Democratic and Popular Republic of Algeria

Ministry of Higher Education and Scientific Research

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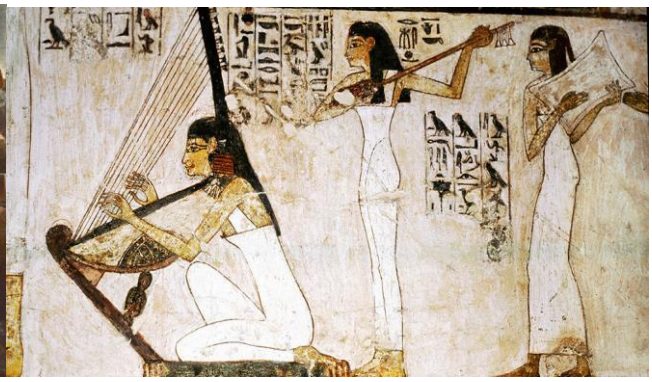
Common Core Department

Universal History of Biological Sciences

Chapter II : The Antiquity Period (3000 BC_ 476AD)

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General

Antiquity is an era in history. Its name derives from the Latin ***"antique"***meaning prior Orancient. Antiquity refers to the period beginning with history and ending at the beginning of the Christian era (by the fall of the Roman Empire).

It is through the development or adoption of the writing that antiquity follows prehistory. The transition from prehistory to antiquity therefore occurred at different periods for different peoples. This period will be characterized by the appearance of the first civilizations.

- **Emergence of Civilization**

A civilization is grouping of populations in which each person has a specific role: tasks are specialized and relationships between individuals are governed by rules organized around an authority.

There are lawsand a judicial system that aims to resolve disputes between individuals while avoiding personal score-settling.

It is generally agreed that the first civilizations were born from the large-scale organization of agriculture, on the banks of the great rivers of the Middle East (Nile, Euphrates, Tigris, Indus) and China. Agriculture near the great rivers benefits from land that is easy to work, this land is exploited thanks to considerable irrigation works. The appearance of cities is a consequence of civilization because:

a) It requires sufficient specialization of work to justify an agglomeration of artisans, merchants and non-peasants in general.

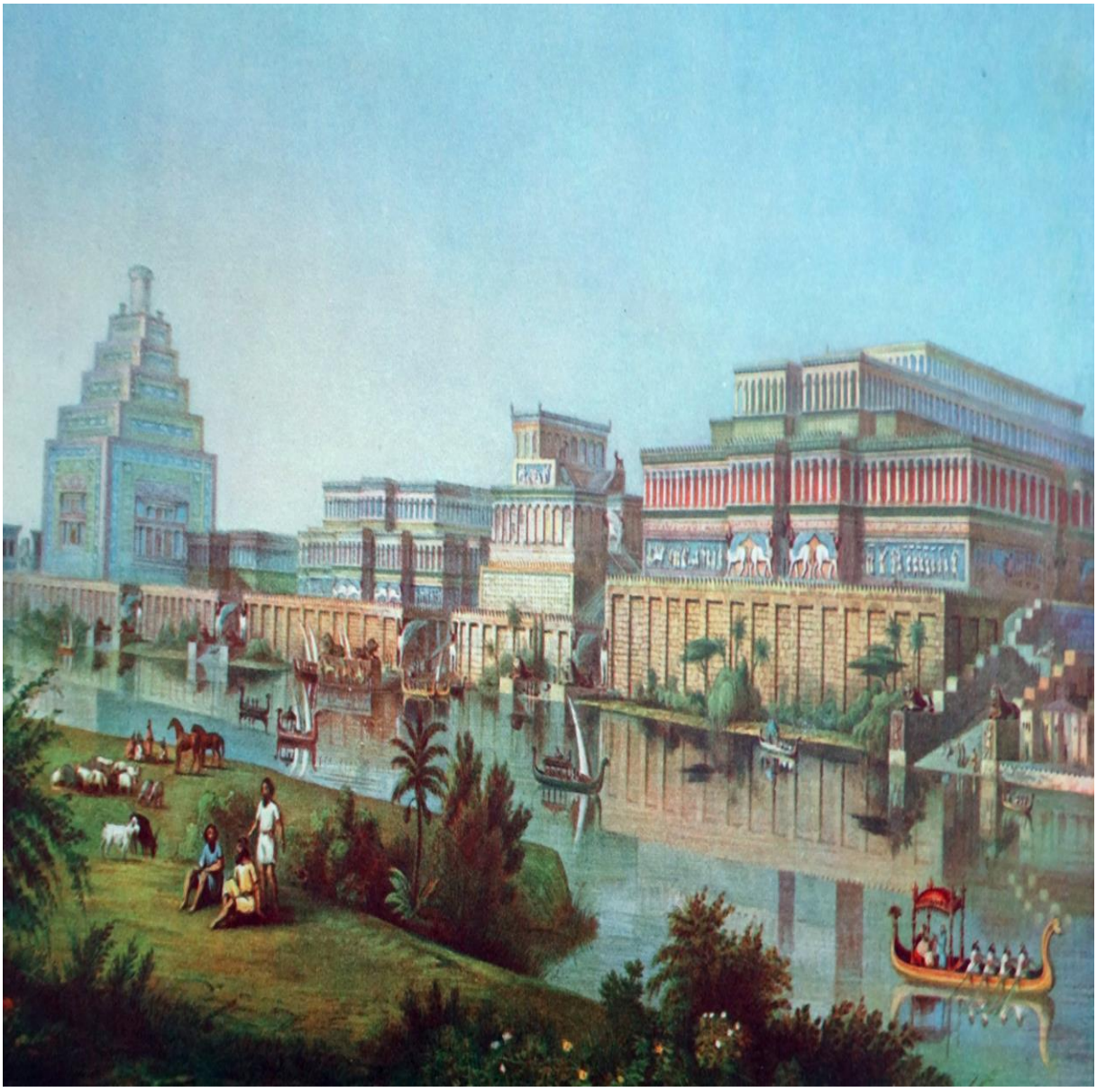
b) It requires significant agricultural surpluses in order to feed this population.

c) With writing comes the class of scribes, those who master this complicated art and who can now transmit knowledge more precisely and permanently than by oral tradition. Writing seems to have arisen directly from the need to keep an inventory of agricultural products, and so was used first in conjunction with the first systems of numbering.

- **Beginning of the historical period :**

It began with the invention of writing, around 3000 BC, in Mesopotamia and Egypt (hieroglyphs). Writing was born from the need to keep an inventory of agricultural products which was directly linked to the first numbering systems.

1.MESOPOTAMIAN CIVILISATION (3000BC _ 200BC)



GENERAL

The dawn of civilizations begins in Mesopotamia (Iraq and Syria), particularly in the Jezira region of Syria. The Sumerians are the people who lived in Mesopotamia between 4000_3000 BC. The Sumerian civilization is the first and oldest civilization in Mesopotamia, followed by the Akkadian civilization and then the Babylonian civilization.

Mesopotamia is a term that comes from the Greek, composed of two words Mesos (in the middle) and Potamos (River), and which means: "Land between the rivers". These rivers are the Tigris and the Euphrates. It was part of a region known as "the fertile crescent", where some of the first agricultural villages in the history of man were located.

This is where one of the first civilizations in history took shape. With agriculture and sedentarization, man established himself on a territory and founded the first cities. These drew their resources from the fertile lands. The inhabitants organized themselves and set up social, political, religious and economic structures.

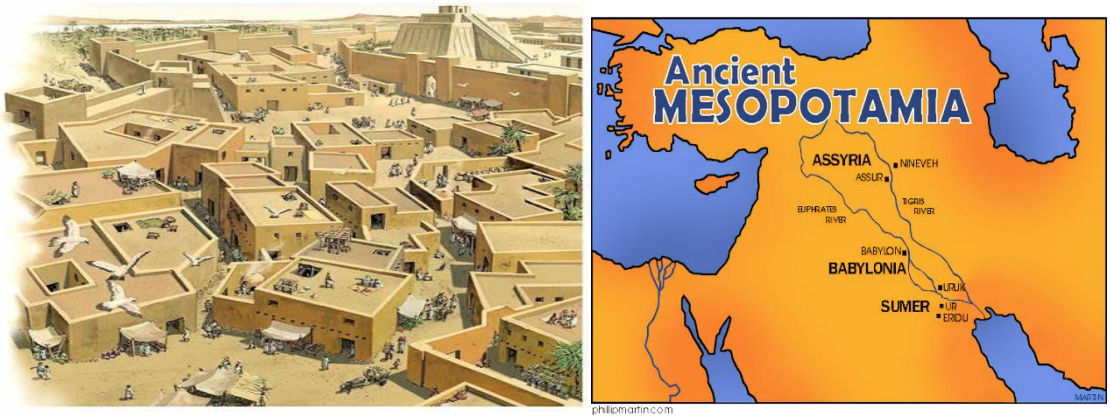


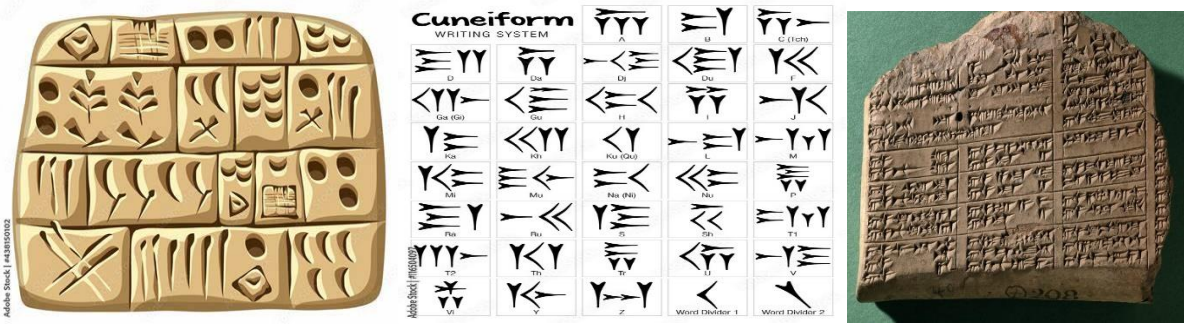
Figure 01 : The Ancient Mesopotamia

- **Scientific and biological practices**

Mesopotamia was the cradle of ancient civilizations with diverse biological practices.

- **Writing in Mesopotamia**

The most important innovation in science is the invention of ***cuneiform writing*** (nail shape) by the Sumerians, which is represented by pictograms (animals, gods, men, etc.) around 3300 BC and allows texts to be reproduced. They invented hundreds of signs that were difficult to understand. Scribes are specialists in this art, because they alone mastered writing. The writing medium was raw clay present under many forms, in tablets, but also in the form of cylinders or prisms, then it was perfected during the Akkadian period.



Cuneiform writing

Scribes

Figure 02 : The Cuneiform Writing and Scribes

In Mesopotamia, someone had to write down what happened every day: the price of products, wars, stargazing, and agriculture. A scribe is, in the historical sense, a person who practices writing.

His activity consisted of writing administrative, religious and legal texts or private documents by hand, and making copies of them. He could then be considered a copyist or public writer. This information was recorded in the Babylonian notebooks.

Numeration, was also the first scientific method to emerge, allowing increasingly complexe calculations to be carried out, even if it relied on rudimentary material means. Mesopotamian civilization thus led to the establishment of the first sciences.

Figure 04 : Babylonian Numerals

Why the writing is important?

- **Cultural domain:** Writing was a means in the transmission of Mesopotamian culture. Thanks to their numerous travels and the writings they carried, merchants contributed to the diffusion of their culture throughout the Fertile Crescent.
- **Social domain:** Writing contributes to :
  - Improve communication between individuals, cities and civilizations.
  - Transcribe and transmit acquired knowledge (Mathematics, medicine).
  - Conjunction with the first numbering systems.

- **Political domain:**

  -To put laws in writing and to make these laws known to the people.

  - Declare war or sign peace treaties between cities or civilizations.

- **Economic domain :**

  - Make exchanges, trade between individuals or between cities.

  - Keep inventories, record business transactions.

  - Calculate taxes. Field rental contract inscribed on clay table

- **Cultural domain:**

  - To make known religious or spiritual beliefs, to evoke epics.

  - Make the rituals known.

  - To make known the techniques and means of construction in order to transmit them to the following generations.

Religion and the Powers of the King in Mesopotamia

His power is absolute and hereditary. He leads the army and the city and manages the use of agricultural surpluses. They have a polytheist religion **"polytheistic"** means that people believe in more than one god.

- **Trade in Mesopotamia**

The Mesopotamians established an important trade network with neighboring peoples, agricultural surpluses were abundant and the Mesopotamians wanted to exchange their goods for materials that they did not find in large quantities on their territory, such as metals and wood.

Figure 05 **: Map of ancient trade Roads of Mesopotamia**

- **Sciences in Mesopotamia**

a) Mathematics

The division of time into 60 minutes and of the minute into 60 seconds dates back to the Chaldeans (The Chaldeans were originally a tribe that lived southwest of Babylon, from the 9th century BC to the 6th century BC). Thus, to write a number in Babylonian writing, it must be broken down into a sum of multiples of: 1; 60; 60×60 (= 3600); 60×60×60,

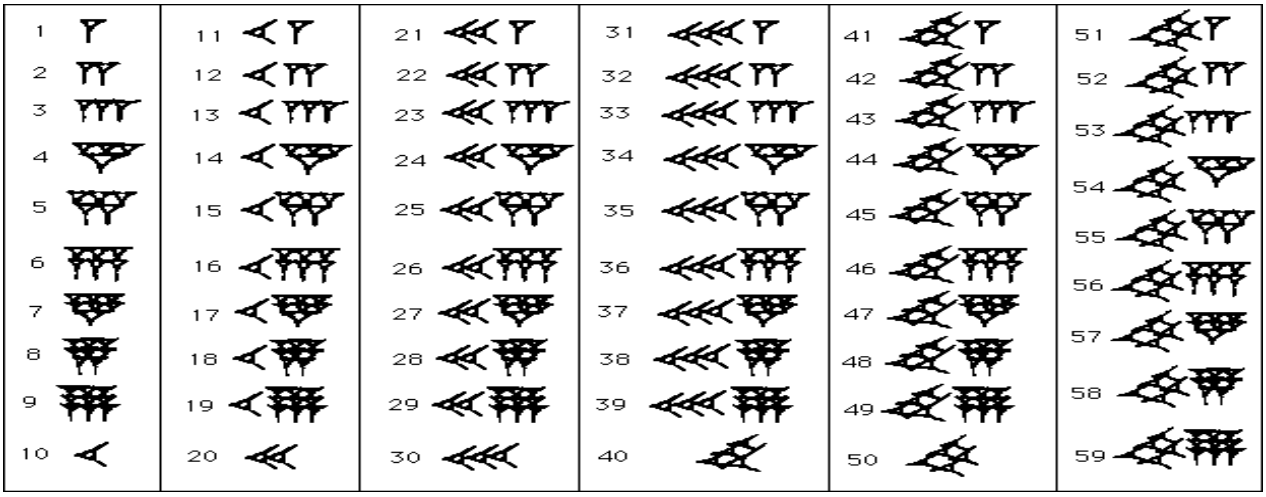


Figure 06 **: Mesopotamian Numbering System**

They were interested in Algebra (Multiplication, division, power, square root, cube root, first degree equations with one and two unknowns) and Geometry (Calculation of surfaces). This science is used for several purposes, namely:

- Helps to draw land boundaries

- Allows better production management

- Allows you to record exchanges.

b) Astronomy

The Mesopotamians were interested in celestial mechanics (the study of the movements of astronomical objects such as stars and planets, using physical and mathematical theorems). This science allowed the Mesopotamians to determine the seasons in order to better plan agricultural production. They used a lunar calendar, and concluded that the solar year is 365.20 days. Which is remarkably close to reality (365.26 days). They could predict lunar and solar eclipses.

c) Agriculture

Farmers dig irrigation channels to cultivate land. Agriculture is the main economic activity in ancient Mesopotamia. Due to the unfavorable natural conditions for this practice in a large part of this territory, men resorted to irrigation to be able to grow plants. At the cost of these developments, they were able to achieve very high yields.

This happened around 6000 BC, when the first agricultural communities developed in lower Mesopotamia. Their survival was only possible thanks to the establishment of an irrigation system, without which the agricultural area of this region would be limited to the edges of the large rivers.

The two main rivers of Mesopotamia, to which the region owes its name, are the Tigris and the Euphrates.

***Figure 07*: Agriculture in Ancient Mesopotamia**

d) **Medicine**

The excavations have brought to light clay table, giving the composition of decoctions and drinkable suspensions (the remedies were based on plant drugs such as roots, but also minerals such as salt) and which provide indisputable proof of the existence of an art of healing. Some data back to 2250 BC, and constitute the first known medical documents of humanity, well before the Egyptian papyri which they precede, in time, by more than a

millennium. It has a special status; it is the first "practical" science, inherited from tentative how-know.

MEDICINE IN ANCIENT MESOPOTAMIA

e) Biology

Since ancient times, probably even before the appearance of modern man, human beings have passed on their knowledge about animals and plants in order to increase their chances of survival. Therefore, biology precedes the writing of the history of Man, because he knew how to distinguish between different plants and animals, and recognize among them the toxic and the edible. They named the animals and plants due to trade.

They also classified them and more then hundreds of animals and plants are classified into "kingdoms" (fish, crustaceans, snakes, birds or even quadrupeds). They had approximate knowledge of general and functional biology, but very precise knowledge of anatomy: they made terracotta organs from various viscera (notably the liver), which proves that they practiced animal dissection. Yeast was used by the Sumerians for making beer and wine.

f) Mapping

Geographical maps were made, such as that of the city of Nippur (which was even used by archaeologists exploring the remains of the city). A world map was found, placing Babylon in the center and distances represented by travel time, not actual distances.

World Map

Oldest Map Of Mesopotamia