

UICL 2302/UHIT 2302

THINKING OF SCIENCE AND TECHNOLOGY



CHAPTER 3 (PART I)

ADVANCEMENT OF KNOWLEDGE AND SCIENCE (PRE-CLASSICAL AGE, CLASSICAL AGE, HELLENISTIC AGE)



OBJECTIVES OF CHAPTER 3



Identify the development of scientific thought from the Pre-Classical Age to the Industrial Revolution.



Explain the concept of knowledge transfer across time.

TIMELINE

Pre-Classical
Age

Classical Age

Hellenistic Age

European Dark
Ages/Islamic
Golden Age

Renaissance
Age

Enlightenment
Age

Industrial
Revolution Age



I. PRE-CLASSICAL AGE

MESOPOTAMIA, ANCIENT EGYPT, ANCIENT GREEK

THE DEVELOPMENT OF KNOWLEDGE AND SCIENCE IN PRE-CLASSICAL TIMES



ACHIEVEMENTS OF SCIENCE AND TECHNOLOGY DURING PRE-CLASSICAL AGE

The following civilizations influenced the development of science in the world;

- **Mesopotamia** - Sumeria, including Ur (discovered around 4000 BCE), Urugay, and Babylon.
- **Ancient Egypt** - Ancient Egyptian Civilization (ca 3000 BCE to 300 CE).
- **Greek Legacy** - Greek civilization that stood out in 600 BCE-529 CE.
- Civilizations around the Arabian Peninsula before the advent of Islam such as Mada'in Salih in Saudi Arabia and the Ma'arib Dam in Yemen.

MESOPOTAMIA CIVILIZATION

Mesopotamia Civilization

Located in between two rivers (Tigris & Euphrates rivers)

Emergence of tribes: Akkad, Babylon, Sumeria & Ubaid

Open policy - establishing trade relations with other civilizations

Famous for the Hammurabi legal code



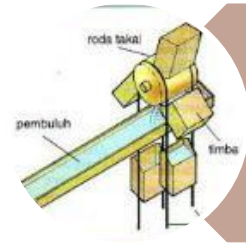
ACHIEVEMENT OF MESOPOTAMIA CIVILIZATION



Construction of the zигurat: places of worship, trade, storing national treasures



Astronomy: creating a calendar based on the solar system



Creation of wheels for war purposes and as a watermill for irrigation & flood control

ANCIENT EGYPT CIVILIZATION

Ancient Egypt Civilization

Located near the Nile River

Pharaoh Menes succeeded in uniting Nomes into a government and founding an administrative center in Thinis City

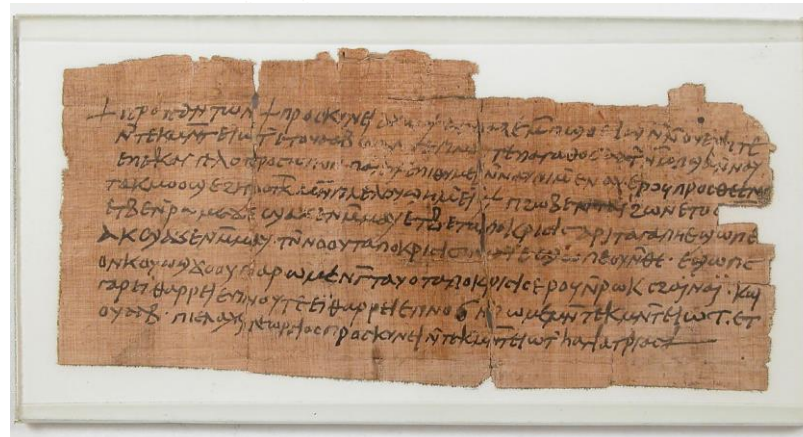
The system of government is led by the king; Pharaoh

Believe in the concept of polytheism



ACHIEVEMENT OF ANCIENT EGYPT CIVILIZATION

- Ancient Egypt (ca 3000 BCE to 300 CE) was founded by the people of Mesopotamia.
- Science and Technology Achievements:
 - 365 days solar calendar
 - Sun Clock (Sundial)
 - Water Clock
 - Medicine
 - Papyrus as writing material (paper)
 - Number System
 - Pyramid



ANCIENT GREEK CIVILIZATION

- The Legacy of the Greek Civilization Science has a huge impact on Islam. Especially when Islam began to grow.
- The emergence of philosophers & scientists
 - The result of curiosity
 - Scientific methods based on logic (reason) and observation.
 - Science is defined as 'an organized body of thought'



ACHIEVEMENT OF ANCIENT GREEK

- Institution Construction: Academy, the Lyceum and the Museum.
- Water as the essence of natural phenomena
- Embryology
- Mathematics - a very important element in science
- Geometry
- Idea of element (Water, Air, Land, and Fire)
- Astronomy - Ptolemy's work "Almagest" is among the most famous





2.CLASSICAL AGE

GREEK, ROME

CLASSICAL AGE- GREEK

- Starting in Ionia, Greek (12 cities)
- Prioritize logos which are incompatible with myth
- Emphasizing the elements of the cosmos in science
- Famous figure was Pythagoras (582-496 BC)

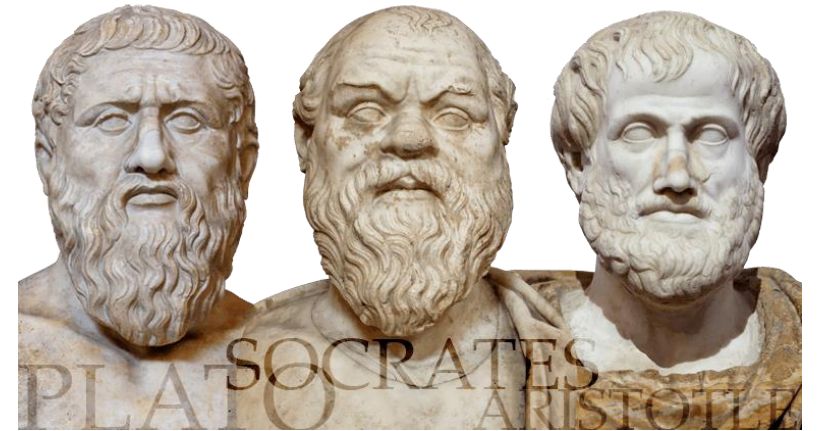
BIRTH OF SOPHIST

- Wisdom man
- Started by Protagoras (5th century BC)
- Key features:
 - Teach rhetoric
 - Humanism is the basis of thinking
 - Relative - no real truth, no reference
 - Sceptics - don't believe in everything
 - Charged high fees



OPPOSITION OF SOPHIST

- Led by Socrates, Plato and Aristotle (SPA)
 - Philosophy, reject pagan religion
- Herodotus
 - Persian War, history as a humanitarian science
- Thucydides
 - Peloponnesian War: discard elements of myths and legends



CHARACTERISTICS OF GREEK CIVILIZATION

Form a city state or polis

- Contains cities surrounded by farms, markets, forts, temples and palaces

Have an assembly hall to legislate

- According to Plato, the country should be ruled by philosophers because they are efficient

Expansion of territory by Alexander the Great

ACHIEVEMENTS OF GREEK CIVILIZATION IN SCIENCE AND TECHNOLOGY

Famous for a scientist named Hippocrates

- Known as the father of medicine

Mathematician: Pythagoras

- Introducing Pythagoras' theorem in Ancient Egyptian geometry

Mathematician: Thales

- Developing the geometry of Ancient Egypt

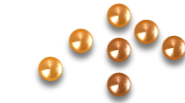
Scientist: Archimedes

- His theory relates to the volume of water and gravity

Scientist: Ptolemy

- Major figures in the field of astronomy

CHARACTERISTICS OF ROME CIVILIZATION



Famous for the city of Pompei- various facilities such as places of worship, shops, colloseum



Located in the Palatine hills near the Tiber River, the Latium Valley

ACHIEVEMENT OF ROME CIVILIZATION



Mathematician Boethius - associates mathematics with music, geometry and astronomy



Creation of strong sails and boats for sea trade activities



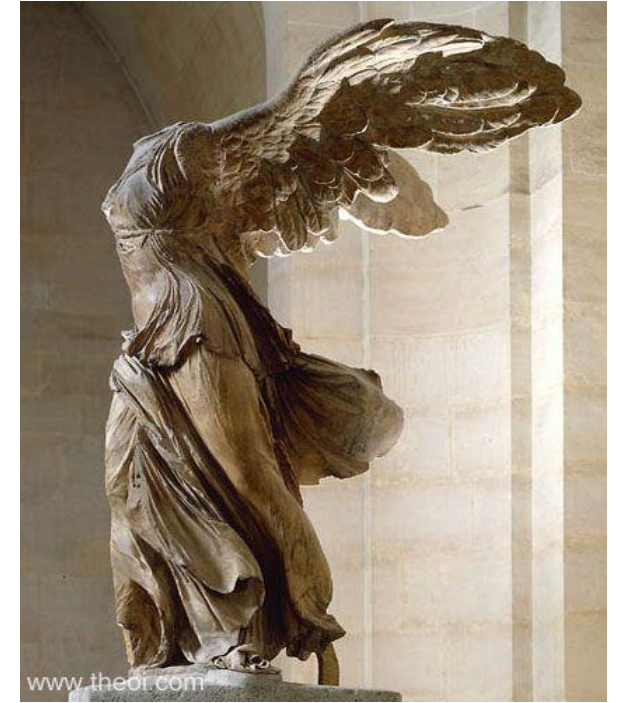
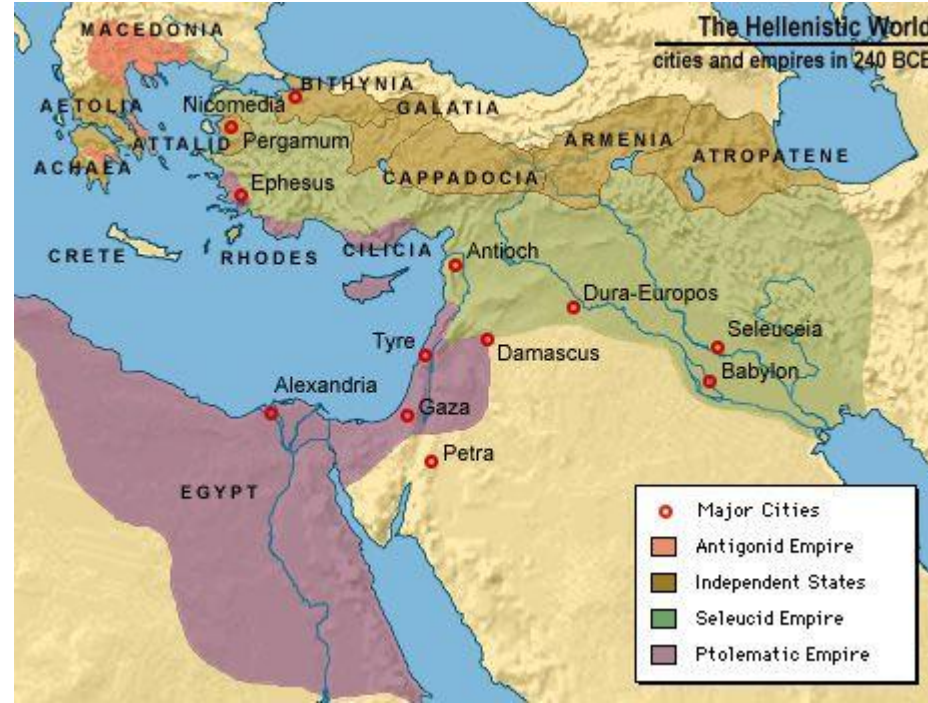
The dome-shaped pantheon is a place of worship and storage of statues of gods as well as a place of public works



The Colosseum was a theater where Roman warriors fought - accommodating 50,000-80,000 spectators



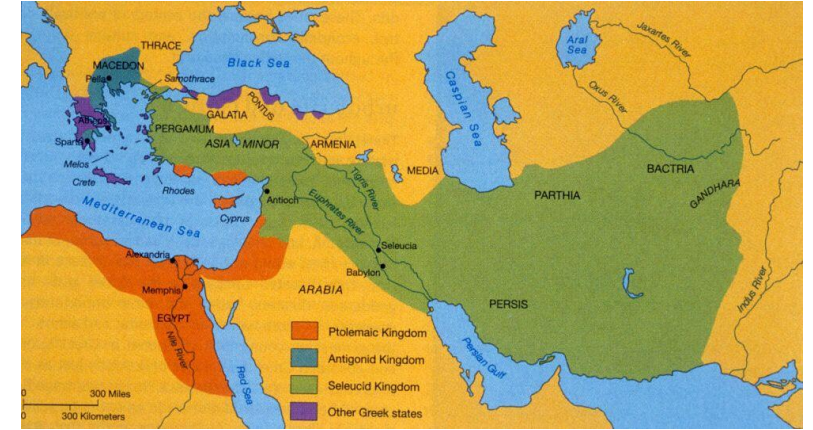
Aqueduct is an underground tunnel and gate using a gravity system



3. HELLENISTIC ERA



Characteristics of the Hellenistic Era

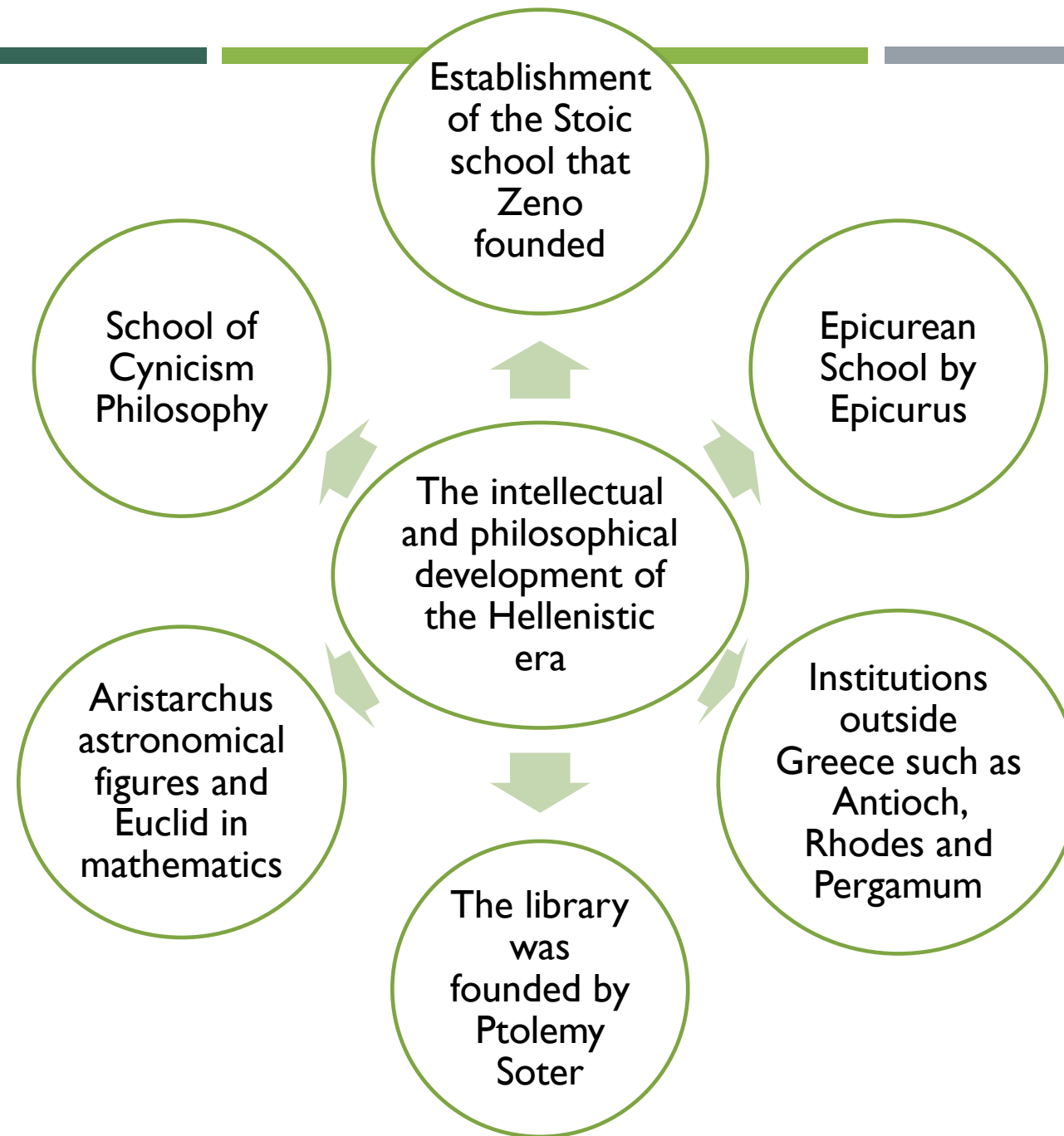


The era after the death of
Alexander the Great in
323CE

This era continued for 3 1/2
centuries until Constantine, the
Roman Emperor changed the city
of Roman to Constantinople in 330
CE

The kingdom was divided
into other kingdoms such
as Macedonia, the Seleucids
and the Ptolemaic.

Effect: there is a spread of
knowledge and culture





TO BE CONTINUED...

CHAPTER 3 PART 2 NEXT WEEK

