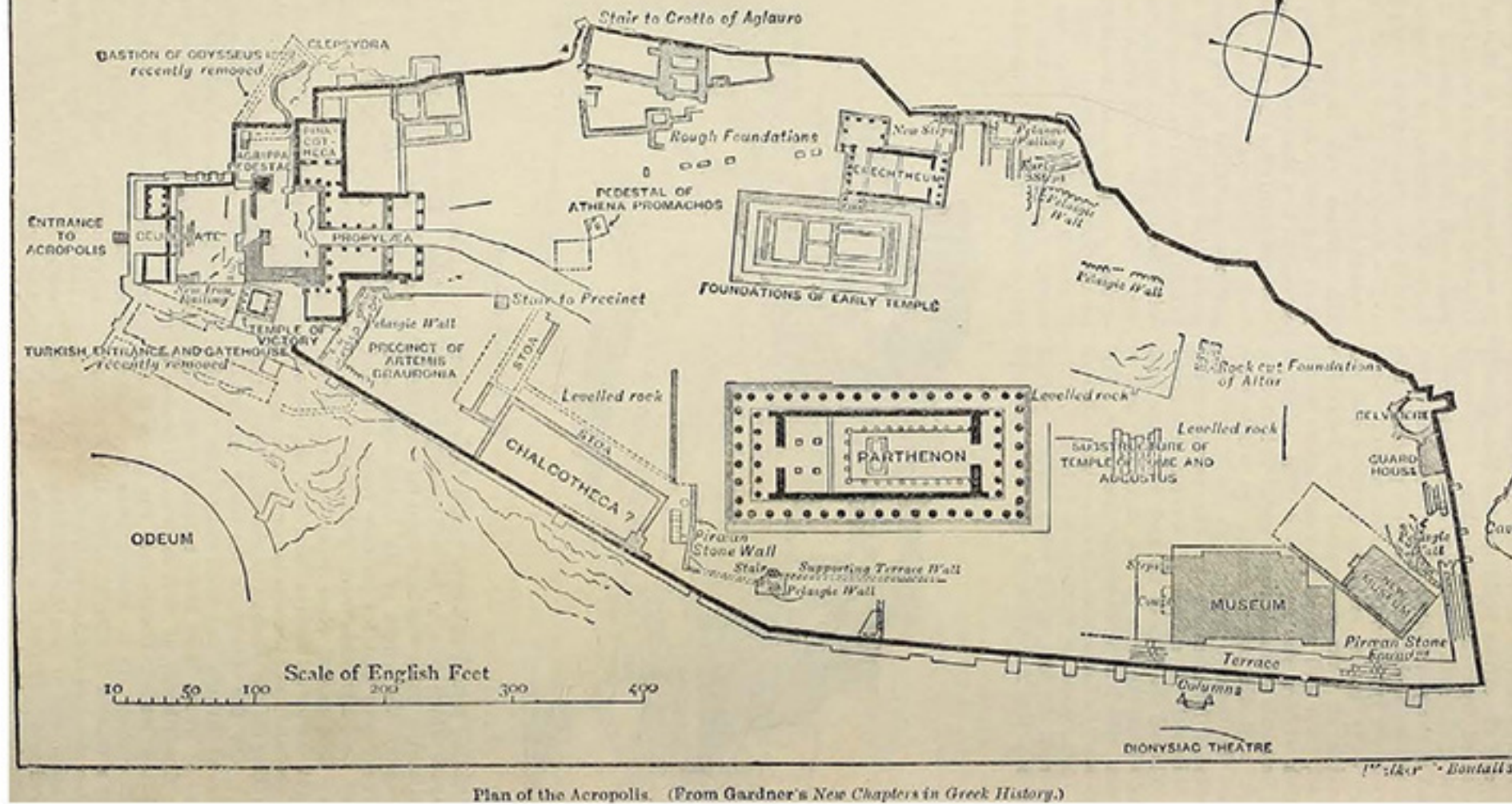
ERECHTHEION

The Acropolis, Athens, Greece [ca. 535 BC]

The three most important structures that are standing today are the

- Parthenon
- Propylaea
- Erechtheion

PLAN OF THE
ATHENIAN ACROPOLIS.



Plan of the Acropolis. (From Gardner's *New Chapters in Greek History*.)

1"=100' - Bostall 1896

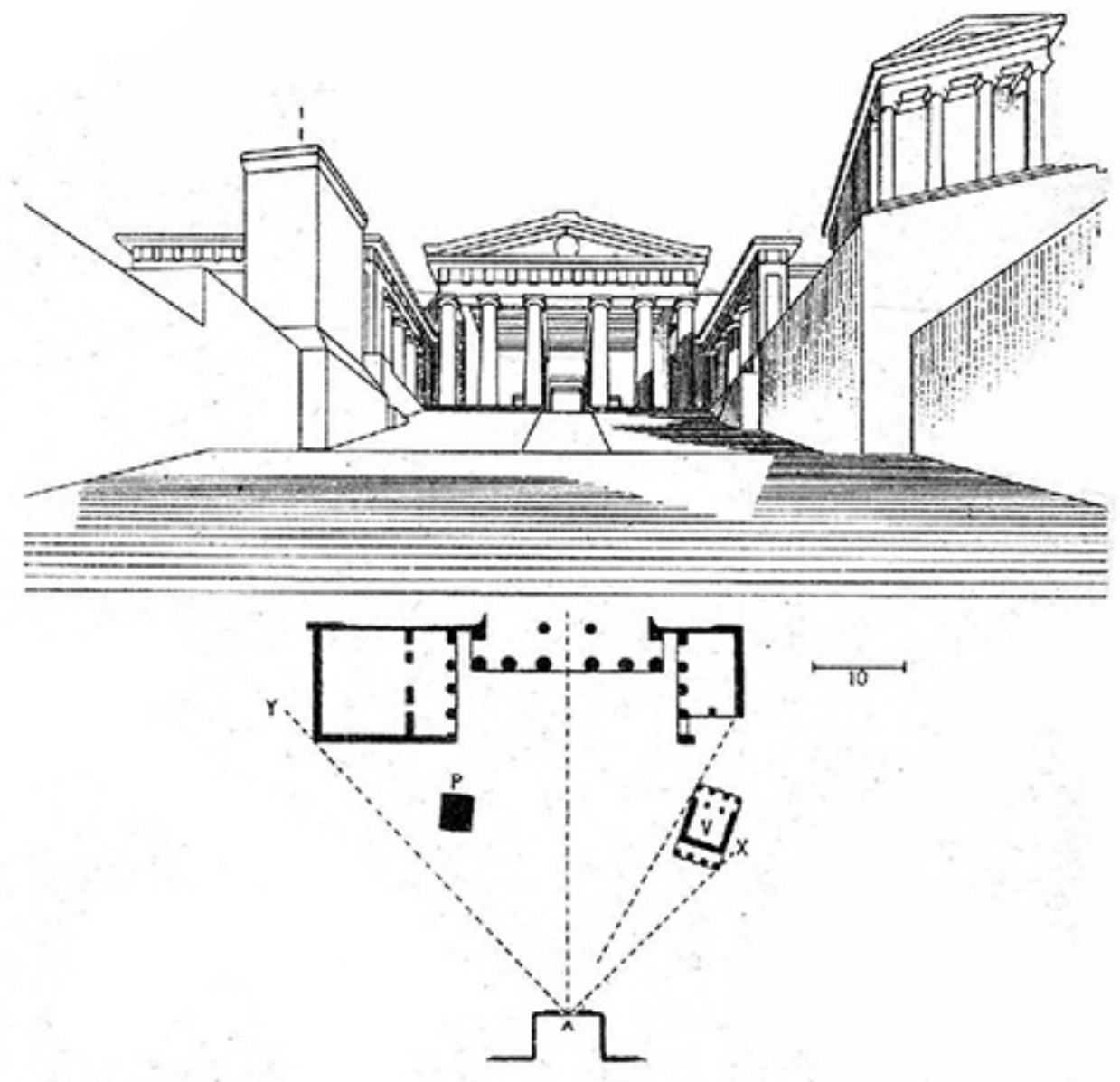
The Acropolis, Athens, Greece [ca. 535 BC]



The Acropolis, Athens, Greece [ca. 535 BC]

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Here is a modern rendering of what the site may have looked like

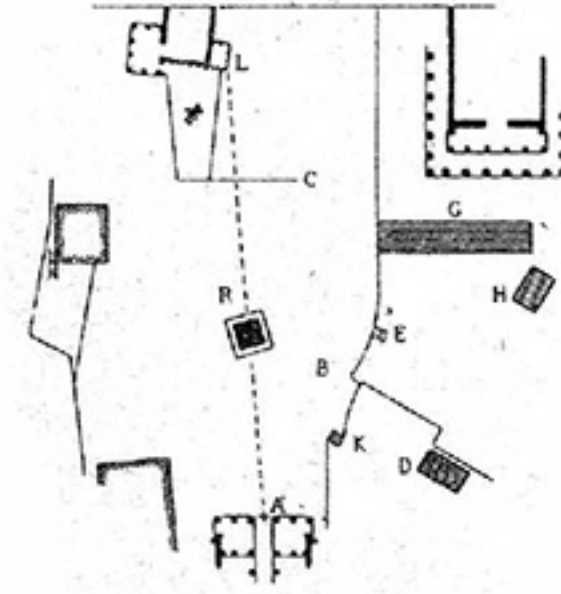


Right: Auguste Choisy, from *Histoire de l'Architecture* (1899)

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In 1899, the architect Auguste Choisy drew a series of perspectives that describe the procession through the Acropolis

- The first being the entry through the Propylaea

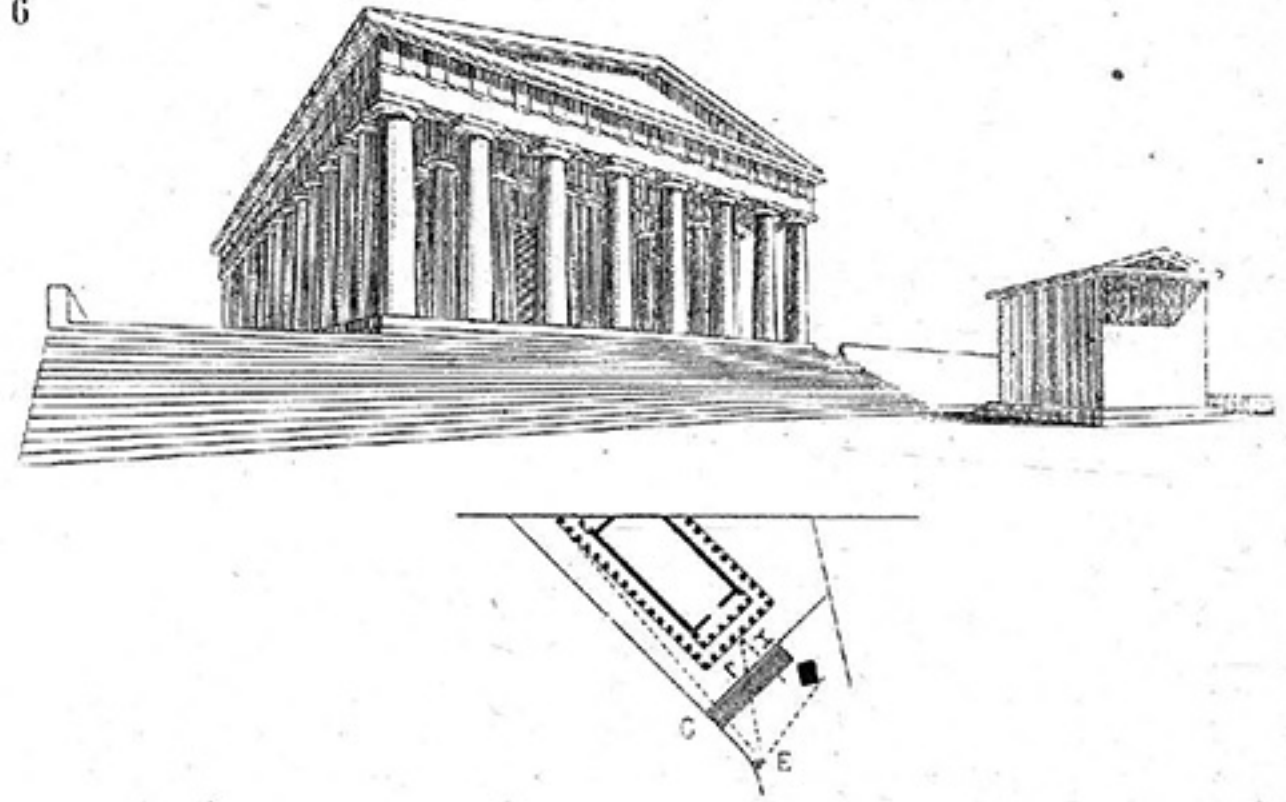


Right: Auguste Choisy, from *Histoire de l'Architecture* (1899)

Right after passing through its gates, we're confronted with the Athena Promachos, goddess of wisdom and warriors.



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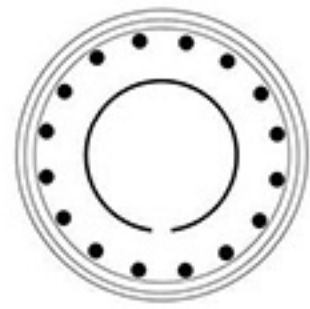


Right: Auguste Choisy, from *Histoire de l'Architecture* (1899)

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Making our way to the right of the Promachos we see the Parthenon, the most important structure on the Acropolis

- Choisy was trying to show how through the coordination of spaces, the spectator gets a strong perspective of the temple



tholos



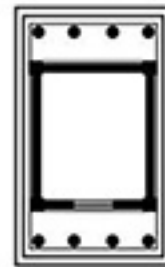
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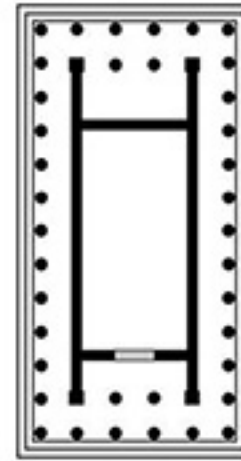
double anta



prostyle



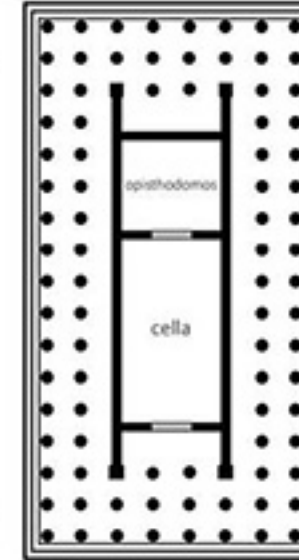
amphiprostyle



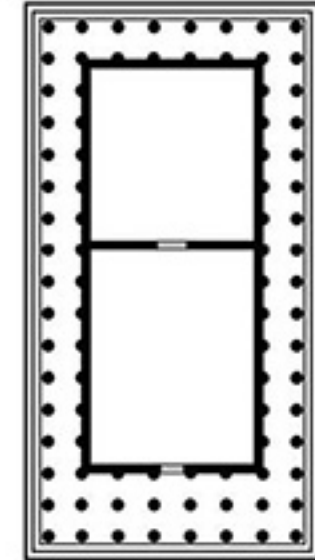
peripteral



pseudoperipteral



dipteral



pseudodipteral

Basic Greek temple typologies

Beyond the Acropolis, Ancient Greek architecture also provided us with a basic vocabulary:

- Anta – columns with walls on the end
- Style – row of column
 - Pro – in front
 - Amphi – on both sides
 - Peri – Around

peristyle / cortile

An internal court or garden
surrounded by a row columns



From these variations, we get the word 'Peristyle'

THE 3 GREEK ORDERS

DORIC

IONIC

CORINTHIAN

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Vitruvius wrote about three orders that defined Ancient Greek Architecture

- The column is usually by far the most distinctive architectural element that defines one order from another

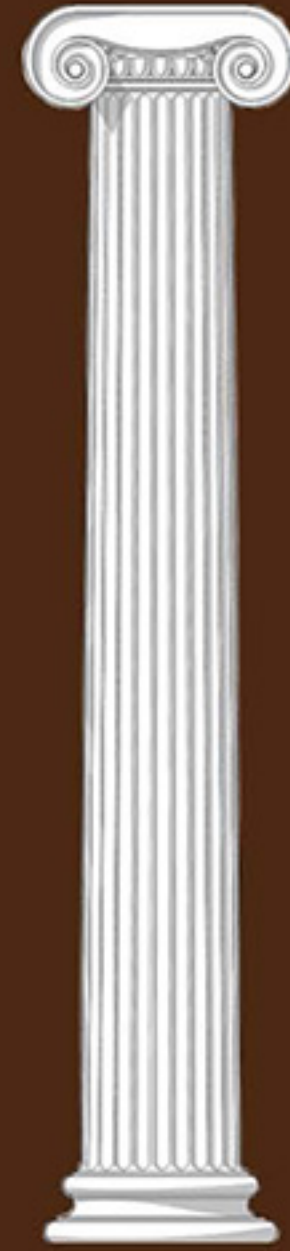
Principal elements of a column

shaft

flute

arris

capital



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- Here we have a basic column, which is composed of 4 principal parts

shaft

The principal vertical cylinder of a column



flute (fluting)

Either concave or convex grooves usually running vertically along a columnar shaft

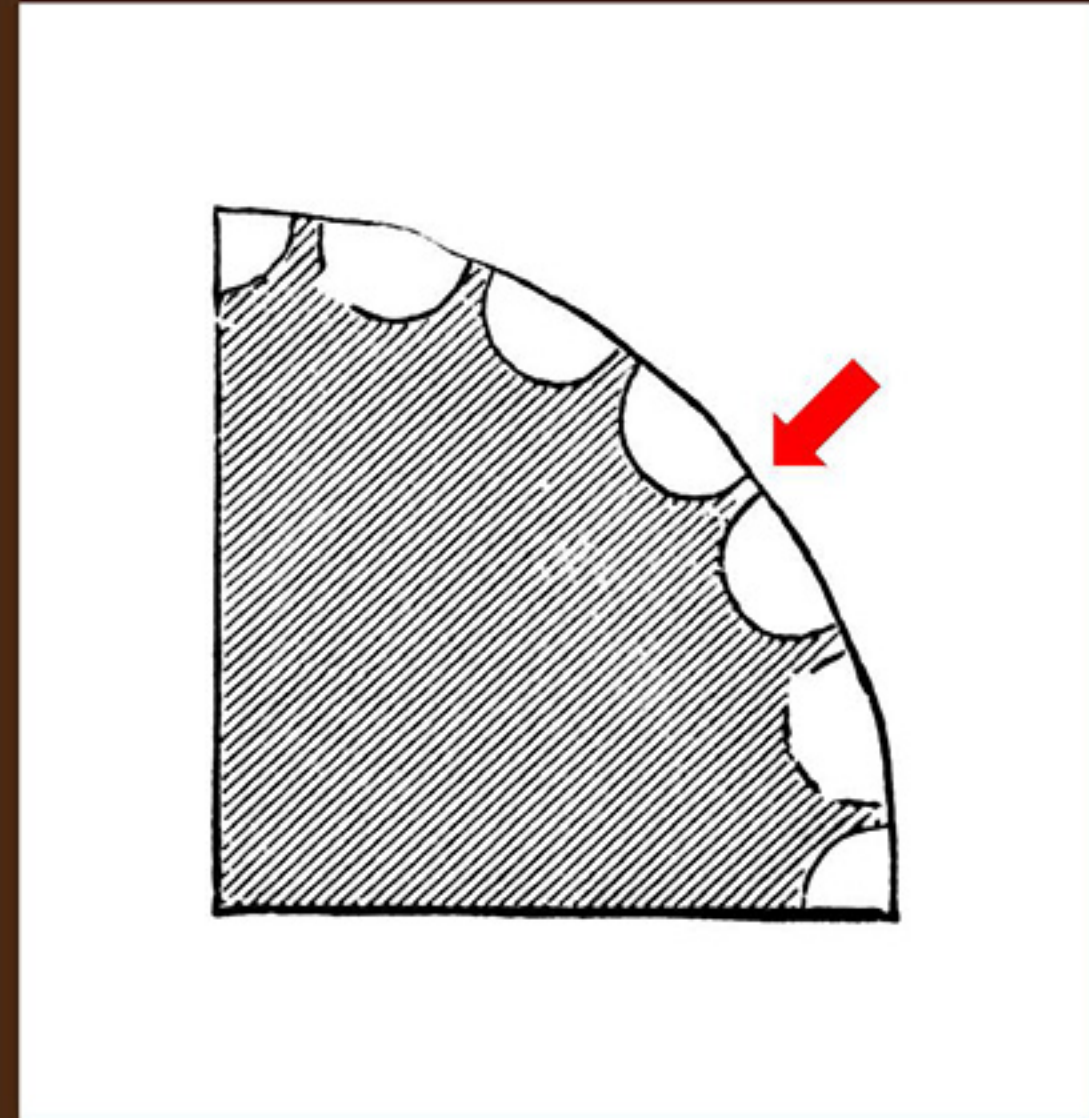


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- On rarer occasion you have some unconventional fluting that runs diagonally or in a criss-cross pattern

arris

The ridge or edge between flutes on a column



- In earlier examples, the arrises were flat, and in more technically complex examples, they became round to more sharply accentuate the edges

capital

The crowning part of a column, oftentimes the most distinguishing characteristic to identify classical orders



By far the most distinguishing element

THE 3 GREEK ORDERS

DORIC



Athena



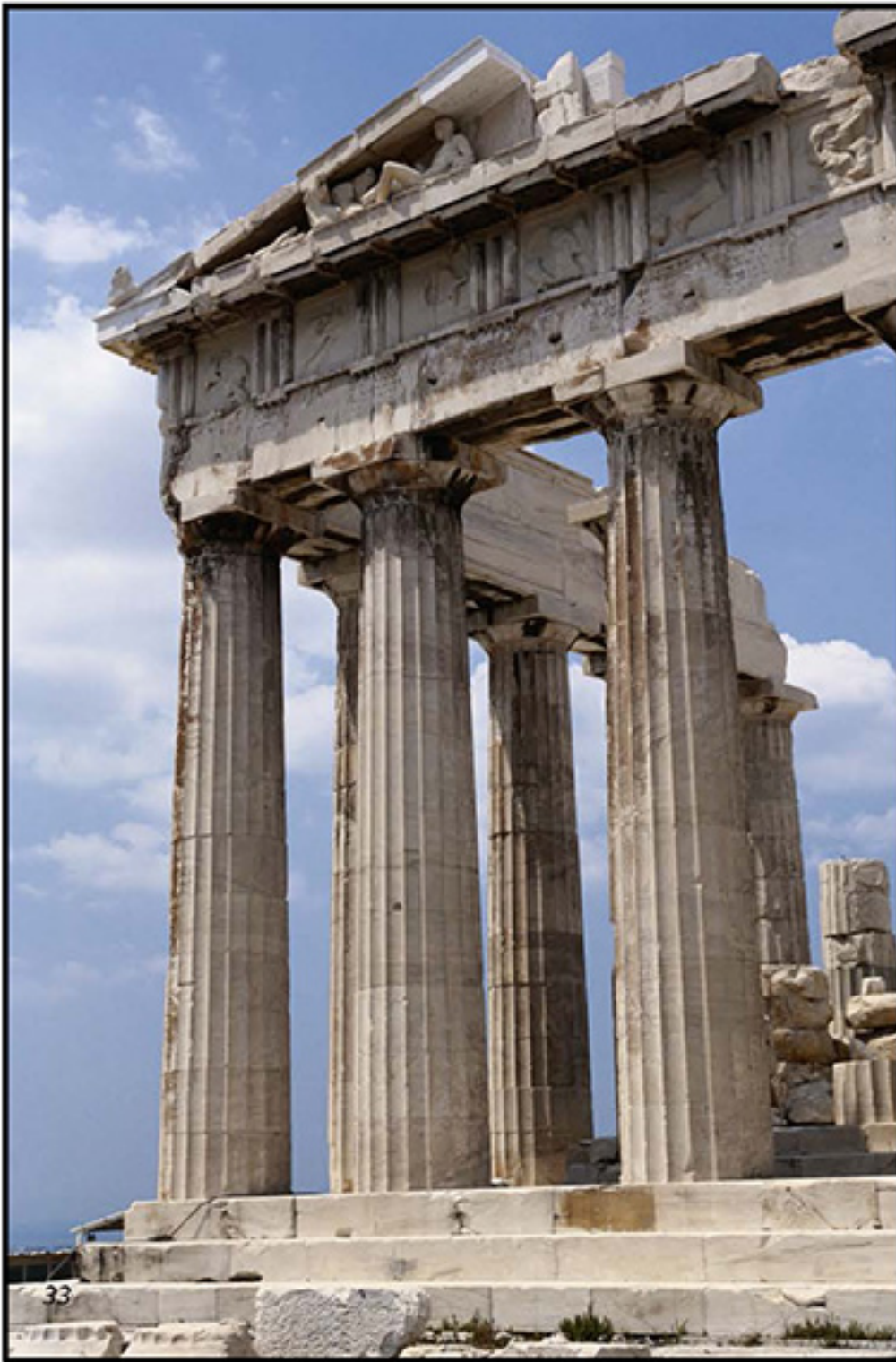
Ares



Heracles

Generally written about as: Patronly

- Gods
 - Athena (Minerva)
 - Goddess of Wisdom, law, justice, strength, the arts
 - Ares (Mars)
 - God of War
 - Heracles (Hercules)
 - Son of Zeus, known for his strength
- Sit directly on the base (Stylobate)



Doric Order

It's the simplest of the three, and can be thought of as the most squat, proportionately the widest one.

- The key indicators of the Doric are two characteristics in particular
 - Very simple capital with no ornamentation
 - No base at the bottom



*Greek Doric Order
Temple of Paestum, Italy*

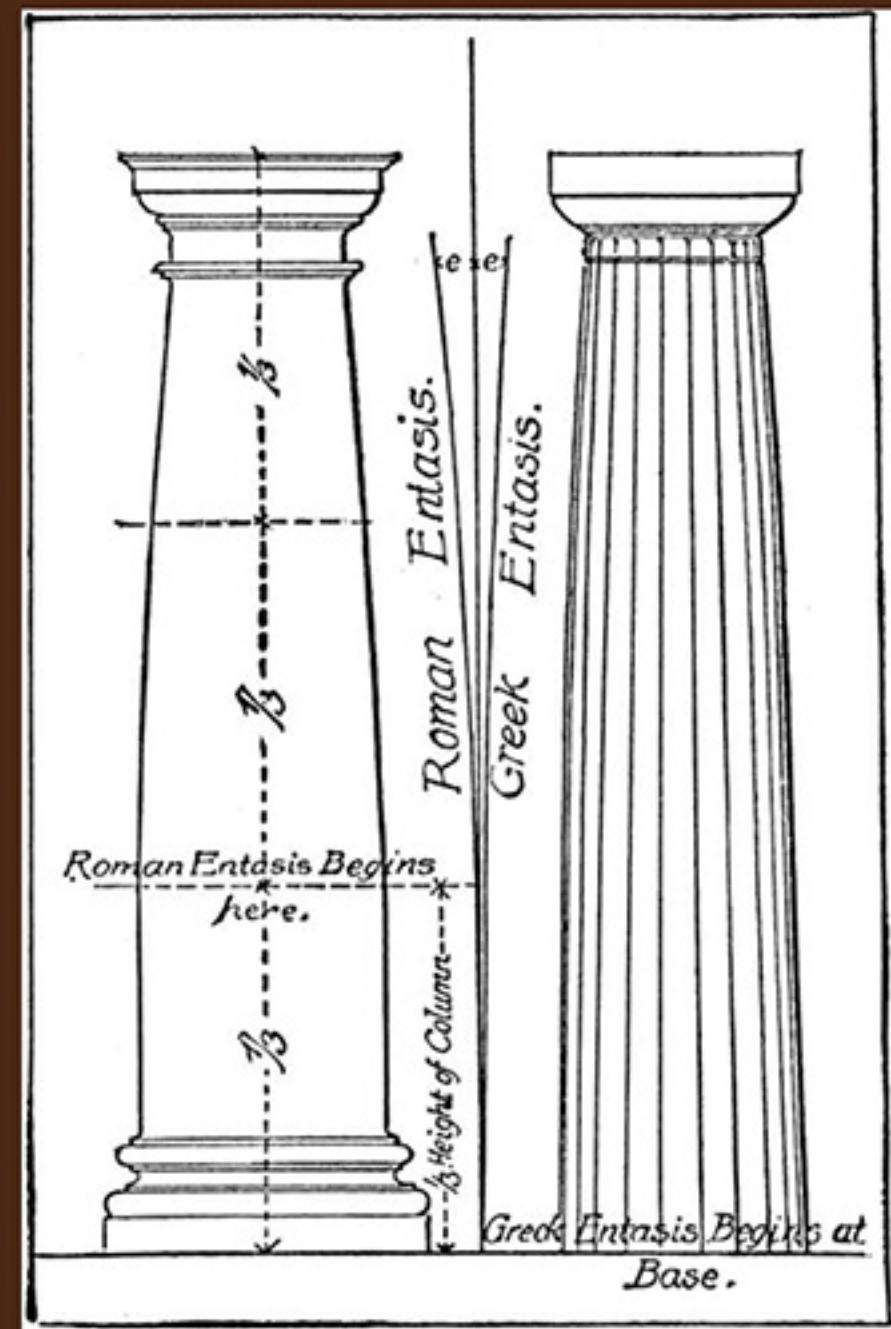
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Another example of the Doric order – you see how squat, **almost compressed down, they appear**

- Part of this appearance is due to **the curvature of the shafts, which are actually part of the design**

entasis

A delicate and almost imperceptible swelling of the shaft of a column
[*Oxford English Dictionary*]



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This curvature is known as Entasis

- Among the common theories
 - Perspective
 - Human body
 - Hide imperfections

THE 3 GREEK ORDERS

IONIC



Hera



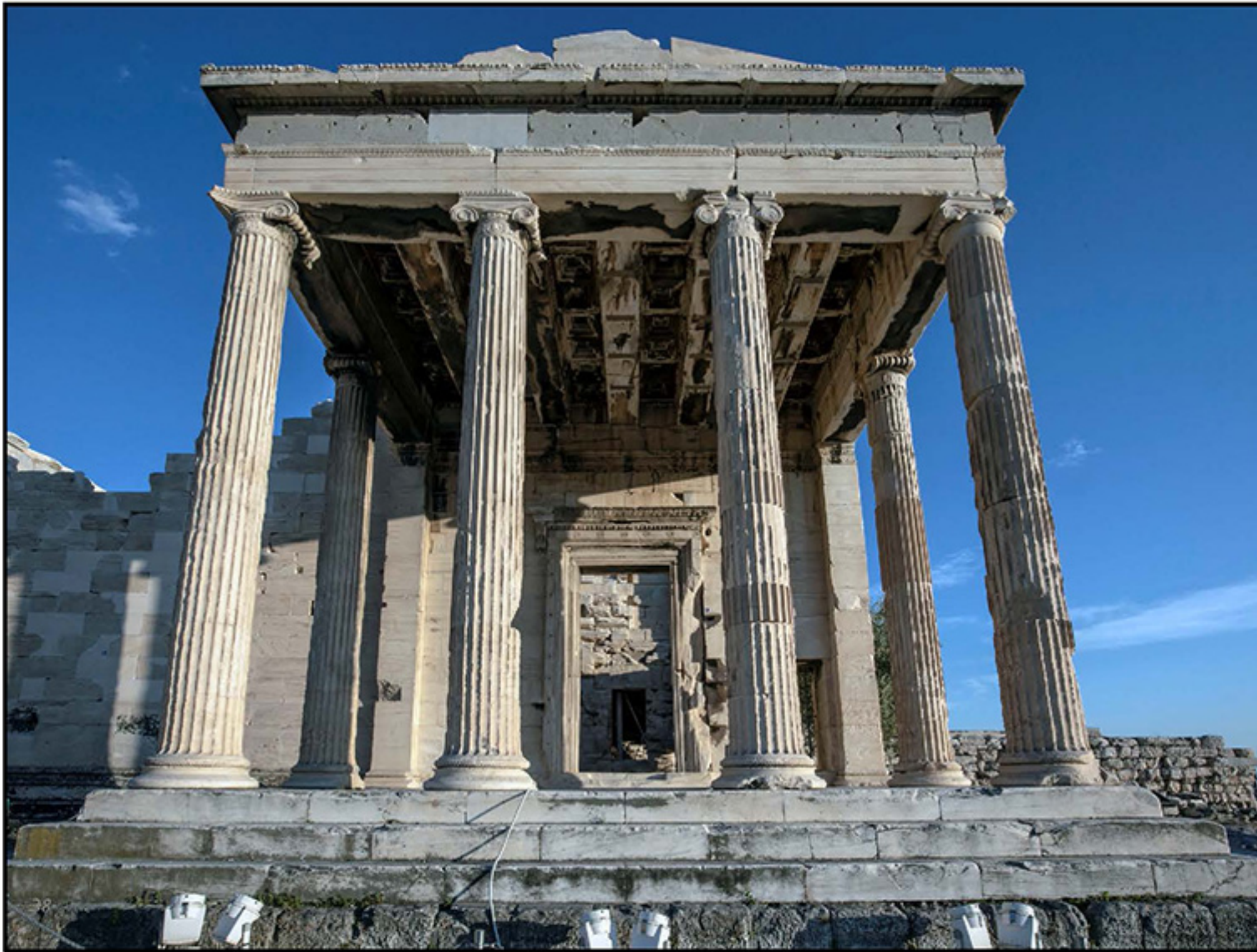
Artemis



Dionysus

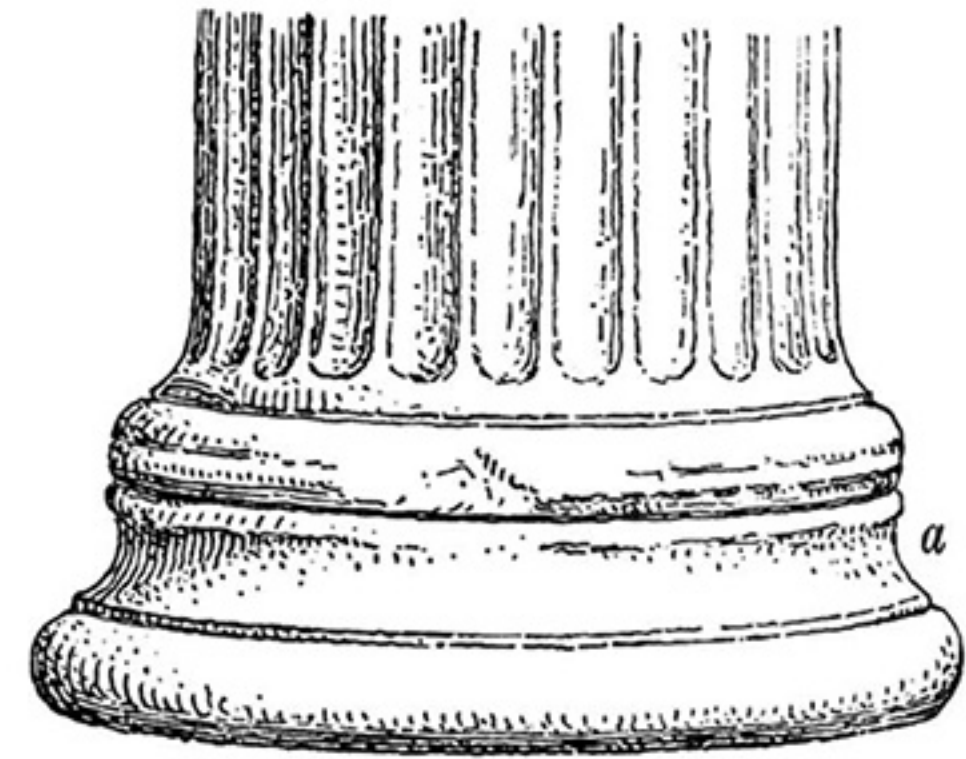
Gods (Matronly):

- Hera (Juno)
 - Goddess of Love and marriage
- Artemis (Diana)
 - Goddess of Wild animals and the hunt
 - Fertility
- Dionysus (Bacchus)
 - God of wine, pleasure, festivity



*Greek Ionic Order
Erechtheion, Athens*

The clearest indicator of the Ionic order is the presence of scrolls on the capital

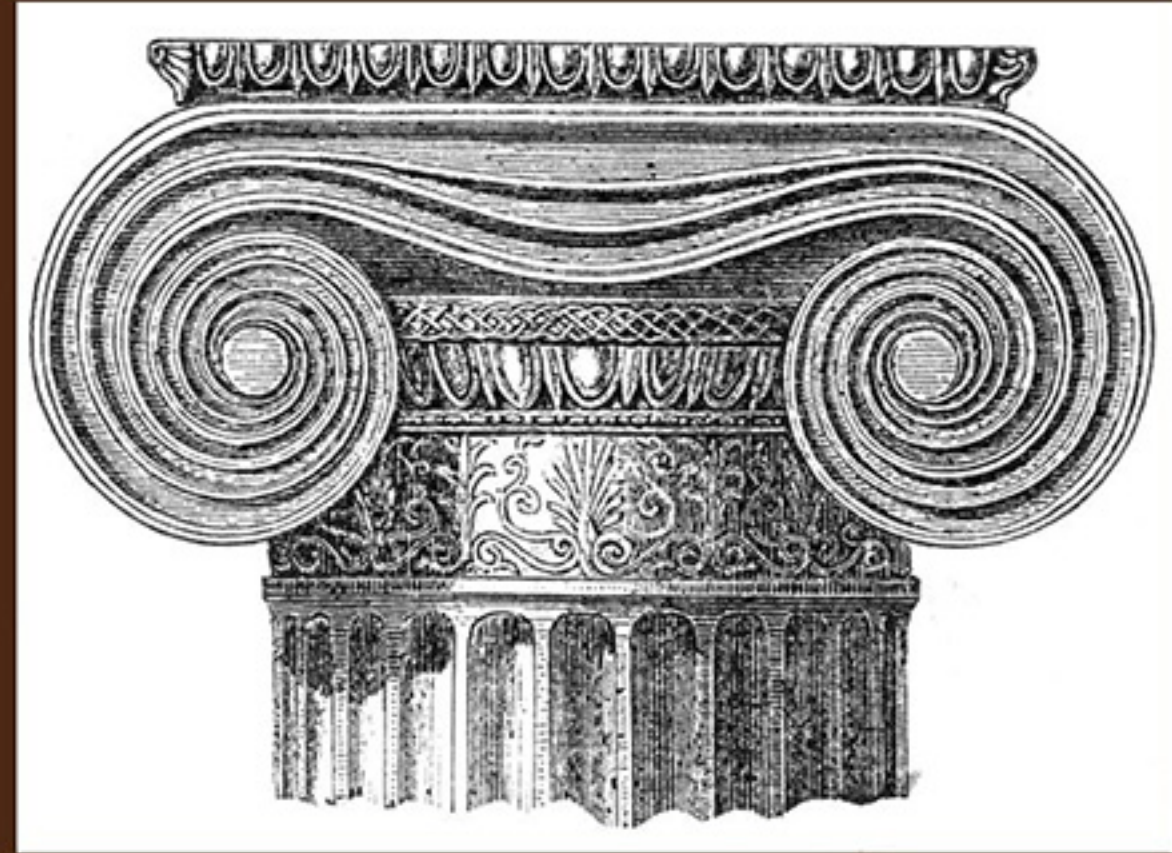


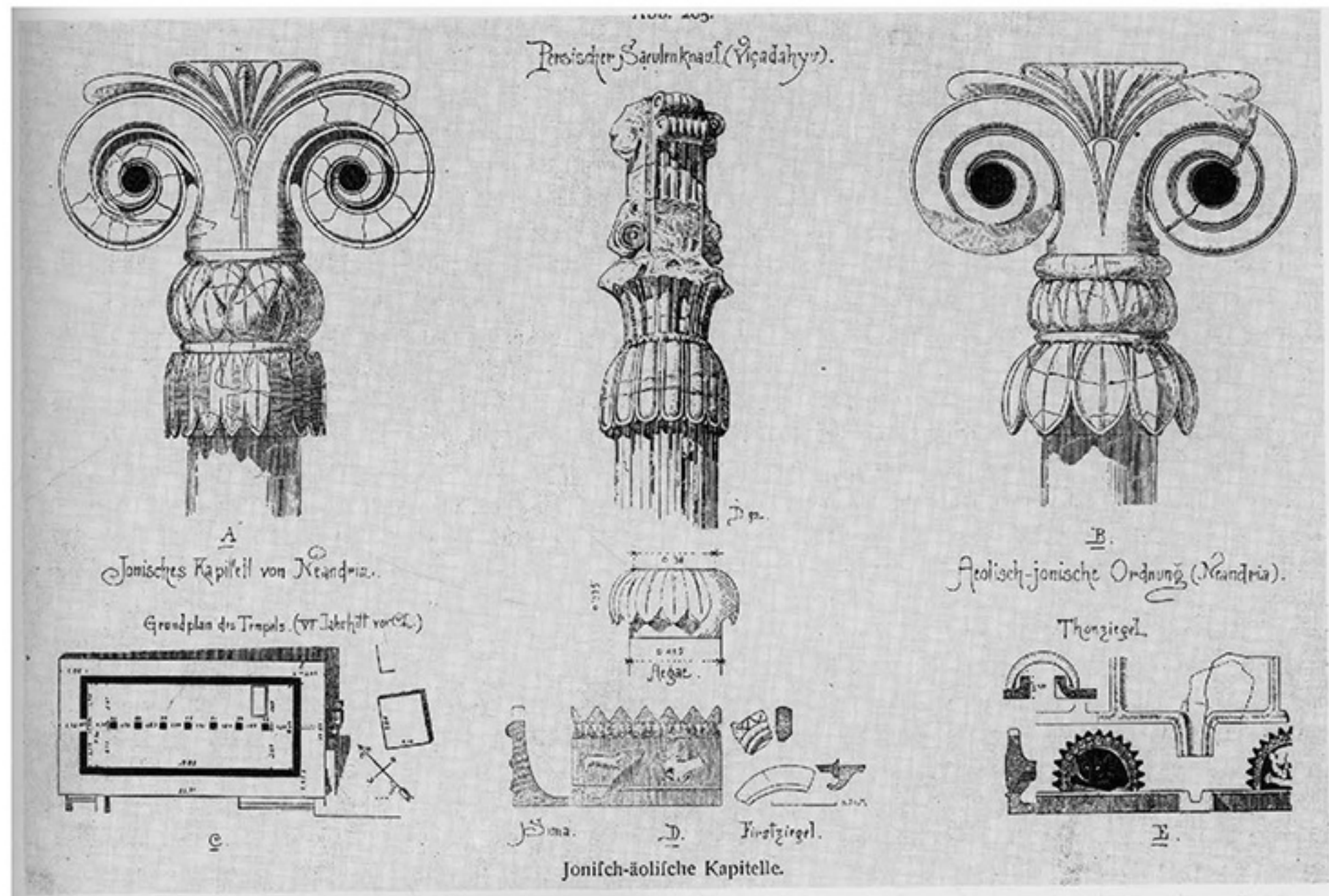
Ionic Order

- Notice that unlike the Doric order, the Ionic column has a base

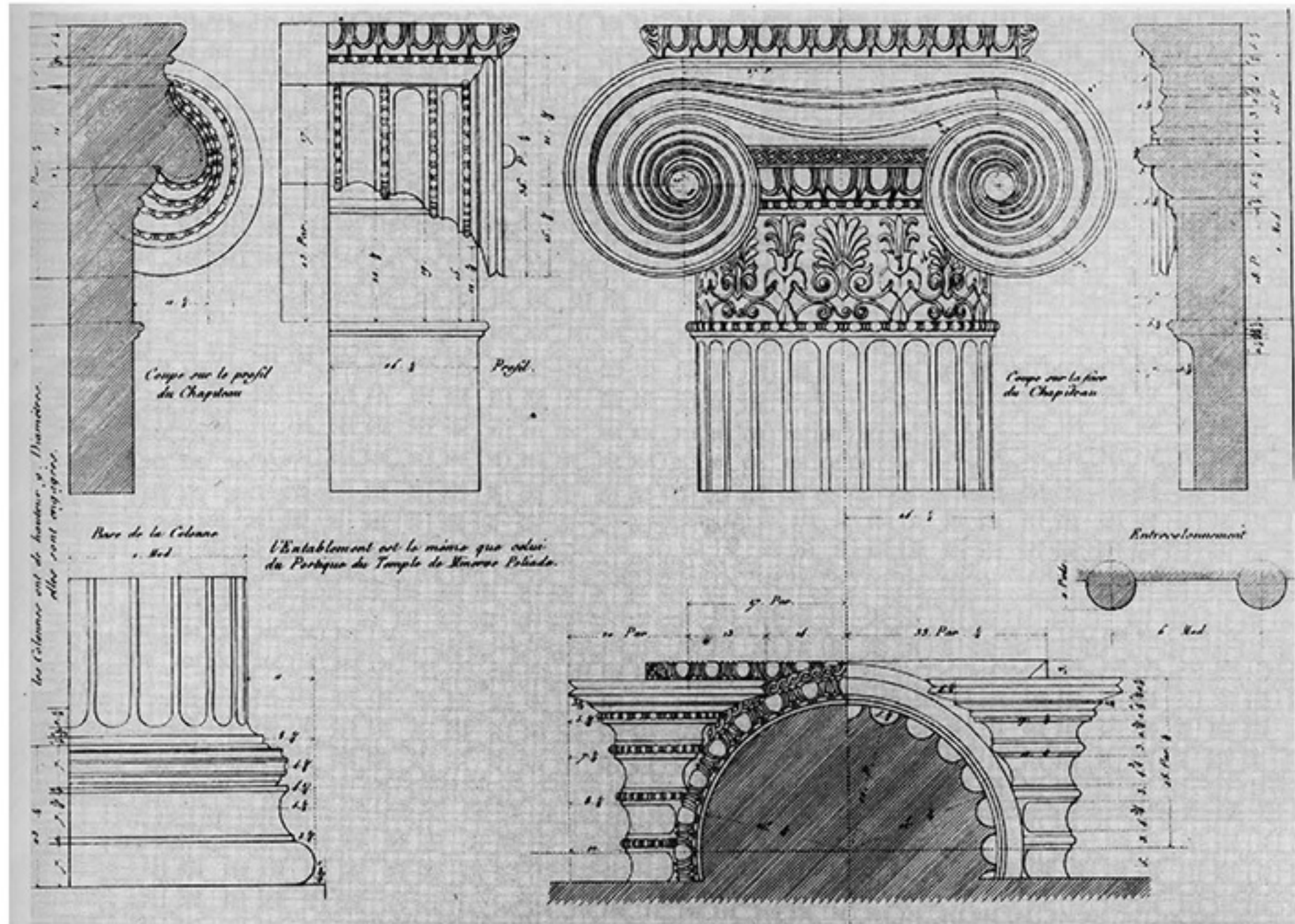
volute

Scroll-like ornament element on the capital of Ionic and Composite columns





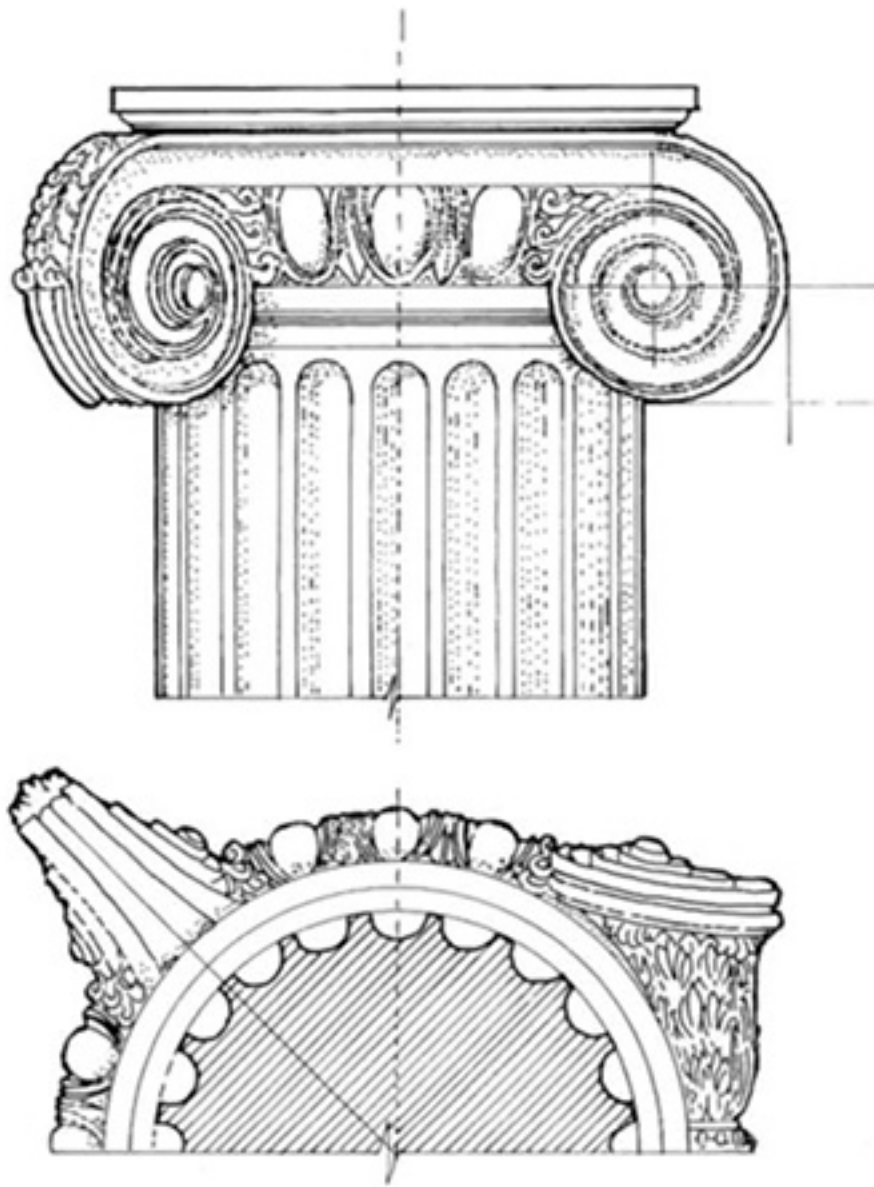
- Volutes shape original unknown, could be rams horns, or scrolls
- maybe plants (palmettes)



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Ionic Order

- Contrary to other orders, the Ionic capital is not square, but rectangular in plan
- Could present problems with directionality



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The Ionic Capital: Problems of directionality

Later variations curved the plane of the volutes to avoid the problem of directionality



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Temple of Athena Nike
The Ionic Capital: Problems of directionality

Center capitals are rectangular, while the ones at the end are curved out so that they are facing in all outside directions

THE 3 GREEK ORDERS

CORINTHIAN



Aphrodite



Persephone



Chloris

Gods

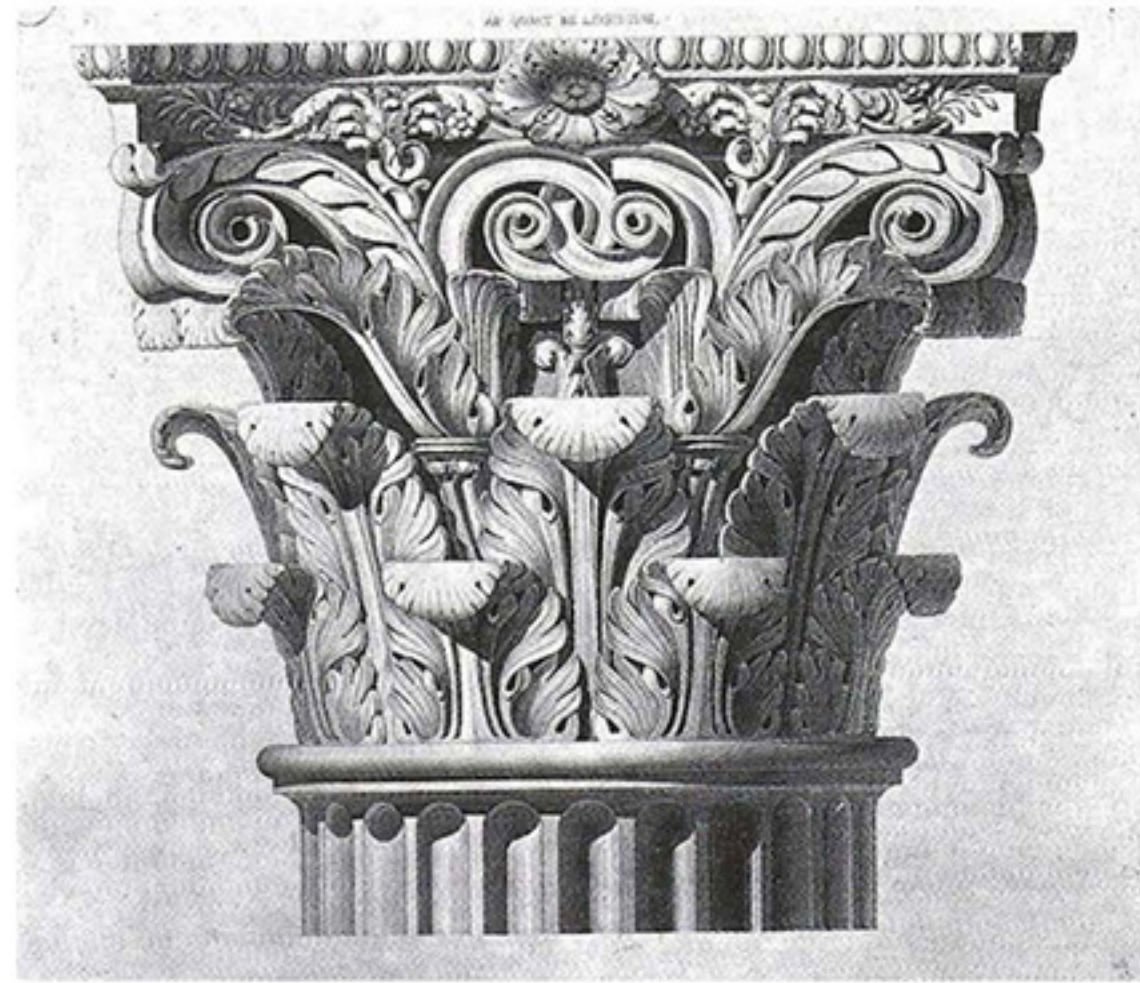
- Aphrodite (Venus)
 - Goddess of Love, beauty, pleasure, passion, procreation
- Persephone (Proserpine)
 - Goddess of Vegetation
- Chloris (Flora)
 - Goddess of Flowering and blossoming plants
 - Wife of Zephyros (West-wind)



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*Greek Corinthian Order
Temple of Olympian Zeus, Athens*

- First introduced around ca. 430 BCE.
- Wide variations of Greek Corinthian



Corinthian Order

Each tier consists of 8 acanthus leaves



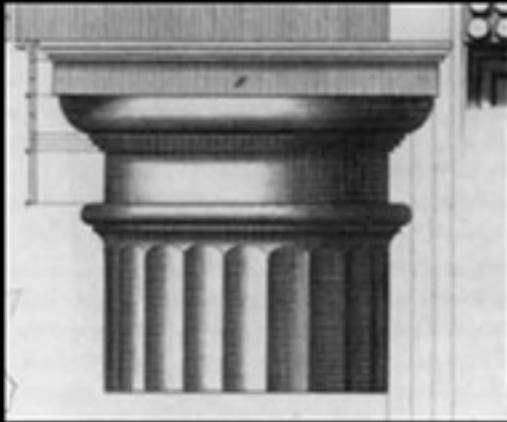
ACANTHUS LEAF



Corinthian Order

THE 3 GREEK ORDERS

DORIC



IONIC



CORINTHIAN



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- Over time, these orders were associated with certain virtues, linked to their relevant gods and goddesses
 - **Doric:** **Strength (basic, utilitarian)**
 - **Ionic:** **Wisdom (scrolls)**
 - **Corinthian:** **Beauty (flowery)**

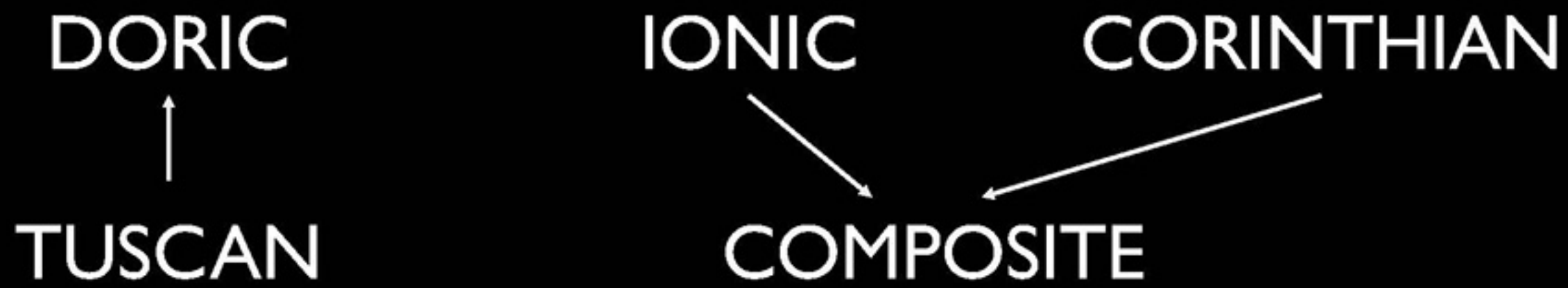
THE 3 GREEK ORDERS

DORIC

IONIC

CORINTHIAN

THE 5 ROMAN ORDERS

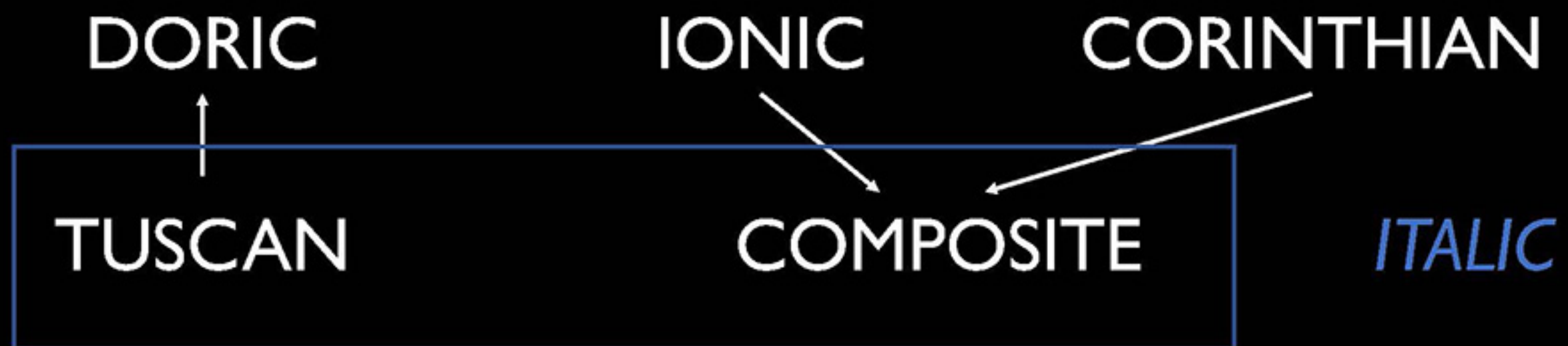


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5 total orders

- 'Preceding' the Doric, we have the Tuscan
- And as a combination between the Ionic and the Corinthian, we have the Composite

THE 5 ROMAN ORDERS



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These 2 additional orders are also called the 'Italic' orders



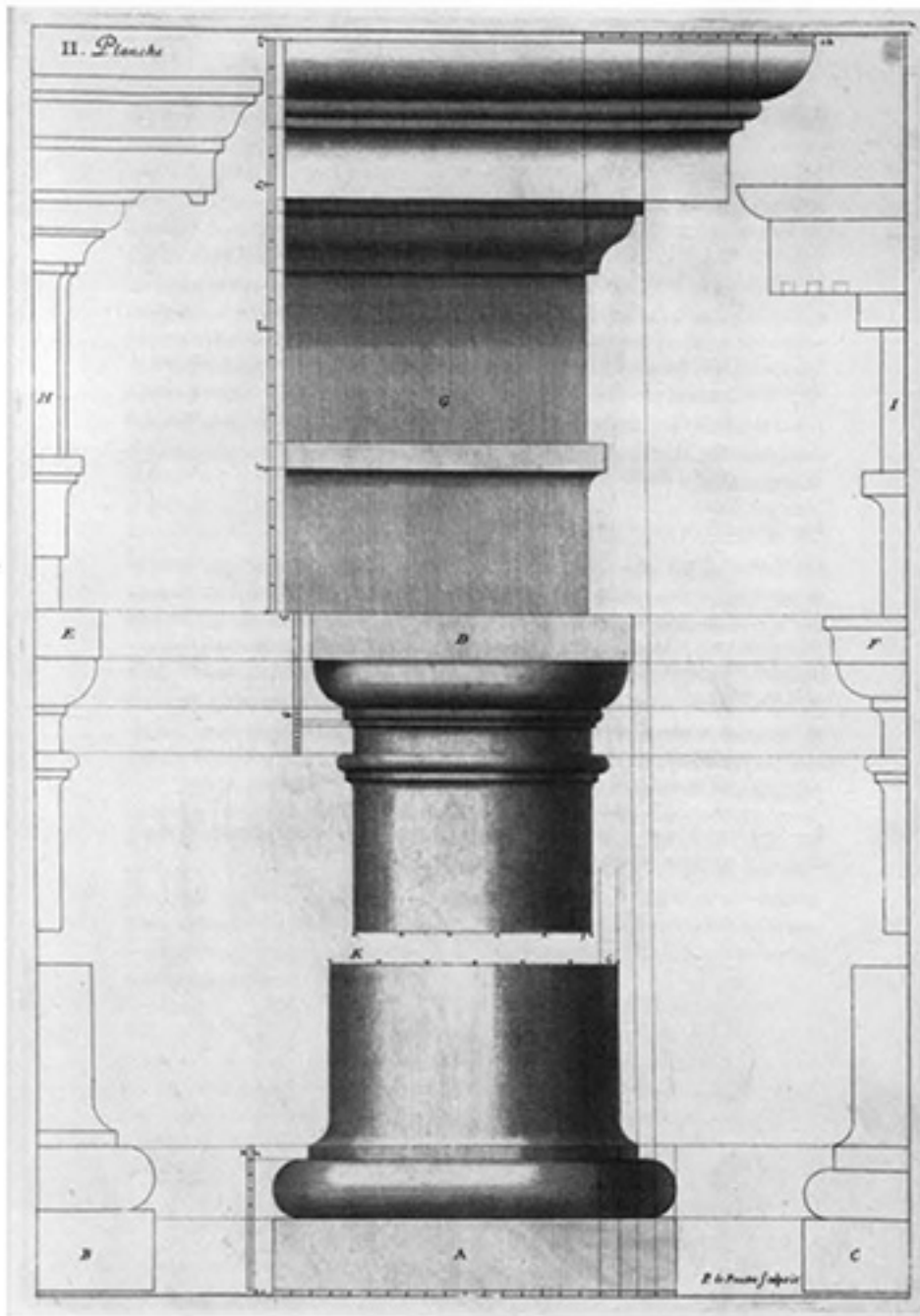
5 Roman Orders

Here are the 5 Roman Orders side-by-side

- All have bases, including the Doric
- Like the Greek Orders, each get thinner as they progress
- Sebastiano Serlio, *L'Architettura* (1545 – 1551), his account outlined the basis of the 5 Roman Orders
- Unlike Greek columns, most important columns often made of single pieces of stone
- Oftentimes were not fluted – the Tuscan is never fluted, but others, some of the time unfluted as well - inconsistent

THE 5 ROMAN ORDERS

TUSCAN



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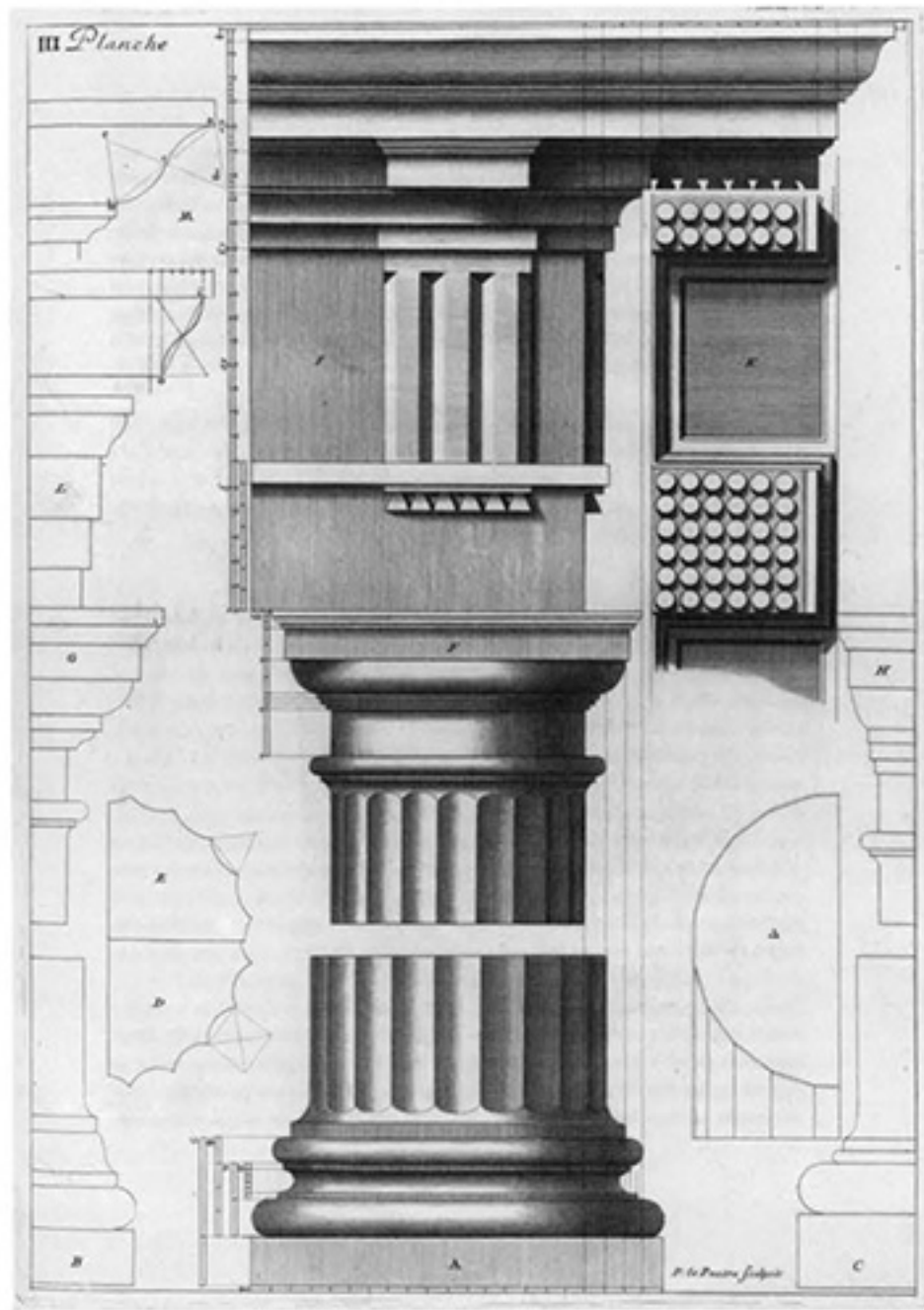
Roman Tuscan Order
 Right: Inigo Jones, *St. Paul's Church*, London [1633]

Plain, unfluted shaft

- Base
- Square plinth
- Large torus
- Entablature (standard, no decoration)
- Per Serlio: suitable for fortifications, prisons (tough, primitive, utilitarian)

THE 5 ROMAN ORDERS

DORIC



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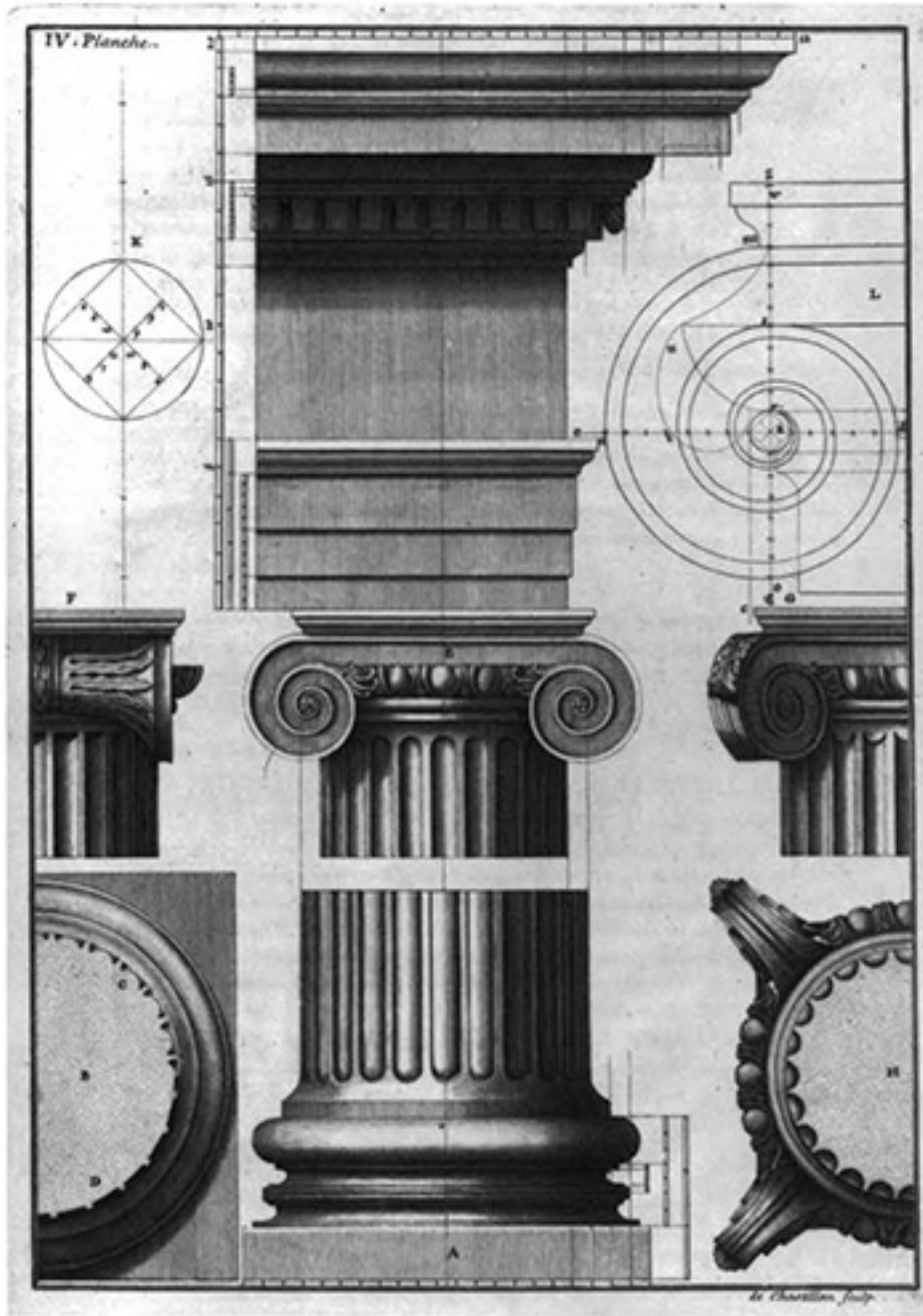
Roman Doric Order
Right: Temple of Hercules, Cori, Italy [ca. 80 BC]

Relative to Greek, more slender

- Smaller capitals
- Low entablature
- Per Serlio: appropriate for churches dedicated to male Saints who were soldiers or otherwise militant

THE 5 ROMAN ORDERS

IONIC

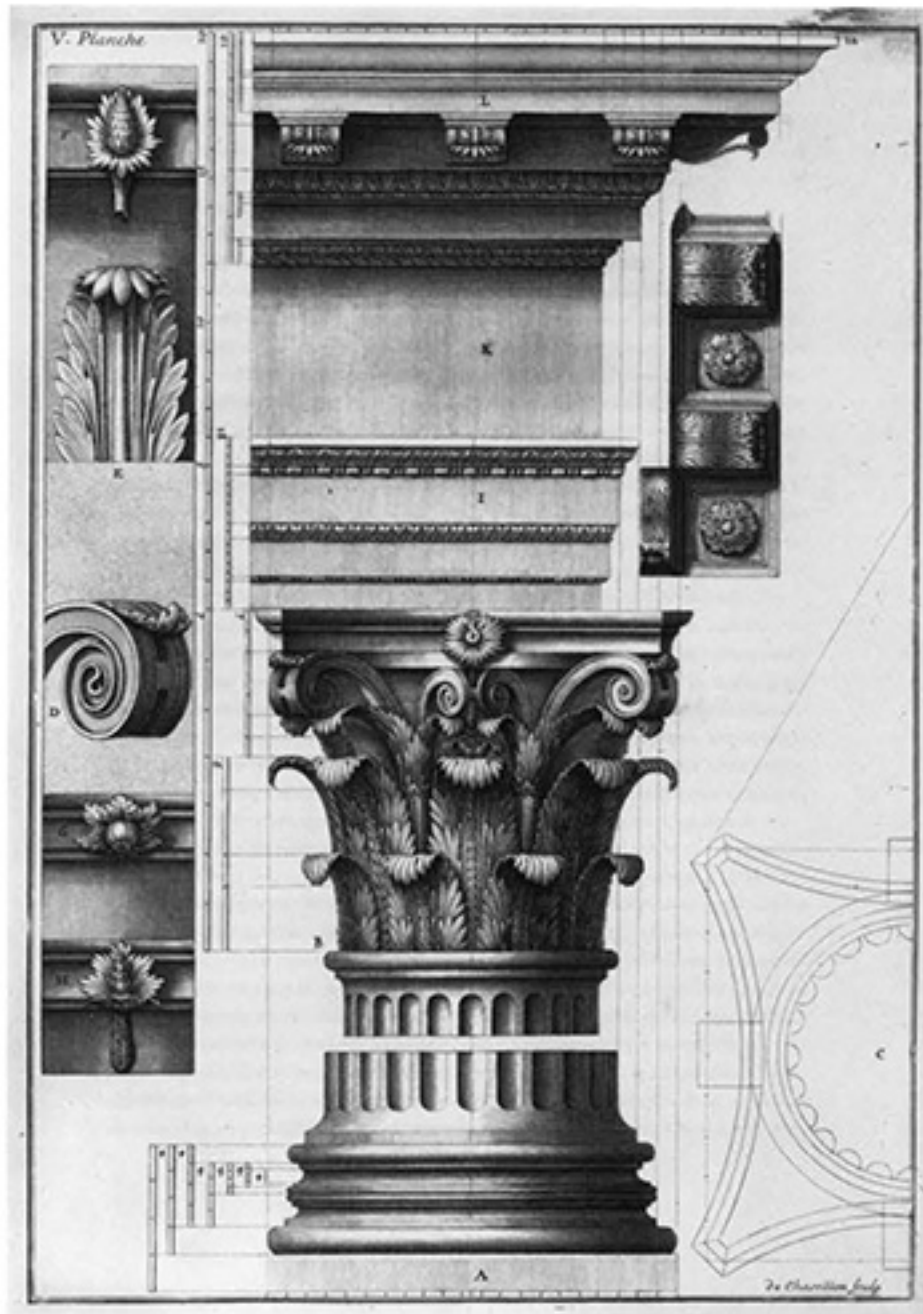


Roman Ionic Order
Right: Temple of Portunus, Rome [ca. 19 BC]

- Could be fluted or unfluted
- specially when compared to Greek, were heavily adorned
- Per Serlio: female saints

THE 5 ROMAN ORDERS

CORINTHIAN



Roman Corinthian Order
Right: Maison Carrée, Nîmes, France [ca. 12 BC]

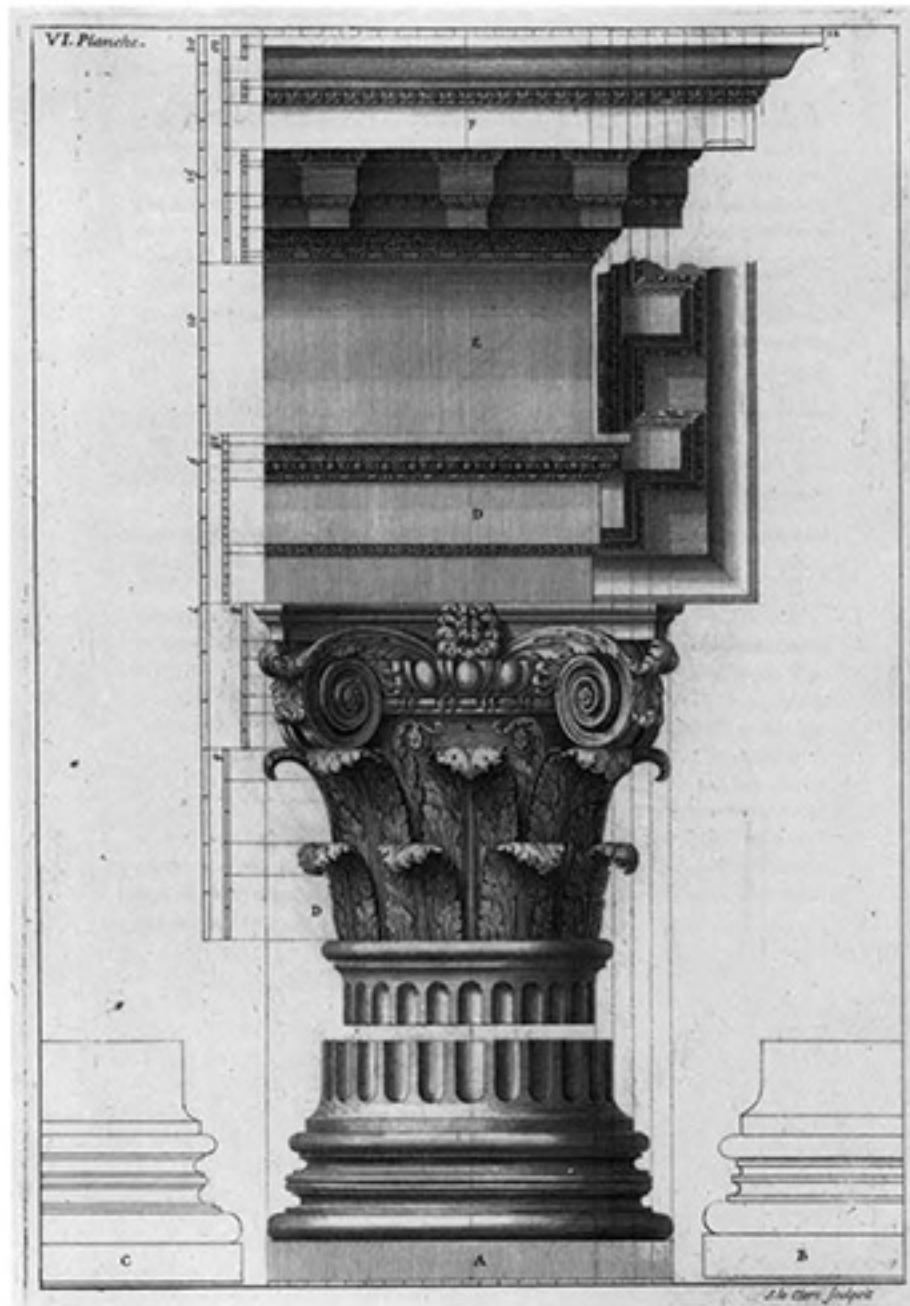
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Fluted or unfluted

- Small volutes on top
- Per Serlio: virginity

THE 5 ROMAN ORDERS

COMPOSITE



Arch of Titus
Rome [ca. AD 81]

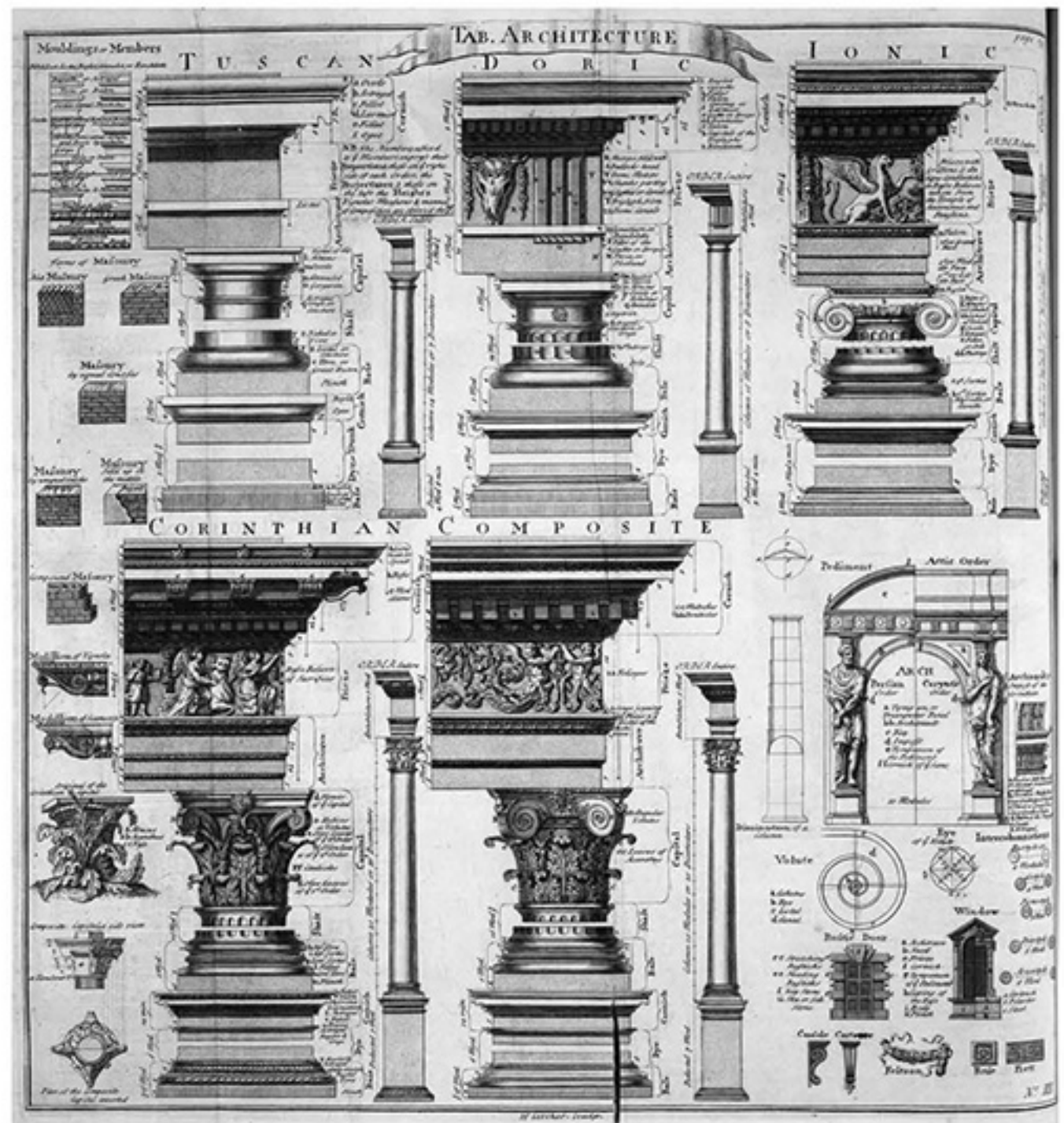
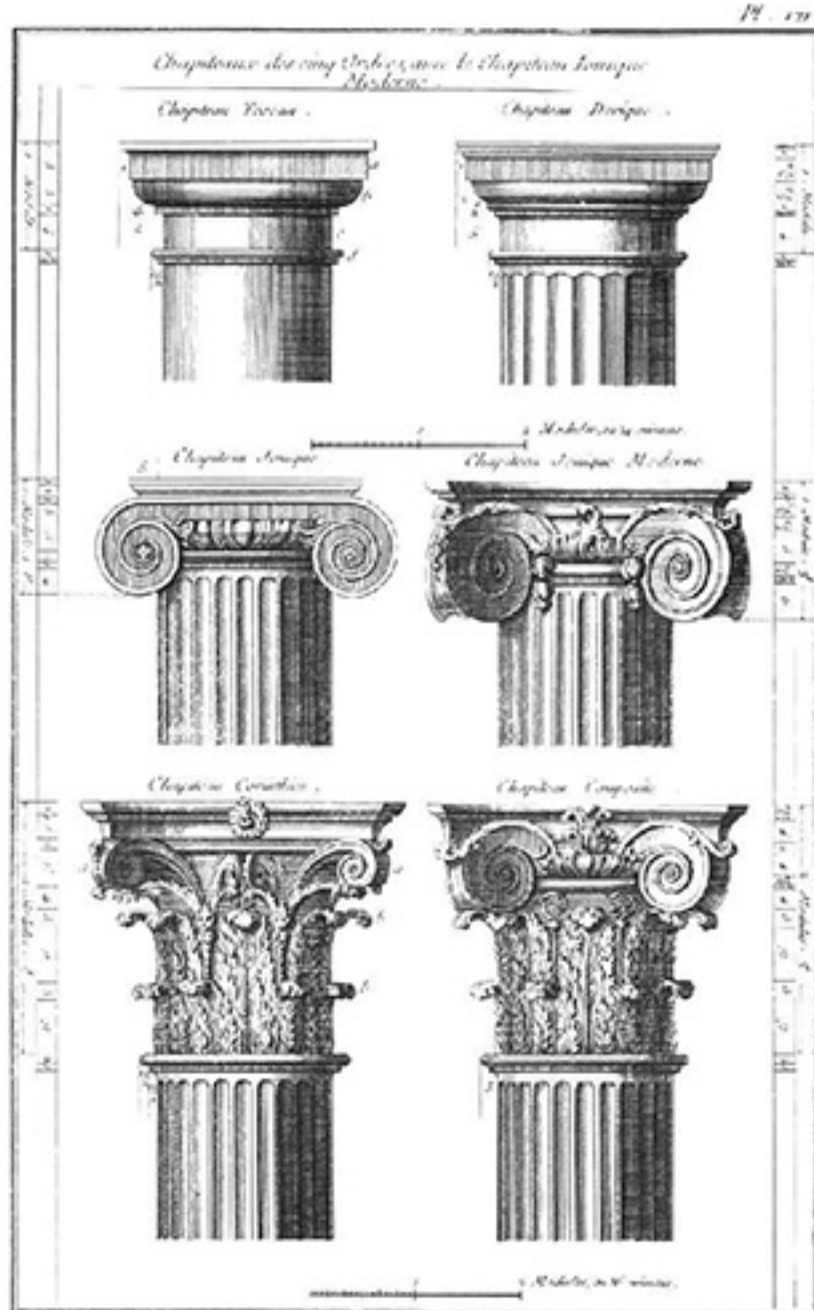
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two rows of acanthus leaves, with diagonal (8 volute) Ionic capital

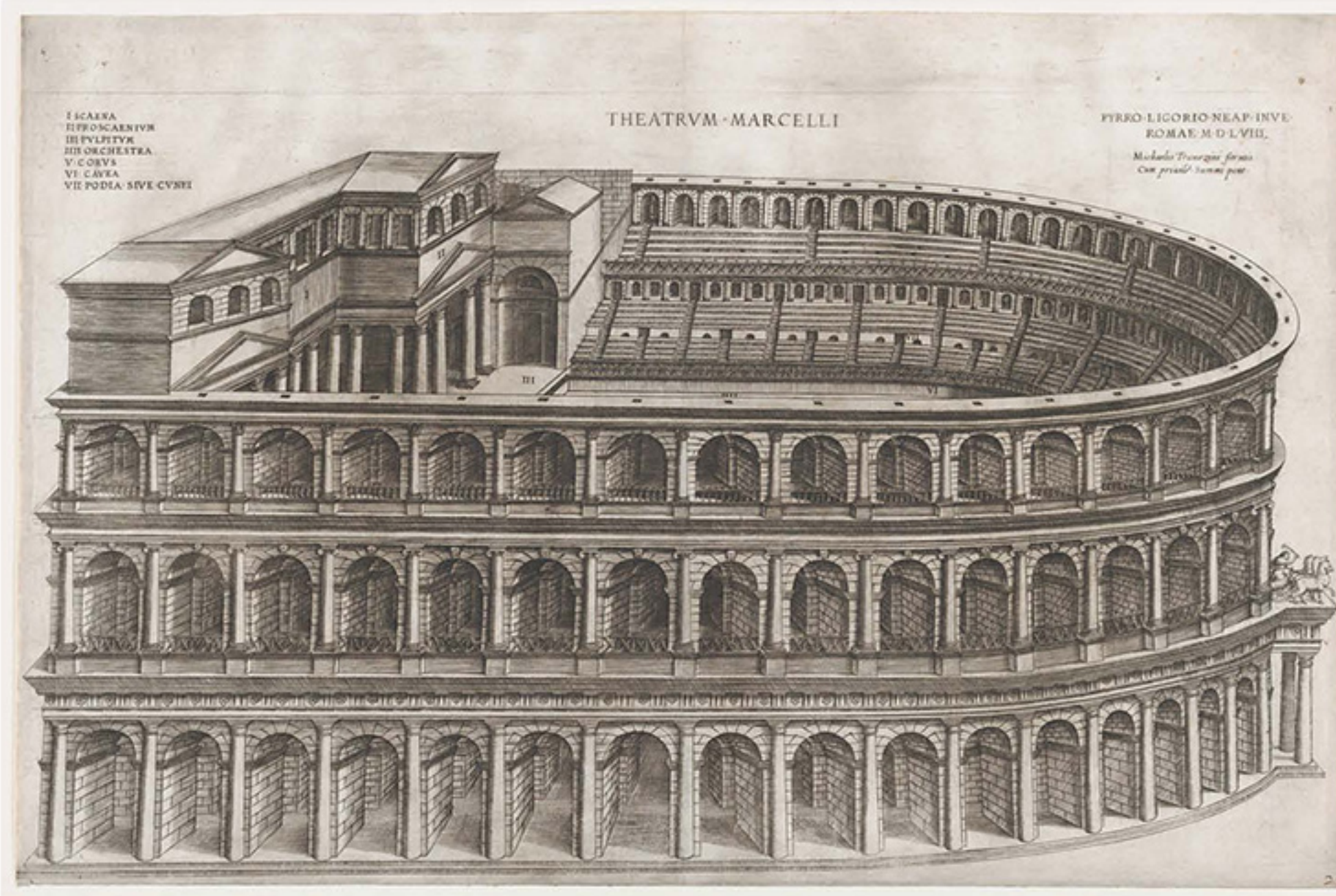


Wisdom and Beauty

- Can be mixed up with the Corinthian, so it's important to look at the scale of the volutes



When see next to each other, the Composite has much larger volutes, which themselves were often adorned with flora

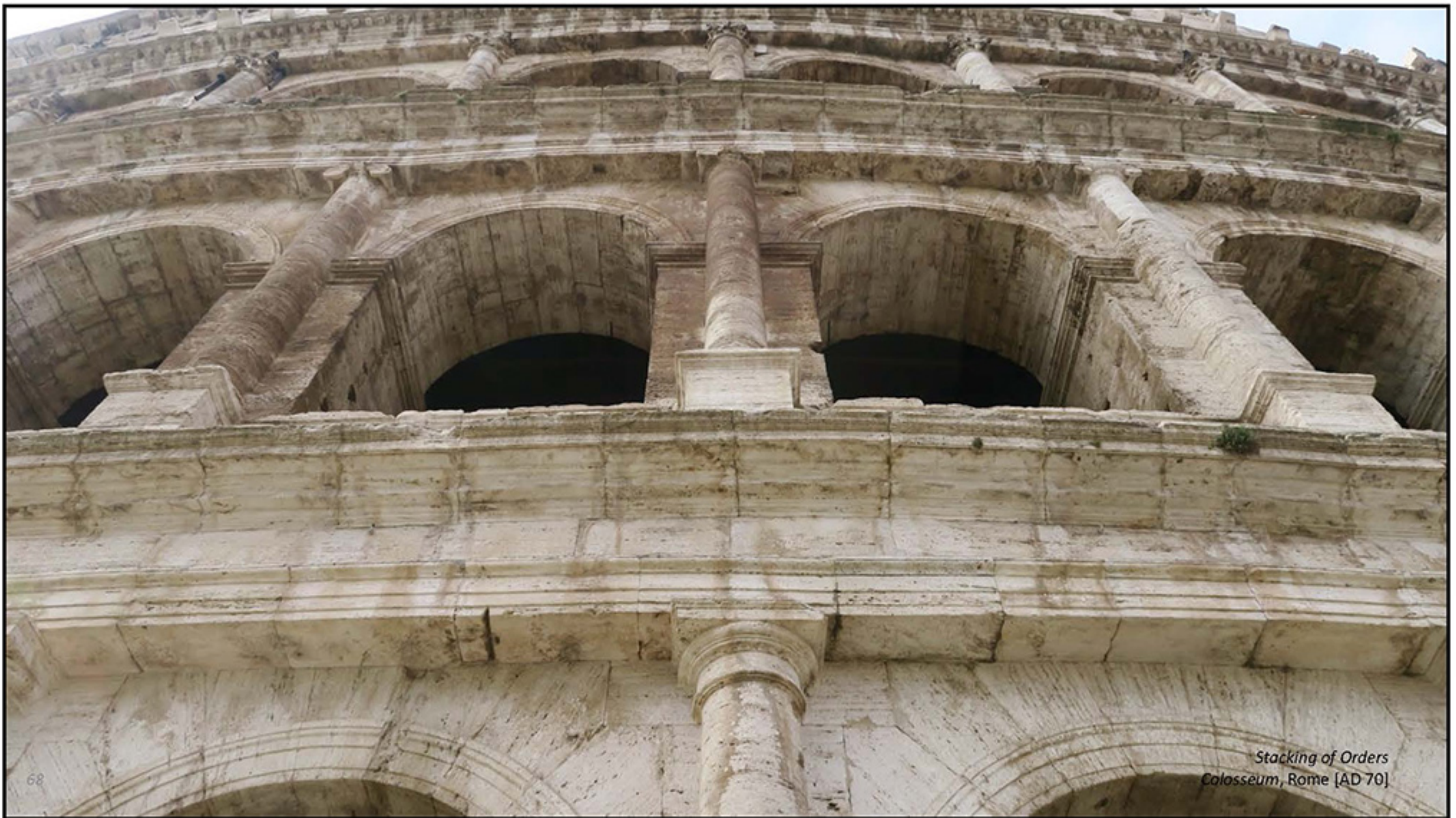


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Roman orders in concert: Superposed Orders
Theater of Marcellus, Rome [13 BC]

Oftentimes in practice, orders were combined, to show a kind of dynamism throughout a building

- the heaviest order (Doric) should occupy the lowest level, followed by the Ionic in the middle, and finally the Corinthian or Composite at the top
- This arrangement is referred to as 'Superposed Orders'



Another, more famous example, the Roman Colosseum

- The lowest level is the ground floor – Tuscan capital
- Next level Ionic
- Top is the Corinthian
 - Not composite – sharp corners, not full volutes

pilaster

An 'engaged' column, that is partially attached to a wall and may be rectangular or circular in profile



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A 'Pilaster', which is simply a column that is embedded into a wall.

- Sometimes these pilasters are structural and essentially serve the same function as a free-standing column, but other times they are merely decorative, and do not contribute at all the structural system of a building
- Also called 'engaged columns'

GREEK vs ROMAN

austere

ornamented

standard fluting

variable fluting

trabeation

arcuation

So to draw contrasts between the Greek and Roman styles, as **GENERALIZATIONS**



*Ornamentation of metope
Left: Greek, Right: Roman*

With regard to the first distinction, if we look at the entablatures of Greek vs. Roman architecture, we see that the Greek variety is far simpler with fewer decorative elements, whereas the Roman paradigm is often flowing with ornamentation

trabeation

The use of post-and-lintel construction



- Trabeation: Post and lintel

arcuation

Construction system based on arches and vaults



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Arcuation

- A system based on arches



keystone

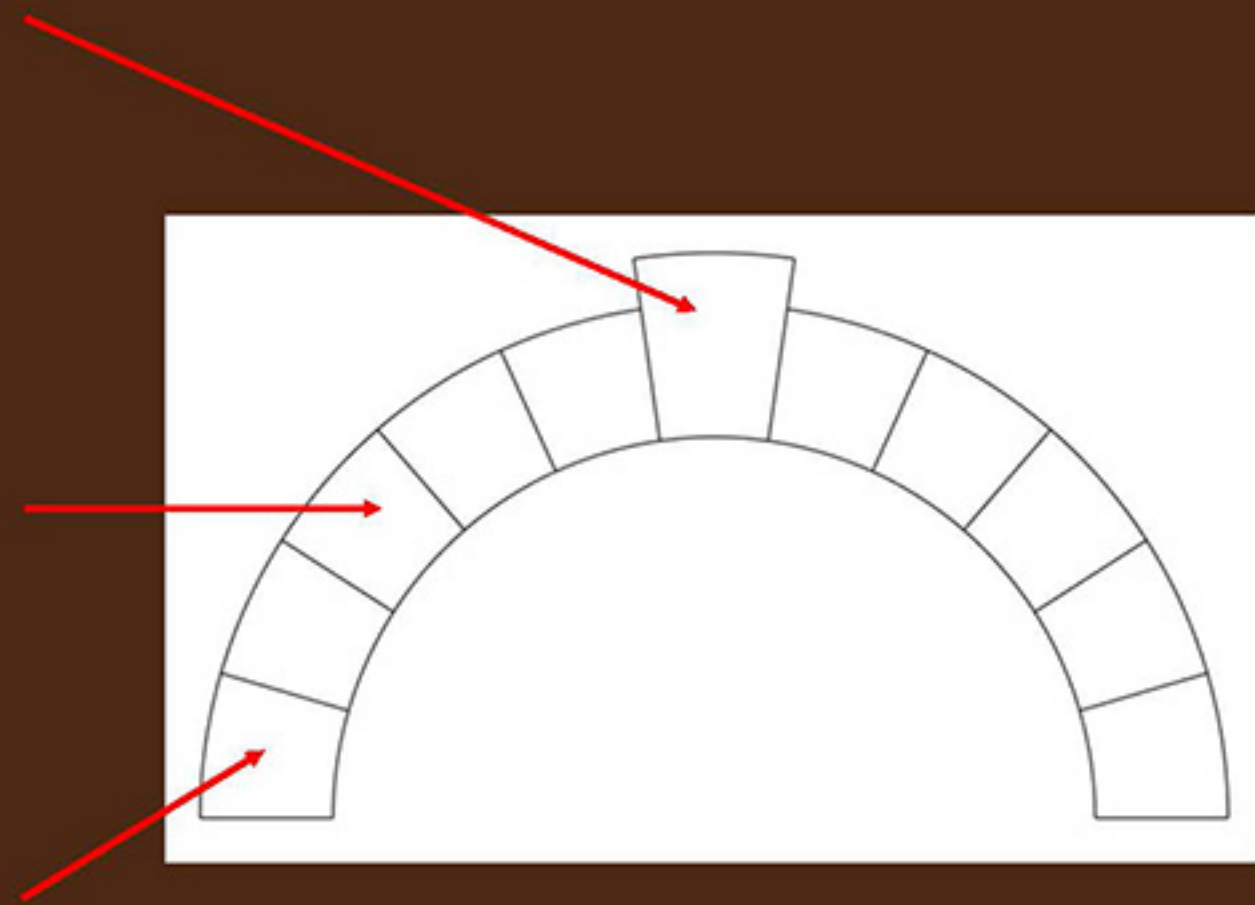
The center stone at the top of an arch, which locks other stones in position

voussoir

Tapered stones comprising an arch

springer

The lowest voussoirs of an arch

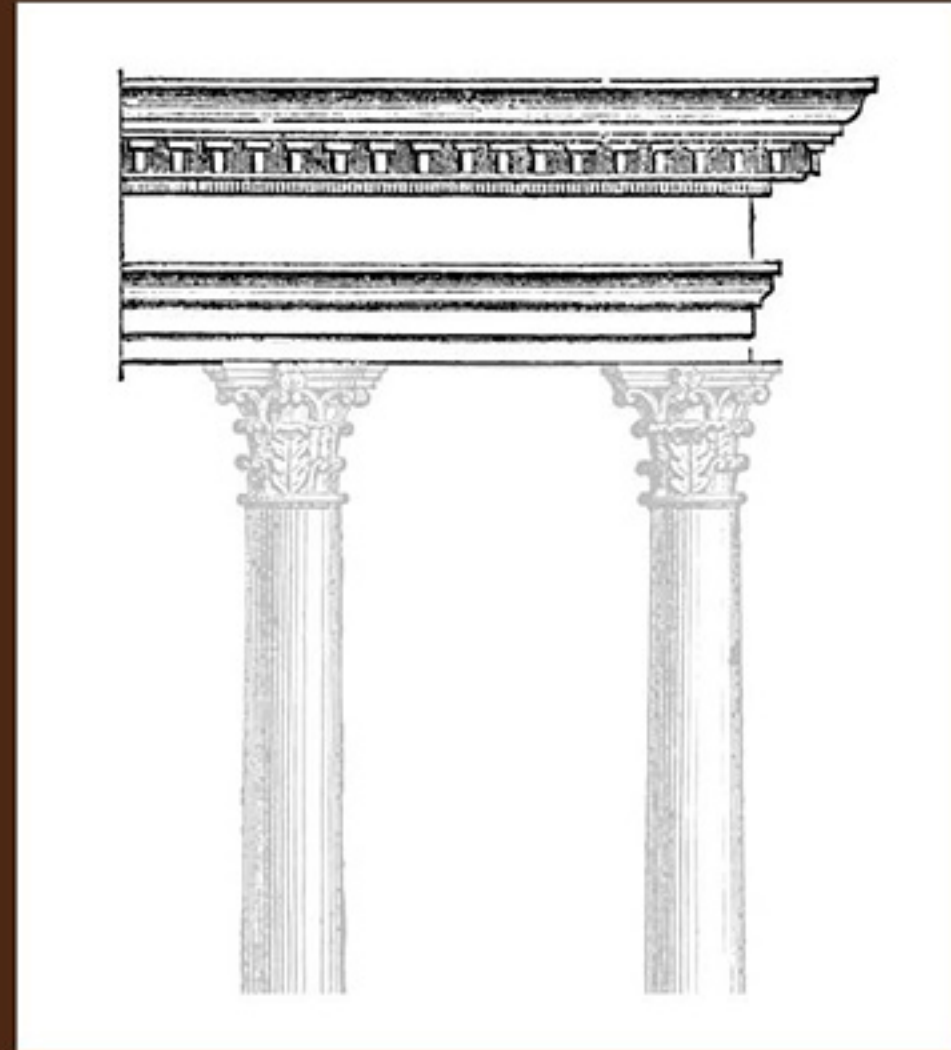




entablature

That part of an order which is above the column; including the architrave, the frieze, and the cornice

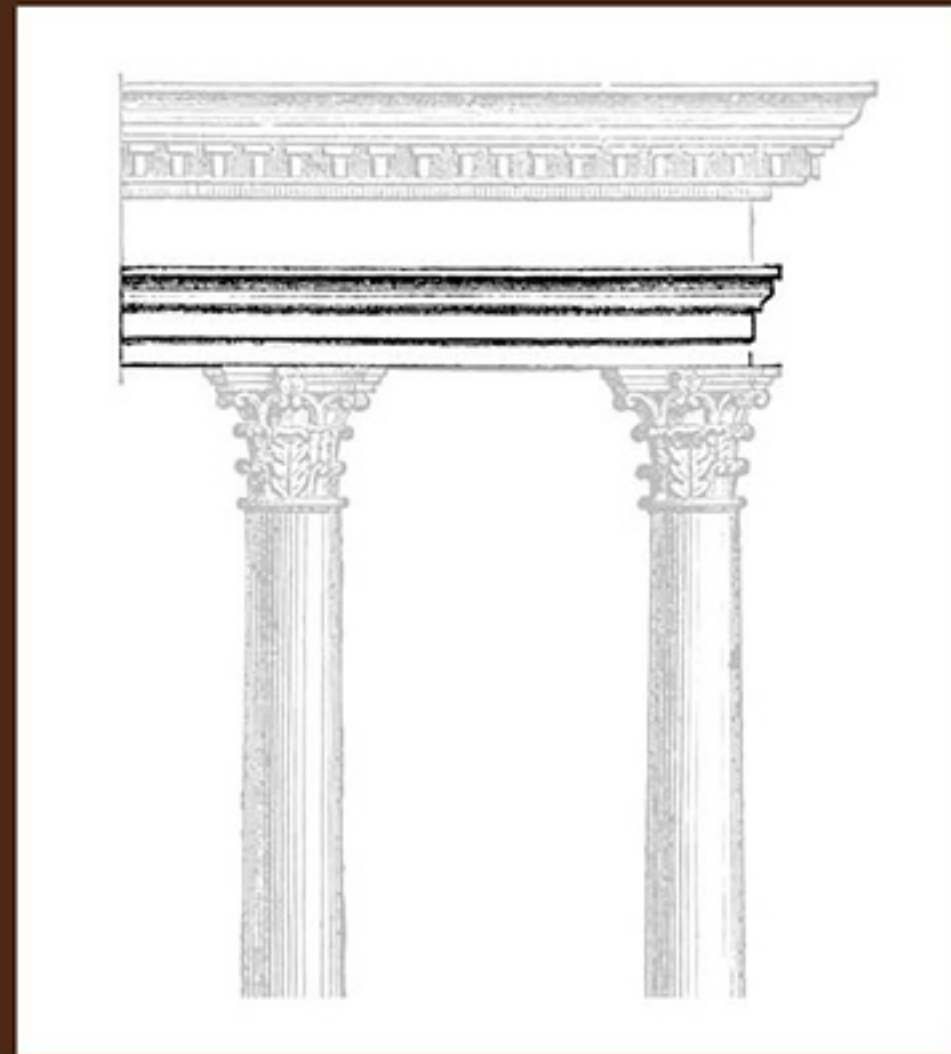
[Oxford English Dictionary]



architrave

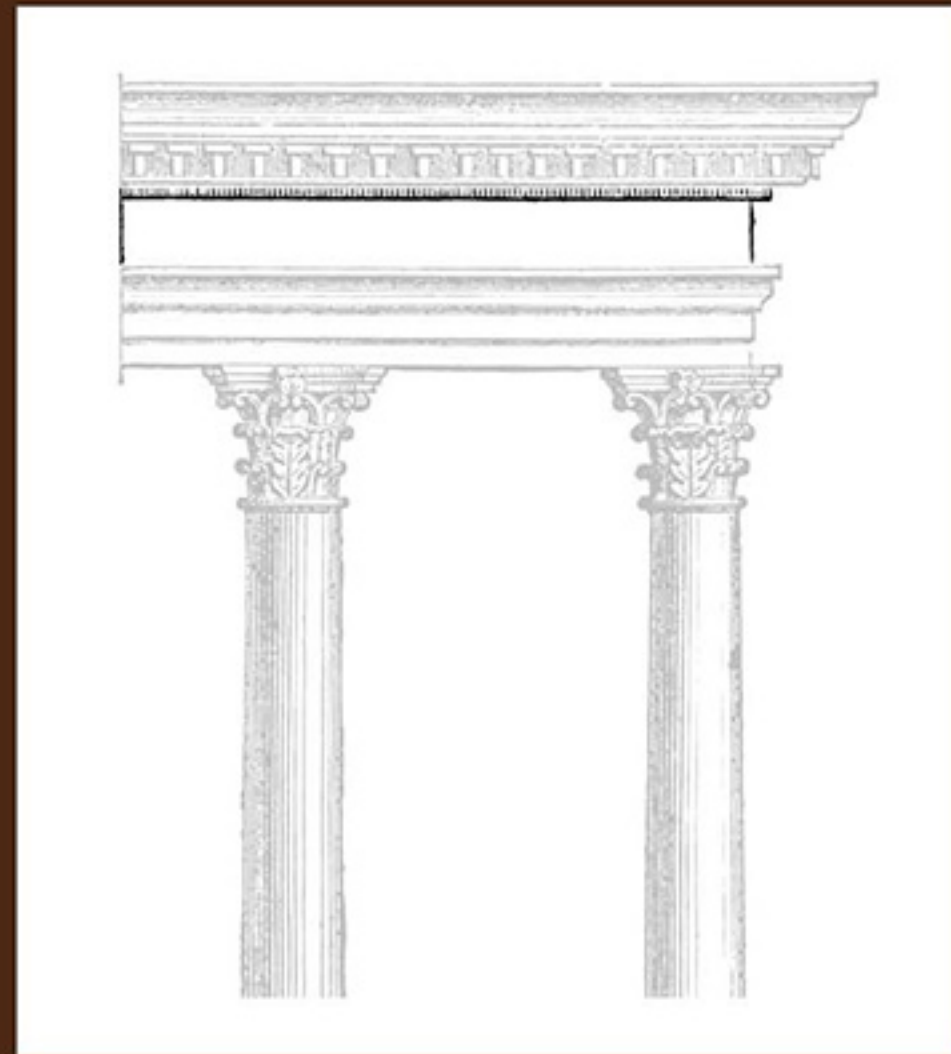
The lowest division of the entablature, consisting of the main beam that rests immediately upon the abacus on the capital of a column;

[*Oxford English Dictionary*]



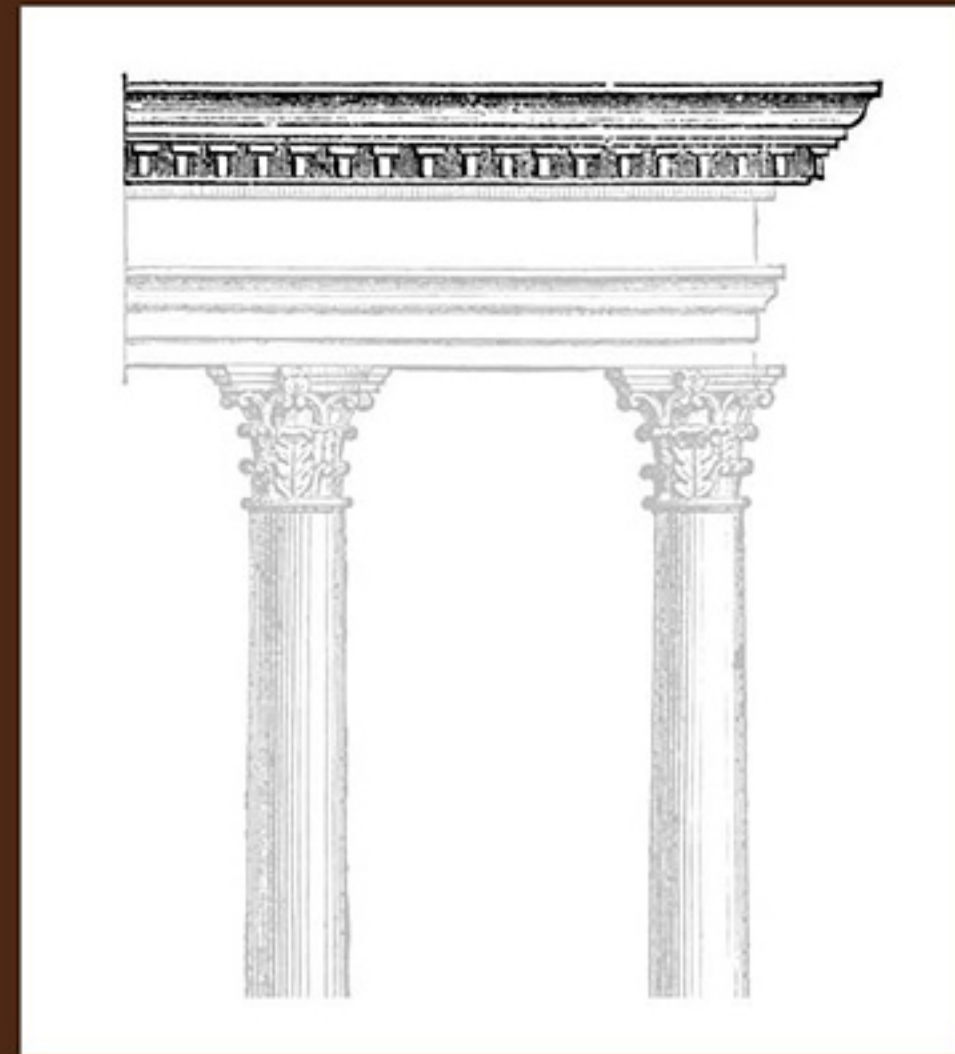
frieze

The middle band of the entablature, most likely containing triglyphs and metopes, or other forms of ornamentation



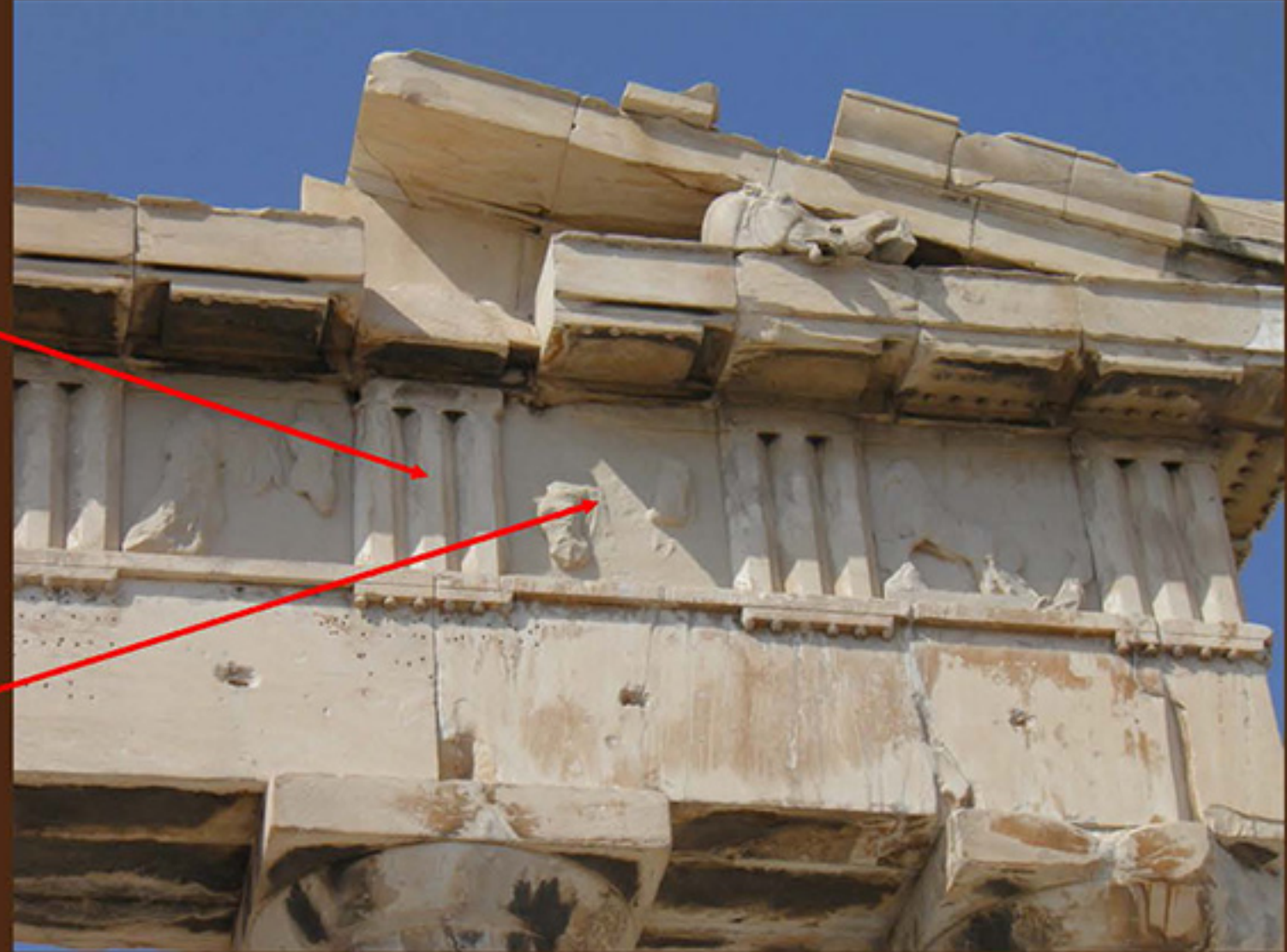
cornice

The uppermost part of an entablature,
serving as the crown of the roof line



triglyph

metope



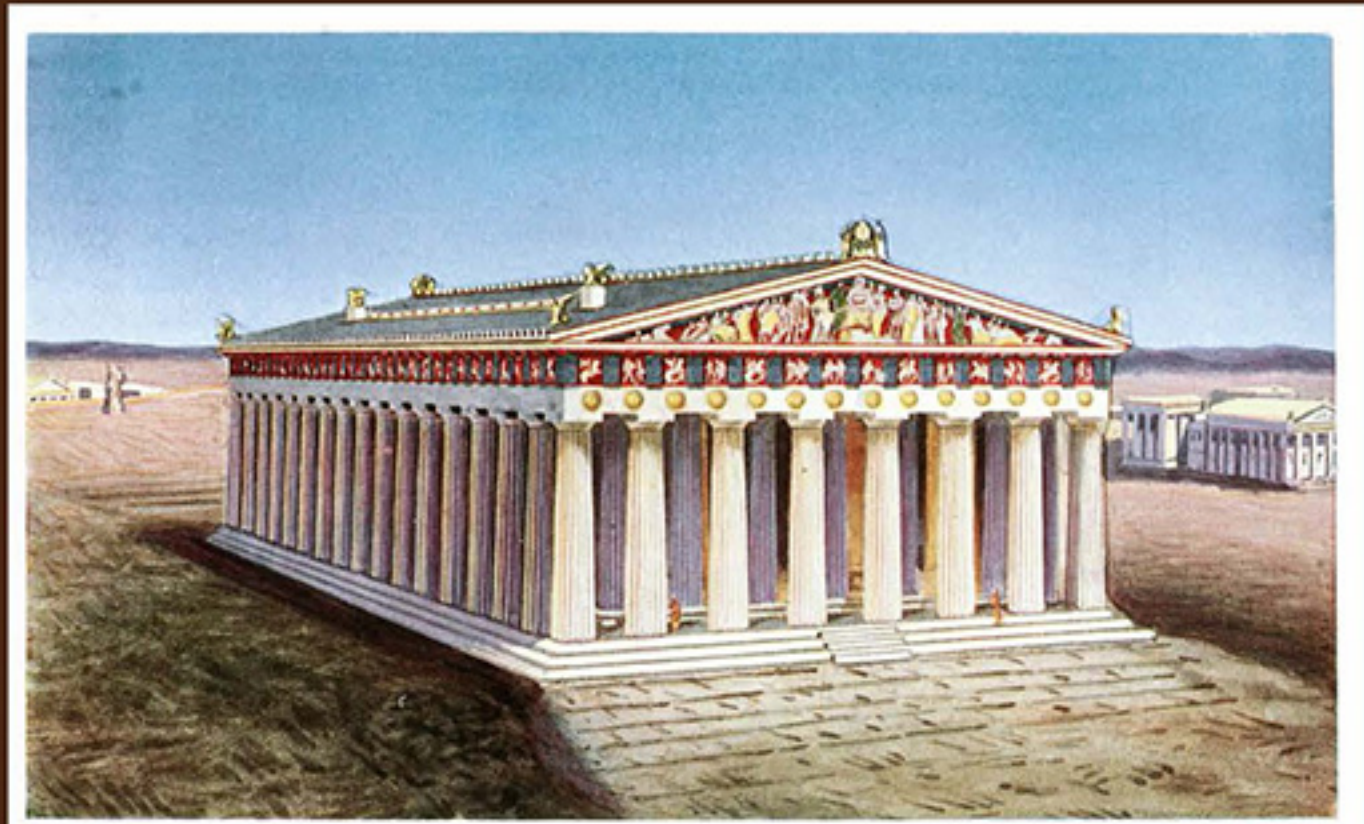
pediment

A wide, usually triangular structure resembling a low-pitched gable
[*Oxford English Dictionary*]



pediment

A wide, usually triangular structure resembling a low-pitched gable
[*Oxford English Dictionary*]



A RESTORATION OF THE PARTHENON