

# Egyptian civilization

## *Pre-dynastic period*

According to the latest archaeological research, in Egypt there are distinguished three pre-dynastic stages of development: Naqada I (4400-3500 BC), Naqada II (3500-3200 BC), and Naqada III (3200-3000 BC).

Naqada I represents a typical primitive Neolithic culture, of which the biggest achievements were : simple painted pottery, clay figurines, combs made of ivory, stone vessels and maces. Settlements consisted of houses made of mud, 1-2 m in diameter. The deceased were buried straight in a pit in graveyards.

During the short period of Naqada II we witness in Upper Egypt accelerated development of civilization. New decorated ceramics came into existence, especially large jars with lug handles reminiscent of Mesopotamian pottery, copper tools and products made from gold and silver. The ways of burying the dead were changed which is visible in the tombs of rulers containing many expensive objects. Well developed trade existed with Sumer and Palestine which is confirmed by many objects of Sumerian origins found in the burials. The country consisted of independent princedoms ruled by local masters, belonging to the so-called dynasty '00'. It is possible that in this period about 20 independent city-states were created<sup>1</sup>.

The period of Naqada III is a continuation of Naqada II and is characterised by the further rapid development of the civilization, confirmed by such discoveries, as the first graphical inscriptions on palettes, the first hieroglyphs, the first royal cemeteries and sculptures of lions found at the Koptos temple. Richly endowed tombs of about 15 rulers belonging to the so-called dynasty '0' were also identified. In this period the first irrigating systems were introduced.

This period culminated in the unification by the pharaoh Narmer, (in Greek, Menes) of the Upper and the Lower Egypt. It took place about 3100 BC From this event starts the dynastic history of Egypt. This united country, in spite of many wars,

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<sup>1</sup> A list was discovered of first principalities corresponding to the later administrative regions in the united Egypt. Archaeological research confirms existence of 4 independent city-states: Hierakonpolis, Elkab, Abydos and Naqada.

internal struggles and fights, and conquests by the barbaric tribes survived for almost 3000 years. The Egypt independence ends after the conquest by Alexander the Great and with the establishing the Ptolemaic Dynasty in 332 BC.

### ***Documents***

The Egyptian civilization probably came into existence in the same period as the Sumerian civilization, i.e. about 3500 BC. However its history is much longer than of Sumer because Egypt, having a better geographical location, was separated from bellicose, barbaric Asian tribes<sup>2</sup> and being united under one ruler was better prepared to defend against their attacks<sup>3</sup>. Although the Egyptian civilization survived 2000 years longer than the Sumerian one, it left many fewer written documents. It was caused by the fact that the Egyptian papyri were made of plant fibres which were not able to survive as long as dried clay tablets. And, for example, in 48 BC, during the fire of the famous library in Alexandria, thousands of valuable papyri were destroyed<sup>4</sup>. The lack of written material also contributed to a significant difference between the political life in Sumer and Egypt. The large majority of the discovered tablet documents were written in the period when the city-states were ruled by the Semitic kings, who appreciated old Sumerian myths which had survived in the oral tradition for thousands of years, and therefore they encourage them to be written. The opposite was in Egypt, where the temples kept their dominating position until the Greek conquest and therefore tried for much longer to keep the information secret by controlling the contents of the written materials<sup>5</sup>. Therefore, apart from the religious inscriptions placed mainly in the royal tombs and temples, few authentic documents survived until our times. However the achievements of the Egyptian civilization had not been lost because, during the ruling of the Ptolemaic dynasty, the Greeks took over the majority of the Egyptian knowledge accessible to them and in this way it become a part of the Greek and Roman cultures.

### ***Governing of the country***

In the early dynastic period a very simple governing system existed. The pharaoh

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<sup>2</sup> Hyksos in the 17<sup>th</sup> century BC conquered and ruled the northern Egypt during several dynasties.

<sup>3</sup> Egypt was attacked by tribes from Nubia and Libya.

<sup>4</sup> The Alexandria library was completely burnt down in 642 AD by the invading Muslims

<sup>5</sup> The majority of the scribes were employed by the temples

was the head of the administration, chief judge, Commander-in-Chief of the army, the High priest at every temple and the owner of all wealth and lands. The system of administration of the country was already established in the beginnings of the Old Kingdom. Egypt was divided into twenty provinces, probably corresponding to the predynastic city-states, each with its own governor. The agriculture based on artificial irrigation was the main source of revenue. The land belonged to the pharaoh and was not owned by the farmers working on it. They paid annual rents and taxes, which depended on the water levels, on the cultivated area and on the amounts of the gathered crop. The due tax was paid in kind, mainly in corn, however the payment abilities of the farmers were taken into consideration, therefore they were not oppressed by the taxes in a heartless way. Every two years there had been a census of farm animals to update the level of taxes. The entire tax system required an efficient organization and a large number of qualified officials and tax assessors. Although the functioning of the civil service was controlled by special supervisors, the pharaoh travelled incessantly along the Nile, checking everything personally. Each province had its own courts and judges dealing with the settling of local matters. However it was possible to appeal against their sentences to the Supreme Court or to the pharaoh. In the period of the 12<sup>th</sup> dynasty, all cases, except small offences, were judged in the capital city of the country where the pharaoh passed the sentences. So much centralized system of exercising authority, controlled by one man, was in the long run impossible to maintain. Therefore the pharaoh handed part of his duties over to his deputy, a Vizier who acted as the minister of war, of finances, of agriculture, and of irrigation, as well as the administrator of the estates of the temples.

This system of governing functioned very well for almost 3000 years, because it was based on high ethical standards being enforced in Egypt, and first of all on the honesty of the pharaoh and of the officials, whose main concern was the well-being of the citizens. Although the Egyptians were subject to an authoritarian ruler it was possible for anyone, even the poorest man, to approach and be heard by the pharaoh, and this helped to guarantee good behaviour of the officials. It was a system of caring paternalism based on a personal relationship between the pharaoh and his subjects.

In fact Egypt was a theocratic state, in which the life of the citizens concentrated on

how to serve the gods and the pharaoh, who also served the gods, by fulfilling his duty by justly ruling the country. Although officially everything belonged to the pharaoh, in fact he was only in charge of the estates given to him by the gods and he could not freely dispose of them, e.g. pass them over to his offspring. Egypt in the early period did not have a professional army<sup>6</sup> and the pharaoh was not interested in conquests of other countries and accumulation of riches or gaining personal glory. The financial resources of the state were allocated almost exclusively for religious purposes, mainly for the building of wonderful temples and pyramids; but the pharaoh's palaces were built as normal houses, made of clay bricks, and timber.

In the building of pyramids the entire country participated, not exclusively slaves as we believed not long ago. During the inundation of the Nile, lasting at least three months, all agriculture was at a standstill, so farmers were called to build temples and pyramids. The work for the pharaoh and the gods was considered an honour and a duty. The workers lived in special dormitories and were well fed. The work was hard, but the teams changed quite often because everyone wanted to participate in this holy work.

The situation changed entirely, when the Greeks seized power in the 4th century BC. The gigantic Civil Service system, deprived of the moral direction, changed into the soulless apparatus which with the greatest ruthlessness exploited society, particularly farmers, imposing excessive taxes independently of their financial situation. The Greek corrupt and bureaucratic officials caused a lot of hardship resulting in frequent strikes and occasional revolts which invariably ended in massacres. It is a good example how the same law can be used for the good of the people or for their enslavement and suppression.

### ***Philosophy and religion***

Egyptians had a very pragmatic approach towards the world and their spiritual needs were entirely satisfied by their religion. They perceived the universe and the society as a static system which functioned according to the principles which were established and handed over to mankind at the beginning of existence by the gods. Any changes and development were not only unnecessary, but even undesirable, and the entire mental and physical effort of the Egyptians concentrated on the

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<sup>6</sup> Until invasion by Hyksos.

maintenance of the status quo. Since everything had been established by the gods, nothing should be changed; since everything is known, there is no need to ask questions and to search for answers - these were the main canons of their philosophy. The Egyptian religious system in principle did not change during almost 3500 years of its existence. If in the later periods certain changes took place e.g. the worship of “new gods” was introduced, they resulted not from the inventiveness of the pharaoh or the priests, but were caused by returning to the original beliefs which were forgotten through the ages.

The lack of written documents means that the information concerning the Egyptian religion is very sparse and confusing, and as a result of this situation in the field of Egyptology many diverse, often mutually exclusive, hypotheses appeared. The problem originates from the fact that in Egypt, as in Sumer existed two religious systems. The first was associated exclusively with the pharaoh, and the second was encompassing the rest of the population. The main canons of the first system included a dogma that the ruler is of divine origins and only he has ensured immortality. The temples were built for the sole purpose that the pharaoh could frequent and worship his divine father, from whom he received the gift of the life essence, helping him to exercise his duties. Only the ruler and the priests had access to the holy places. Every day in the main temple complicated ceremonies were held which normally should be conducted by the pharaoh. However he was not able to cope with these everyday duties, so the high priest replaced him, in this way gaining access to the divine sources which increased his prestige and power in the country. We know very little about details concerning the religious doctrines of the rulers and of the ceremonies associated with them, because as in Sumer, they were never written down. Our superficial knowledge is based mainly on the studies of inscriptions in burial places. These matters were kept very secret and nobody apart from the pharaoh and the high priests could have access to them. E.A.Wallis Budge, an authority on the Egyptian religion stated that: “Undoubtedly the priests of the higher grades possessed esoteric knowledge, which they communicated orally to those who were their equals or successors, but it is tolerably certain that they did not commit it to writing”<sup>7</sup>. The role of the priests in Egypt did not include tasks of the creation of new religious doctrines, but just the opposite, on the faithful handing over

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<sup>7</sup> E.A.Wallis Budge, From fetish to god in ancient Egypt, Dover publications inc., New York, 1988.

traditional beliefs from one generation to the next generation. Understanding of the Egyptian religious doctrines complicates that in the course of a few thousand years the religious canons changed, as the gods worshipped in the main religious centres of Thebes, Memphis or Heliopolis.

To the most profound and metaphysical, without any doubt, belongs the Memphis doctrine which we know more about thanks to the saved inscriptions from the Shabak period<sup>8</sup>. We learnt from them that in the period of the Old Kingdom this doctrine had a deep spiritual and philosophical character and in this respect was greatly superior to all other Egyptian doctrines. For the Memphis priests, Ptah was the highest god described as all-encompassing, self-creating, self-subsisting, immaterial substance, without beginning and end. He was regarded as pure Intellect which is the ultimate origin of all creation, whose thought created every material thing and every being on the earth, in the sky and in the underground. Other gods were regarded as a form (emanation) of his thoughts, therefore, strictly speaking, he was the only god. A light radiated from his heart which permeated entire nature, all beings lived thanks to his breath, and the words said by him had an enormous, causative power. The original Memphis doctrine came into existence much earlier and probably arrived in Egypt with new masters-gods. This abstract image of the god had faithfully been transferred to the Bible, as well as to the New Testament<sup>9</sup>, and constitutes the foundations of the main contemporary monotheistic religions. This intellectual concept of god is undoubtedly astounding, considering that was created at least 3000 years before Christianity.

However probably for some pharaohs and high priests such a vision of god was too difficult to comprehend. For this reason in about the third dynasty a new worship of the sun-god, Ra came into existence which was more conventional. However the original doctrine, associated with the Ptah worship, had been too deep-rooted in the Egyptian theology, because after almost a thousand of years, in the period of the New Kingdom returned in a form of the new god, Amon who had many attributes of Ptah.

Amenhotep IV, called also Akhenaten, a pharaoh of the 18<sup>th</sup> dynasty ruling in the

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<sup>8</sup> The founder of the 25<sup>th</sup> dynasty in the 8th century BC

<sup>9</sup> Very similar description of God we find in the Bible in the Letter to the Hebrew 4: 13

14th century BC dismissed Amon priests and for the period of his rule introduced a monotheistic worship of the sun-god Aten. This worship was not wide spread and after the death of the pharaoh was quickly forgotten. Some scholars promote the idea which incorrectly attributes to Amenhotep IV the creation of the revolutionary, monotheistic religion which was adopted by Judaism. However it is known that Akhenaten, being the youngest son of the pharaoh Amenhotep III, was prepared for the high priesthood and was familiar with old beliefs, therefore his monotheistic religion was not his invention but the reviving of the very old traditions.

Theology referring only to the pharaoh and ignoring the afterlife of other people could not be satisfactory for the growing in strength middle classes and the influential priests belonging to the higher social strata. Therefore arose a need to introduce a second religious doctrine, embracing all people. In this way came the birth of the worship of Osiris, who was assumed to be a predynastic king of Upper Egypt who implemented farming. The name Osiris indicates that originally he was the astral god associated with the star Sirius, and his wife Isis was associated with the planet Venus.

The Osiris worship spread in Egypt during the 12th dynasty, about the 21st century BC. This was a very popular cult, because it destroyed the pharaoh's monopoly of heaven, and promised every man renewed life after death. According to the contemporary beliefs Osiris was killed and then resurrected, and his body was restored as a result of certain magic ceremonies symbolizing life after death. There is no evidence showing that the believers regarded Osiris as the Saviour. He was worshipped as the King of Kings, the Ruler of Men and the master of the Nether World. The Book of the Dead describes the 'Great Judgement' of the dead based on 'the Weighing of Hearts', during which the life of the deceased is subjected to evaluation. If he committed more good than bad acts, then his soul will find its way to heaven. The soul of an irredeemable sinner is surrendered to destruction. Some of the Osiris cult elements were borrowed by Christianity and Islam.

Egyptologists formulated many hypotheses about the religious beliefs in the land of pharaohs. Problems in establishing a consensus on the religious life originates largely from the fact that in Egypt, in different periods of its long-lived history, many various gods and demigods were worshipped, and each of them had peculiar characteristics and abilities, which allowed them to affect human life. As in Sumer,

every city-state before the unification had its own god, therefore in the united country all these gods were still worshipped. To the main pantheon of gods belonged: Atum, Ra, Amun, Ptah, Aten and Osiris. Many other gods were related to them, and together created a complicated structure governing heaven, earth and the underworld. The fact that they believed in so many gods does not automatically preclude monotheistic character of the Egyptian religion. Jean Champollion, a famous French Egyptologist wrote in 1839: "The Egyptian religion is a pure monotheism, which manifested itself externally by a symbolic polytheism ". This shows his remarkable insight into such a complex subject.

To the most controversial and often misunderstood symbols associated with the beliefs of Egyptians belong the depicting of human gods with the head of an animal. Many contemporary Egyptologists interpret these symbols literally and are convinced that they belong to a typical primitive animistic religion. Without a doubt some animals, like e.g. the Bull Apis, which was worshipped in Memphis as an incarnation of Osiris and the second life of Ptah. Anubis, the son of Osiris and Nephthys was regarded as the god of the deceased and is depicted as a man-god with the head of a dog or a jackal. However it does not mean that dogs were worshipped as gods or that the Egyptians believed in some hybrid god-monsters. The head of an animal symbolized certain characteristics of the god such as courage, wisdom, intelligence, etc., and in practice facilitated the identification of individual representatives of the vast pantheon of gods, of which it would be difficult to distinguish their human faces, particularly on pictures in dim temples and tombs.

### ***Ethics and morality***

Even though we do not know doctrines of the Egyptian religion in detail, we can try to draw certain conclusions by analysing ethics of the rulers, of the privileged groups and of the ordinary inhabitants of Egypt. Nothing attests better to the influence and the principles of the religion, than the behaviour of its believers, particularly the ruling elites. We can learn from the inscriptions in the royal tombs, that the pharaohs regarded taking good care of their citizens and securing their high standards of living as very important achievements and took proud in them. They did not boast about building temples and pyramids, and making military conquests. Most important above all was that during their ruling nobody was hungry. Pharaohs also vaunted taking care of orphans, widows and poor, as well as emphasising that all subjects

were treated fairly.

Without any doubt about the advancement of every civilization is reflected by its standard of justice. In Egypt impartiality of the judges and the equal treatment of all accused belonged to the most important and strictly observed principles of the justice system. In the Egyptian system of governing giving favours to family and friends was inadmissible, and the bribery of officials and dignitaries were severely punished, and even during the 18<sup>th</sup> dynasty was subject to capital punishment. Judges, similarly to pharaohs, vaunted the fact that they protected the weak and the poor against the power of the rich. It is necessary to say that such high standards have not been achieved in many contemporary societies yet.

The Egyptians were not racists and had no ethnic prejudice. The skin colour and the social origins did not play any role in the public and private life. Everyone was equal before the gods and the pharaoh. We know that viziers, deputies of the pharaohs, sometimes came from low social strata, and their promotion owed exclusively to their abilities and hard work. Egypt was a tolerant country and therefore strangers, and among them Jews, lived in it for hundreds of years, achieving senior positions. We learn from the Bible that Joseph was a vizier in Egypt<sup>10</sup> and according to the historian Josephus, Moses was a chief priest in the holy centre in Heliopolis.

The Egyptian concept of a healthy society was based on the preservation of the correct proportion between various aspects of life, i.e. religion, family life and financial matters. Any excesses were undesirable and should be eliminated. This social system imposed from above by the pharaohs collapsed in later periods, during the changes of dynasties. As in other parts of the world, in Egypt brutal and cruel events took place, which almost always accompany the power struggle.

The importance of high ethical standards confirms the Book of the Dead from which we learn that everyone who does good acts will be blessed in the future life, but his sins will be counted and punished. It describes, how during the Great Judgement the deceased recites a long list of sins which he did not commit, so called 'negative confession', such as murder, seduction, robbery, giving a false testimony, slander, blasphemy etc. He must also convince the judges that he did not cause pain, did not bring tears, did not rob the widows, did not oppress the poor and did not say words

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<sup>10</sup> Bible, Genesis 41: 37-43

in anger.

Caring about one's own children and parents was the essential obligation of every Egyptian. Attest to it in inscriptions found in tombs saying about the deceased's love, obedience and deep affection for his family and friends. The same high standards referred also to the pharaoh. His offspring attended the royal school which also accepted other privileged children. After reaching maturity sons of the pharaoh were sent off to work in different professions such as priests and administrators and nobody was allowed to be idle.

### **Law**

The most important person in the country was a pharaoh. Any action directed against him was treated as treason and punished by death. The great oath in the law-courts was by the life of pharaoh, therefore perjury was also a capital crime, because to swear falsely could harm the ruler. A worse punishment than taking the condemned man's life was throwing the perpetrator body into water, because not placing the body in a grave meant destroying the man's soul. For serious crimes the convicts' nose or ears were cut off, or they were sentenced to hard labour in the mines. For smaller offences such as a theft, the thief had to pay back triple the value of the stolen things. Civil, property and inheritance cases were tried before the Vizier.

The same law applied to men and women. Women had the right to own, manage and sell property, to sign legal contracts and were able to take legal action and to appear as a witness. It was also accepted, that they travelled independently, without a male escort. All marriages were monogamous and women had the right to negotiate marital contracts. It is worthwhile noticing that the conditions of women in despotically governed Egypt, were completely different than in the democratic Greece, where women had no legal rights and were treated as second-class citizens. A Greek historian Herodotus wrote maliciously that in Egypt the roles were reversed: "the women trade on the market and the men stay at home and spin".

The Egyptian legal system was not interested in controlling the life of married couples or preventing divorces. Even though the marital conflicts were, as today quite frequent, the law-courts in more serious disputes did not favour either side. It is interesting that Egypt was the only country in history, in which in the case of adultery the man was punished more severely than the woman.

The Great Papyrus of Harris, which quotes the pharaoh Ramses III, tells us a lot about the attitude of the Egyptians towards women:

“I planted the entire country with trees so thanks to its people could sit in their shadow. I caused that every woman in Egypt could go with the raised head where she wanted, and no stranger nor traveller on the road molested her”.

### ***Special position of women***

Women in Egypt enjoyed a special, privileged position which resulted from the fact that all landed property descended in the female line from mother to daughter. In practice the husband enjoyed the wealth as long as his wife was alive, but after her death her daughter came into possession. This marriage law was never written down, therefore probably had to be established in the predynastic period of the Egyptian civilization. This law was very strictly followed in the royal family where a female was a heiress to the throne<sup>11</sup>. Such a way of succession is not obvious, because the royal list contains mainly male names, but it was women who secured continuation of the royal line. The Great Wife of the pharaoh was the heiress and by right of marriage the king came to the throne. The king's birth was not important and he could be of any rank, but to be recognized as the ruler he had to marry the heiress to the royal line. In order to stay in power in case of the death of his wife, a pharaoh safeguarded himself from abdication by marrying many heiresses including his own daughters regardless of their age. If the pharaoh wanted to secure the throne for his son, he had to arrange his son's marriage with a royal heiress, which could be his own mother, grandmother, sister or even a newly born niece.

The law of matrilineal succession explains the many marriages of Cleopatra who was married to her eldest brother, who reigned by right of that marriage. After his death she was married to her younger brother. When Julius Caesar conquered Egypt he had to 'marry' Cleopatra to be recognised as the ruler and after his death the queen married Anthony, the next Roman conqueror. The fact that this law was observed by the Ptolemaic Greek dynasty attests to its importance for the Egyptian population.

Such a law created favourable conditions for the changing of dynasties, because as a result of the revolution or the palace coup, the new master married any heiress of

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<sup>11</sup> M. A. Murrey, *The splendour that was Egypt*, Sidgwick & Jackson, London 1987, p. 68.

the old royal line, not necessarily the queen, and became automatically a pharaoh. In a certain way it was beneficial for the country, because it provided a supply of a new blood to the royal line, since, as it often happens that the sons of outstanding rulers do not necessarily inherit from their fathers their extraordinary political talents. Also the law of primogeniture, i.e. inheriting by the oldest descendant did not apply in Egypt, and for example, the successor of Ramses II became his thirteenth son. However marriages of closely related persons were harmful and resulted in genetic illnesses of their descendants. It has been discovered, that Amenhotep IV, the pharaoh of the 18<sup>th</sup> dynasty ruling about 1350 BC suffered from a serious deformation of the body. Researchers believe that all pharaohs of this dynasty endured this problem.

An interesting question arises, why such a law was enforced<sup>12</sup>. Undoubtedly it complicated the handing over of the power from the father to the son. Yet, the total power lay in the hands of a pharaoh and only he was regarded as the god, however the political significance of the queen, with a few exceptions<sup>13</sup>, was limited to sanctioning his right to the throne. So what was the purpose of the divine marriage? Where does the special position of the queen originate from?

In the Egyptian mythology it is often emphasized that the first king was a son of the god and of a mortal woman. This means that the offspring of the first queen were of the divine origin. Using the modern language one could say that the divine genes were inherited from one generation to another generation only in the female line. One could argue that the divine element could also be transmitted through the male line. It is possible, but it would never be absolutely sure, because children of the pharaoh's wife potentially could be begotten by another man, and then the transmission of the divine genes would be discontinued<sup>14</sup>. Whoever introduced this law was familiar with the problems associated with the inheritance of certain, in this case divine features, and perhaps knew about genetics. Although this system did not ensure that every pharaoh would have the divine genes, however it gave the guarantee that these genes will survive in the royal line through thousands of years.

### ***Engineering and sciences***

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<sup>12</sup> This subject was not analysed by the academic researchers.

<sup>13</sup> In the history of Egypt for about 120 rulers only four were women.

<sup>14</sup> Also the Judaic law states that a Jew is a person having a Jewish mother.

Undoubtedly engineering belongs to the most important knowledge and without it Egypt could not function. One of the most important engineering undertakings was a gigantic irrigation system spreading throughout the country along the Nile, consisting of many dams, canals and dykes. Since the level of inundation was variable, the irrigation system had to function at the lowest level of water, as well as delivering water to the fields lying a long way from the river. The whole system was in operation during the first dynasty, but some significant improvements, consisting of building artificial water storage in the Fayum depression, were added during the 12<sup>th</sup> dynasty. The irrigation system was a great engineering feat, comparable to the greatest contemporary constructions, although was not as advanced as in Sumer. The advanced technology of the civil engineering was already used right at the beginning of the dynastic period when the first pharaoh of the united Egypt, Menes diverted the flow of the Nile in the Lower Egypt in order to build a new town – Memphis in its dry bed. Hypothesis that the knowledge enabling implementation of undertakings on such a great scale came from outside is supported by the fact that the irrigation system had not been changed much during 5000 years and in principle it functioned till the 19<sup>th</sup> century, when it was modernised by French engineers.

Without any doubt to the highest achievements of the Egyptian engineering belong buildings, especially pyramids. There are a plenty of books published on this subject, but it is worthwhile to mention, that in spite of 150 years of research and of many proposed hypotheses it is still not sure what the pyramids were used for and how they were built. Constructing such gigantic buildings required an advanced knowledge which Egyptians possessed already at the beginnings of the Old Kingdom. It is probable that it came from Sumer, since a close cooperation existed between these two civilizations. We know that Imhotep, the Vizier and architect of the pharaoh Djoser from the third dynasty, who designed the step pyramid at Saqqara about 2650 BC, studied in Sumer. The accuracy of the Egyptian engineers is amazing. Alignment of the sides of the pyramid of Khufu at Giza with the north-south directions was carried out with the accuracy of 1/12 of a degree, and the angular deviation of its base was less than 1/15 of a degree. Such a precision was achieved in the West only from the mid-19th century.

Apart from engineering, medicine also achieved a very advanced level in Egypt. The centres of the medical knowledge were temples, where appropriately trained priests

worked as doctors. Egyptians had a good knowledge of the human anatomy, enabling them to perform surgical operations. Somewhere they were also aware of the existence of bacterium, because they sterilized surgical instruments and recommended drinking boiled water. They knew how to make medicines helping to cure various illnesses and they wrote prescriptions similar to the ones used in the contemporary pharmacology. Methods of contraception and obstetric techniques were also known. According to Clement of Alexandria (died 215 CE) the medical knowledge was contained in six books on: anatomy, illnesses, surgery, medicines, eye diseases and gynaecology which were based on the experience of the early Egyptian doctors. What have reached our times are unfortunately only a few papyri<sup>15</sup>.

Egyptians created the foundations of the modern calendar. The year consisted of 365 days and was divided in 12 months. However, for setting the dates of the agricultural works the solar calendar with 365.25 days, based on astronomical observation, was used. Egyptian astronomers were able to forecast eclipses of the sun and moon well in advance which therefore did not cause any panic. For the first time day was divided into twenty four hours and in order to measure time a water-clock was used, called by the Greeks clepsydrae.

In order to provide a constant supply of educated officials and priests for the country, there were many schools which were attended by boys from the age of four. The subjects taught at school were primarily reading, writing and arithmetic. Each government department had its own school attended by the children of the employees, learning the skills needed to take over their father's position. However there was no compulsion to follow a parent's profession. Future scribes learnt how to write petitions and letters to the offices and law-courts. Arithmetic was one of the most important subjects, because it was used to calculate taxes.

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<sup>15</sup> The most known are Smith, Ebers and Kahun papyri