

This article was downloaded by:[Bochkarev, N.]
On: 12 December 2007
Access Details: [subscription number 746126554]
Publisher: Taylor & Francis
Informa Ltd Registered in England and Wales Registered Number: 1072954
Registered office: Mortimer House, 37-41 Mortimer Street, London W1T 3JH, UK



Astronomical & Astrophysical Transactions

The Journal of the Eurasian Astronomical Society

Publication details, including instructions for authors and subscription information:
<http://www.informaworld.com/smpp/title~content=t713453505>

Ethno-astronomical testimonies, written and architectural, from ancient egypt: Evidence for the discovery of the solar year

A. V. Kuzmin ^a

^a The State Academy of Oil and Gas, Moscow, Russia

Online Publication Date: 01 January 1999

To cite this Article: Kuzmin, A. V. (1999) 'Ethno-astronomical testimonies, written and architectural, from ancient egypt: Evidence for the discovery of the solar year', *Astronomical & Astrophysical Transactions*, 17:6, 515 - 527

To link to this article: DOI: 10.1080/10556799908244113

URL: <http://dx.doi.org/10.1080/10556799908244113>

PLEASE SCROLL DOWN FOR ARTICLE

Full terms and conditions of use: <http://www.informaworld.com/terms-and-conditions-of-access.pdf>

This article maybe used for research, teaching and private study purposes. Any substantial or systematic reproduction, re-distribution, re-selling, loan or sub-licensing, systematic supply or distribution in any form to anyone is expressly forbidden.

The publisher does not give any warranty express or implied or make any representation that the contents will be complete or accurate or up to date. The accuracy of any instructions, formulae and drug doses should be independently verified with primary sources. The publisher shall not be liable for any loss, actions, claims, proceedings, demand or costs or damages whatsoever or howsoever caused arising directly or indirectly in connection with or arising out of the use of this material.

ETHNO-ASTRONOMICAL TESTIMONIES, WRITTEN AND ARCHITECTURAL, FROM ANCIENT EGYPT: EVIDENCE FOR THE DISCOVERY OF THE SOLAR YEAR

A. V. KUZMIN

The State Academy of Oil and Gas, Moscow, Russia

(Received August 15, 1998)

Egyptologists of the 20th Century often consider the reign of King Akhenaton as being the most mysterious period in the whole history of Egypt. The historico-astronomical approach allows us to look at this as well as many related mysteries of ancient history in quite a different way.

KEY WORDS Akhenaton's heliolatrous revolution, ancient Egypt, astronomy, calendar reform, solar year, Sothis (Sirius), Sphinx

1 INTRODUCTION

Among the well-known achievements of Egyptian culture there was, beyond all doubt, the introduction of the solar calendar with a year containing 365 days. Its main purpose was to help in planning the seasonal works with the complex irrigative system which were to be finished just before the Nile's yearly overflow, always coming at the same time of the year – near the day of the summer solstice. The question was how to determine this date beforehand so as to be up with all the preliminary works; the knowledge might influence the life of a whole nation.

So the Egyptian priests created a solar calendar with the purpose of coping with these fundamental questions. But how long ago was it introduced in Egypt? There is no direct evidence concerning the date of this truly revolutionary event. We can nevertheless solve the historical puzzle if we complement the historical facts with those provided by an astronomical study.

2 THE SOTHIC PERIOD

We know that ancient Egyptians distinguished the star Sirius (which they called Sothis) and glorified it as a true sign of both the New Year and the Nile flow (Van

der Vaerden, 1974; Nikolov and Kharlampiyev, 1986; Britannica CD, 1997). They also used to offer it prayers in the hope of gaining a favourable beginning of the year. A widely known inscription dated to the times of the 1st Dynasty (about 3000 years BC) reads, 'Sothis the Great shines in the skies, and the Nile comes out from its springs'.

The yearly overflow of the River Nile was the most prominent event in Egyptian life, and the best means to foretell its beginning was watching the night skies. The brilliant star Sothis gave a true sign of the coming flood by its *heliacal rise*.

What does the term mean? It means that after some months' period of absence in the night sky (because during the spring time the star used to ascend *after* sunrise and was therefore invisible in daylight), by the time of the summer solstice, for the first time Sothis the Great ascended *just before* sunrise and was clearly seen as a large beautiful star. Astronomers call it 'the heliacal rise' of Sirius.

As regards the Egyptian state calendar, it was quite another thing. The Egyptian year counted 365 days, i.e. twelve months having 30 days each, plus 5 additional days at the end of the year. The first four months were named '*the Months of Flood*', the next four '*the Months of Growth*' or '*of Grain*', and the last four '*the Months of Crops*' (Van der Vaerden, 1974; Nikolov and Kharlampiyev, 1986; Britannica CD, 1997). Judging by these names one may think that each month has a fixed position in the yearly cycle, but this was not so in reality. In fact the year in Egypt was a wandering one, because it counted 365 days, while an astronomical year has 365 1/4 days; so every four years the Egyptian New Year came approximately one day earlier than the previous one. As a result the starting point of an Egyptian year moves in succession, through all the seasons, forming a so-called '*wandering year*' (Van der Vaerden, 1974; Gurshtein, 1996).

The names of the three seasons give us clear evidence that the Egyptian year was agricultural in origin and that its conventional division primarily corresponded with the natural seasons of a year under the peculiar conditions of Egyptian land burnt by the hot African sun and fertilized by the life-giving waters of the Nile. The Nile flood initially marked the beginning of a new agricultural year, and a most prominent sign was seen in the first morning rise of Sirius which always tended to precede the flood by a certain number of days. (Due to the phenomenon of precession the heliacal rise of Sirius is no longer a presage of the Nile flood in the present day, but, as some astronomers put it, it tended to be so in the period dating from six to five thousand years ago (Idelson, 1976; Gurshtein, 1996).)

So the Sothic heliacal rise continued to be a reliable basis for the agricultural calendar while the official 365-day calendar tended to wander around the year. Sooner or later this tendency must have been noticed by both the priests and the governmental officials, but they still used the wandering year for centuries. The most likely reason is that the calendar system with months and years of equal length was highly convenient for all economic and administrative purposes except for agriculture and other seasonal works. For that reason the official 365-day calendar came along with a sacral Sothic calendar conjoined with yearly ceremonies and prayers aimed to urge the Holy Star to bring the Nile flood in time and provide the people with a good crop.

Many centuries passed till the time when Egypt was conquered by the Roman emperor Augustus who in 26 BC introduced a modified type of Egyptian calendar in which every fourth year had not five, but six additional days, while months remained of equal length. This so-called 'Alexandrian calendar' existed along with the old 365-day calendar for some centuries, and it has survived till the present day among Copts and Ethiopians. It is known that Ptolemy (2nd century AD) who preferred the simpler 365-day calendar in his astronomical calculations, also mentioned in some of his works the Alexandrian calendar as 'more common among us nowadays' (Van der Vaerden, 1974).

The length of an Alexandrian year being equal to a Julian year (365 1/4 days on average) is very much (but not exactly) the same as a tropical year, and, moreover, corresponds closely with the Sothic year, too. One may easily draw a correlation:

$$1460 \text{ Alexandrian (= Julian) years} = 1461 \text{ Egyptian years.} \quad (1)$$

Knowing this proportion between the two calendars, as well as the fact of the concurrence of the heliacal rise of Sirius with the beginning of an Egyptian state year (the 1st of Thoth month, the first month of the Egyptian year), Theon of Alexandria (IV century AD) estimated that the previous years of this rare concurrence were the years 1322, 2782, and 4242 BC, because due to equation (1), in every 1461 Egyptian years the two different calendars would meet in their starting points – the heliacal rise of Sirius came together with the 1st of Thoth.

This rare phenomenon admittedly would not slip the attention of watchful Egyptian priests, Custodians of Time.

3 THE HELIACAL RISE OF SOTHIS AND A NEW LOOK AT CERTAIN EVENTS IN ANCIENT EGYPTIAN HISTORY

Pharaoh Akhenaton (or Amenhotep IV) reigned in Egypt in the XIV century BC. He was known mainly by his attempt to replace multiple Egyptian cults by a monotheistic cult of Aton, God of the visible Sun (Bray and Trump, 1990; Jacques, 1992; etc).

Very soon after his accession to the throne Amenhotep IV added to his name the title 'the Only One for Ra', or in other words 'Unique for the Sun'. It became the favourite Pharaoh's name since his second regnal year (Bongard-Levin, 1988, 1989). In the same year his residence in Thebes acquired a new name 'the Castle of Triumph (or maybe, of the Triumphant?) in the Dome of Heaven', and a year later the Pharaoh added an even more uncommon title to his name – 'the One Long by Age' (Bongard-Levin, 1988). A Pharaoh in Egypt personified the Sun on Earth. Could 'the long by age' mean a beginning of a new long calendar period, or cycle, and could it be in some way connected with observation and/or recognition of this long cosmic period, binding together the greatest 'King', the Sun, and the holy star Sothis, devoted to the supreme goddess Isis? For we cannot ignore the coincidence of two facts: (a) a very near connection of the morning rise of Sirius

with the day of the Egyptian New Year and (b) the radical reforms launched by the 'sun-worshipper' or the 'heliolatrous' King Akhenaton (Gurshtein, 1996).

4 THE SPHINX AND THE DISCOVERY OF THE SOLAR YEAR

The third important fact is the following: at the very end of the 28th century BC, just about the date of concurrence of the Sothis year and the Egyptian state calendar, 2782 BC or, maybe, some 50 or 70 years later, the Egyptians started building the Great Pyramids and the Sphinx. It is remarkable that the three Great Pyramids were erected over the span of one century by three kings of Dynasty IV, Khufu, Khafre and Menkaure, and the first known pyramid, the burial vault of Pharaoh Djoser of Dynasty III, was built only 80 years earlier. (I owe this major confrontation of historical facts to A. Gurshtein, 1996.)

According to Ch. Jacques (1992), the Sphinx was erected in the reign of Pharaoh Khafre (Chephren) and thus bears his face. Most contemporary historical writings determine the date of creation of the Pyramids and the Sphinx as about 2800 BC (Bickerman, 1968, Bongard-Levin, 1988; Gurshtein, 1996), in accordance with the dating of Dynasty IV from 2723 to 2563 years BC as established by Bickerman (1968). This corresponds very closely with the date under discussion. No earlier mentions of the Sphinx were ever registered in any inscriptions of the Old Kingdom (Bickerman, 1968). This fact may mean either that it was the actual date of creation of the Sphinx or otherwise that its name was sanctified and forbidden to be mentioned anywhere.

We may put another question here. Is not the Sphinx itself a certain kind of hieroglyph, a symbol of great significance, whose meaning is still beyond our understanding: we meet pyramidal forms in many ancient cultures, while the Sphinx is a symbol of Egyptian origin (see Britannica CD: Sphinx, 1997).

Most egyptologists consider that the Sphinx was built more or less simultaneously with Khafre's Pyramid, but some argue that it may be older than the Pyramids (Jacques, 1992). This assumption brings the date of its construction very close to the key date of 2782 BC. Why could not therefore this monstrous sculpture have been deliberately intended to embody the major astronomical discovery made by priests, a discovery binding together three different natural events: the first morning rise of Sothis, the Sun's position in the summer solstice, and the abundant, life-giving flood of the Holy Nile, coming nearly at the same time every year and forming a reliable base for creating a solar calendar, the first in ancient history? It was, in fact, the first notice of time's cyclicity, and of the possibility to measure time by recurrent earthly and heavenly events. The Sphinx in this case might symbolize an important historical event – the establishment of the sun year, associated in that time with the Sothic Year and with the beginning of a new agricultural season necessarily accompanied by a pompous festival with urgent prayers for a good crop of grain; and the sculpture's enormous size may only support the significance of such a rare historical event.

Distinct signs of water erosion on the stone body of the Sphinx (under the hot desert climate!) may bear witness to numerous ritual water-pouring ceremonies in honour of annual Nile floods, which brought fertility to the earth and life to the people. The ceremony might even precede the flood, being a sort of magic rite, having much in common with ritual sprinkling of blessed water, performed by Christian clergymen on the most solemn occasions.

The Sphinx, a lion with a human head, is located south-east of the Great Pyramid. Its face is turned to the east, toward the rising sun. Its head is covered with a ritual head-dress named a 'khaft'. The figure is 20 metres high and 57 metres long. The Greek name 'Sphinx' is likely to have come from Egyptian words 'Shepes Ankh' which meant 'living image' (Jacques, 1992). Another interpretation of the Sphinx's name is 'the Gatekeeper of the Sun' (Gurshtein, 1996).

Later, in the times of the New Kingdom, when the Sphinx was born for the second time (see Section 5) Egyptians identified it with the god Harmachis, whose name meant 'Horus in the Horizon'. The course of dramatic events connected with the Sphinx's returning from a vast period of 'non-existence' is worth a separate story.

5 THE RETURN OF THE GREAT SPHINX: FIRST STEPS OF REFORM OR A TRIBUTE TO TRADITION?

Not long before the 'sun-worshipper' Akhenaton's birth a very special event happened in Egypt. During the reign of Pharaoh Thutmose IV (about 1400 years BC) there was performed, maybe for the first time in the history of mankind, a large-scale restoration of a historical monument, that is, extraction of the Sphinx from the sand in which it had been buried for centuries.

The fact is that in times of decline, which happened more than once in the history of Egypt, the Great Sphinx had partly deteriorated and was covered up with the sands of the desert until Pharaoh Thutmose IV of the XVIII Dynasty (New Kingdom) – or, maybe, the all-knowing Egyptian priests – decided to free it from the sand and to restore its original splendour. Most remarkable of all was the fact that all this took place only some decades before the next turn of the 1460-year Sothic period, the year when both calendars returned to their initial points.

Certainly, a difficult question arose for priests in that period: should they preserve the 'wandering' calendar for a next one-and-a-half thousand year period, or carry in a correction to the official calendar to stop its lasting journey through the seasons of the year? We know that by that time the priests-astronomers, conducting continuous observation of the sky, were able to measure the precise length of the year (Van der Vaerden, 1974; Lauer, 1948; Britannica CD: Solar Year), as well as being ready to make a very important discovery of the ecliptic drift against the 'fixed' constellations (Gurshtein, 1994); so they were informed enough to bring about a calendar reform. But they did not, for it meant breaking an ancient tradition, consecrated by time; such an unworthy deed was truly incredible on the part of the priesthood, whose power, to a great extent, was itself a tribute to the

unprecedented traditionalism of Egyptian culture. The problem of preserving the calendar system unchanged was of such great meaning in Egypt that during many centuries a new pharaoh acceding to the throne was obliged to take an oath to make no attempts at changing the course of calendar dates (Nikolov and Kharlampiyev, 1986).

The very idea of giving a second life to the monumental figure of the Sphinx in the anticipation of the Great Day of the Egyptian calendar should in the most substantial way demonstrate the firmness of tradition and the great respect to the memories of the past. Again, after many centuries had passed, the phrase 'Sothis the Great shines in the sky, and the Nile comes out of its springs' fully regained its special meaning.

One may of course suspect that it was not Pharaoh Thutmose himself but the sage priests who had the blissful idea of freeing the Sphinx from the sand as a 'living image', a symbol of eternal traditions. The action was nevertheless designed in such a way as if it was all due to the Pharaoh's prophetic dream in which the Sphinx talked to him and asked to free it from the sand in exchange for a long and happy reign. The plan appears clear and logically comprehensive: to present the Pharaoh as a conductor of the gods' will a means to justify the expensive and laborious project. Probably the priests were thus clearing the way for even more extraordinary and novel decisions; if it was really so, what then obstructed their plans?

By the logic of things, the more elderly and wise a Pharaoh was, the better he would be to fulfil his role in accomplishing the reforms. The King of Ancient Egypt was considered to become much closer to the gods and to their heavenly will after he had celebrated the thirty-year jubilee of his enthronement. (This date is astronomical by origin, as we shall see later.) But it so happened that Thutmose IV did not remain long on the throne. He died fairly young, having conducted several victorious military campaigns and leaving an obelisk of his name in the Karnak Temple unfinished, it remained unfinished for 35 years after his death. Judging by the dates of inscriptions, the 8th year of his reign (about 1400–1402 BC) was his last year among the living.

His inheritor Amenhotep III, on the contrary, succeeded to rule for a long time: 1402–1364 BC (Bray and Trump, 1990), or else 1390–1353 BC (Britannica CD: Egypt: History: Amenhotep III). During that period the New Kingdom of Egypt is known to have reached the climax of its power. The years of his reign were peaceful and prosperous, and marked by an enormous range of temple building never equalled either before or afterwards. The building activity was conducted in different parts of Egypt itself, in Ethiopia and Syria–Palestine as well (Bongard-Levin, 1988; Britannica CD: Amenhotep III, 1997), but the main cult objects were built in Thebes in the name of the supreme state god Amon, whose glory, to the mind of ancient Egyptians, contributed to the glory of Thebes and of the whole Egyptian Kingdom. Amenhotep III added one more pylon to the Amon's Temple in Karnak, and built nearby a temple dedicated to Amon's spouse Mut. On the south end of Thebes the magnificent temple of South Amon was built – the famous Luxor Temple, a perfect work of Egyptian architects. It was planned like a single passage through

an imposing open court with colonnades of lotus-capitelled columns, then through a large hypostyle hall to Amon's shrine, hidden in the depth of the building. The temple has many chambers designed for various purposes; on the walls of one of them there was depicted a series of scenes of 'miraculous birth' of Amenhotep III from Queen Mutemuya (Mut-Ma-Wa) and the supreme god Amon, who had accepted the image of Thutmose IV (Bongard-Levin, 1988): here again we encounter an episode in which Thutmose IV personified the Sun god Amon-Ra.

A great number of massive stone figures of a ram, a sacred animal dedicated to Amon-Ra, were put on both sides of a flagstoned road leading from one sanctuary to another. The ram is a distinct solar symbol proving that Egypt was already on its way from the Taurus period to the Aries period as determined by attaching the point of the Sun in the vernal equinox to certain reference constellations (Gurshtein, 1994–1997). In earlier times the same role of guards of the road leading to a sanctuary would have been played by sphinxes. Does the lion torso of a sphinx correspond to Leo, another reference constellation of the Taurus period? Nevertheless the Sphinx as a sacred image and a symbol of royal authority was still in usage: a sculptural portrait of King Amenhotep III in the traditional 'sphinx' form is kept in the State Hermitage Museum in St. Petersburg, Russia.

Deification of pharaohs has a long history in Ancient Egypt; but probably only Amenhotep III put the deification of himself on such a large scale. He was treated like a living god. The colossal statues of the King were put in the open places so that common people could come and offer them prayers (Britannica CD: Amenhotep III, 1997).

There is one more peculiarity about Amenhotep III. Not a single king before identified himself with equal persistency with a 'visible sun'. Moreover, he often emphasized his relation to the goddess of truth, Ma'at, daughter of Amon-Ra, a female deity who was believed to be a source of right and justice on the earth. Three of five royal names of Amenhotep were devoted to her: 'The One Shining in Truth', 'The One Who Establishes the Laws', and 'The Sun, Father of Truth'. He also took care of building a separate sanctuary of Ma'at near the main temple of Thebes.

Amenhotep III's 30th anniversary on the throne was celebrated with pomp. A special palace was built for the purpose, a 'House of Triumph' in the south-western end of Thebes. We consider the tradition to celebrate 30th anniversaries of pharaohs' reign to be in a way connected with the full cycle of Saturn, the most remote of the planets visible to the naked eye. This natural cycle might seem very important to priests-astronomers, who were permanently studying the sky.

The years of Amenhotep III's reign formed a stable and relatively calm period. No radical reforms took place in Egypt during the 63 year long period, although some of the facts mentioned above indicate a hidden turmoil among the priesthood. Probably they (at least a part of them) thought over a calendar reform, but the matter was too complicated and they were unable to come to a final decision; or they might be waiting for a more appropriate time for such a decision to be carried out.

The royal dynastic name Amenhotep, as most egyptologists agree, means 'Amon is contented' and indicates the close connection of the dynasty with worship of

Amon, the supreme deity of Thebes. In that time Thebes was one of the main political, scientific and cultural centres not only in Egypt, but in the whole ancient world. The kings' residence had been placed there since the XI Dynasty (21st century BC). The largest temple devoted to the worship of the official state cult of Amon-Ra was located in Thebes. Near to the city of the living, a huge necropolis was found. Beginning from King Amenhotep I, the pyramidal form of the royal tomb was abandoned in favour of a rock-cut tomb, and, except for Akhenaton, all subsequent New Kingdom rulers were buried in concealed tombs in the famous Valley of the Kings in western Thebes. Separated from the tombs, royal mortuary temples were erected at the edge of the desert (Britannica CD: Egypt: The New Kingdom).

After the death of Amenhotep III his son Amenhotep IV succeeded him on the throne. Soon afterwards most extraordinary events took place in Egypt, their meaning remaining a puzzle till the present day.

6 AKHENATON'S HETERODOXY: WHAT DOES IT REALLY MEAN?

The Chronology of Ancient Egypt is still unsettled in many respects, with no exception for the New Kingdom history; so we cannot point out a precise date of Amenhotep IV's accession to the throne. The date varies in different literary sources: 1367 BC (Bray and Trump, 1990), or 1364 BC (Jacques, 1992), or ultimately 1353 BC (Britannica CD, 1997). To note, the latter source is the most recent one; most dates in Egyptian history tend to turn 'younger' in more recent studies, as a rule. However, a well established fact is that his reign lasted for nearly 18 years. (One should remember that the 'Great Year' when the two calendars 'came together in one point' was 1322 BC). On his fifth regnal year the young Pharaoh changed his royal name to Akhenaton ('The One Useful to Aton'), thus tearing all the bonds with his ancestors' faith. By that time the 'new truth' of Aton's worship was already announced to Egyptian society and several temples to the new supreme god were erected in a short time in Thebes near the Karnak Temple. Aton, presented as 'the solar disk', or the 'visible sun' in its most refined form, was declared not merely 'supreme', but 'the only god', and the Pharaoh himself the god's only son and 'high priest'. The portrait pictures of Akhenaton, his wife Nefertiti and his six daughters, and the sun disk Aton, placed above them, gradually took the place of traditional images of gods and goddesses on temple walls and columns. Amon's and other gods' names were erased from many older monuments throughout the land, including even the texts containing the name of the King's father Amenhotep III, and his own former name as well. It was forbidden to utter the word 'gods' in plural form under pain of death. As worship of former gods was forbidden to the priesthood, temples were closed all over the country, the cult of Amon being persecuted most of all; no wonder that Amon's priests, losing their enormous authority, felt great discontent, even those who themselves were longing for reforms. So the greater part of the priesthood formed a natural opposition to the new King, and pretending submission, in the depth of their souls were awaiting revenge.

The King forced the priests and the people to worship, besides Aton, himself and his wife, like living gods (the latter fact was not yet unusual for Egyptians, who had a long history of deification of their supreme rulers). He also moved his residence from Thebes more than 200 miles north to the desert place of Amarna, where he built a new city, named Akhetaton ('The Horizon of Aton') comprising all that was necessary for luxurious life of the royal family and that of the high officials, and for performance of the new cult, which demanded large open spaces rather than temples in a habitual sense. On moving to this new splendid city, he took an oath not to return to his former capital up to the end of his life.

The heliolatrous revolution performed by Akhenaton meant a total, even a polar change of the whole mythological system. It was a forceful attempt to reverse a many thousands of years' tradition and replace the Egyptian pantheon of anthropomorphic deities with a strictly monotheistic religion, characterized by a worship of the only god Aton depicted as a solar disk without any human features except multiple rays ending in little human-like hands. The hands meant an immense solar power shed upon the King and his family. This specific kind of monotheistic reform seems a separate and unprecedented event in the ancient world, and therefore Pharaoh Akhenaton is considered the most enigmatic and controversial figure in Egyptian history.

Akhenaton's reign and reforms have been a permanent source of wonder for many generations of historians. But was it all truly as sudden and groundless as it seems?

A study of historical facts persuades us that if not the reform itself, then at least some elements of it were present in the two previous reigns. In this connection it would be of use to turn our attention once more to the above-mentioned Luxor Temple, built on the demand of Amenhotep III. In a special chamber dedicated to the 'miraculous birth' of Amenhotep III, a series of pictures was found on the wall. First, the supreme god Amon impregnates the Queen of Egypt; then Khnum, a ram-headed god, forms the future King's body together with his 'Ka' (a kind of spiritual body) using a potter's wheel; then male and female deities assist the Queen in delivery; then the goddess Khathore nurtures the baby; and, finally, the young King is acceding the throne.

Reliefs carved on a colonnade depict the celebration of a New Year, with ceremonial boats proceeding from Karnak to Luxor. A hieroglyphic inscription reads that the final goal of the New Year festival is to renew the divine force which supports the World Order (Jacques, 1992). What kind of world order is meant there? Was it an usual New Year festival or not? Cannot all this mean, together with restoration of the Great Sphinx and the building of the magnificent Amon's temple, the largest and the most beautiful in Thebes, that the whole Egyptian state, and above all the priesthood and Kings, were waiting for the next Great Year, when the two calendars would meet in their initial points?

In this case the ram-headed god Khnum and the New Year festival depicted on the wall join together in a meaningful symbol. The ram symbolized the reference constellation determined for that epoch (Gurshtein, 1991–1996). The most significant New Year was the one combined with the beginning of a new Sothic period,

a critical point on the axis of time, which was expected to give Egyptian people a new start in future, or a 'renewal of the World Order'. One may easily reckon that a hundred years before the Great Year the Sothic morning rise fell approximately on the 10th day of the 12th month of the year (the last month of the Egyptian calendar, Messory, was dedicated to the Sun, as well as the first month, Thoth, to the Moon). It was close enough to the 1st day of Thoth to cause the thoughtful priests to shiver at the notion that they were approaching the doors of Eternity.

This anxious expectation might awake in the priesthood and King a sharp sense of responsibility. It was their duty to conciliate the mighty gods and provide the nation one more safe and fortunate period of time, one more piece of eternity. In their opinion, the calendar was a sacred item, completely depending on the gods; and according to the nature of the solar calendar their activity was greatly influenced by solar motifs. Thutmose sought to win the favour of the sun god Horns, or Harmakhis ('Horus in the Horizon', closely associated with the rising sun); Amenhotep III strengthened the Egyptian economy and built grandiose temples and statues in the name of Amon-Ra, the 'king of the gods' and the patron of kings; and Akhenaton's heliolatry brought forth the most abstract notion of sun god, having no personal traits.

The sun worship of King Akhenaton was a joyful, positive cult, free of any mythological or magical content. He asked people to praise the sun itself for the light and warmth it gives, for being the source of life for all that lives and moves and breathes on earth.

The King addressed a beautiful hymn to his god. Aton, says the hymn, gave these blessings not only to the Egyptians but also to 'Syria and Nubia, and to all distant foreign countries', to 'all men, cattle, and wild beasts; to the lion coming from his den, the fish in the river, and the chick within the egg'; 'men live when the sun has risen, but at night the dark land is as if dead'. This hymn is often compared with Psalm 104 in the Bible, in which God is praised for His kindness to each living thing (Britannica CD: Akhenaton, 1997).

Speaking of the succession between Amenhotep IV and his ancestors, there is a fact worth a separate mention. Akhenaton did not create a new god, the term Aton had long been in use before, but under Thutmose IV Aton, the solar disk, had been more frequently referred to as a god, and under Amenhotep III those references became even more frequent (Britannica CD: Egypt: The New Kingdom: Amenhotep IV). So we see a certain tendency, expressed most vividly in the 'heliolatrous' King Akhenaton.

Besides the specific conditions connected with the solar calendar and the Sothic period we have already spoken about, maybe political affairs also contributed to the necessity of changes in the religious cult. Due to Thutmose III's victorious wars, Egypt became, in a certain sense, a world power, including now Nubia to the south, Palestine, Syria and part of Mesopotamia to the north. Now this world power needed a world (or universal) religion. The Sun as an object of worship could become a really universal deity, absolutely free of national limitation.

But besides being a conductor of an already existing tendency, Akhenaton became more active after some years of his reign, and brought in rather non-

sympathetic features to the ideology of sun-worship: his monotheism turned out to be repressive, hostile to any foreign elements. Together with the first attempt in world history of a strictly monotheistic faith a religious intolerance arose, which, as S. Freud stated, is a frequent companion to a single-god religion (Freud, 1939).

Since Akhenaton's monotheism was obviously a premature attempt, not meeting sufficient support in the wider community, and mostly because of massive opposition of traditionalist priesthood, the monotheistic cult of Aton did not last for long. Akhenaton died either in 1351 BC (Bray and Trump, 1990), or in 1347 BC (Jacques, 1992), or in 1336 BC (Britannica CD: Akhenaton). His successor Smenhkare reigned for only two years, and the next in turn, Pharaoh Tutankhaten (Tutankhaton), beginning his reign as a 9 year old boy in about 1332 year BC (Britannica CD, 1977), on his third regnal year moved his capital to Memphis, abandoned the Aton cult, changed his and the Queen's names to Tutankhamen and Ankhesenamun, thus emphasizing his acceptance of Amon worship, and returned the Amon priests to their temples. The period of 'Amarna heresy' was over.

7 TRADITION FULLY REGAINED

Tutankhamon, who died young, was succeeded by Ay, who in turn was succeeded on the throne by General Horemheb. Pharaoh Horemheb (who ruled from 1319 to 1292 BC, according to Britannica, 1997) continued the restoration of the old religious system in Egypt. He destroyed many monuments erected by Akhenaton and his successors and used the blocks as fill for huge pylons at Karnak. He is considered the first king of XIX Dynasty.

Seti I (he ruled 1290–79 BC), who became a Pharaoh after the very short reign of Ramses I, was a successful military leader who reasserted authority over Egypt's weakened empire in the Near East. He also restored a large number of monuments that had been defaced in the Amarna period, and the refined decoration of his monuments, particularly his temple at Abydos, shows a return to classicism. So, under these Pharaohs, the former religious and cultural traditions were fully restored.

One may notice that the period of restoration (Tutankhamon–Ay–Horemheb–Seti I) adjoins closely to the very important year 1322 BC. The insufficient exactitude of Egyptian chronology does not allow us to attach the Great Year more definitely to one of these reigns; but the tendency appears clear enough. As was cited above, the momentary return of the calendar system to its initial point undoubtedly reassumed the traditional values and 'revived the world order'. It looks as if the enormous psychological tension which had dominated the priests' and king mentality during the short, but dramatic 'Amarna period' had now gradually eased and everything was put in order in all senses. The priesthood returning to their temples succeeded to 'mollify' the gods, so that both Amon-Ra and merciful Sothis confirmed the 'prophecy' announced by the priests in an opportune moment: the 'heavenly order' proved its eternal stability, and all was brought home.

There was one more reign which corresponds well with this hypothesis: Seti's son Ramses II, whose reign (1279–1213 BC) was the second longest in Egyptian history. In addition to his wars with the Hittites and Libyans, he is known for

his extensive building programmes and for the many colossal statues of him found all over Egypt. The reign of Ramses II formed the last peak of Egypt's imperial power, and he is known in history as Ramses the Great. He ordered the erection of a large pylon in front of the Amon temple in Luxor (the temple built by Amenhotep III), and beside it two obelisks and six colossal statues of himself. An inscription engraved on them lets us know that the colosses were dedicated to Amon and to Ra-Harakhte (Ra-Horus-of-the-Horizon).

It is known that the first public act of Ramses after his accession to sole rule was to visit Thebes, the southern capital, for the great religious festival of Opet (Egyptian name of the New Year), when the god Amon of Karnak made a state visit in his ceremonial barque to the temple of Luxor (Britannica CD: Egypt: Ramses II). It is also notorious that this mighty ruler appropriated many monuments and inscriptions of his famous ancestor Amenhotep III, putting cartouches with his own name and the name of his spouse Nefertary in place of the names of Amenhotep III and Queen Tiy. (Jacques, 1992; Britannica CD, 1997). This mode of royal behaviour may serve as evidence of his high esteem of this great King whom he wanted to equal in fame (in which aspiration he succeeded, too). From the same source (Britannica CD, 1977) one may know that the Luxor colonnade created by Tutankhamon bears detailed reliefs of the traditional beautiful festival of Opet, which was celebrated very solemnly under his rule, and that the young king 'affirmed his legitimacy by referring back to Amenhotep III, whom he called his father'. According to the dating used in Britannica (1977), we should be inclined to attach the year of the calendar 'turnover' (1322 BC) to Pharaoh Ey's reign; but if we assume the dating of Bray and Trump (1990) or of Jacques (1992), it will have happened in the time of Horemheb (1333–1306 BC), which equally well corresponds with this latter Pharaoh's image as depicted above.

Thus the sequence of Kings of this disturbed and complicated historical period is completed. It becomes clear that sun-worship was continuously refined and perfected during this time span; and even the queer and paradoxical course of Amenhotep IV's reforms becomes comprehensible in this perspective. It was the same desire to praise the beneficent, life-giving Sun in the anticipation of a critical phase, a turning point of the solar calendar whose divine origin was 'obvious' to all Egyptians according to their general mystical world-outlook, but additionally tinted with specific colours of a rather eccentric King's personality. He must have been really scared by a crucial trial 'threatening' to either the sacred calendar or the Sun itself in the near future. His exaggerated religious fervour may be partly due to this supposed 'danger'. And the 'happy end' of this historical drama is illuminated by the heavenly light of regained Amon.

Acknowledgements

This article appeared owing to collaboration with Alexander A. Gurshtein, who proposed both the idea of stadial development of the twelve-sign zodiac and a novel conception of chronology of the ancient world (see References, Gurshtein A. A.,

1991–1997). This study was planned as an application of the above-mentioned conception to Egyptian chronology and the meaning of reforms conducted by Amenhotep IV. I am very grateful to Prof. A. Gurshtein for his kindly rendering me some necessary material and information, without which this work would have never been done.

I am very much obliged to Valentin A. Yureviteh and Mikhail A. Chegodayev for an extremely useful discussion, respectively, of astronomical and historico-archaeological aspects of this work, and to Anna V. Spirova who helped me to prepare the English version of the article.

References

- Bickerman, E. (1968) *Chronology of the Ancient World* Cornell Univ, Ithaca.
- Bongard-Levin, G. M., Ed. (1988) *History of the Ancient East: Origin of the Early Class Societies and First Centuries of Slavery Civilization. Part 2* Nauka, Moscow (in Russian).
- Bongard-Levin, G. M., Ed. (1989) *Ancient Civilizations* Mysl, Moscow (in Russian).
- Bray, W. and Trump, D. (1990) *Dictionary of Archaeology* Progress Publishers, Moscow (Russian transl.).
- Britannica CD (1997) Encyclopaedia Britannica, Inc.
- Fagan, C. (1951) *Zodiacs Old and New*, London.
- Fagan, C. (1962) *The Symbolism of the Constellations*, London.
- Freud, S. (1939) *Moses and Monotheism*, London. (Russian transl.: Nauka, Moscow, 1993).
- Gurshtein, A. A. (1991a) *Civilizations of the Past in the Mirror of the Zodiac Priroda*, No. 10, 57–71 (in Russian).
- Gurshtein, A. A. (1991b) *The Sky Was Divided into Constellations in the Stone Age Priroda*, No. 10, 69–71 (in Russian).
- Gurshtein, A. A. (1992) *Reconstruction of the Zodiacal Constellations' origin*. In: *Advances in Exploring the Universe (Historico-Astronomical studies)* Nauka, Moscow, 19–63 (in Russian).
- Gurshtein, A. A. (1993) *Vistas in Astron.* 36, 171–190.
- Gurshtein, A. A. (1994) *Dokl. Akad. Nauk* 337, No 6, 741–744 (in Russian), (Eng. transl.: *Physics-Doklady* 39, No 8, 575–578).
- Gurshtein, A. A. (1935a) *Vistas in Astron.* 39, 347–362.
- Gurshtein, A. A. (1995b) *Sky & Telescope*, October, 28–33.
- Gurshtein, A. A. (1996) *Dokl. Akad. Nauk* 348, No 3, 331–335 (in Russian), (Eng. transl.: *Physics-Doklady*, 1996 41, No 5, 228–232).
- Gurshtein, A. A. (1997a) *Sky & Telescope*, June, 46–50.
- Gurshtein, A. A. (1997b) *Amer. Sci.* 85, May–June, 264–273.
- Idelson, N. I. (1976) *Etudes on Sky Mechanics* Nauka, Moscow (in Russian).
- Jacques, C. (1992) *Egypt of the Great Pharaohs* Nauka, Moscow (Russian transl.).
- Jenkins, N. (1986) *The Barque Beneath the Pyramid (Royal Barque of Cheops)* Nauka, Moscow (Russian transl.).
- Lauer, J.-Ph. (1948) *The Problems of Egyptian Pyramids* (in French), (Russian transl.; Nauka, Moscow, 1966).
- Nikolov, N. and Kharlampiyev, V. (1986) *Astronomers of the Ancient World* Nauka i Izkustvo, Sofia (in Bulgarian), (Russian transl.: Mir, Moscow, 1991).
- Van der Vaerden, B. (1974) *Science Awakening: The Birth of Astronomy* Leiden, Netherlands, (Russian transl.: Moscow, 1990).