Intellectual and artistic achievements of ancient egypt research paper

Technology, Development

Introduction

On the territory of a country, which is now called the Arab Republic of Egypt, in ancient times one of the most powerful and mysterious civilizations, which for centuries and millennia like a magnet attracted the attention of contemporaries, emerged. At a time, when the era of primitive Stone Age hunters dominated in Europe and America, the ancient Egyptian engineers were constructing irrigation facilities along the River Nile, the ancient Egyptian mathematics were calculating square base and the angle of slope of the Great Pyramids, the ancient Egyptian architects were building grand temples, which greatness cannot be diminished by the time.

Ancient Egypt was the first country in the world, the first powerful empire, which undoubtedly had reasons to be considered as a world dominating nation. It is believed that the name, given to a person at birth, determines his life and destiny. This statement can be applied to the name of this country as well. Translated from the Ancient Greek, “ Egypt” means “ mystery”, and it fully corresponds to the name given – for centuries it has been surrounded by an aura of mystery.

The history of Egypt numbers more than 6, 000 years. Unique monuments of ancient culture, preserved on its territory, attract a huge number of tourists every year from all over the world. The grand pyramids and the Great Sphinx of Giza, magnificent temples in the Upper Egypt, and many other historical and architectural masterpieces – all of them still strike the imagination of all those who manage to get acquainted with this magnificent country and its culture. Ancient Egyptian scholars to an enormous extent contributed to the development of world science as well, leaving priceless legacy to succeeding

generations, legacy, which caused much positive effect to the civilization of today. A treatment of subjects of my research I will begin with addressing to cultural heritage of the Ancient Egypt apportioning its historical development into three basic eras and specifying artistic achievements related to every epoch. And the second part of the paper will be devoted mainly to intellectual achievements of ancient Egyptian civilization.

Artistic innovations during the Old Kingdom (3000 – 2, 300 BC)

The capital of Egypt in the era of the Old Kingdom was the city of Memphis, located in the Nile Delta, near the modern Egyptian capital – Cairo. Memphis, being one of the oldest cities in the world, played an important role in the history of Egyptian culture and made an enormous contribution to the development of Egyptian culture.

Period of the Old Kingdom was the time of formation of the main forms of Egyptian culture, including the very form of Egyptian statehood. At the same time, and it was in Memphis, when the main prerequisites and the nature of Egyptian art were defined, and the main types of architectural monuments of Egyptian culture were gradually formed. Throughout the history of Egyptian arts the leading role belonged to architecture. Already at the time of the Old Kingdom massive stone buildings – pharaohs` tombs, pyramids – were created. According to Wilson (1951), “ Egypt had an abundance of building stone in great variety. It might be pointed out that the architectural types worked out in stone were Egyptian in spirit” (p. 52).

The desire, to provide special durability for religious buildings, and especially tombs, was associated with ancient Egyptian beliefs. Hence, it was of a great

importance for the construction of the royal tombs, for the construction of which huge sums of money were spent. It was the sphere where technical inventions and new ideas of architects were applied. Classic examples of this kind of structures are the pyramids of the pharaohs of the IV-th Dynasty (27 century BC) Khufu , Khafre and Menkaure. Brilliant in its simplicity, the pyramidal structure was carrying an artistic compilation of the very essence of the Egyptian society, which was subordinated before the limitless power of the Pharaoh. It is really impressive how the ancient Egyptian builders could achieve an extreme accuracy in building of the giant pyramids: “ The Great Pyramid (Pyramid of Khufu) is nearly a perfect square at its base and it is perfectly oriented to true north, while the north and south sides of its 13. 5-acre base are off true parallel by just one inch” (Silverman, 2003, p. 177). Exceptional place in Egyptian arts belongs to the famous Great Sphinx. The basis of the Great Sphinx is made of natural limestone rock, which by its shape resembles a shape of a reclining lion, and parts forming Sphinx`s face are limestone slabs respectively hewn. Dimensions of Sphinx are huge: its height is 20 m, length – 57 m. A face of the Sphinx used to be painted in brick-red color; stripes at the shawl were blue and red. In the ancient times Sphinx, a huge monster with the face of Pharaoh, had to indoctrinate along with the pyramids an idea of superhuman power of the rulers of Egypt (Gadalla, 2007, p. 123).

A significant place in the arts of the Old Kingdom is allocated to the reliefs and paintings covering walls of tombs and temples; and already in the period of the Old Kingdom the basic principles of the further development of these art forms were coined. Paints of those times were mineral and really

astonishing: white paint was produced from limestone, red – from red ocher, black – from carbon black, green – from grated malachite, blue – from cobalt, copper, grated lapis lazuli, yellow – from yellow ocher.

Fine Art of Ancient Egypt, represented by the architecture, sculpture, reliefs and paintings, is closely related to the mortuary cult. And architecture was influenced by those beliefs at most among all types of the fine art of Ancient Egypt. The first significant building in a series of grand royal tombs was the so-called Step Pyramid of Pharaoh Djoser at Saqqara (28 century BC). With this brainchild of the architect Imhotep two important points are connected: first – the creation of a full set of monuments, which absorbed the complex of funerary temples, chapels and courtyards surrounding the 60-meter tomb. The second point was in the embodiment of the idea of the role every person played in the Ancient Egyptian society even after his death. Standing of the Pharaoh's tomb out of others` by a sharp increase of its size reflected the growing power of “ the sons of God”, it was “ a symbol of his power and influence over his people” (Cook “ Step Pyramid of Djoser”).

Artistic achievements during the Middle Kingdom (21-st century BC – early 18-th century BC)

Art of the Middle Kingdom is a complex phenomenon. In a distinguished political struggle both Pharaohs and nomarhs used instruments of art. The first pharaohs during the Middle Kingdom, with a wish to emphasize the legitimacy of owning the throne, sought to emulate the monuments of the mighty rulers of the Old Kingdom. The first to build a tomb in a pyramid was Amenemhat I, the first Pharaoh of the XII dynasty, who decided to construct it in the north, having finished with traditions of ancestors – a quite difficult

step when taking into account the stable world of ancient Egyptians. Striving of pharaohs of the XII dynasty to imitate the monuments of the Old Kingdom forced Egyptian architects to return to samples of that period (Mieroop, 2010, p. 124).

However, due to bad conditions of economic development, construction of giant stone pyramids was no longer possible, that reflected at the scale and technologies of construction of the pyramids during the XII dynasty. The size of these pyramids dropped down considerably. Architects switched to mostly adobe brick as a main building material, and the way of pyramid masonry dramatically changed.

In the era of the Middle Kingdom a new type of funeral temple emerged. The brightest example is a temple of Mentuhotep I in the valley of Deir el-Bahari (at the west bank of Nile). The first striking innovation is a change of location: not in the desert, but in the rocks of the Libyan Plateau. Second – is the sophistication of a composition of a mortuary temple consisting of two terraces, one above the other, ending with a small pyramid. Additional elements of this architectural complex were stone painted statue of the pharaoh standing on the road, and a garden with two swimming pools in front of the first hypostyle hall.

The memorial complex of Menhotep I gave rise to the temple architecture of the New Kingdom, one of the earliest examples of which was a mortuary temple of Queen Hatshepsut (beginning of the 15th century BC). The most important innovation was that a burial was separated from the temple – the pharaoh`s mummy was hidden in a secret compartment in the adjacent mountains. The architectural ensemble was composed generally of the same

elements as the temple of Mentuhotep I, but with a tendency towards larger grandeur: three terraces, rising one above the other, have larger scale, richer decoration, widespread use of sculptures (over 250 statues), and abundance of colonnades, there is enormous number of trees and artificial ponds, located on the terraces (Silverman, 2003, p. 195).

Monuments created in a number of local centers, particularly at the courts of the rulers of polynomials located in the Middle Egypt, have drastically different character. It was those centers where more advanced artistic movements in art in the early Middle Kingdom were developing. Pharaohs were no longer able to get back polynomials` political and economic independence, acquired at the end of the Old Kingdom by them in the Middle Egypt. Nomarhs in the Middle Egypt in the 20th century BC still felt themselves as masters of their nomes. In their everyday life they imitated the customs of the royal court, built magnificent temples and tombs, and surrounded themselves with prodigious architects, sculptors and painters.

Thus, the Middle Kingdom was an important and fruitful period in the history of Egyptian art. Along with the creative processing of a heritage of the Old Kingdom, it introduced a lot of innovations. The three-aisled construction with a raised middle aisle, pylons, colossal statues set outside of the building, the growth of realistic tendencies and their brilliant display of a number of monuments – this is the contribution of the masters of the Middle Kingdom to the treasury of the Egyptian culture.

Artistic triumph at the times of the New Kingdom (16-11 BC)

Most common in the New Kingdom was the type of a temple with a strict rectangular plan. In Thebes colossal temples in favor of the god Amun were built at Karnak and Luxor. The end of the XVIII dynasty (late XV – beginning of the XIV century BC) – was a period which had exceptional importance in the history of the Egyptian culture. In an effort to undermine the authority of the priesthood, Amenhotep IV put forward a new doctrine declaring the one true god – god Aten in the view of the solar disk. Pharaoh left Thebes and in the place where the village Amarna is situated nowadays, built the new capital, naming it " Akhetaten", which means " a horizon of Aten" (David, 1998, p. 125).

Naturally, drastic changes took place in the arts, so closely associated with religion in Egypt. Temples, as before, were oriented from East to West; their territory was surrounded by walls. However, they had a number of new features that have been caused by the need for construction of temples, as well as the entire city, within the shortest possible time. According to David (1998), those temples had no columned halls typical for the Egyptian architecture, they were hastily built, mostly of bricks, with low pylons, they had neither monumental nor artistic value (p. 129).

The golden age of arts of Akhetaten, however, suddenly came to an end. In a quarter of a century after the death of Amenhotep IV, the priests declared him a heretic, destroyed his city, and turned his heritage to oblivion. Still, the value of Amarna culture was still visible at times of Amenhotep IV`s successors. It played a significant role in the composition of culture of the

XIX dynasty, and, thus, of the culture of the whole second half of the period of the New Kingdom.

The development of science in ancient Egypt

Science is an integral part of any culture. Without a specific set of scientific knowledge there cannot be normal functioning of the economy, building, military, governmental spheres of any state. Ancient Egypt was not an exception and draws our attention with its intellectual scientific discoveries. In the system of Egyptian culture scientific knowledge reached a fairly high level, particularly in these three areas: mathematics, astronomy and medicine.

Astronomy in Ancient Egypt

Determination of the onset, peak and end of the water rising in the River Nile, terms of sowing, ripening of grain and harvest, the need for the re-measurement of land, which boundaries had to be recovered after each spate of Nile, required mathematical calculations and astronomical observations. Among the greatest achievements of the ancient Egyptians was a fairly accurate calendar. The centuries-old observations allowed the Egyptian priests to associate the frequency of annual floods of the great Nile river, occurred immediately after the summer solstice (nowadays – June 21-22), with the appearance in the rays of dawn of a shining “ star of Nile” that was the so-called heliacal rising of Sirius in the constellation of the Canis Major for the first time after a 70-day period of its invisibility. Therefore, the Egyptian calendar year became known as the year of the Sun, of Sirius and of the Nile. Predawn appearance of Sirius coincided with the beginning of the

hottest time of the year. Then all the work ceased, trade was suspended, and a period of rest began (Neugebauer, 1969, p. 82-83).

On the basis of calculations of heliacal risings of Sirius ancient stargazers learned to predict the onset of the Nile floods. It was the moment when a new working year was beginning in Egypt. The year was divided into three seasons of four months each. A month consisted of three decades of 10 days. There were 36 decades in a year, which names were devoted to the constellations, in particular, named in honor of the Egyptian deities. A day was divided into 24 hours, although the value of an hour was not constant, as it is today, and varied depending on the time of year (Neugebauer, 1969, p. 84). The Egyptians perfectly studied a starry sky visible to the naked eye; they distinguished between the fixed stars and the wandering planet. The stars were grouped into constellations and got the names after the animals, the outlines of which, in the opinion of the priests, they looked like (“ bull”, “ scorpion”, “ hippo”, “ crocodile”, etc.). Surprisingly accurate catalogs of stars, star charts were drawn – one of the most accurate and detailed maps of the sky was placed on the ceiling of the tomb Senenmut, a minion of Queen Hatshepsut (1508–1458 BC).

One of the scientific and technical achievements of Ancient Egyptians was the invention of water and solarium clock. The most ancient Egyptian water clock (clepsydra) was founded at Karnak and dates back to the era of Amenhotep III (XIV c. BC) (Neugebauer, 1969, p. 78). Water clocks were used mainly at night on the premises of temples, where it was impossible to observe the sky with stars. Those clocks had different shapes (of inverted truncated cone, a prismatic, cylindrical shapes, etc.) and were counting time

taking into account the volumes of water out-flowing or in-flowing. Clepsydrae influenced the development of solar, or shadow, clocks, applied during the daytime. The earliest instance of the sundial, found in Egypt, dates back to the era of Thutmose III (XV century BC). The clock consisted of a horizontal base, divided into measuring intervals, on which at the edge perpendicularly to it a horizontal plate was set, which cast a shadow on the basis.

Ancient Egyptian mathematics

Practical problems of measuring the land after the flood of the Nile, measurement and distribution of the harvested crop, complex calculations when constructing temples, tombs and palaces contributed to the success in development of mathematics. The Egyptians used non-positional notation, in which the numbers from “ 1 to 9” were denoted by means of the corresponding number of vertical dashes, and for the successive powers of “ 10” individual characters were introduced. With the advent of papyrus, the so-called hieratic cursive writing emerged, which contributed, in its turn, in the emergence of a new numeral system (Silverman, 2003, p. 94).

The geometry of the Egyptians was limited to computing squares of rectangles, triangles, trapezoids, circles, and the formulas calculating the volumes of some bodies. It is needed to mention that mathematics, which the Egyptians used during the construction of the pyramids, was simple and primitive (Silverman, 2003, p. 95). Problems and solutions to them, listed on the papyrus, were formulated in a purely prescribed manner, without any explanations. The Egyptians were dealing only with the simplest types of

quadratic equations and arithmetic and geometric progressions, and therefore those general rules, which they were able to get out, were also of the very simplest form. Nevertheless, it was not an obstacle for them to create architectural masterpieces, which rise much astonishment with our contemporaries, and left many innovations to descendants dictating vector for their development at the same time.

Medicine in Ancient Egypt

Across the whole the then existing world Egyptian doctors were famous for their adroitness. For the first time the existence of medical treatises in ancient Egypt is mentioned in a recording on the wall of the tomb of Uash-Ptah – the chief architect of the pharaoh Neferirkare-Ra (XXV century BC). However the oldest medical treatises written on papyrus have not been preserved to the present day, and we know about them only by the testimony of ancient historians. The most complete information about the medicine of ancient Egypt is provided in two papyrus dating about 1550 BC, both, apparently, written by the same person and are the copies of more ancient treatises. Discovered in Thebes in 1872 these medical encyclopedias of the ancient Egyptians contain more than 900 prescriptions of drugs for the treatment of diseases of the gastrointestinal tract, the respiratory and cardiovascular systems, treatment of hearing and visual impairment, various infectious processes, and parasitic infestations (Gadalla, 2007, p. 170-175). Egyptian healers knew and widely applied ointments, plasters, lotions, potions, enemas and other dosage forms. Bases for the preparation of medicines were milk, honey, beer, water from sacred springs, vegetable oil.

The dominant gods of healing considered to be the god of wisdom Thoth and the goddess of motherhood and fertility Isis.

The transfer of medical knowledge in ancient Egypt was closely associated with hieroglyphic writing instructions taught in special schools adjacent to temples. In these places strict discipline prevailed, and corporal punishment was an ordinary practice for underperformance. Medical activities in ancient Egypt were subject to strict moral standards. By observing them the doctor did not risk, even in case of unsuccessful treatment outcome, on the contrary to capital punishment in Mesopotamia. However, a violation of the prescribed rules was severely punished up to the death penalty. All these factors above mentioned resulted in such state of things when Egyptian population was relatively much healthier in comparison with other nations. In witness whereof, “ Herodotus reported that there were no healthier people than the Egyptians” (Gadalla, 2007, p. 161).

Medical art in Egypt was divided into concrete spheres, so that each physician healed only one disease – the method that brought medical treatment to a qualitatively new level and had its repetition later few centuries ago in the times of the Medieval. Their subtle craftsmanship was undoubtedly favored by the widespread custom of mummification of corpses. The practice of embalming in ancient Egypt was, apparently, the first and main source of knowledge about the structure of the human body. Embalming required the use of various chemicals, which indirectly contributed to the emergence of concepts of the chemical nature of reactions. Moreover, the range of application of knowledge of Egyptian healers amazes: from circumcision and wide-spread use of similar to today`s

wooden splints and bandages for fractions to medicines smoothing out wrinkles and removing moles, mixtures for hair and eyebrow coloring and even for hair growth.

Conclusion

Thus, having traced the development of arts and science of ancient Egypt, we can draw some conclusions about this culture.

The culture of ancient Egypt went through a series of successive stages of development. Its heyday it reached in the eras of the Old, Middle and New Kingdom. These three periods determine the identity and characteristics of ancient Egyptian culture.

The oldest in the world and massive stone monuments – the pyramids of Egypt – were created to awe people and amaze their imagination. The original culture of ancient Egypt from times immemorial attracted the attention of all mankind. It caused surprise among the people of Babylon, so proud of their civilization. Philosophers and scholars of ancient Greece learned wisdom of the Egyptians. Great Rome admired the harmonious state organization of the country of pyramids.

In Egypt, all kinds of art can be considered as “ born” from architecture. Architecture of Egypt – is a leading form of arts, which largely determines the nature of sculpture and painting. Sculpture and mural painting form the unique and organic entity with architecture. Development of architecture and art in the Ancient Egypt was in close relation with the changes to the Egyptian religious ideas about the afterlife and about the ritual burial of the dead Pharaoh and his nobles.

Science in Ancient Egypt excelled to a large scope scientific development in all states and state-like formations. The culture of ancient Egypt not only affected the diversity of its forms, but also is of great importance for the further development of the international process in the field of science, the arts and religion. Without doubt, the Ancient Egyptian culture and civilization laid the foundation for future cultural development of many nations.

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