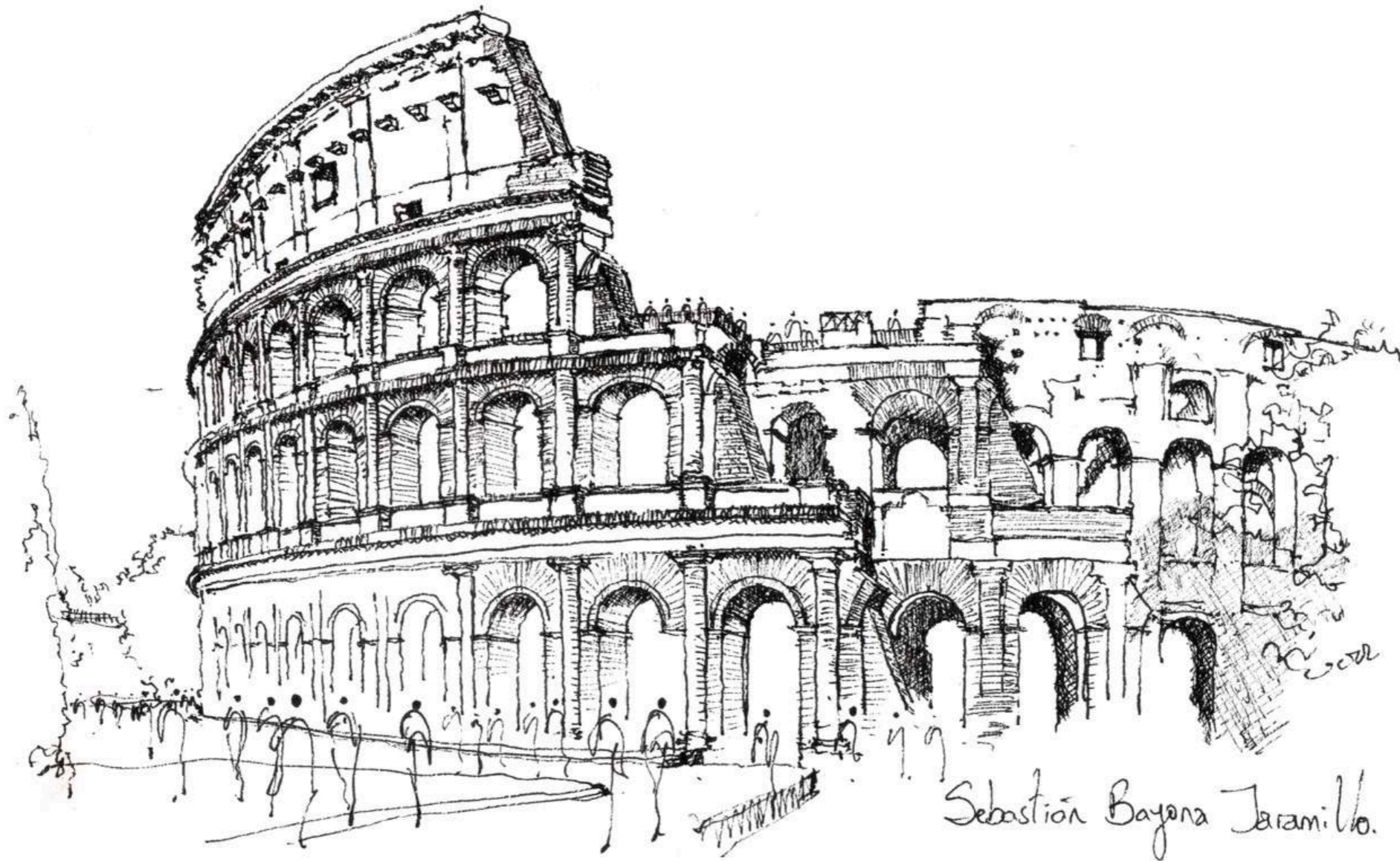
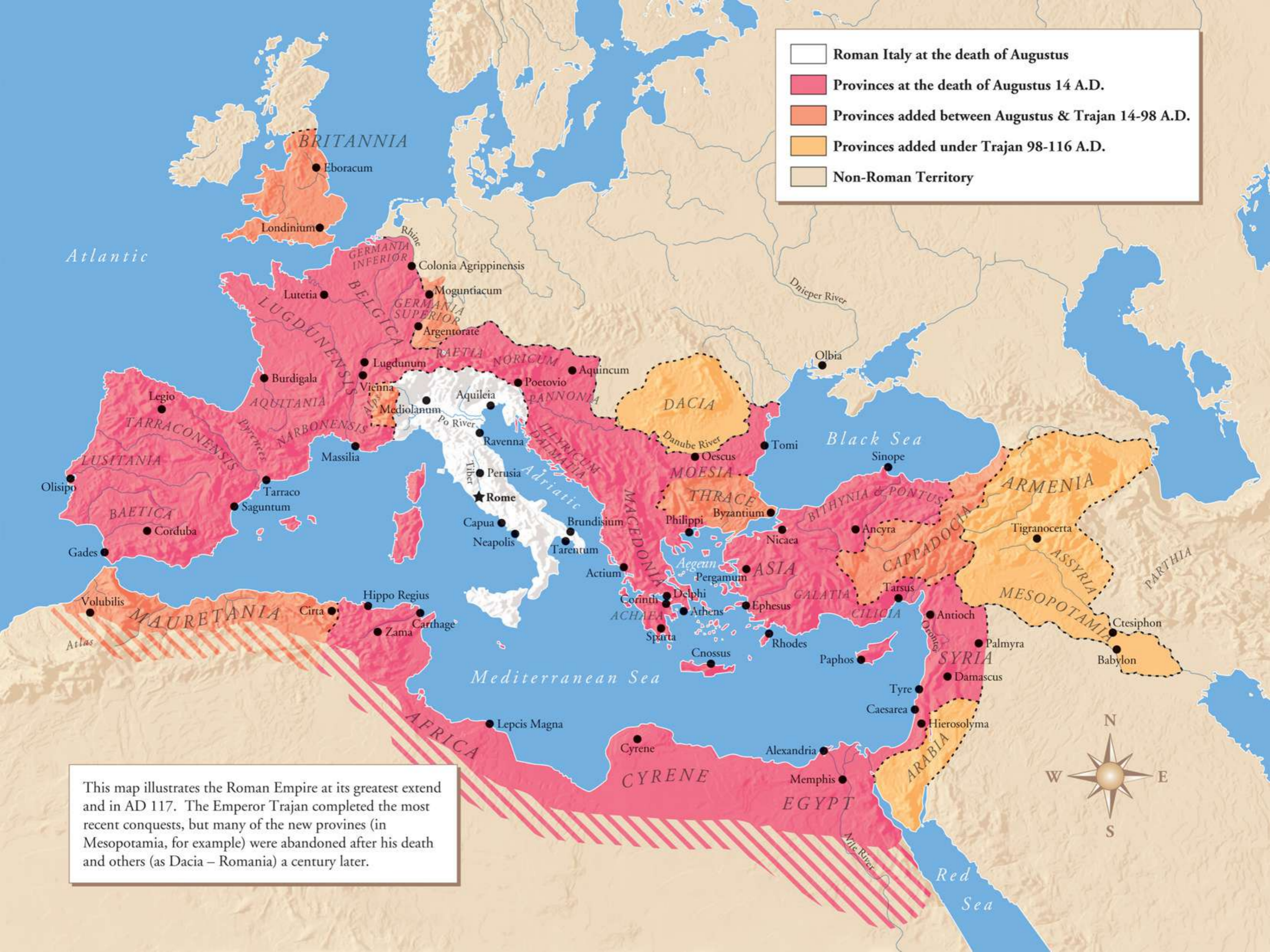


History of Architecture

Roman Architecture



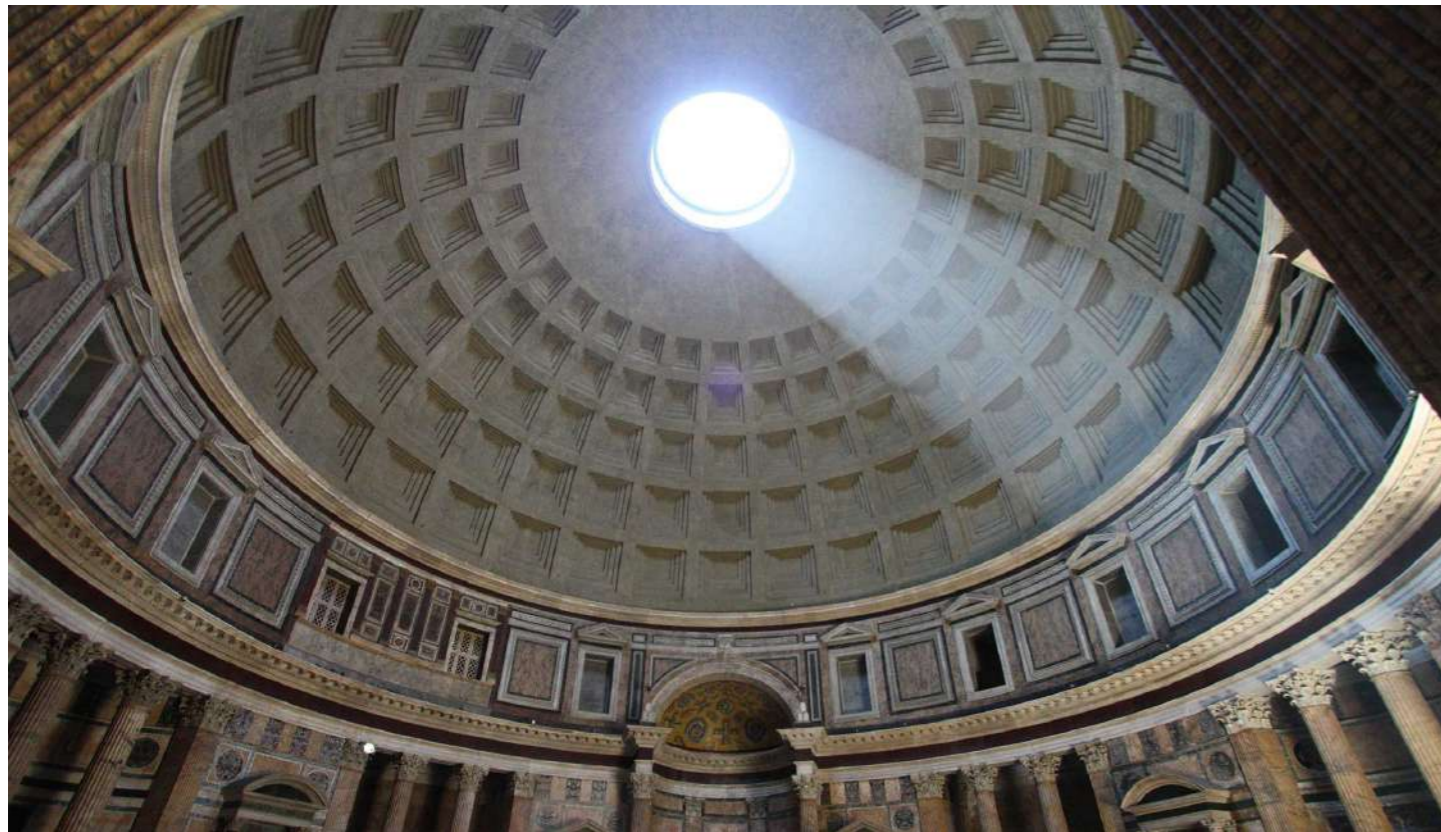


- Roman Italy at the death of Augustus
- Provinces at the death of Augustus 14 A.D.
- Provinces added between Augustus & Trajan 14-98 A.D.
- Provinces added under Trajan 98-116 A.D.
- Non-Roman Territory

This map illustrates the Roman Empire at its greatest extent and in AD 117. The Emperor Trajan completed the most recent conquests, but many of the new provinces (in Mesopotamia, for example) were abandoned after his death and others (as Dacia – Romania) a century later.

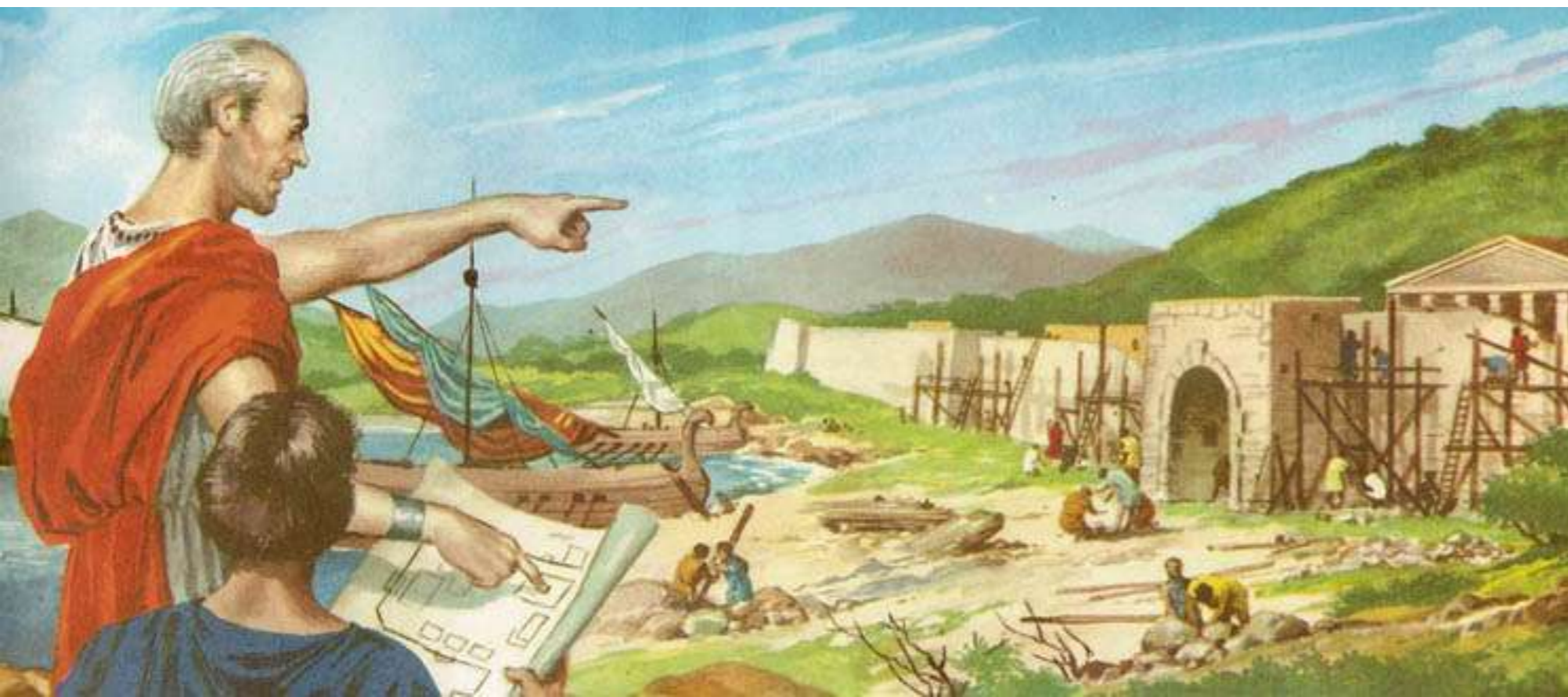
Geography

- Italy had many different minerals and means of construction, **marble, terra-cotta, stone, brick and Pozzolana** were largely used even for more important buildings
- The existence of **Pozzolana** gave the Romans a material which contributed to the **endurance and durability of their architecture**, it gives strength, hardness and durability especially when **mixed with stone and bricks**



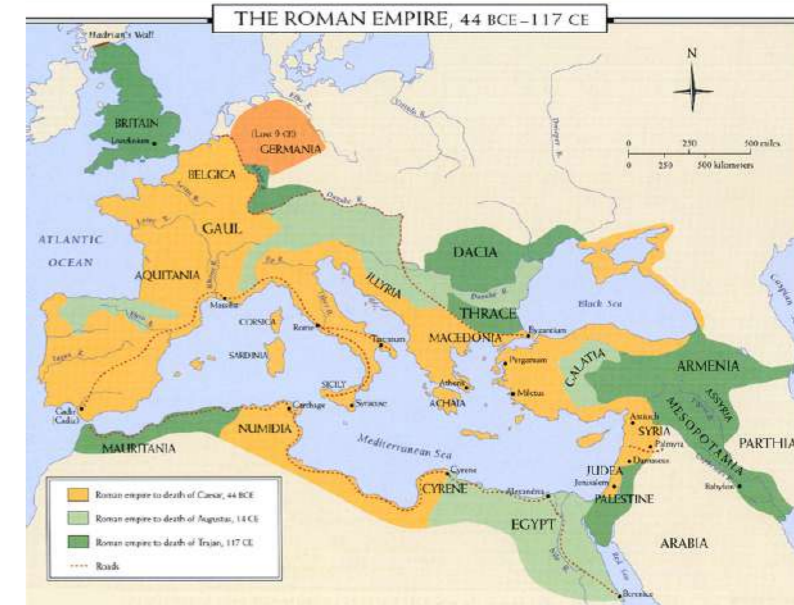
History

- Through the Greek culture, the early Romans were provided with a **model on which to build their own culture** including religion and the fundamentals of architecture
- In about **700 BC**, the **Etruscans** moved into the area of north of Rome and came to dominate the neighbouring tribes, over whom they **imposed a king**
- In **509 BC** the inhabitants of Rome **rebelled** and instituted a **republic governed by a senate**



History

- With the growth of Rome, it became an **empire**, with **Julius Caesar** as dictator in **46 BC**. Julius was killed after 2 years.
- In **31 BC**, Caesar's Nephew, **Octavian**, became the - emperor - and head of the army. He reign for **41 years** with peace and the established of an imperial bureaucracy
- Later, the empire was ruled by **Five Good Emperors**. Their reign of almost **90 years** marked the **longest period of peace** from **96 - 180 AD**



History

- After Marcus death, the empire began to suffer and **was divided into two to be administrated by 2 equal emperors**
- The Empire was then pulled again by **Constantine in 324 AD**, the first Roman emperor to claim **conversion to Christianity**



History

The Roman Empire can be divided to three main periods:

1. **Etruscan Civilization (753- 509 BC)**: Etruscans established political control in the region by the late 7th century BC, forming the aristocratic and monarchical elite
2. **Roman Republic (500-31 BC)**: System based on annually elected magistrates and various representative, assemblies was established
3. **Roman Empire (31-395 AC)**: Which had the separation of West and East

Religion

- The Etruscans had introduced the **Greek gods** and began the construction of **columnar temples**.
- Later, the Romans adopted Greek gods with slight change on their characters



Greek Gods and their Roman Counterparts



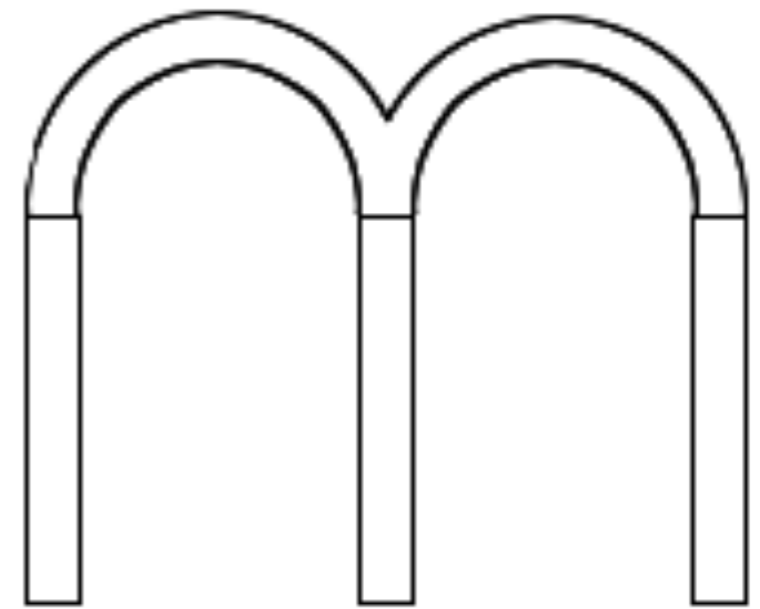
Greek God (English name)	Roman Counterpart	Domain
Aphrodite	Venus	Goddess of Love
Apollo	Phoebus Apollo	God of the Sun
Ares	Mars	God of war
Artemis	Diana	Virgin goddess of the hunt, wilderness, wild animals , childbirth and plague. In later times she became associated with the moon.
Athena	Minerva	Goddess of wisdom
Demeter	Ceres	Goddess of grain/crops
Dionysus	Bacchus	God of wine
Eros	Cupid	God of love
Hades	Pluto	God of underworld
Hecate	Trivia	Goddess of witchcraft , crossroads, and justice
Helios	Sol	The sun God
Hephaestus	Vulcan	God of fire, and the forge
Hera	Juno	Queen of the Gods
Hermes	Mercury	Messenger of the Gods
Nike	Victoria	Goddess of victory
Pan	Faunus	God of woods and pastures
Poseidon	Neptune	God of the sea
Zeus	Jupiter	King of Gods

Architecture Character

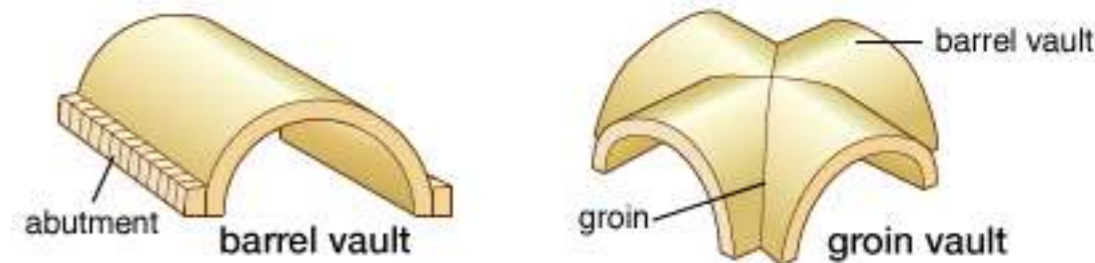
- The Romans were inherently **pragmatic** and **realistic**, unlike the speculative and idealistic Greeks
- The Romans advanced with **technological** but had no great theoretical scientists - what the Romans produced in abundance was **engineers and builders** who developed architectural forms on a scale that the Greeks could not
- Roman civilization **focused on the city** as its basic constituent element
- The adoption of the **classical Greek orders**, and the combination of these orders with an **arches, domes & vaults**



- The romans built structures with **several stories** and hence the orders attached in design were only **decorative** rather than structural
- Increasingly during the 2nd century AD, Roman builders used **concrete** for the walls and vaults of the public buildings
- The introduction of **new proportions** relating to the use of different materials
- Many new types of building such as **public baths, and basilicas**
- The widespread **use of vaulted and domed forms**



**arched construction
(aka vaulted construction)**



Roman Architecture shapes spaces - H. Kahler

Greek

Greek public architecture was made up of sculptural masses set in balanced contrast to the landscape

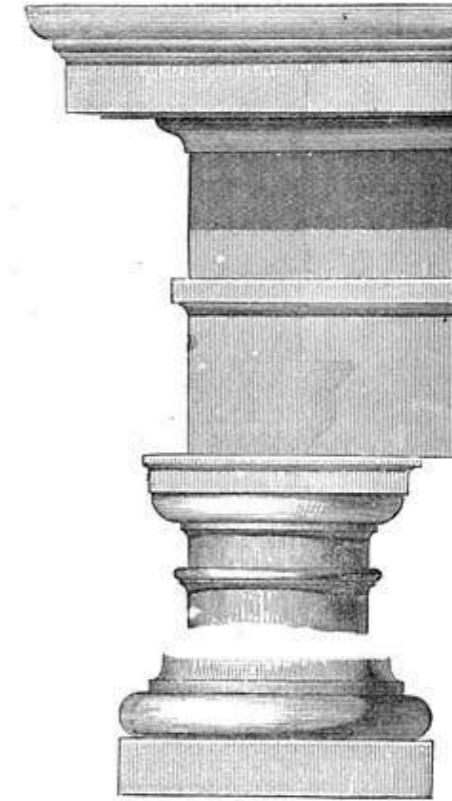
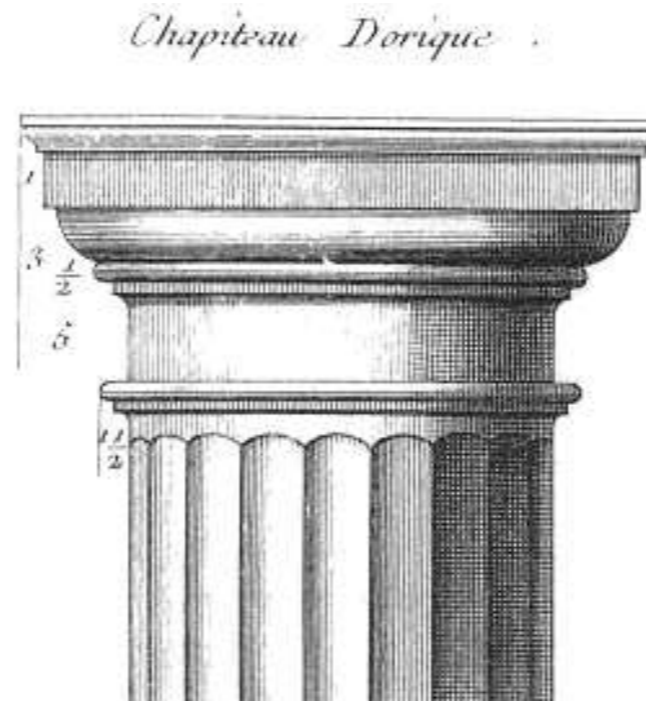
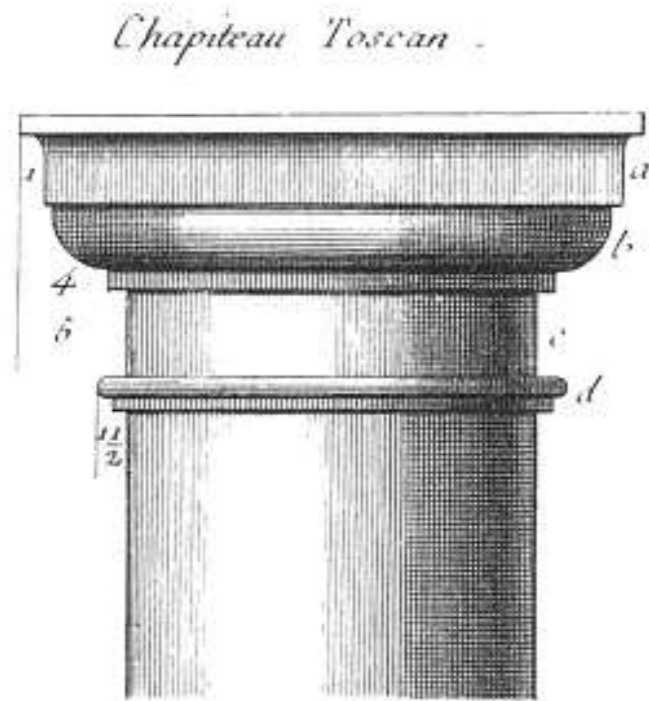
VS

Roman

The Roman architecture is an architecture of space, enclosed internal space and outdoor space, opened on grand scale

New Orders:

- To the 3 Greek orders, the Romans added the **Tuscan**, which they made simpler than Doric



Tuscan Order:

- The column had a simpler base. It was unfluted
- Both capital and entablature were without adornments
- The modular proportion of the column was 1:7

New Orders:

- and the **Composite**, which was more ornamental than the Corinthian



The Composite Order:

- The A mixed order, combining the volutes of the Ionic order capital with the acanthus leaves of the Corinthian order
- The column of the composite order is 10 diameters high



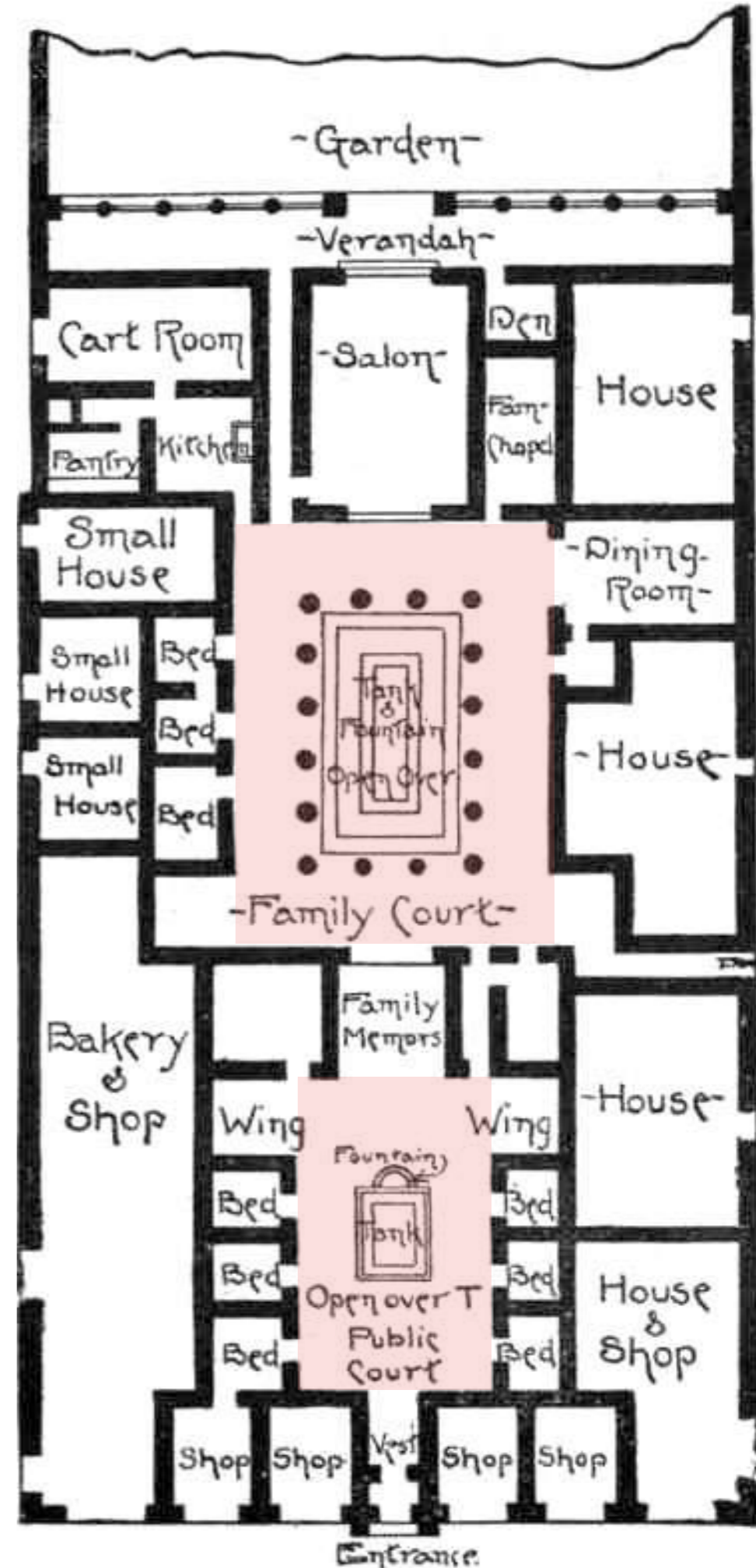
Columns Arrangement:

- The Romans also invented the **superposed order**, it is when successive stories of a building have different orders
- The heaviest orders were at the bottom, whilst the lightest came at the top
- This means that the
 - Doric order was the order of the ground floor
 - Ionic order was used for the middle story
 - Corinthian or Composite order was used for the top story



Domestic Architecture

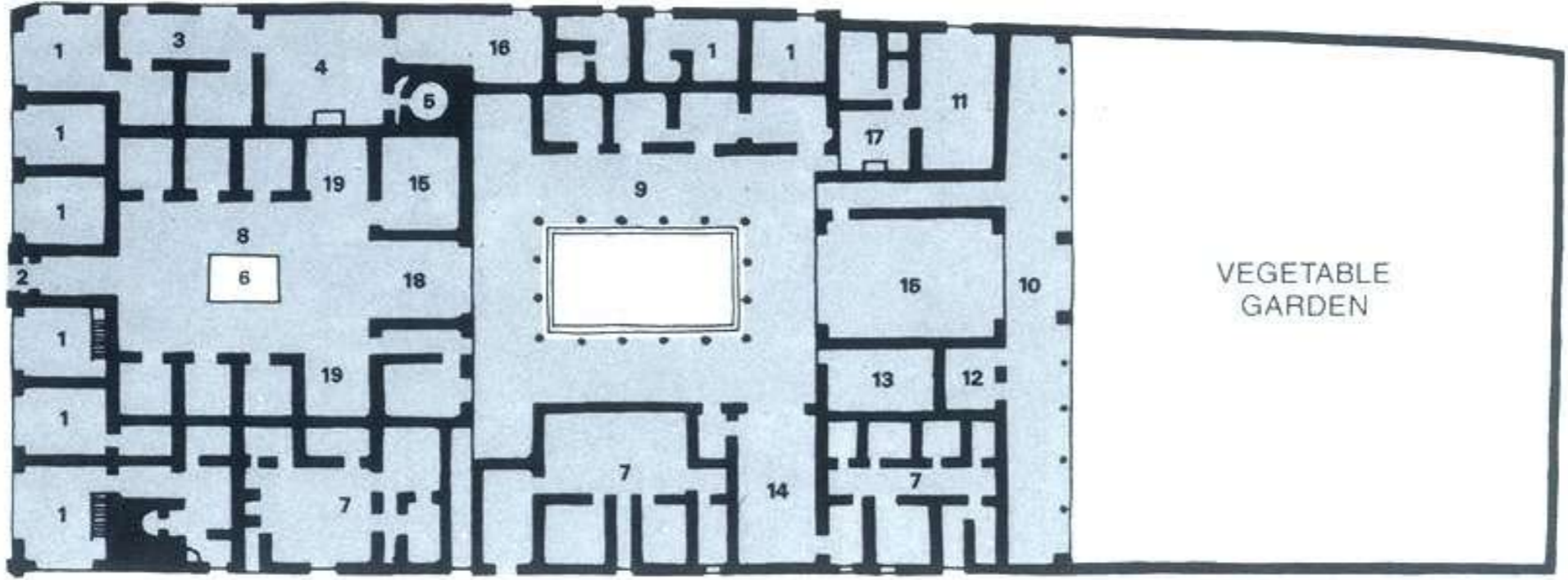
- The entrance is connected with a large public room, **the atrium**, open to the sky
- Usually the house **was closed off from the street** and focused inward unless the front rooms were let off as **shops**
- It was **two story**, and mostly houses had a **symmetrical floor plan**
- Beyond it is another **court yard**, always unroofed and used as a **garden**, surrounded by colonnades and by the more private living rooms



Roman Villa



- 1. Vestibulum
- 2. Impluvium
- 3. Compluvium
- 4. Peristylum
- 5. Latrinae
- 6. Tabernae
- 7. Cubiculum
- 8. Culina
- 9. Tegulae
- 10. Opus musivum
- 11. Triclinium
- 12. Trabs.

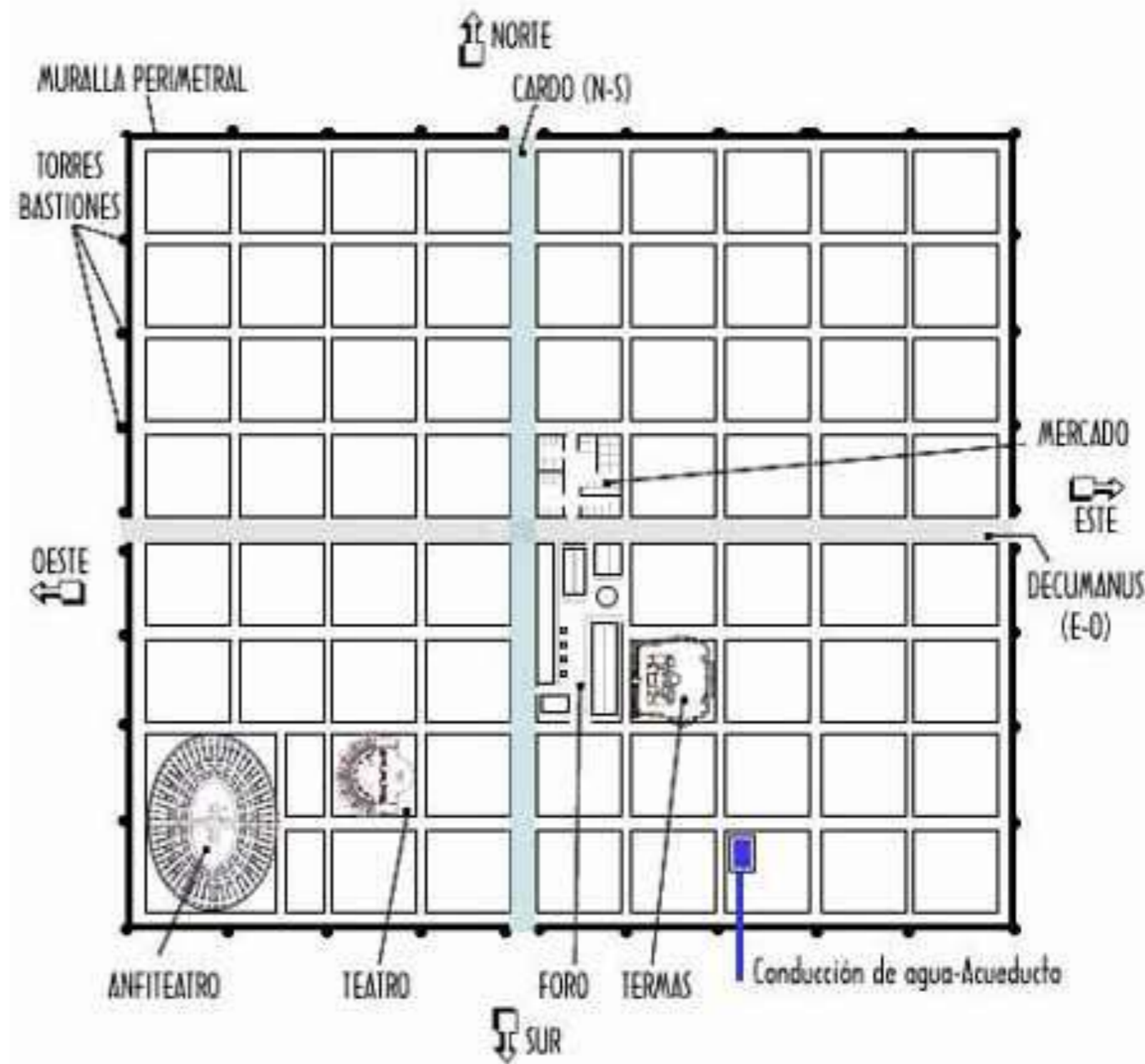


- 1. Shops
- 2. Main entrance
- 3. Baker's shop
- 4. Bake house
- 5. Oven
- 6. Impluvium
- 7. Separate house
- 8. Atrium
- 9. Peristyle
- 10. Portico
- 11. Wagon shed
- 12. Gardener's shed
- 13. Winter dining room
- 14. Dining room (triclinium)
- 15. Reception room (oecus)
- 16. Office
- 17. Kitchen
- 18. Tablinum
- 19. Alae

Towns and cities

Towns and cities

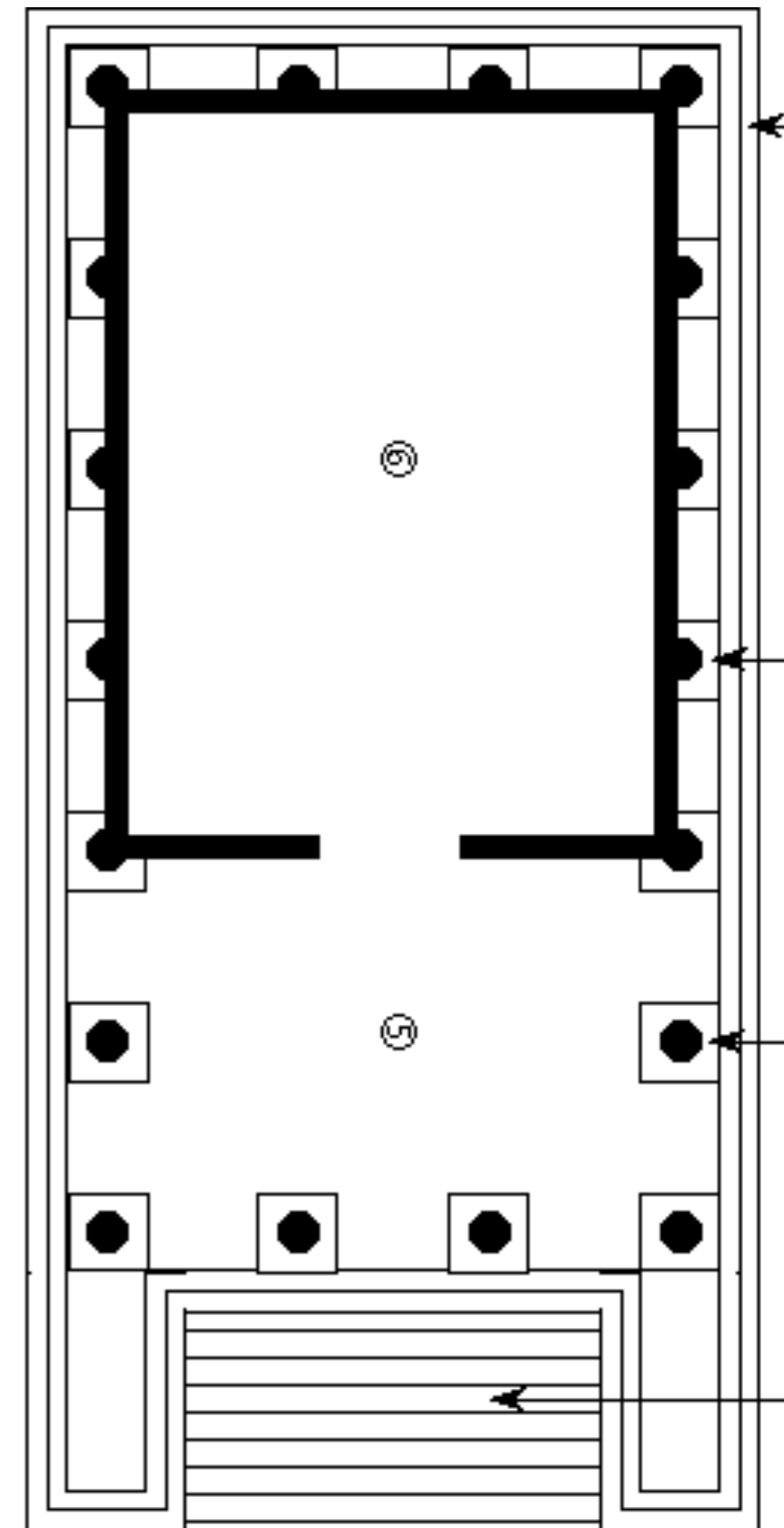
- The basic Roman plan consisted of **central forum** with city services, surrounded by a **compact, rectilinear grid streets**
- All roads were equal in width except for two, which were slightly wider. **Cardo** (N-S) & **Decumanus** (E-W) intersected the middle to form the centre of the grid



Temples

Temples

- Set on **high podium**, and approached only from the front
- Had simple **rectangular cellas** preceded by **columned porticoes with timber roof**
- It was usual to site an **important temple building in a commanding position in relation to the city forum**



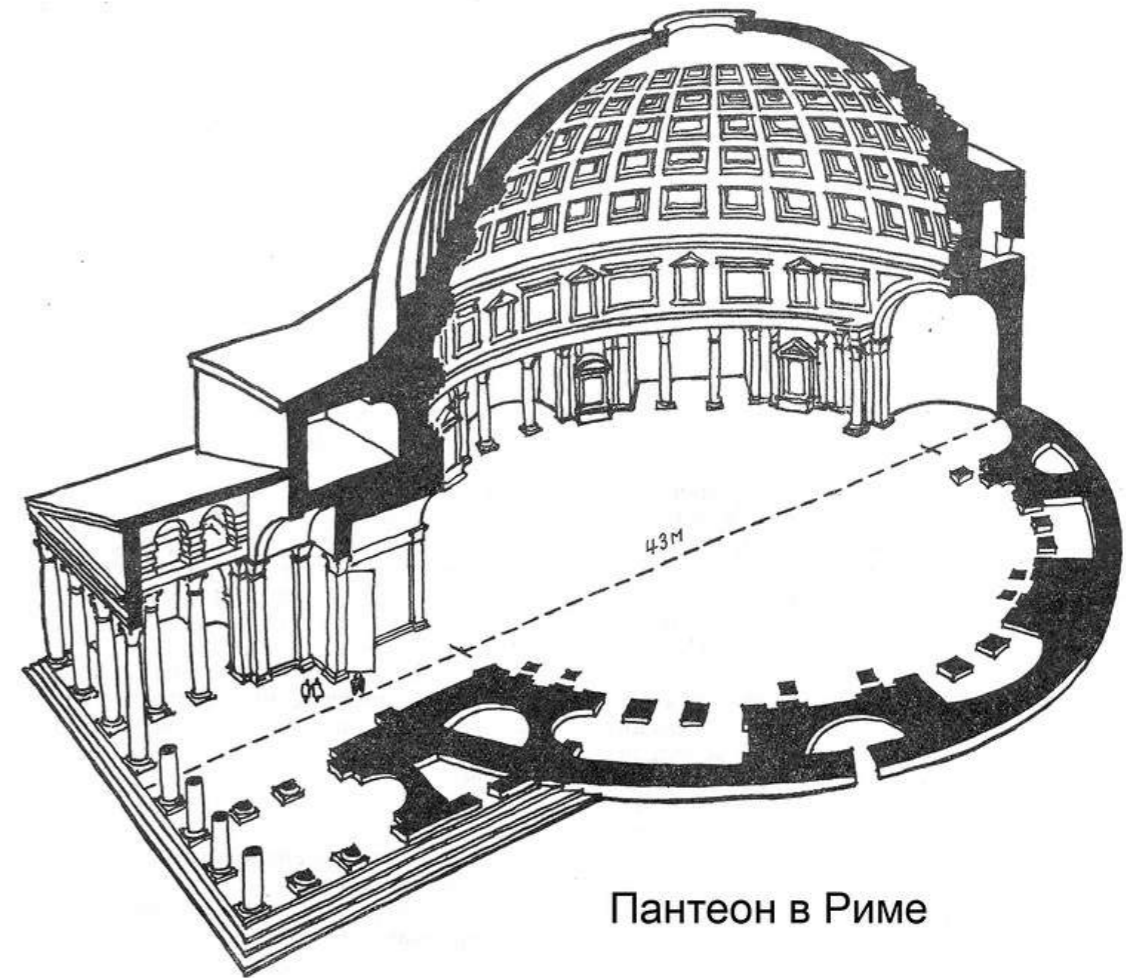
The Pantheon

118-128 AD



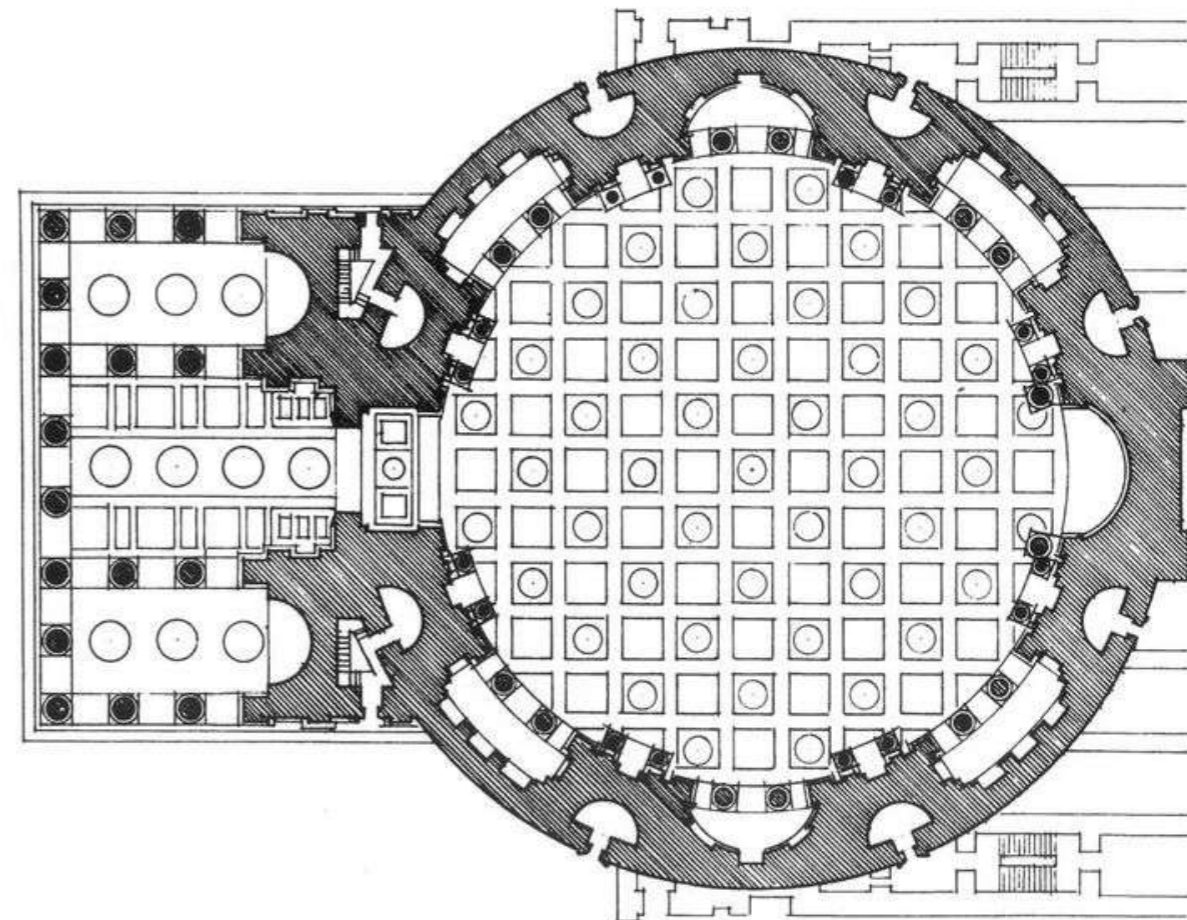
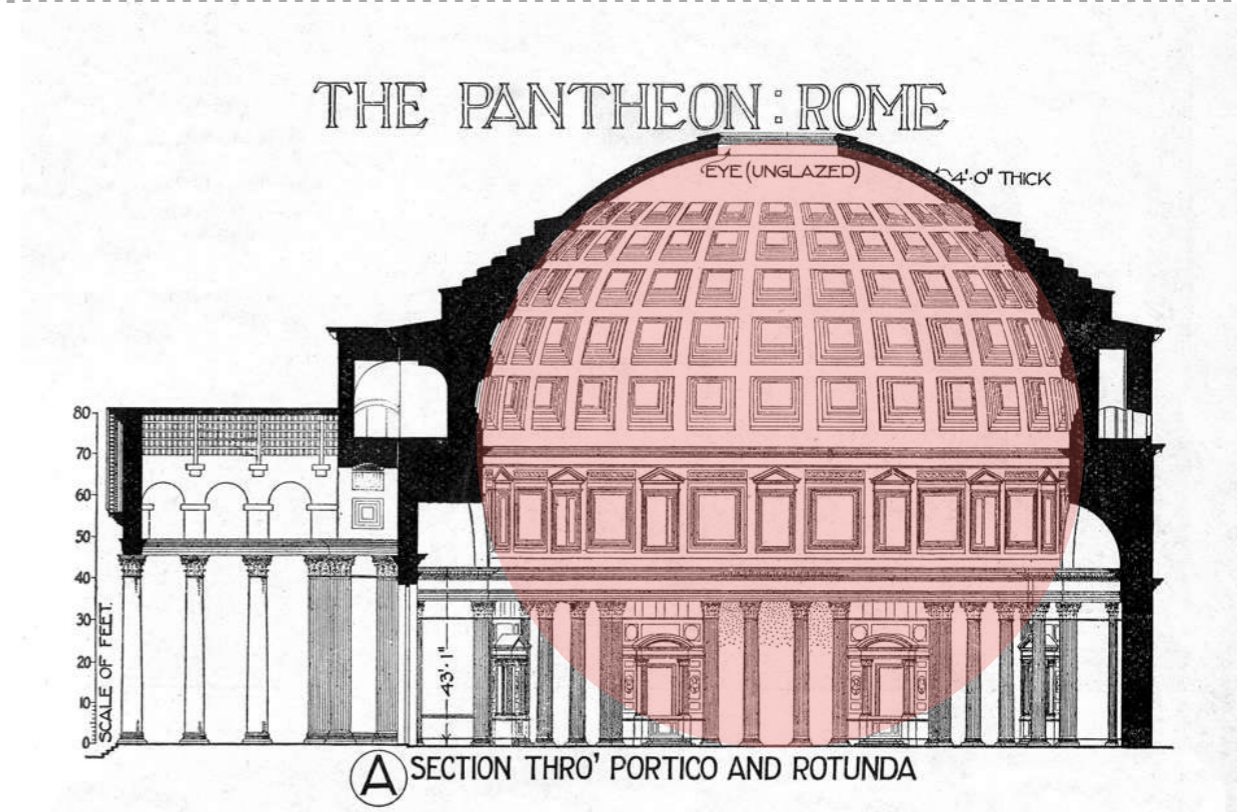
The Pantheon

- The **temple of all Gods**, built during the reign of **Augustus**, and rebuilt by the emperor **Hadrian** about 126 AD
- Its name comes from the Greek **pans 'all'**, and **theos 'god'**
- Since the Romans **imagined the earth as a disk covered with a heavenly dome**, the structure was to resemble that universe of the earth and the gods
- It was built of **concrete** with **varying density** from bottom to top.



The Pantheon

- It is **43.4m** in diameter. The distance from the top of the dome to the floor is the same as the width of the dome - **it could inscribe a perfect sphere inside**
- The only source of light is from the **oculus**
- The concrete dome stood on **8 major piers**, between these piers are **8 deep niches** where the statues of the gods were placed
- From the outside, a person approaching would have had little suggestion of the space within since the **long colonnade at the front prevented clear views**





The Pantheon



The Forum

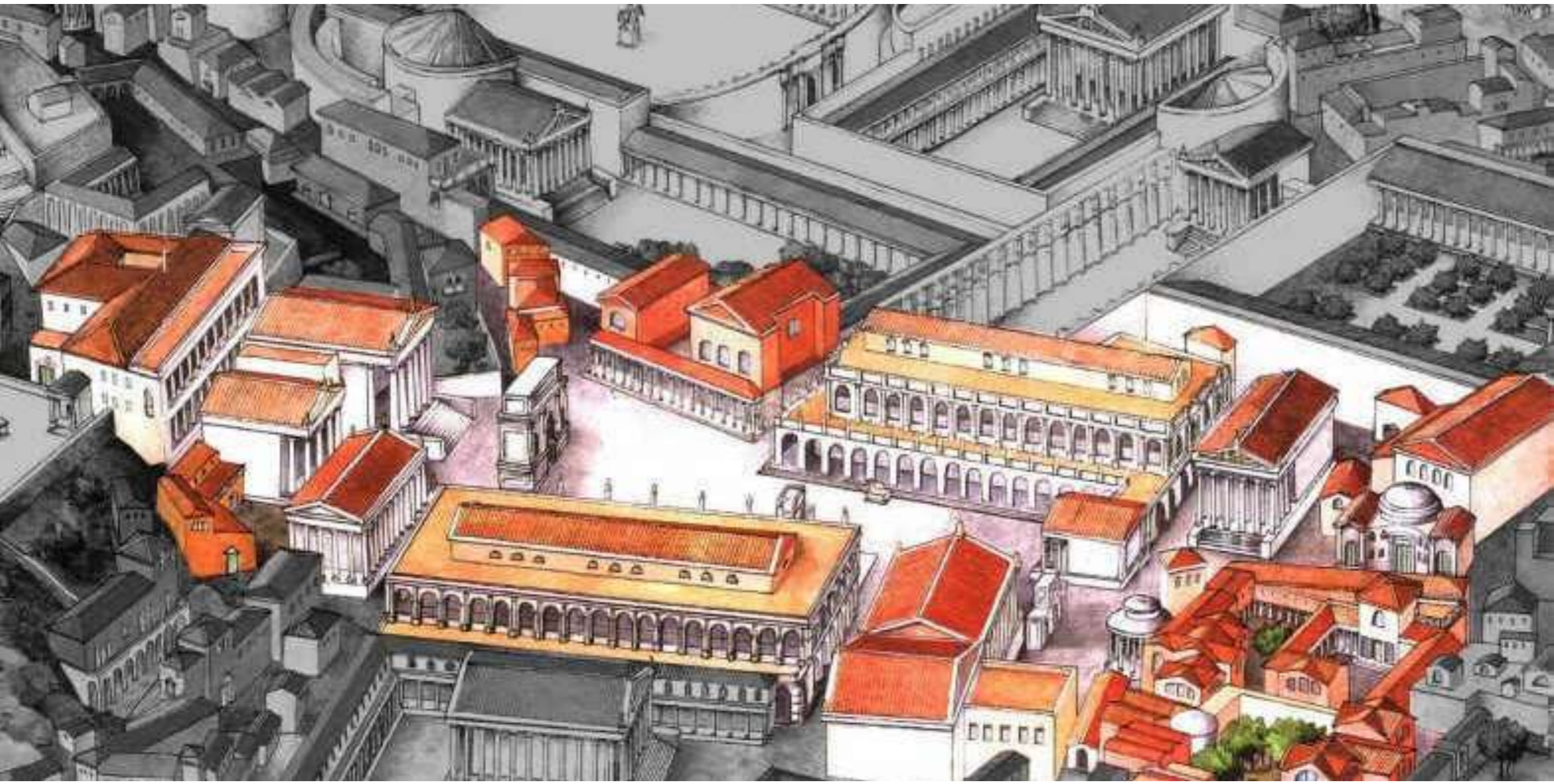
The Roman Forum

- The Corresponding to the **Greek agora**
- Started as an **irregularly shaped open space** serving as market, general meeting space, and the setting for political discussions
- In late republican times it was a **multi-purpose space**, hemmed in by unplanned groups of dwellings, shops and, workshops, but it was usually a more **formal rectangle, closed at one end by a temple**



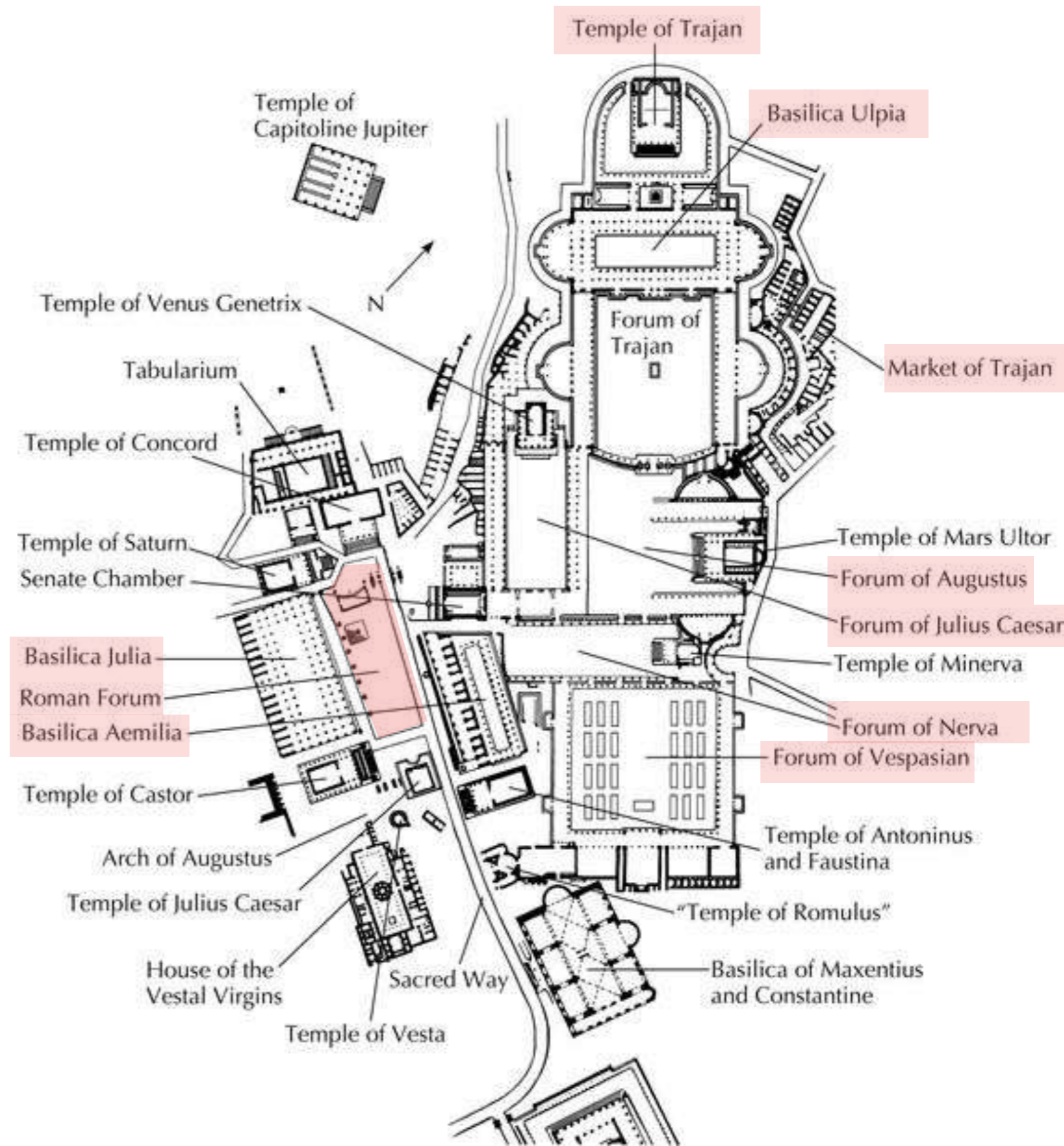
The Roman Forum

The beginning of the large complex of forums in Rome was the **Forum Romanum** during the **Republic period**.



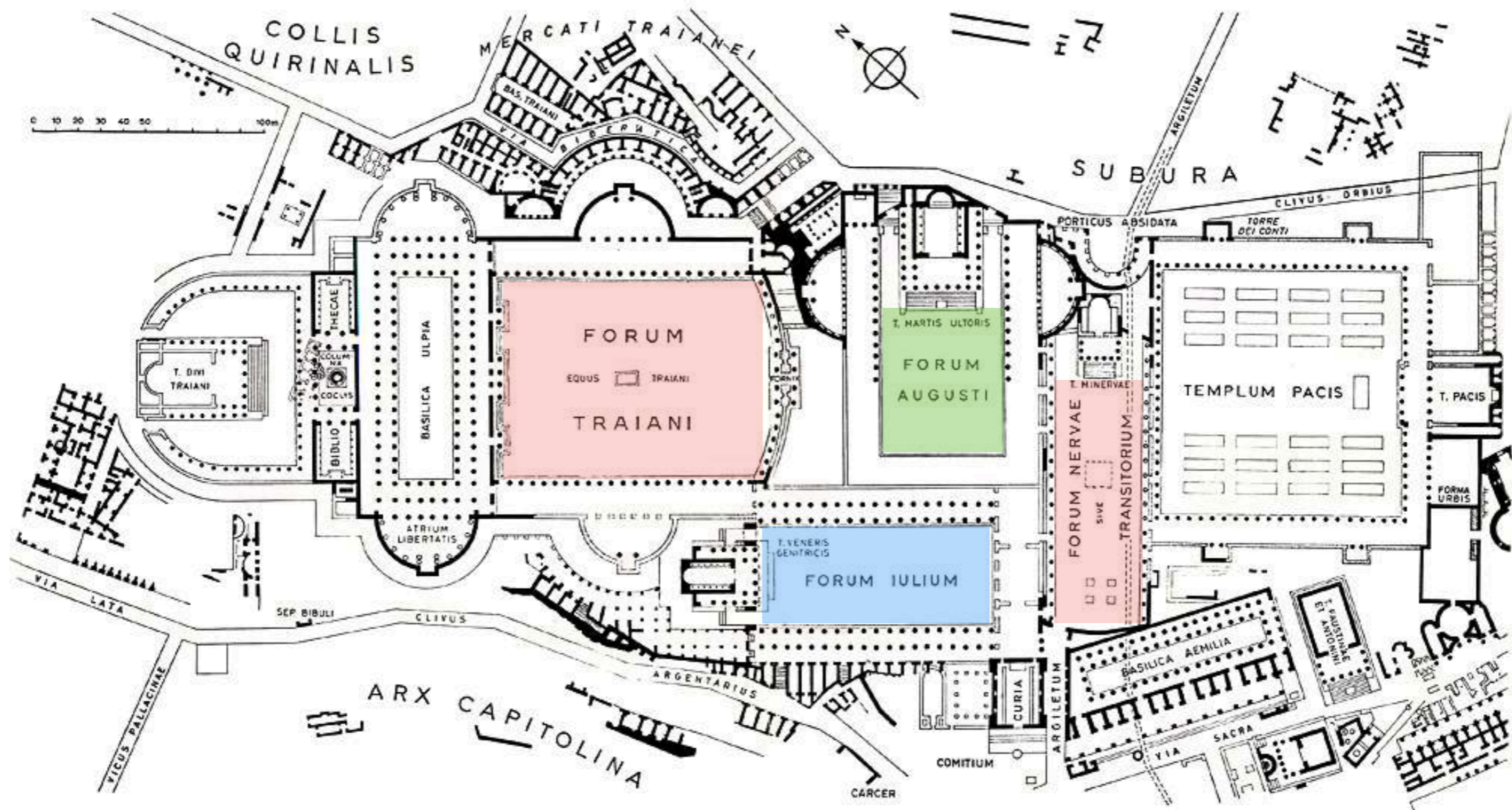
The Roman Forum

- With the end of the Republic period and beginning with Julius Caesar, **additional forums were built**
- Later, it would be largely **surrounded by colonnades and public buildings usually including markets and a basilica**



The Roman Forum

Julius Caesar's forum, began around 56 BC and provided the model for the new forums. It was strictly rectangular, lined with loggias, and focused on a temple. Augustus then added his Forum Augustum (2 BC) on an axis perpendicular to the Julius forum.

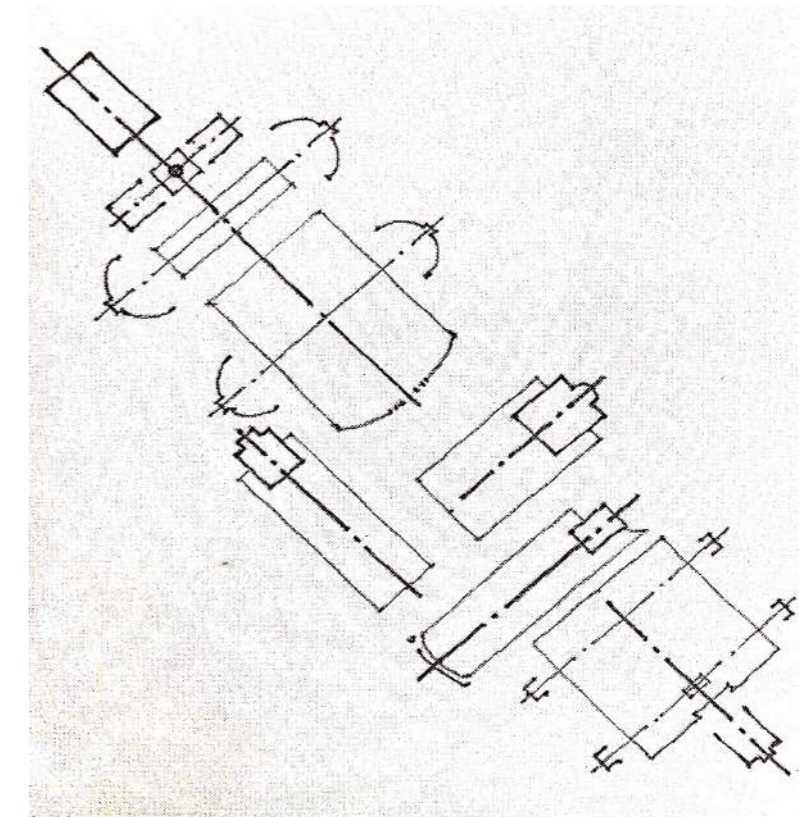
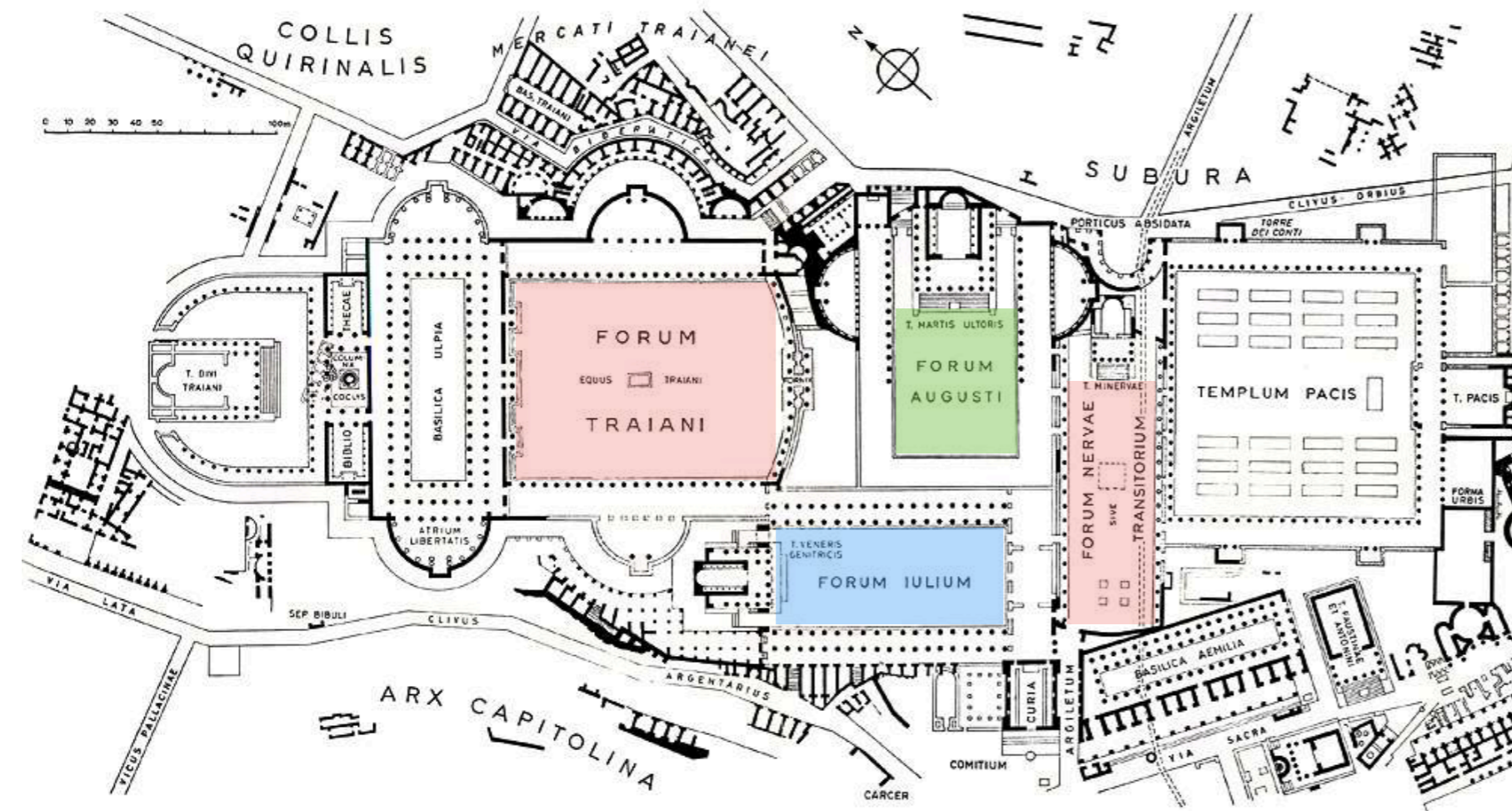


The Roman Forum



The Roman Forum

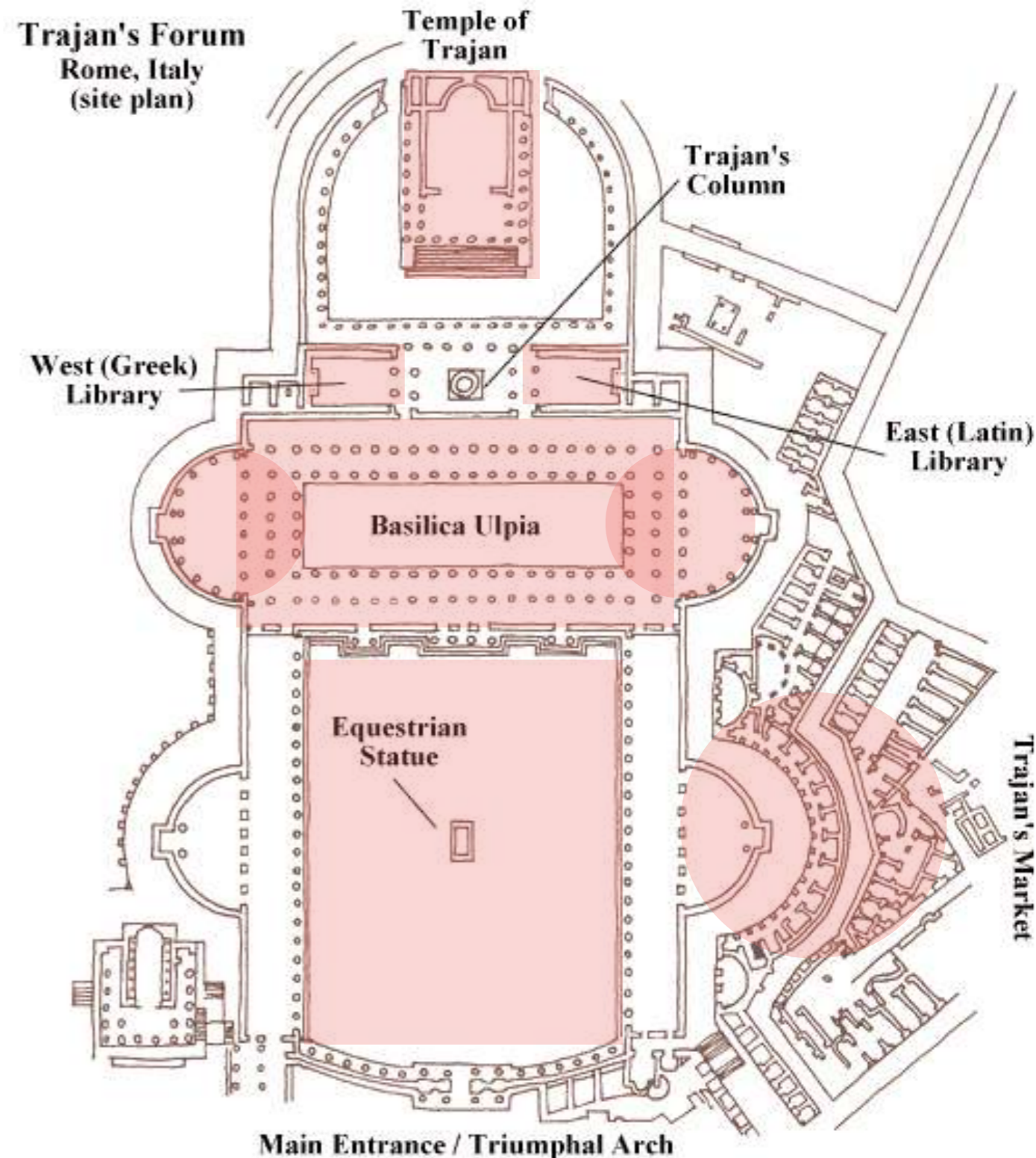
Additional forums were then added by succeeding emperors each forum commemorating **a significant military achievement** and **dedicate to a god whose attributes were admired by the emperor**. The imperial forums were then reached their maximum with the **Forum of Trajan (98-117 AD)**

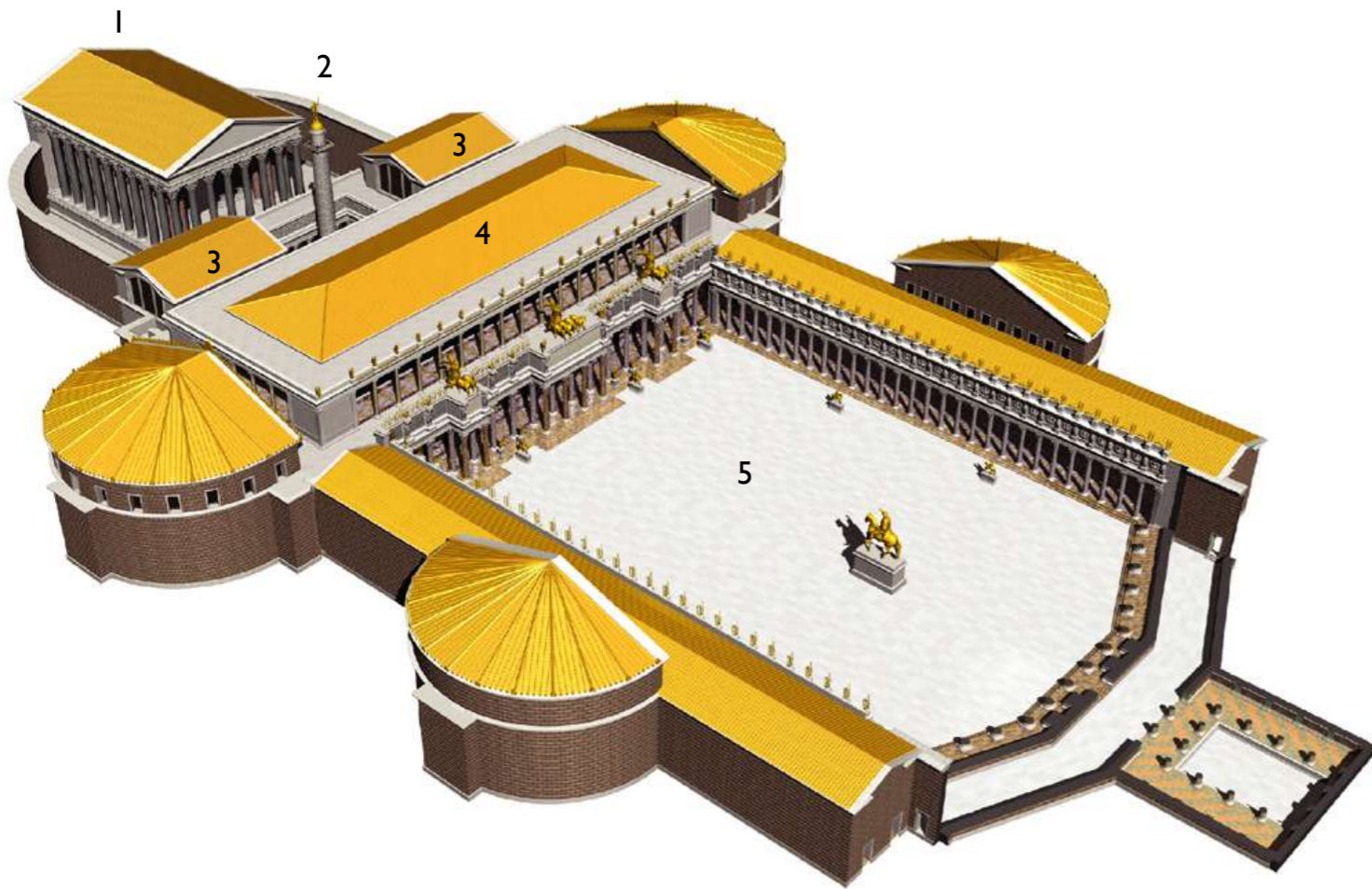


6.41 Axial Relationships: Imperial forums

The Roman Forum

- The Forum of Trajan is more **complex spatially**
- The structure had a broad **loggia-lined forecourt, measuring 200 by 120 m**
- On the sides were **public markets** constructed by Trajan. At the far north end was a **temple**
- In front of the temple were **2 libraries**. Between the libraries stood the great **column of Trajan 38 m high**
- Between the inner functions and the forum lies the **Basilica of Ulpia**, the largest in Rome





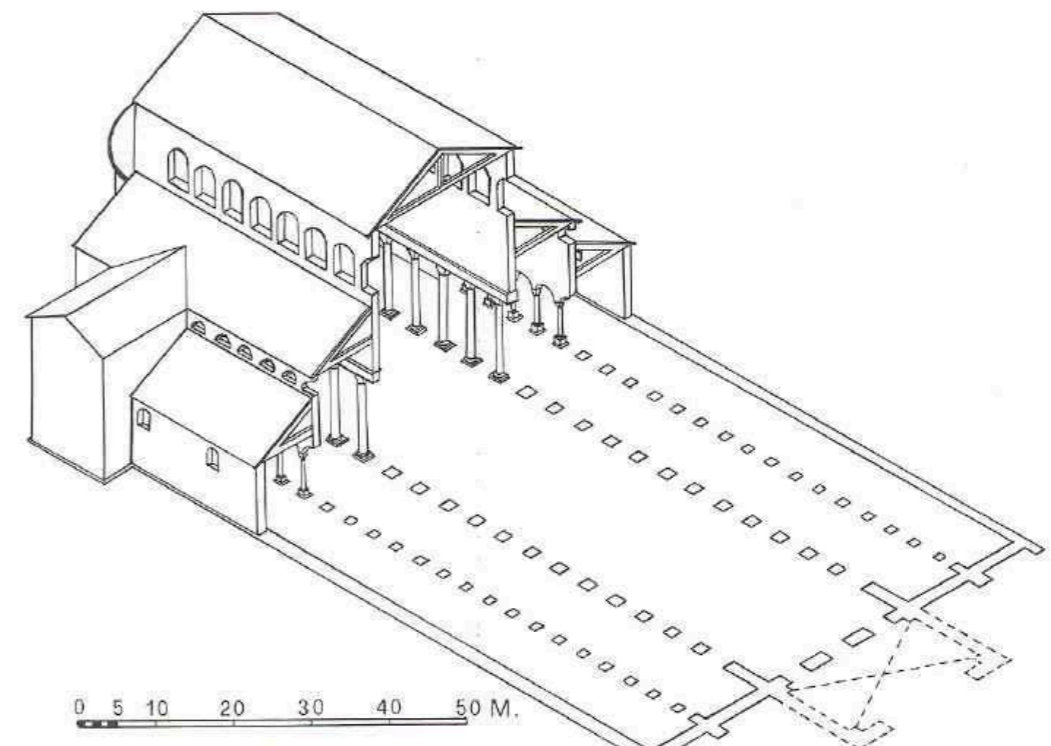
- 1- Temple of Trajan
- 2- Column of Trajan
- 3- Libraries
- 4- Basilica Ulpia
- 5- Forum



The Basilica

The Basilica

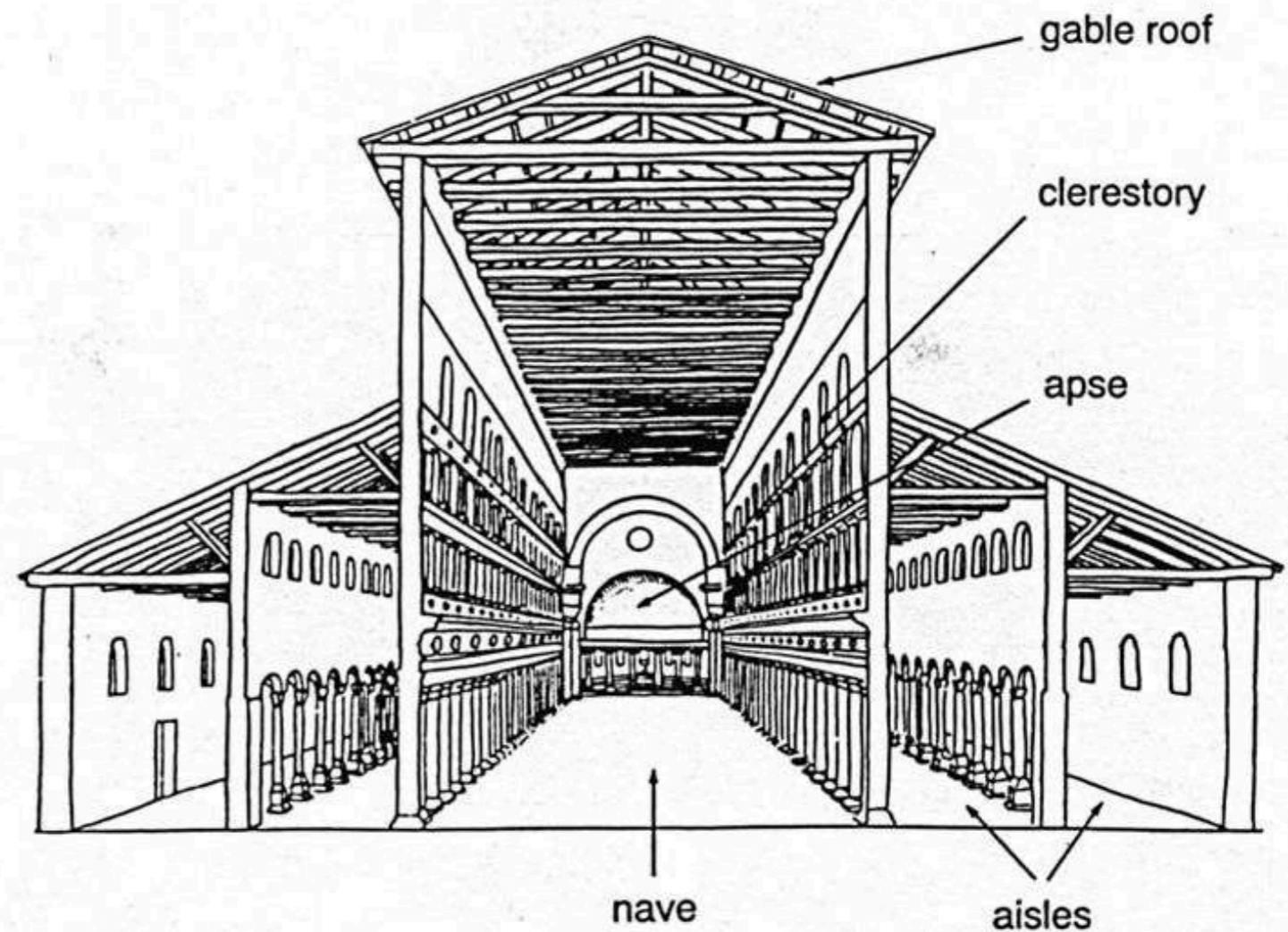
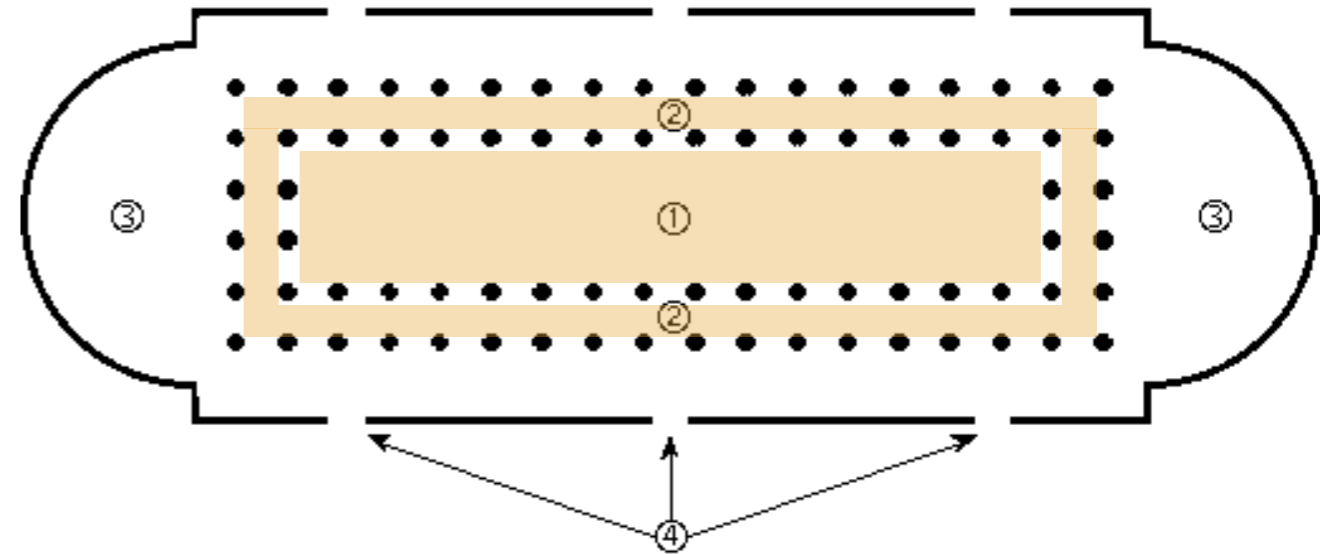
- An open public building, usually located adjacent to the forum of a Roman town.
- It served as **a meeting place for administration, as a law court, and as a marketplace**
- Its central space usually rectangular, had a **trussed timber roof** and was open at the sides to lower aisles behind the colonnades
- Light frequently came from **clerestory windows** above the colonnades, and there might be **side galleries above the aisles**



The Basilica

The main parts of the Basilica are:

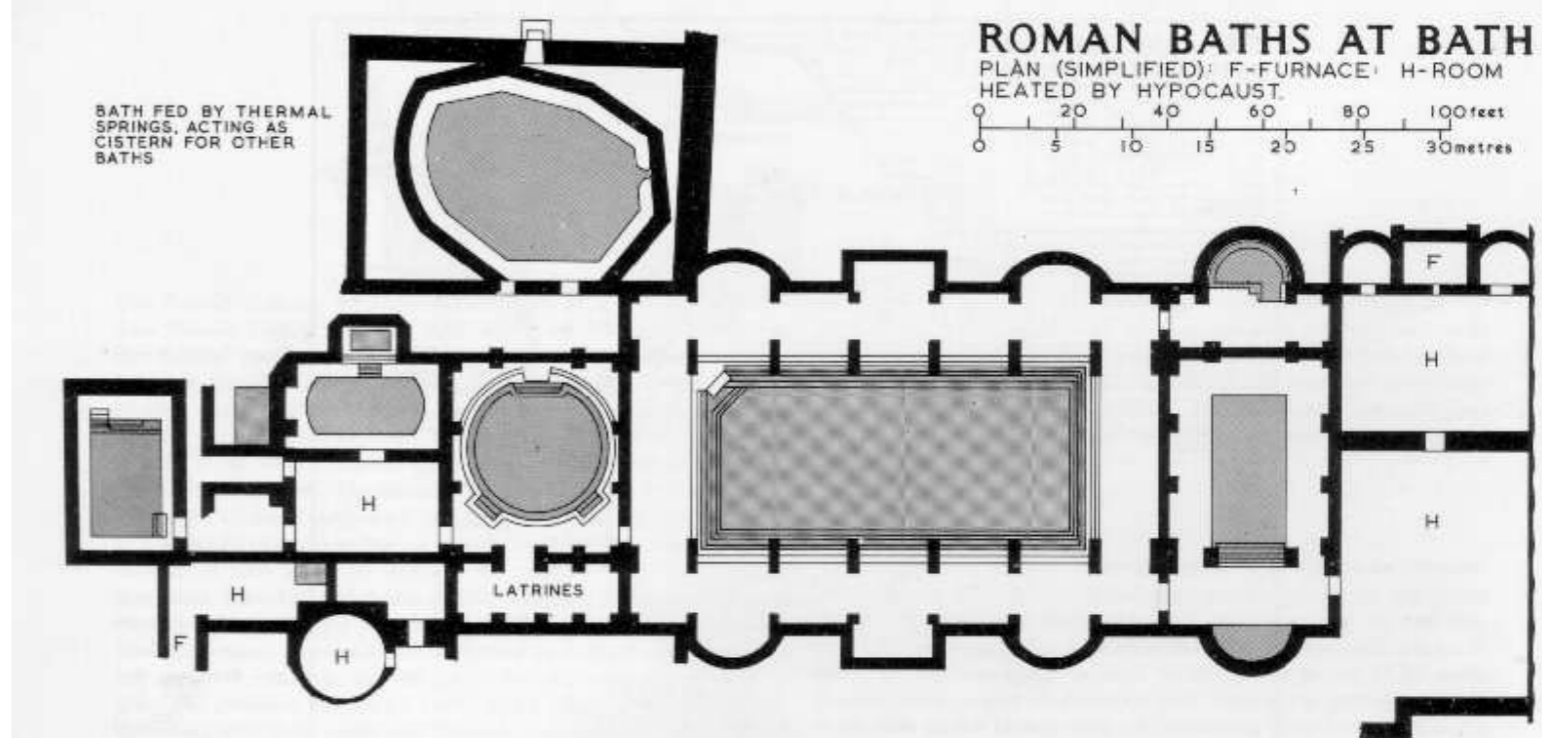
1. Nave
2. Aisles
3. Apses
4. Entrance



The Roman Bath

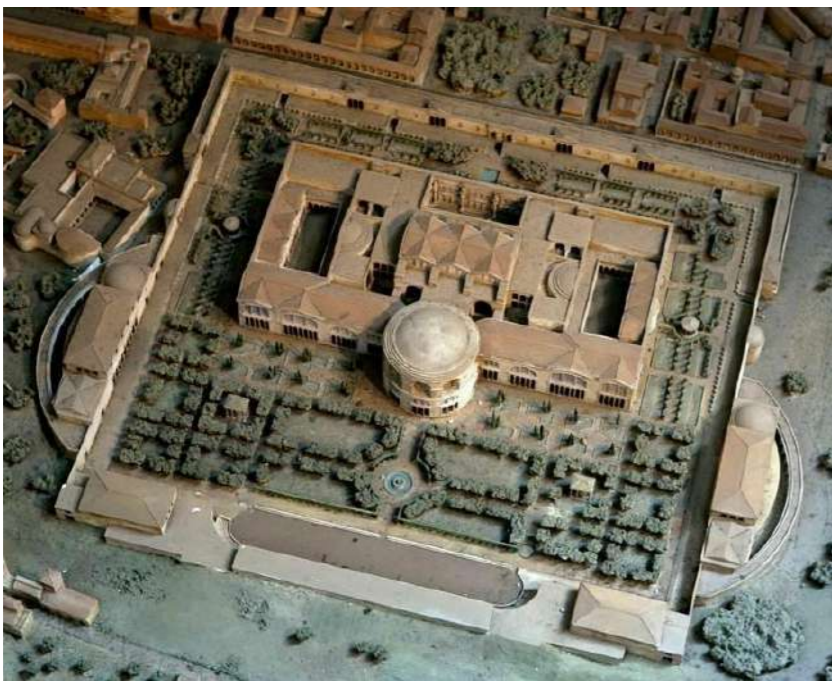
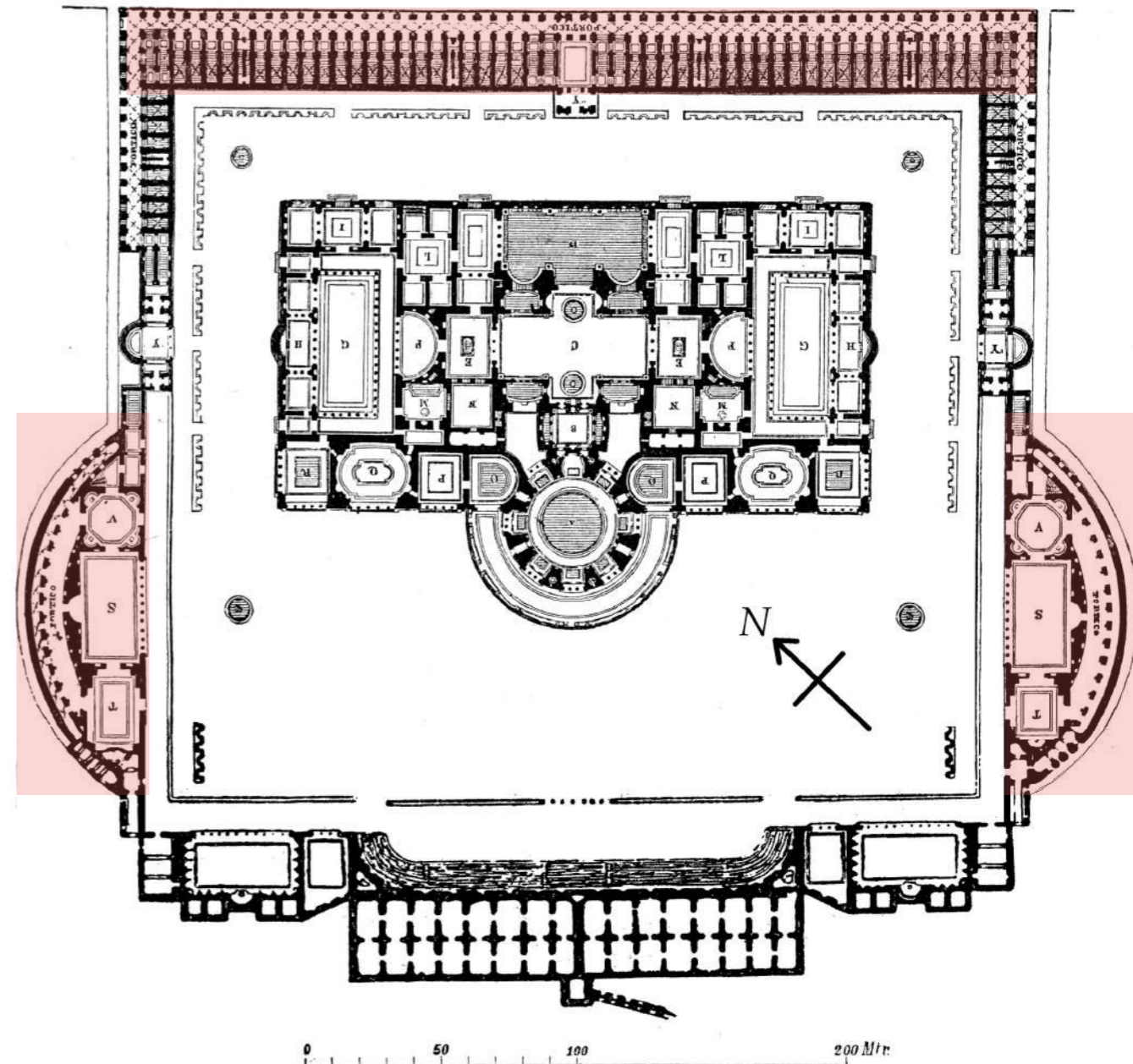
The Roman Bath

- They consisted originally of a series of rooms of very different forms reflecting their uses in the bathing sequence, which progressed from a cold plunge to a warm room and then a hot room
- In Rome itself, there were about **952 baths** in 354 AD
- The bath combined aspects of **modern health club** with public library and school, shops, restaurants, exercise yards, lecture halls and reading rooms



Baths of Caracalla (212-216 AD)

- The bath of Caracalla was **the largest in Rome** with more than **1,600 bathers** of one gender could be accommodated
- The entire complex was **351m wide** and **379m deep**
- Along the north side were **shops**, and on the sides were **libraries and lecture halls**

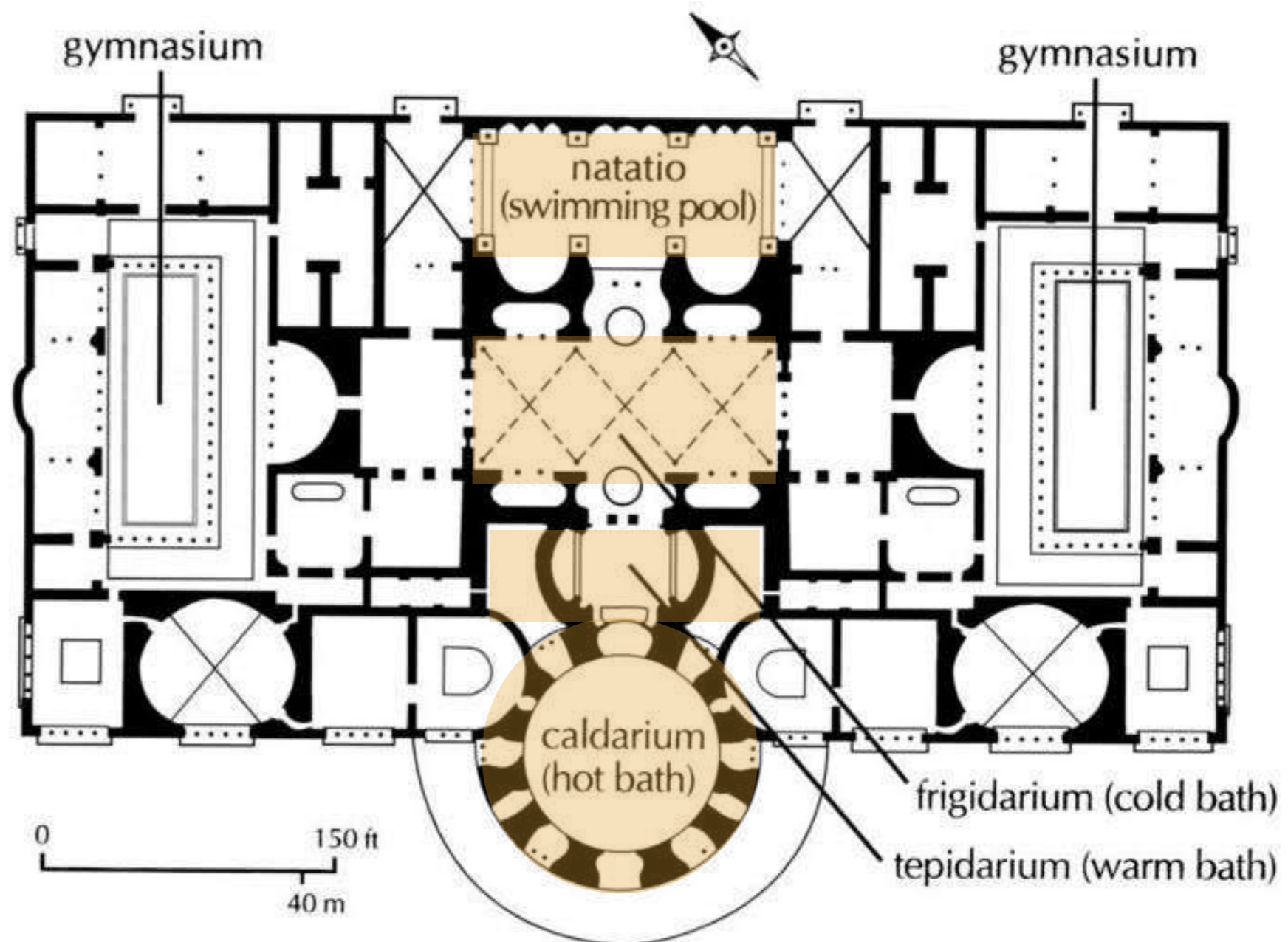


Baths of Caracalla

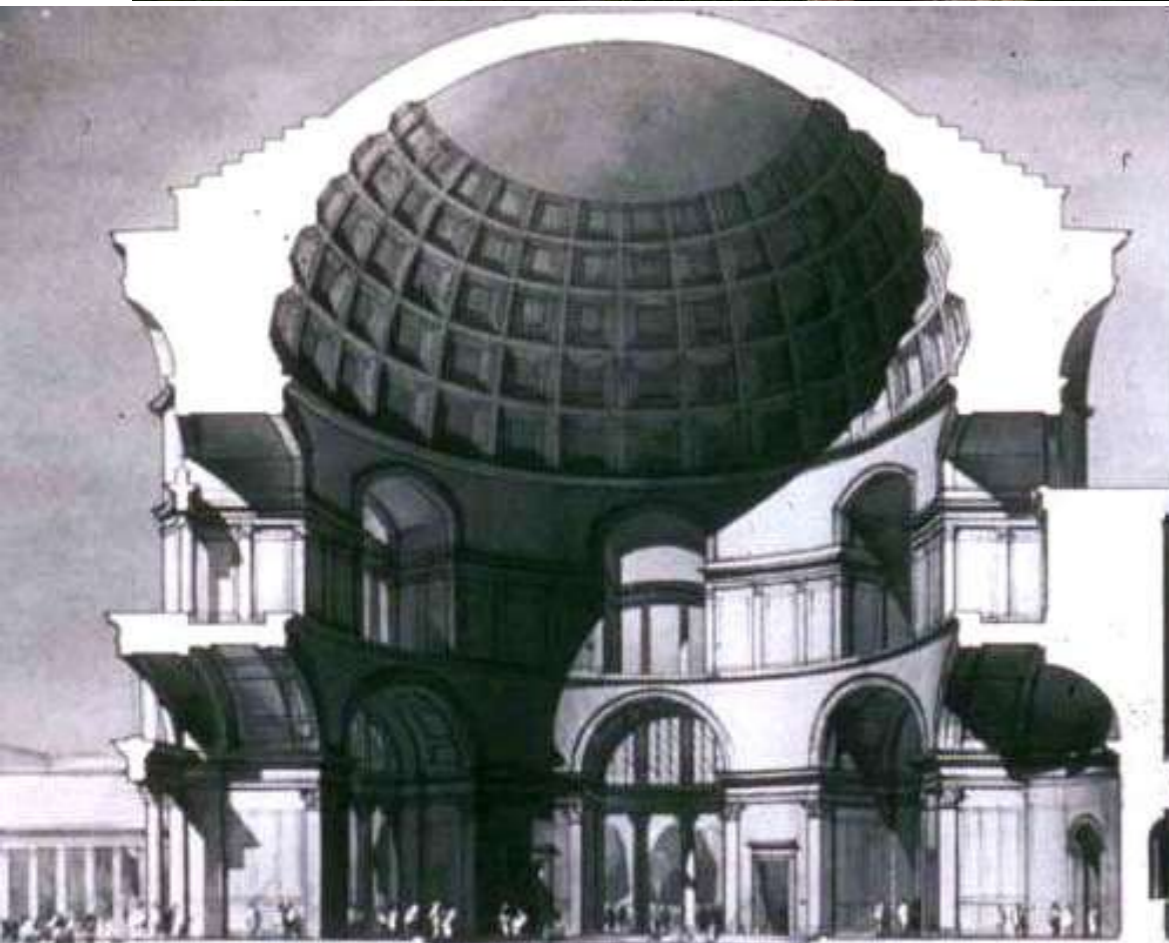
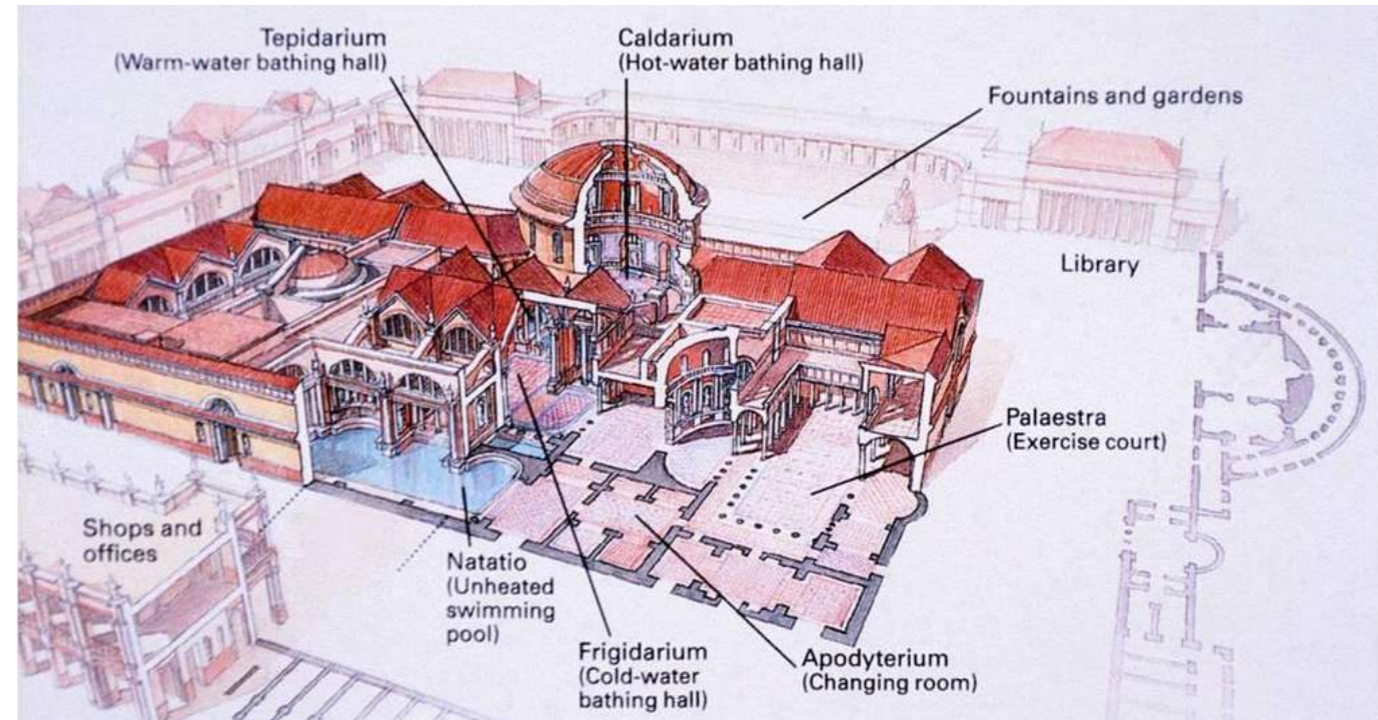
- The bath building was 228x116m. To the north, there is a the **swimming pool, the natatio**, open to the sky. The pool leads to the large **cold room, the frigidarium**, which had 3 cross vaults

- Immediately south of the frigidarium there was a **warm room, the tepidarium**, with 2 pools at the sides of the hall

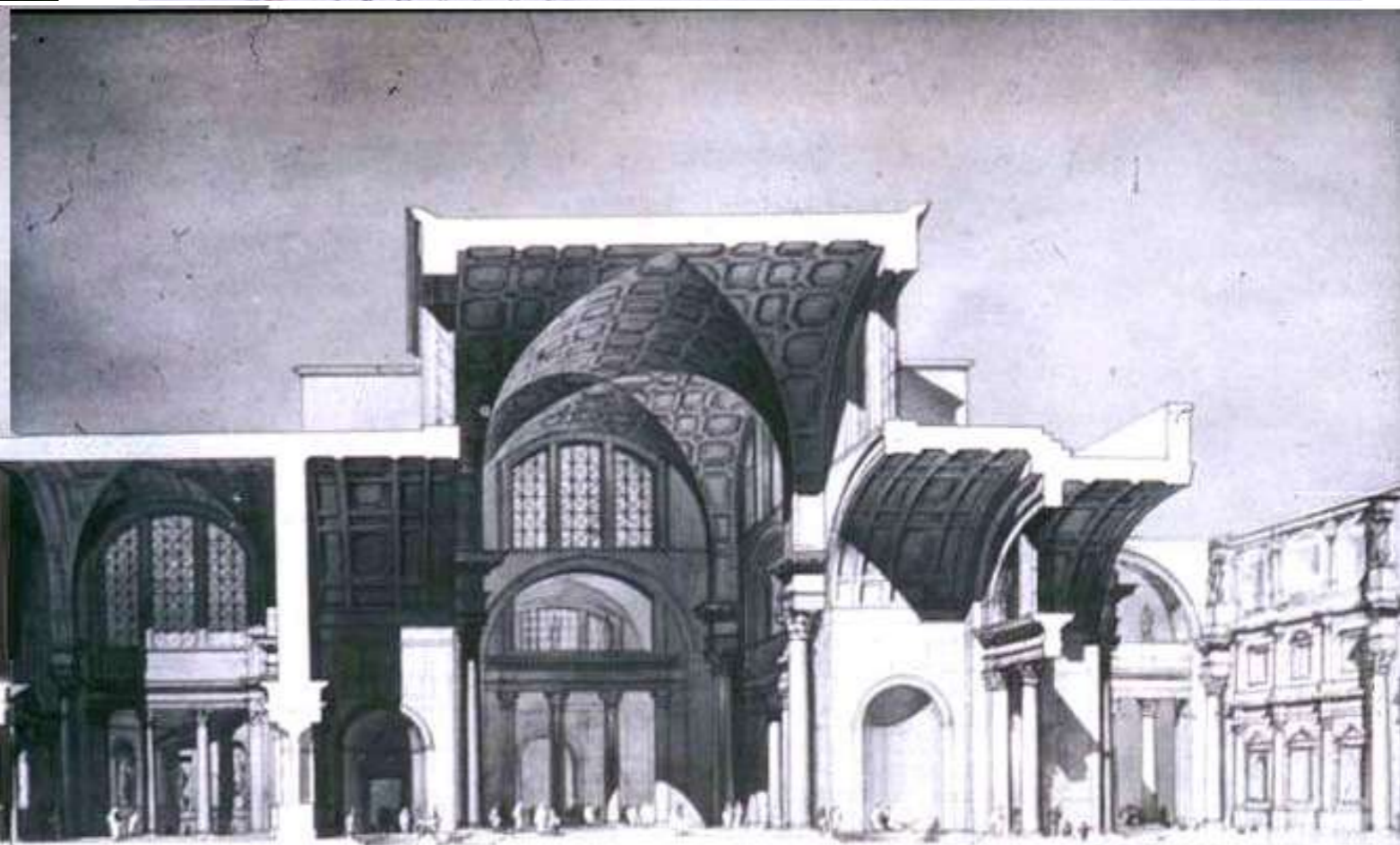
- South and on the central axis was the **domed hot room, the calidarium** with hot pools in niches



Baths of Caracalla



calidarium



tepidarium

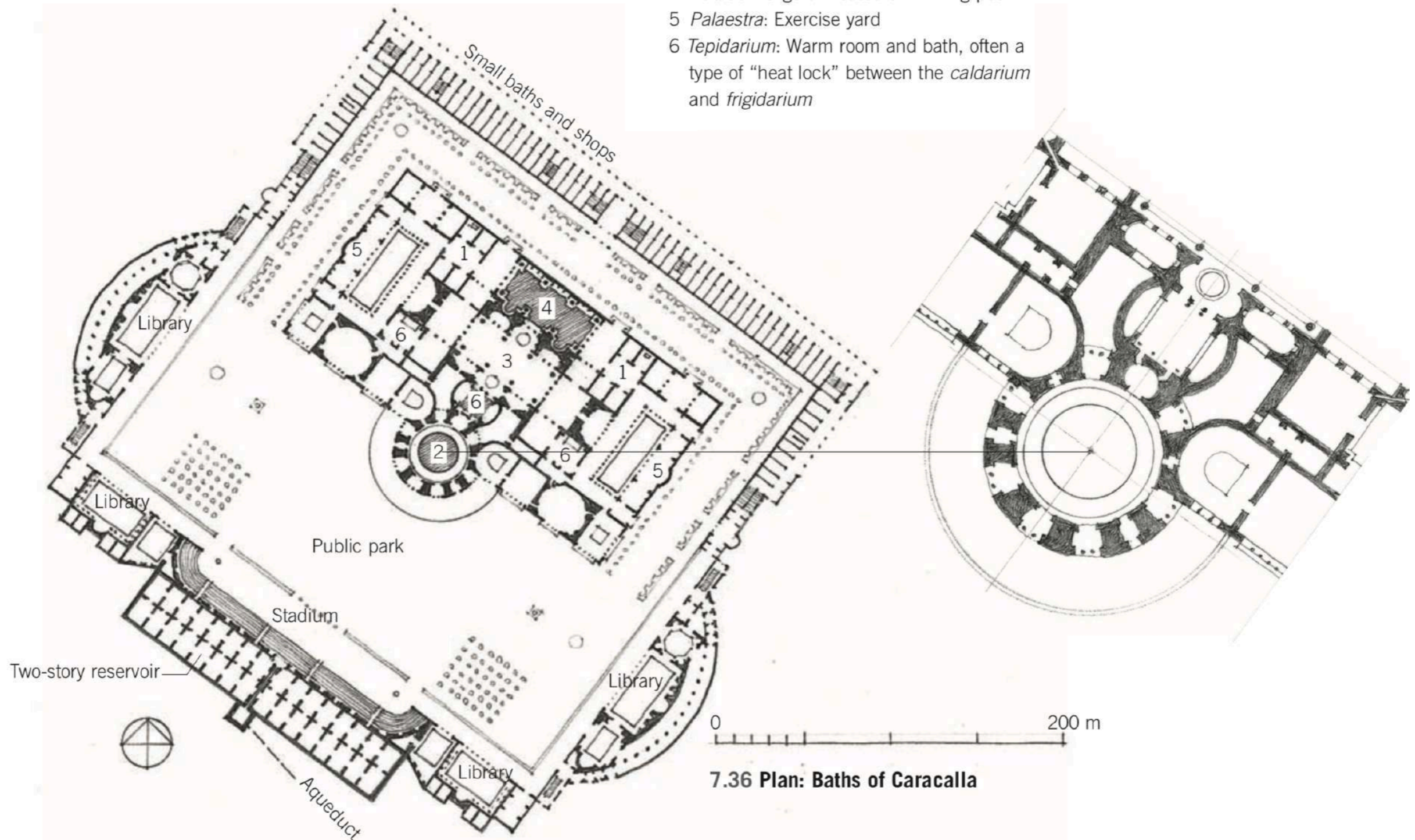
frigidarium

natatio

Baths of Caracalla

Parts of the Roman Bath

- 1 *Apodyterium*: Dressing room/locker room
- 2 *Caldarium*: Main hot room
- 3 *Frigidarium*: Main cold-water hall, often containing several unheated pools
- 4 *Natatio*: Large unheated swimming pool
- 5 *Palaestra*: Exercise yard
- 6 *Tepidarium*: Warm room and bath, often a type of "heat lock" between the *caldarium* and *frigidarium*

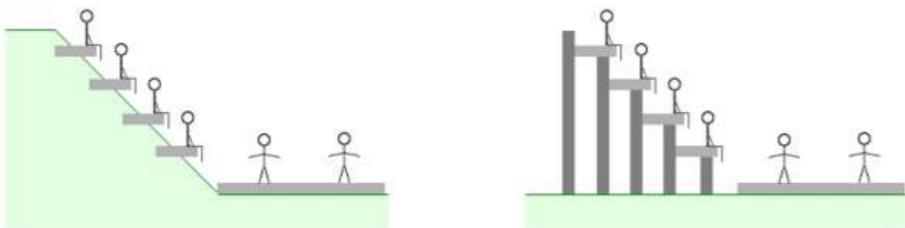
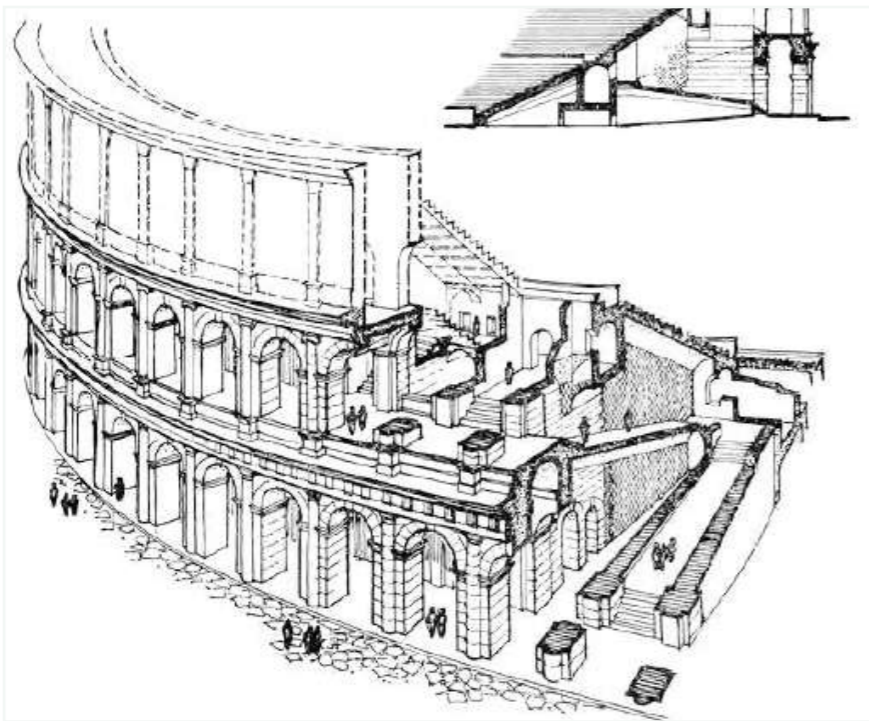
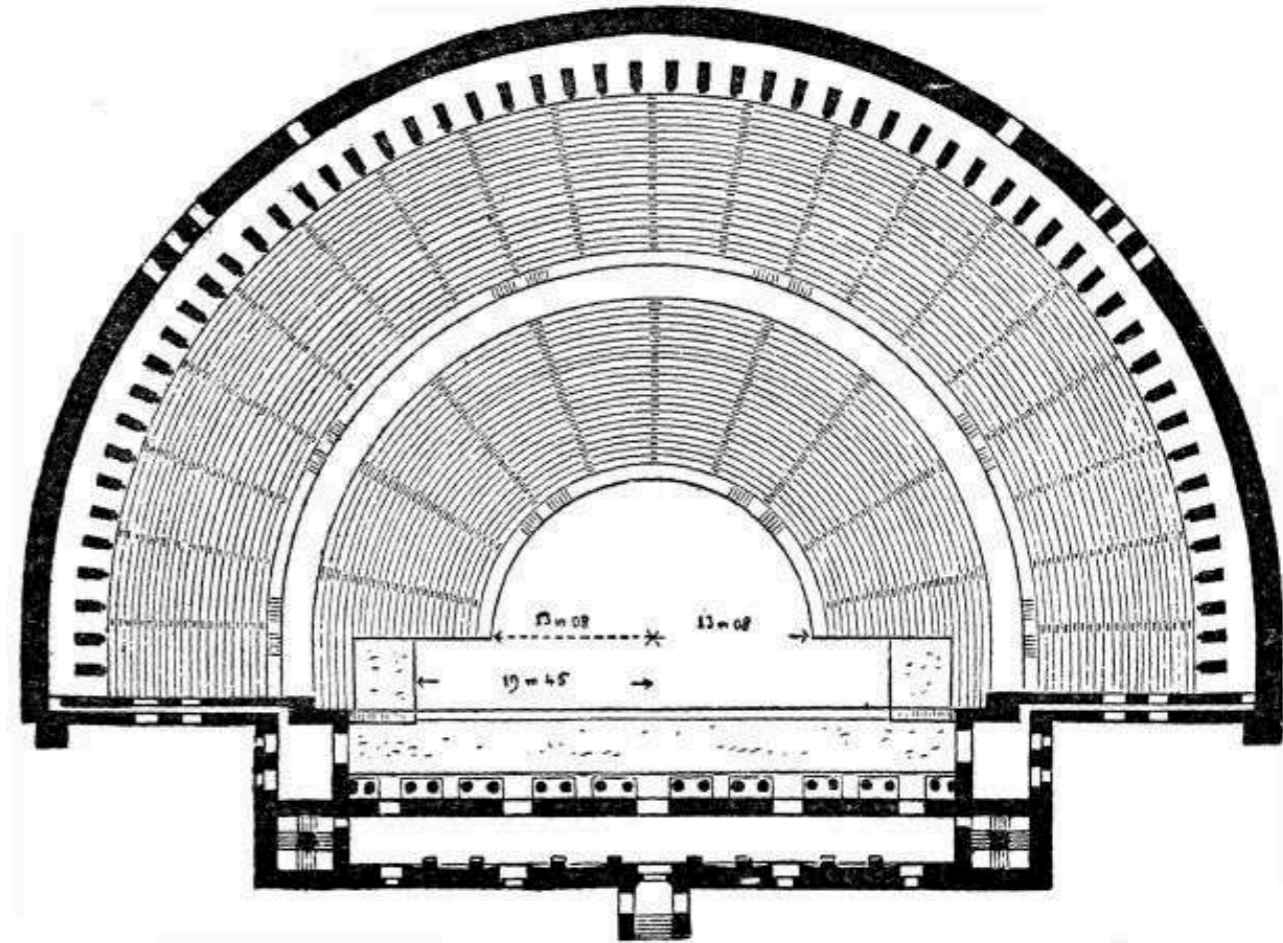


7.36 Plan: Baths of Caracalla

Theaters

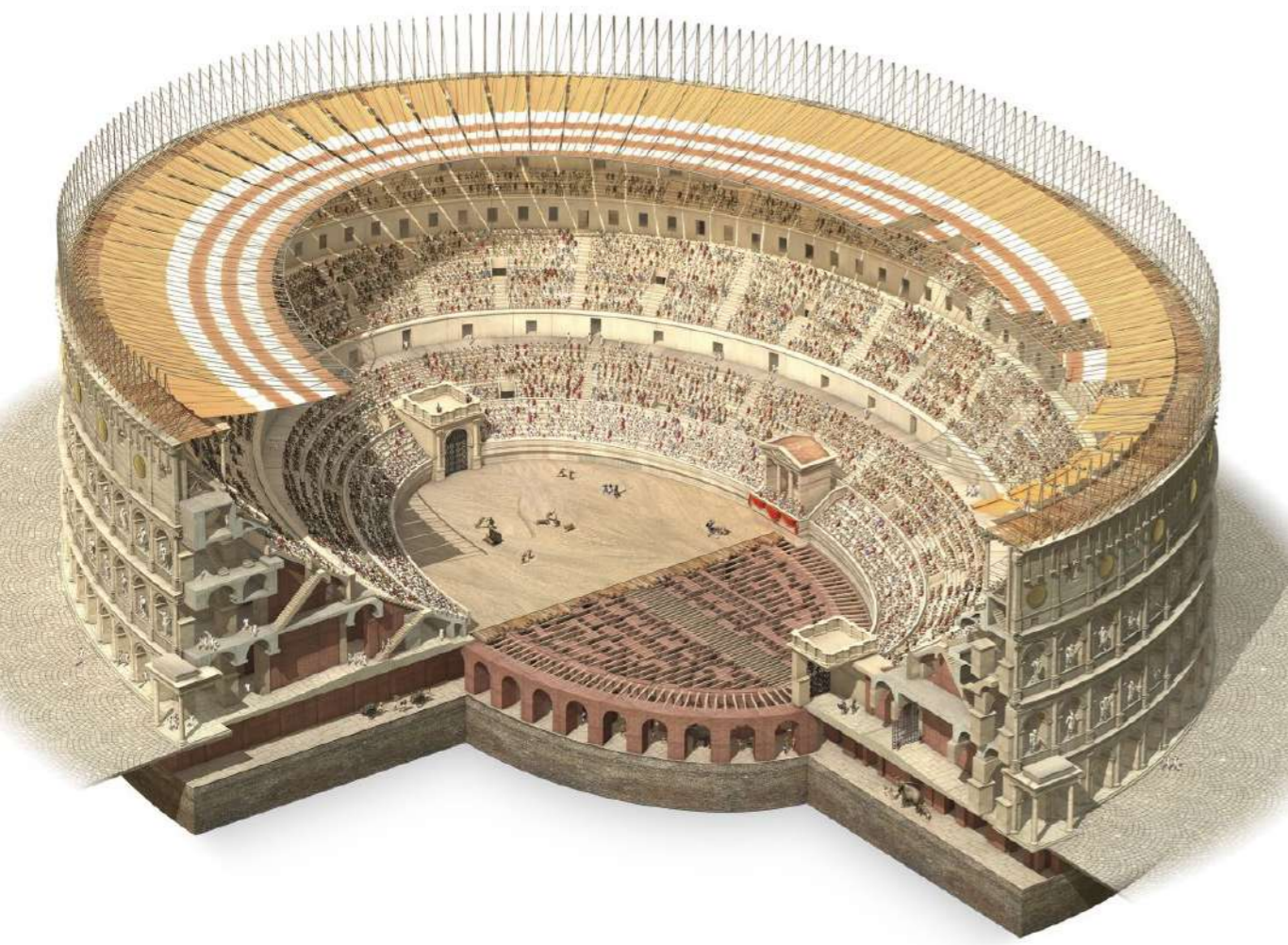
Theaters

- It was usually constructed on **level ground**
- Seating was **restricted to a semi-circle**, a raised stage set in front of it was backed by a **tall structure extending from one side of the auditorium to the other**



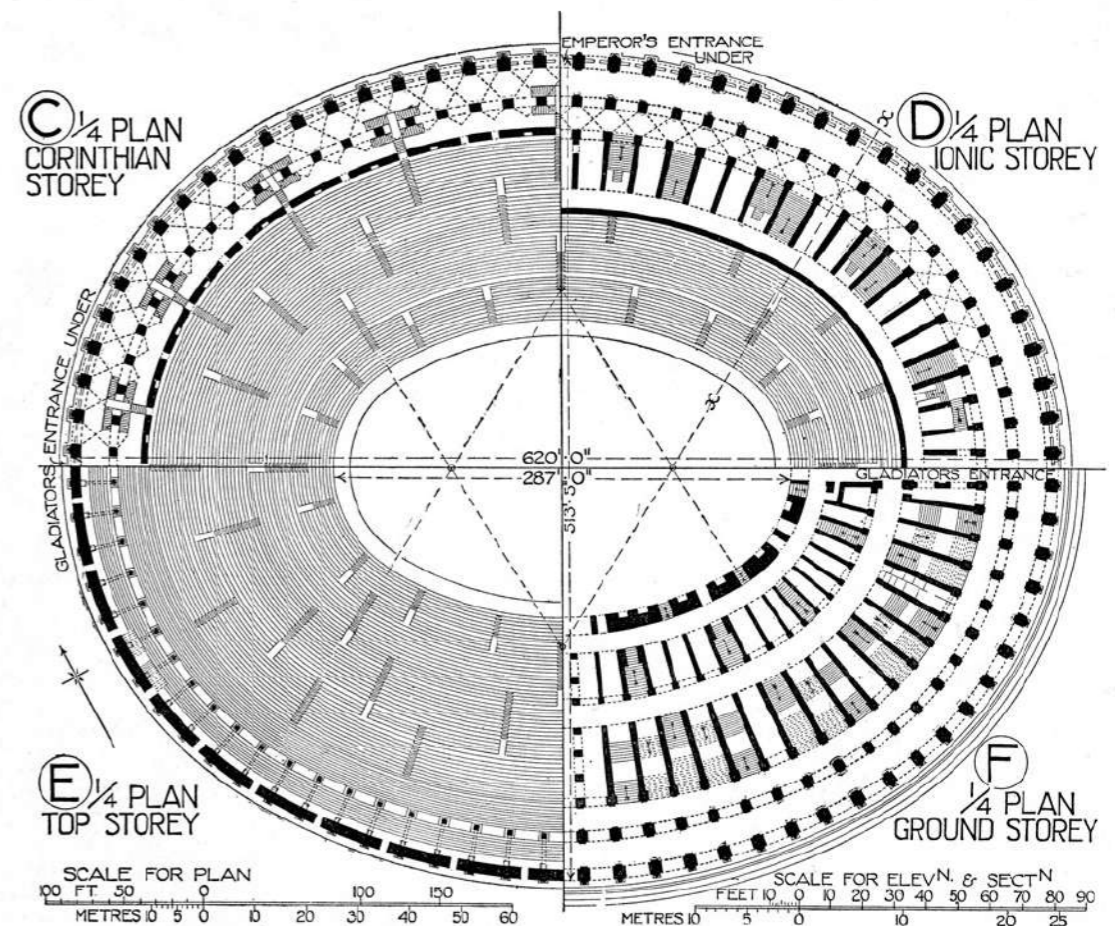
Amphitheaters

- It The amphitheater was similar in construction
- It was theater-in-the round, with its seating completely encompassing the central arena
- Because of their construction, both theatre and amphitheater rose prominently from their surroundings

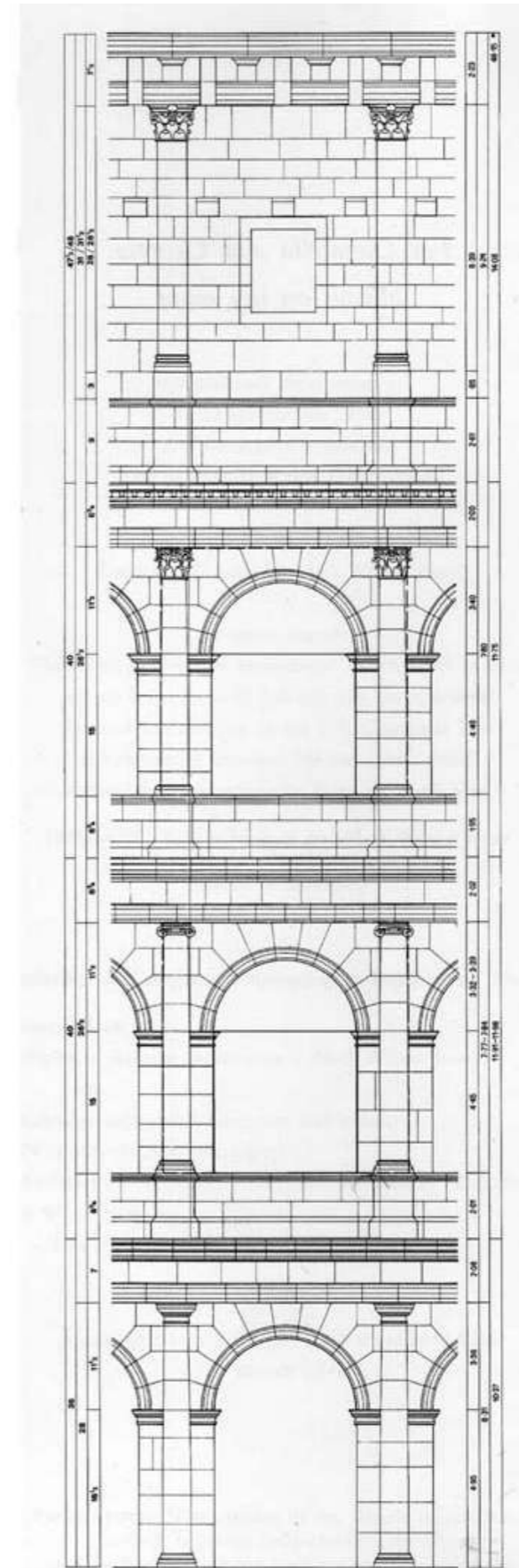
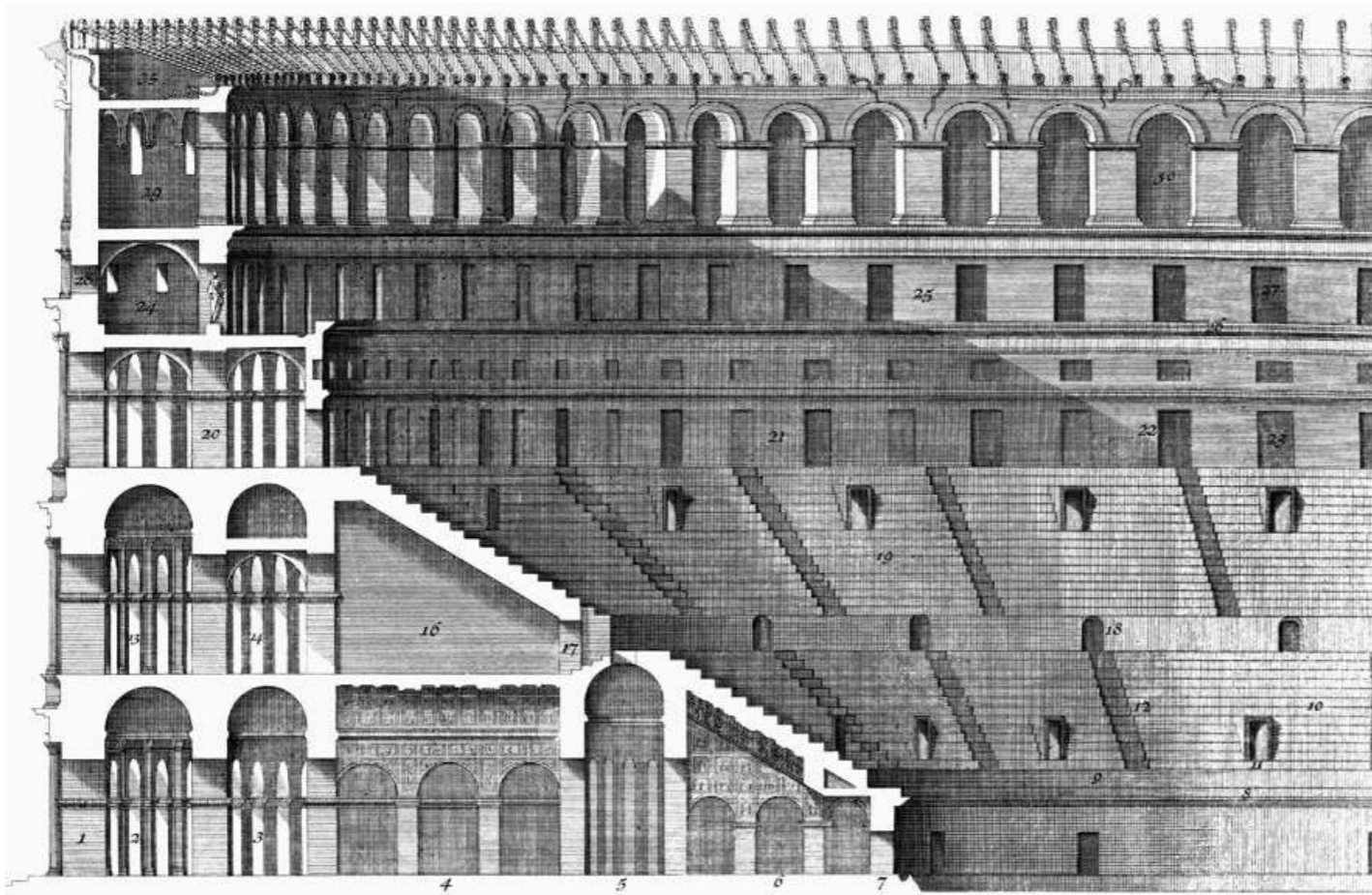


The Flavian Amphitheater (Colosseum)

- It was begun by the Emperor **Vespasian** in 80 AD.
- Built on a **foundation ring of concrete** with **piers of stone carrying the concrete vaults**
- The amphitheater measured 188 by 156m, with 50m high, and had **80 entrances**. Between **45,000 to 55,000** people could be seated in the space at one time
- The floor laid with **wood planks over subterranean chambers**
- The outer wall engaged **Doric columns on the ground, ionic, and Corinthian columns on the upper levels**



The Flavian Amphitheater (Colosseum)

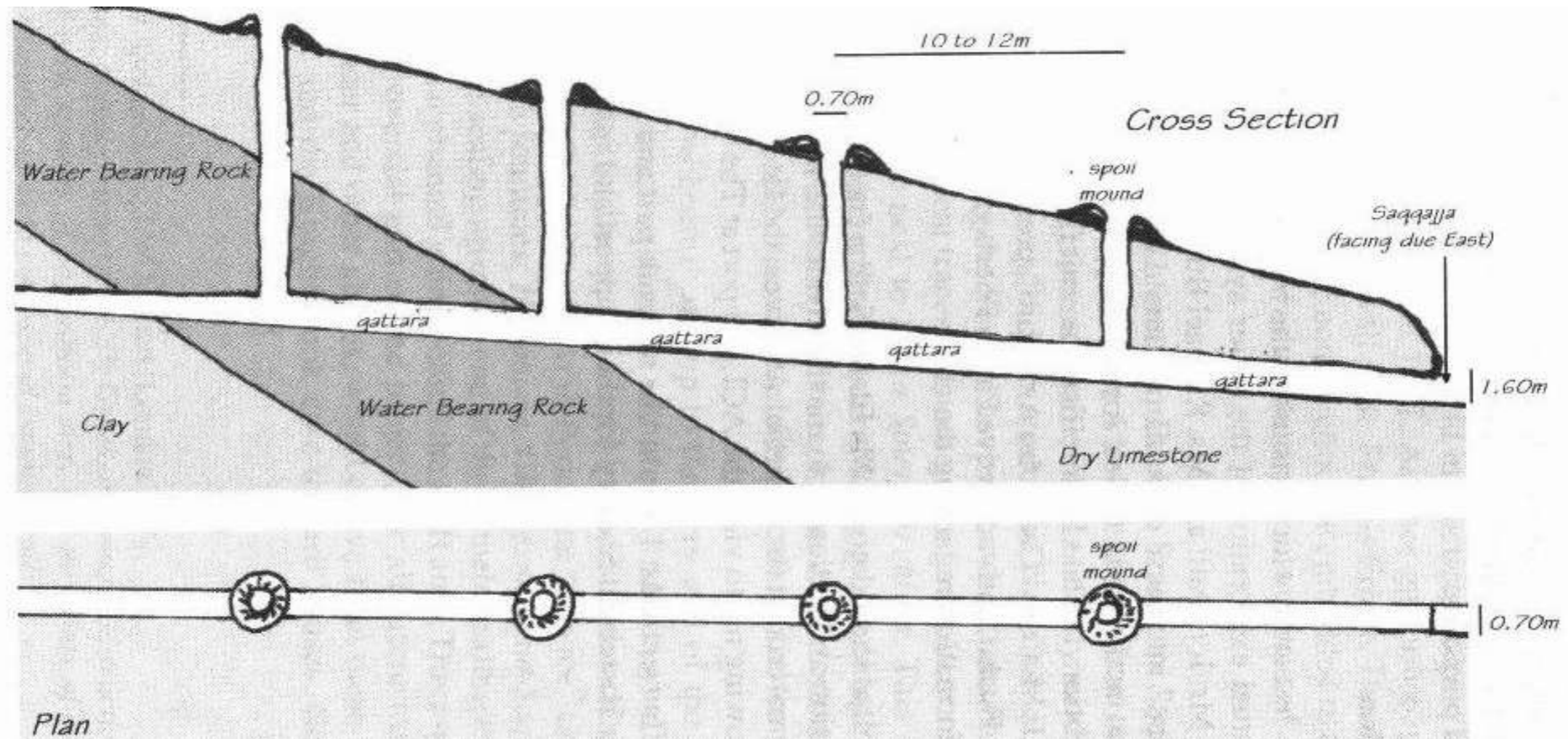


Water system

1. Etruscan Cuniculus

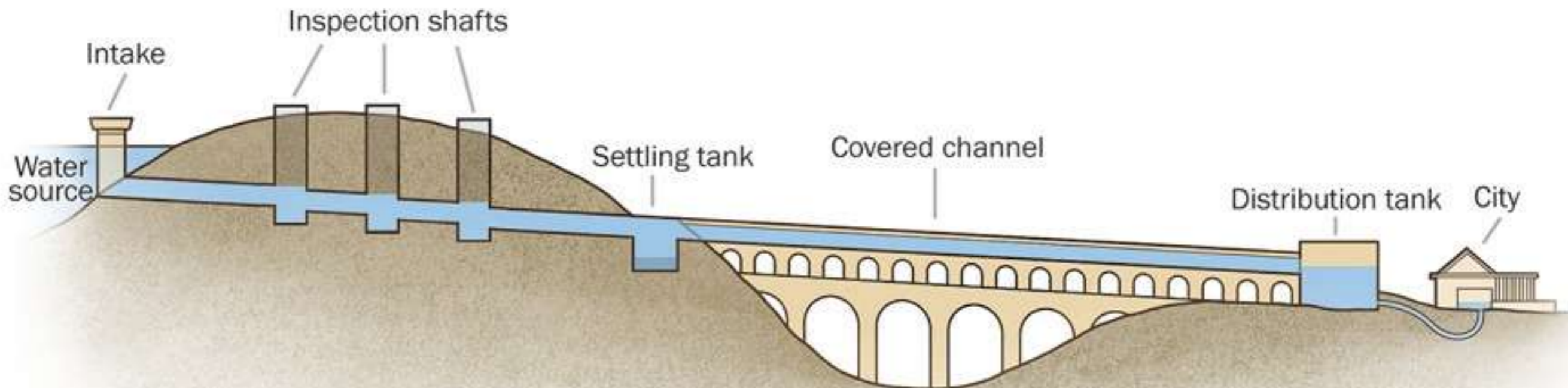
- The Cuniculus; a multi-use irrigation trench

- It consisted of an **underground trench** cut at a slight incline into the earth, with a series of **vertical shafts cut downward** to join the trench
- It was used as a channel to carry water to cities. **Cuniculi** were the forerunners of the Roman aqueducts and sewage systems



2. Aqueducts

- Piping water technique through the valley and the city. They preferred the aqueducts to be channels with a consistent slight downward fall to the distribution reservoirs
- The elevated sections of aqueducts were built of cut stone in simple arched forms



2. Aqueducts



SCI

<https://www.youtube.com/watch?v=pAUqodcXyWQ>

Links:

<https://www.youtube.com/watch?v=OfwoX3vYJUA>

Next lecture

Early christianity