

2. Pharaonic Egypt (3110 BC – 324 AD)

EGYPTIAN CIVILISATION



General

Ancient Egypt comes from the distant civilization. Its existence and maintenance extend over more than 3,000 years BC (from - 3110 BC to 324 AD). It will develop the Mesopotamian heritage, nevertheless, due to its specific cultural unity, the Egyptian civilization will give a certain continuity in the scientific tradition of the time, and within which the ancient elements remain very present.

➤ **Scientific and biological practices**

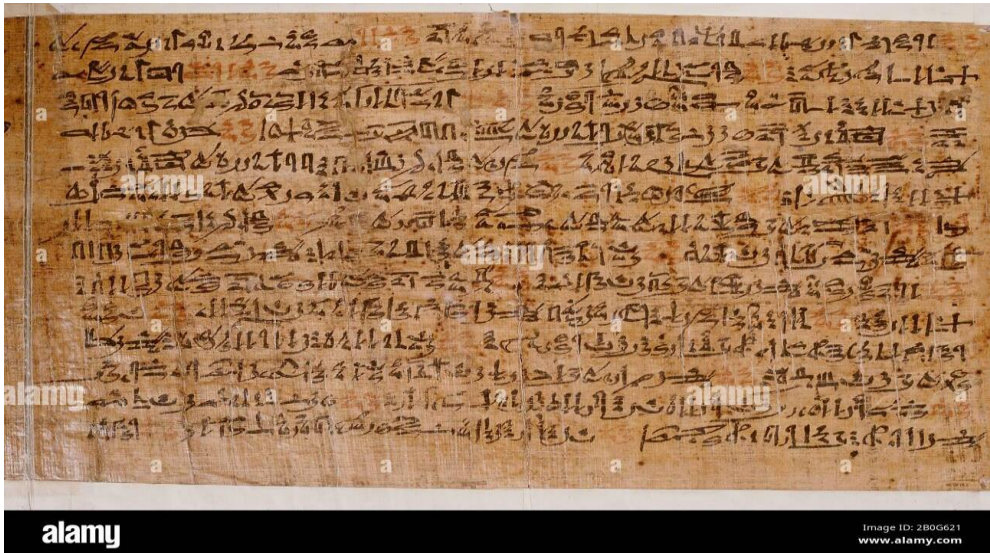
Like Mesopotamia, ancient Egypt is one of the civilizations that marked the development of science and its practices.

➤ **Egyptian writing**

- **Hieroglyphic writing:** It is a figurative writing, the characters that compose it represent various natural or human-produced objects, such as plants, figures of gods, humans and animals. Due to their complexity, hieroglyphs, written only by scribes, were used for religious monuments, because their handling was too complicated for daily use.



- **Hieratic writing:** It succeeded and simplified hieroglyphic writing, allowing scribes to write quickly by simplifying hieroglyphs and was used in administration. Hieratic characters no longer represent objects, but only signs in the manner of letters of an alphabet. It is a horizontal writing that is linked from right to left.



Writing (hieroglyphics) allowed the State to organize itself from numerous civil servants (scribes, priests) trained in schools (the elite school of kee provided high level education).

- **Egyptian papyri :**

Papyrus, a plant from the Nile, was used as a support for writing. It provided one of the oldest and most extraordinary flexible plant supports for writing and drawing. It was a light, handy support, ideal for administrative texts, accounts, legal or medical texts. Papyrus That said, the oldest painted drawing on a flexible support found in Egypt was not made on papyrus but on linen canvas. The canvas (linen) therefore appears to be earlier as a support for the sign. The Egyptians continued to write on canvas, but also on other supports, such as limestone shards, pottery fragments, wooden or wax tablets, but the best known remains papyrus.



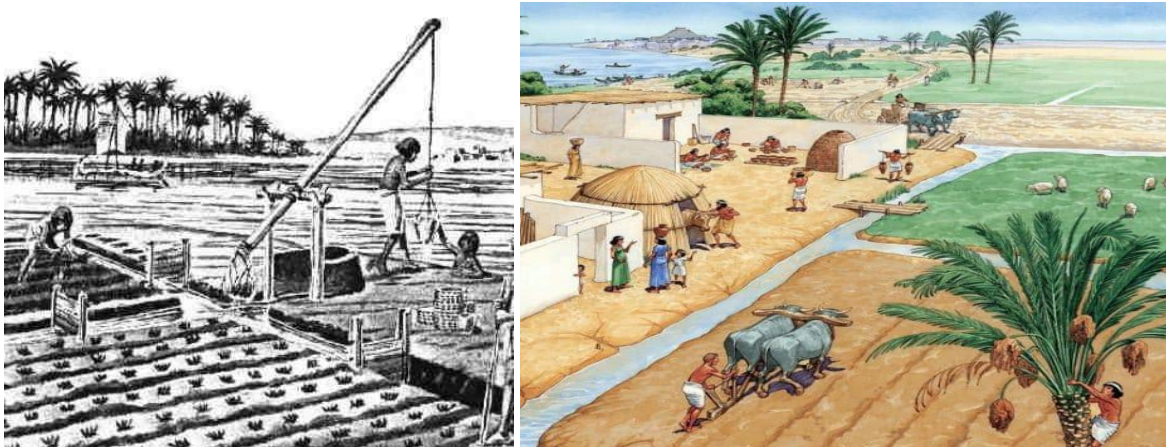
Papyrus



Linen Canvas

➤ Irrigation

Egypt's strategic geographical position, which is located at the level of the Nile Valley, allowed the appearance of irrigation in agriculture.



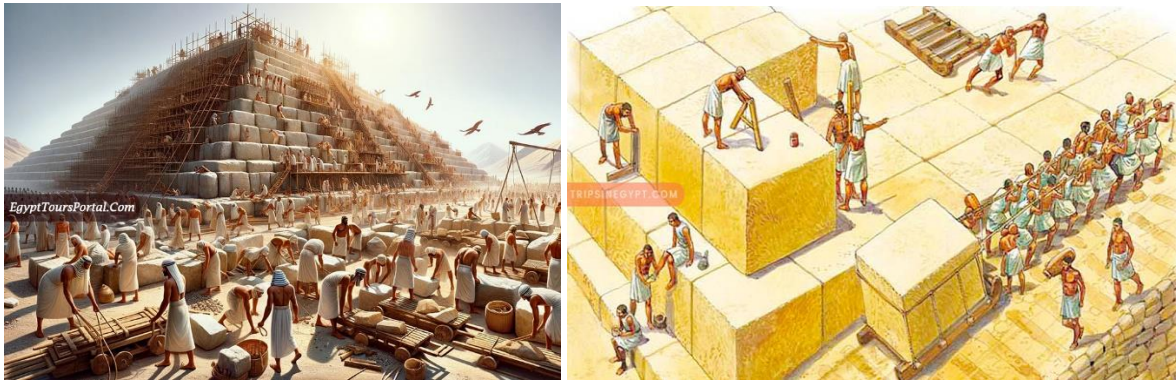
Irrigation canal by the river Nile

➤ **Engineering and Construction**

The ancient Egyptians were very efficient when it came to construction. They took only 30 years to build each of the great pyramids. The temples, obelisks and tombs are equally impressive.



The number of workers, the volume of stone blocks to be carved, the transport of these blocks from the quarries, the infrastructure necessary for the realization (ramps), the quantity of food to be brought to the workers, everything is calculated. They mastered the precision of the stone cutting technique.



➤ Science in Ancient Egypt :

a) Numeration and mathematics

The Egyptians mastered mathematical science with brilliance. From geometry, which is essential for the construction of monumental buildings, to calculation, which finds its concrete applications in all areas of daily life.

	=	1 (line)	1		
∩	=	10 (loop)	10	∩	
⌒	=	100 (rope)	100	⌒	
⌘	=	1000 (flower)	1000	⌘	
☞	=	10000 (finger)	10,000	☞	
🐸	=	100000 (tadpole)	100,000	🐸	
♀	=	1000000 (God)	1,000,000	♀	
			1/2	⌒	
			2/3	⌘	
			reciprocal	∩	
				2006	
				(1/4)+(1/28)	
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Geometry was very developed; used to calculate the area of the rectangle, triangle, use the number pi, which helped them to make the pyramids.

The boundaries of agricultural land were redone every year. The flooding of the Nile disrupted the landmarks every year, and the limits of each plot therefore had to be re-established.

It is essential for architects to assess the dimensions of the buildings they construct. The most widely used system is the system that has the large royal cubit as its standard. This is used to note the widths, lengths and heights of buildings. The cubit represents the distance between the tip of the middle finger and the tip of the elbow.

b) Astronomy

The Egyptian calendar has 365 days, time is measured from a star clock (according to the position of the stars).



c) Medicine

Egyptian physicians gained extensive knowledge of the interior of the human body through embalming. Embalming or mummification processes responded to the religious belief of immortality after death. According to the Egyptians, for a man's soul to access eternal life after death, his remains had to be preserved. This is why their corpses were mummified.

Embalming refers to the set of techniques aimed at preserving the bodies of dead people in a state more or less close to that in which they were alive



The Embauement



The Mummy

• They were thus able to identify and describe a large number of diseases by analyzing symptoms and treatments from 2300 BC. Medical texts specify the stages of clinical examination, diagnosis, prognosis and treatments which were often rational and appropriate.

Among the plants used in medicine:

- ✓ The opium poppy was used as a painkiller and sleeping pill.
- ✓ Wheat ears were used to treat skin problems applied in the form of pastes or ointments.
- ✓ Honey for its antiseptic properties (Eliminates or prevents the development of bacteria or virus).



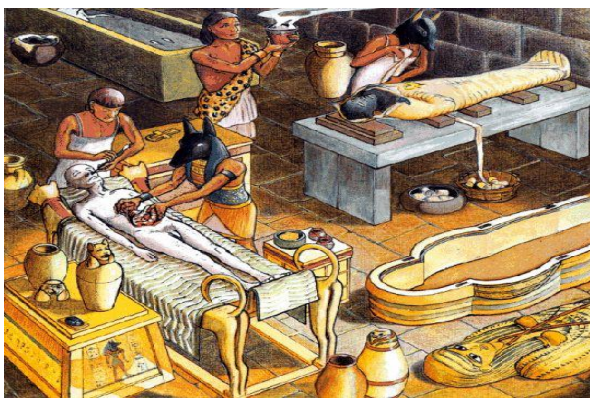
Papyrus médical égyptien du Nouvel Empire (1550-1050 av J.C.), musée du Louvre, Paris

This papyrus presents hieratic writing, a set of diagnoses and medical recipes, describing diseases transposed into a particular divine context.



A papyrus that was discovered in Luxor in 1862, dating from 1600 BC, where diseases, dentistry, contraception, surgery, first references to cancer are written. 875 substances were described: opium, liver extract (Rich in vitamin A), castor oil.

They were skilled in cardiology, gynecology (including contraception), ophthalmology, gastroenterology and urinary examinations. They successfully performed even surgical operations. Egyptian doctors performed minor, non-invasive surgery, fracture reduction, had a rich pharmacopoeia and used magic formulas (always in relation to the divine).





Ancient Egyptians use anesthesia in their medical practices.

d) Biology

In 4000 BC, the Egyptians discovered how to make sourdough bread using yeast. It is likely that yeast and lactic ferments were accidentally discovered much earlier. They also implemented selective breeding methods: crossbreeding between horses and donkeys as well as the use of selection for animals.