

Astronomical and Spiritual Function of Hatshepsut Temple in the Lunar-solar Synchronism

Función astronómica y espiritual del templo de Hatshepsut en el sincronismo solar-lunar

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[This article offers evidence to demonstrate certain new, unpublished aspects of the Egyptian Temple of Queen Hatshepsut, in Deir el-Bahari, Luxor (fifteenth century B.C.): A) The number and the disposition of the doors of the building symbolize the synchronism of the lunar and the solar Egyptian calendars. B) The representations on the walls, at the three terraces of the temple, generally interpreted as historical events from the queen's life, also correspond to pairs of unpublished nocturnal and diurnal versions of the *Books of the Afterlife*. The representations relate the northern half to night and to the lunar year, and the southern half to daylight and to the solar year. C) In parallel to its main function as a funerary site, the temple was deliberately designed as an astronomical instrument for the observation of solstices and equinoxes, which allowed determination of the length of the solar year.]

Key words: Hatshepsut, Deir el-Bahari, Funerary Temple, Egyptian Calendars.

[Cet article offre assez d'évidences pour démontrer les nouveaux aspects, non publiés, du temple égyptien de la reine Hatshepsut, à Deir el-Bahari, Luxor (XV B.C.): A) Le numéro et la disposition des portes du bâtiment symbolisent le synchronisme des calendriers, lunaire et solaire, égyptiens. B) Les représentations des murs, dans les trois terrasses du temple, qui ont été généralement interprétées en tant que des événements historiques concernant la vie de la reine, correspondent aussi à une paire de versions nocturnes et diurnes, inédites, des *Books of the Afterlife*. Ces représentations rattachent la partie nord de la nuit à l'année lunaire, et la partie sud du jour à l'année solaire. C) De façon simultanée à la fonction funéraire du temple, ce bâtiment fut désigné, de façon délibérée, comme un instrument astrologique pour observer les solstices et les équinoxes, ce qui permet de déterminer la durée de l'année solaire.]

Mots clés: Hatshepsut, Deir el-Bahari, Temple funéraire, Calendriers égyptiens.

1. Introduction

Probably the similarity between the ancient Egyptian terms¹ *seba* 'star' ⲥⲁ and *seba* 'door' ⲥⲁⲛ is not fortuitous, bearing in mind that both are very linked in the *Books of the Afterlife*, that describe the trip of the Sun across twelve doors of the nocturnal hours. The groups of stars named decans, whose

1. Gardiner, *Egyptian Grammar* (3rd ed.), Oxford, 1988, 487: N14, 496: O32.

course was used in the ancient Egypt to determine the hours of the night, are represented in the *Books of the Afterlife* as guardians of each one of twelve doors.²

My study offers evidences on the association of doors and stars in the Temple of the Queen Hatshepsut, at Deir el-Bahari, in Luxor, and documents to demonstrate the following points of my hypothesis:

A) The number and the disposition of the doors of the building symbolize the lunar-solar synchronism.

B) The representations of the walls, at the three terraces of the temple, usually interpreted as historical events of the queen's life, are also two unpublished versions from the *Books of the Afterlife*. There is a *Book of the Night* in the northern wing and a *Book of the Day* in the southern wing of the building. The representations of the northern half relate it to the night, as well as to the lunar year. The representations of the southern half relate it to the daylight, and to the solar year.

C) The temple is an excellent astronomical instrument for the observation of solstices and equinoxes, which allows determining the accurate length of the solar year. Certainly, the temple had a main funerary function. But, simultaneously, the building was a tool for astronomical observation, deliberately designed as such, given the well documented interest of his architect, Senenmut, in that field.

2. Hatshepsut funerary temple, a symbol of the lunar-solar synchronism

Hatshepsut funerary temple has a central body with two groups of symmetrical 12-gate 3 terraces, in the North and South of the axis of the building. According to my interpretation, they represent the 3-decan 12 months of the lunar and of the civil years, respectively. Each wing of the temple has 36 gates, which represent to 36 decans. Every door symbolizes a decan and a 10-day Egyptian week, for every group evokes 360 days.

The 5 epagomenal days, which were added to the Egyptian 360-day civil year, are symbolized at the northern 5-door Anubis chapel and at the southern 5-door Hathor chapel, which were appended to the central body at the middle terrace of the building.

The 12-gate 3 terraces are also linked to the 12 hours of the night and of the day, arranged in a similar way they appear depicted in many *Books of the Afterlife*, as 12-door 3 registers.

In the South of the main court of the temple,³ there is a model to indicate which one of the two symmetrical wings of the building might have corresponded to the hours of the night, and lunar years, and to the hours of the day, and solar years. In the so-called Hatshepsut offerings room, a representation shows the queen sailing in the solar boat between the hours of the day, on the South, and the hours of the night, on the North. In order to verify the pattern offered by the owner of the temple and her architect, the analysis of the representation at the walls of the three terraces of the building is essential. The images, which have been generally understood as historical events of the queen's life, are also connected to the episodes of the funerary *Books of the Afterlife*, according to my interpretation.

3. The gates of Hatshepsut temple, a version of the funerary Book of the Gates

2. Three snakes before the doors in Hornung, *The Ancient Egyptian Books of the Afterlife*, Ithaca, 1999, 58, 67-76; snakes as the symbol of the decans in Greek temples in Egypt, Parker, *The Calendars of Ancient Egypt*, Chicago, 1950, 54 ff; plate IV; Wells, "Re and the calendars", in *Revolutions in time*, (Spalinger ed.), San Antonio, Texas, 1994, 1-38, connects the guardians of the gates and the decans.

3. Naville, *The Temple of Deir el Bahari* (7 vols.), London, 1895-1908, IV, 9 ff.

The purpose of the most ancient *Pyramid Texts*, of the later *Coffin Texts*, and of the *Book of the Dead*, was to protect the deceased from inimical beings and other dangers of the hereafter by means of magical spells that allowed him to obtain the knowledge to answer to different questions, as well as to transform himself in several deities, aiming to succeed at the judgment of the dead, and to be able to join the cyclical course of the sun.⁴

That was also the intention of the New Kingdom *Books of the Netherworld*, which evolved into illustrated topographical guides of the afterlife. The main subject was the transit of the deceased, while joining the trip of the sun during the 12 hours of the night, inside the body of the sky-goddess Nut, in order to overcome the judgment of the dead, as well as different dangers, to demonstrate the appropriate spiritual level to be reborn at dawn and to remain united to the everlasting solar curse.⁵

The vignettes of the books *Amduat*, the *Spell of the Twelve Caves*, *The Book of Gates*, *The Enigmatic Book of the Netherworld*, *The Book of Caverns*, *The Book of the Earth*, thoroughly describe the nocturnal path of the sun and the catharsis of the deceased, alluding to the hours of the night.

Despite so many nocturnal descriptions of the solar journey, there are few illustrations of the diurnal path of the sun the deceased reached after his rebirth at the sunrise, once he was eternally linked to the solar orbit. Champollion suggested the possibility that two types of books together could indicate certain intention to allude to the nocturnal and diurnal trip of the sun, Re, and therefore, of the deceased, in several tombs.⁶ But that intention only seems evident later, in the so-called *Books of the Sky*, so frequent in the Remesside tombs. Two different types of *Books of the Sky* were often represented on the ceilings of the chambers, with a double figure of Nut, symmetrically placed, back-to-back, supporting herself with her hands on the ground. In one of them, the *Book of the Night*, the ram-headed sun enters Nut's mouth, in the West horizon, during the evening, and travels inside her celestial body to the place where he is born every morning. In the *Book of the Day*, the journey of the hawk-headed sun moves from the legs of the goddess, in the East horizon, towards her mouth.

In my opinion, the previously commented image of Hatshepsut travelling as the sun along the nocturnal and diurnal hours, at the so-called enclosure of offerings, in the South of the main court of the temple,⁷ is a precursor shortened representation of the funerary double compositions that allude to both nocturnal and diurnal aspects of Re's journey.

Most of the *Books of the Afterlife* describe the 12 hours of the night as 12 gates, very often divided into 3 registers. The solar barque appears in the middle one. The upper row treats general celestial events,⁸ while the punishment of the enemies is usually depicted at the lower one. There is an obvious similarity between the arrangement of 12 hours in 12-gate 3 registers of the *Books of the Afterlife*, and in 12-gate 3 terraces of Hatshepsut temple, whose three-dimensional levels illustrate the idea of the upper, middle and lower realms, more precisely than the two-dimensional interpretation of the funerary drawings.

Four arguments allow relating the double 36-gate sets of Hatshepsut temple to nocturnal hours, at the northern wing, and to diurnal hours, at the southern wing: A) As commented by Hornung, traditionally the left side belongs to the sun god and the right to Osiris in the texts of The Litany of Re.⁹ B) In the already

4. Hornung, *op. cit.* (ref. 2).

5. Hornung, *op. cit.* (ref. 2).

6. Hornung, *op. cit.* (ref. 2) 56.

7. Naville, *op. cit.* (ref. 3), IV, 9 ff.

8. Hornung, *op. cit.* (ref. 2) 32.

9. Hornung, *op. cit.* (ref. 2) 139.

commented room of offerings at the upper court of her temple, Hatshepsut pattern shows the queen entering the hours of the night, in the North, and leaving behind the hours of the day, in the South. C) On the same representation of Hatshepsut sailing, the text near the third hour of the night allude to the falcon, associated with the sun-god, in the South, and to the ibis, the symbol of the moon-god, in the North 'Hatshepsut is a falcon in the southern sky and an ibis in the northern sky'.¹⁰ D) The double 5-door set of the temple that I related to the 5 epagomenal days of the Egyptian civil year, corresponds to the lunar god, Anubis, in the North, and to the 'Re's solar eye' Hathor, in the South.

Considering the aforementioned arguments that allow the relation of the North wing of the temple to the night and the moon, and the South wing to the day and the sun, I aim to compare the scenes that appear in the walls of the three northern terraces with the representations of the nocturnal trip of the sun and the catharsis of the royal deceased in the Books of the Afterlife, and the depictions at the three southern terraces with a diurnal journey of the sun, Hatshepsut, after her renaissance and rebirth at the sunrise, in a kind of original version of Book of the Day of the Afterlife:

Both the middle northern terrace and the central register of the Books of the Afterlife contain the main mentions of the catharsis and spiritual renewal of the deceased, linked to the travel of the sun by the 12 hours of the night and to his rebirth from the sky-goddess' body at dawn.¹¹ Both the lower northern terrace and the inferior register of the Books of the Afterlife, allude to the enemies' punishment. Both the upper northern terrace and the upper funerary texts register, point to general celestial events.¹²

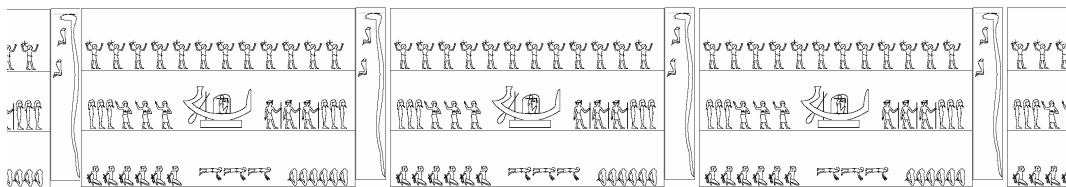


Figure I: Archetypal 3-register doors, similar to some 12-gate *Books of the Afterlife*, such as *The Book of Gates* (For real representations, Hornung, *op. cit.* (ref. 2))

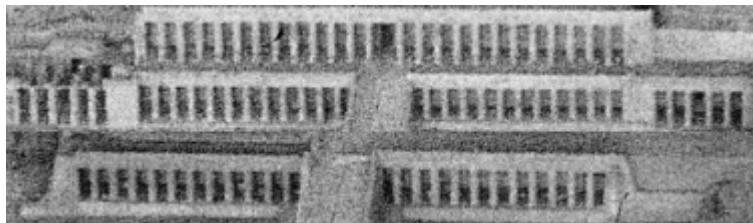


Figure II: Twofold 3-level 12 gates and 5-door chapels of Hatshepsut Temple

10. Naville, *op. cit.* (ref. 3) IV, 11.

11. Fig. I.

12. The general pattern of *Amduat*, which also appears in many *Books of the Afterlife*, according to Hornung, *op. cit.* (ref. 2) 32, 63, 64, 84, 86, 87, 99, 110-111, 126-130 fig. 48-50, 61-62, 73-77.

3.1 *The central register of the Books of the Afterlife and the central terrace of the northern wing of the temple*

The central register of the Books of the Afterlife contains the course of the solar boat by the doors of the 12 hours of the night, related to the aspiration of the deceased in joining Re's trip for his spiritual regeneration and renaissance, assimilated at the sunrise. I think that the travel by 12 gates could also represent the itinerary of the dead and of the sun through the 12-month year, considering the following reasons. Some Coffin Texts offer information on the annual position of the decanal constellations,¹³ with the intention of guiding the dead in the netherworld, which means that, probably, he expected to spend one year traversing the body of the goddess of the Sky. As well, probably the 3 guardians of the 12 gates, in the Books of the Netherworld, represent decans, as Wells indicated.¹⁴

They total 36, the number of the annual decanal constellations. Possibly, the 3 guardians of the 12 gates of the afterlife developed into the 36 decans of the year that appear in the *Books of the Sky*,¹⁵ a new group of books, without doors or guardians, but with the same or very similar motifs that the *Books of the Netherworld*. Also, the funerary Book of Traversing the Eternity offered to the dead the annual cycle of religious festivals, during the Roman Period, following perhaps a text of the Ptolemaic Period, although Hornung argues that it described the return of the deceased into the realm of the living.¹⁶

My interpretation agrees with an interesting suggestion of Wells.¹⁷ He says that although the birth of Re legend talks about the passage of the sun through Nut's body, swallowed by the goddess in the western horizon, at night, to be born in the eastern horizon every day, it is possible that the annual solar cycle is also described, meaning the sun's periodical roundtrip in Egypt, between the most northern and southern sunrises, during summer and winter solstices, respectively. The author observes that the Milky Way has the classical form of goddess Nut's depictions, with her bend body resting on her hands and feet, touching the western and eastern horizons, respectively. Following the author, during the night of the spring equinox, the visible part of the Milky Way looks like Nut's head with her open mouth next to the place of the sunset. Then, 272 days later, in the morning of the winter solstice, the sun seems to come out of Nut's belly from the part of the Milky Way that resembles her legs, the day the Egyptians called 'Re's birthday'. According to Wells, probably the Egyptians become aware of the fact that 272 days correspond both to the time between the spring equinox and the winter solstice as well as to the period of woman pregnancy.

The central terrace of the northern wing of the temple offers the depiction of Hatshepsut's conception by her mother and the god Amon, as well as the details of the pregnancy and birth process, included on the allegory of the theogamy, which is thought points to legitimize the queen's royal succession.¹⁸ I agree with that interpretation, but I simultaneously accept the Altenmüller's¹⁹ association of this representations to the so-called 'bed scenes', which the author explains as a symbol of the renewal of the deceased. In my opinion, the depiction makes a double reference to the physical birth and to the

13. Neugebauer & Parker, *Egyptian astronomical texts* (3 vols.), London, 1960-1969, 97-100.

14. Wells, *op. cit.* (ref. 2) 10; Three snakes before the doors in Hornung, *op. cit.* (ref. 2) 58, 67-76; snakes as the symbol of the decans in Greek temples in Egypt, Parker, *op. cit.* (ref. 2) 54 ff., plate IV.

15. Hornung, *op. cit.* (ref. 2) 26, 112.

16. Hornung, *op. cit.* (ref. 2) 151, 152.

17. Wells, *op. cit.* (ref. 2) 4 ff.

18. Naville, *op. cit.* (ref. 3) II, 12 ff; Ratié, *La reine Hatchepsout. Sources et problèmes*, Leiden, 1979, 94; Desroches Noblecourt, *Hatshepsut, la reina misteriosa*, Barcelona, 2004, 187 ff.

19. Altenmüller, "Auferstehungsritual und Geburtsmythos", *Studien zur Altägyptischen Kultur*, 24 (1997) 1-21.

spiritual rebirth of the queen, i.e. to her everlasting renaissance. In fact, the third hour of the *Book of the Night* contains very similar patterns on the birth process on a bed and offering the child to god.²⁰

In agreement with Altenmüller's view, my interpretation is that both the images of the central terrace of the funerary building and of the central register of the *Books of the Afterlife* are related to the rebirth of the deceased linked to Re's daily sunrise and to the cyclical beginning of the year. Hatshepsut, inside her pregnant mother, is compared to the sun inside Nut's body. Both the sun and the queen are born from the maternal womb at the sunrise, in similar funerary contexts, the 12-gate central register of the *Books of the Afterlife* and the 12-gate central terrace of Hatshepsut temple.

The parallelism between both funerary depictions offers a new key to interpret the previously doubtful meaning of certain images of the central terrace:

A) At the lower end of the central terrace, the formerly obscure presence of a ram-headed god and Anubis rolling a disc corresponds, according to my interpretation, to the final elements of the *Books of the Afterlife*, where the ram-headed Re's rebirth is announced by means of a disc, ready to the sunrise, or by a scarab.²¹ The disc followed by the ram-headed Re appears at the *Book of Caverns*.²² The nocturnal ram-headed Re is often crowned with a solar disc.²³ The solar disc, followed by the nocturnal ram-headed Re, is ready to be born at Hatshepsut temple from the lunar netherworld, the realm of Anubis, the god rolling the disc at the lower end of the central terrace of the building.

B) The scenes at the same central row which describe the trip of the queen and her father to the North to visit several gods,²⁴ after she was born, have been explained as a real travel during Hatshepsut's life by several authors.²⁵ However, she is not represented as a living queen on the image in front of Amon, because she is holding the Osiris sceptres, the symbols of the royal deceased.²⁶

Even if a real trip to the North perhaps happened during her lifetime, I propose a parallel reading of the depiction, given the funerary context of catharsis and solar resurrection of the building, as well as its simultaneous character of astronomical instrument for the observation of solstices and equinoxes, according to my interpretation, to be explained later in this text.

The deceased queen and her father, once renewed and after their solar rebirth at dawn, travel with the sun to the beginning of the civil year, that is to say, to the summer solstice, at the most northern sunrise in the East horizon, from the royal funerary temple, whose axis is exactly oriented to the winter solstice, at the most southern sunrise in the East horizon.

That would be the behaviour to be expected from the deceased father and daughter, since they became assimilated to the sun and to the solar cyclical progress, coinciding with my former interpretation, in agreement with Wells's approach, on the double meaning of Re's trip inside the celestial 12-door body of goddess Nut, as a journey deployed by the 12 annual months, as well as by the 12 nocturnal hours.

3.2 *The lower register of the Books of the Afterlife and the lower terrace of the northern wing of the temple*

20. Hornung, *op. cit.* (ref. 2) 126, fig. 73.

21. Hornung, *op. cit.* (ref. 2) 53, 77, 95, plates 25, 41, 52.

22. Hornung, *op. cit.* (ref. 2) 91, plate 47.

23. Hornung, *op. cit.* (ref. 2) front page.

24. Naville, *op. cit.* (ref. 3) III, 3.

25. Naville, *op. cit.* (ref. 3) III, 4 ff; Desroches Noblecourt, *op. cit.* (ref. 18) 56-60.

26. Naville, *op. cit.* (ref. 3) III, 4, plate LIX.

The lower register of the Books of the Afterlife usually contains most of the references to the punishment to the damned, to the enemies of Re, Osiris and the deceased.²⁷

The lower terrace of the northern wing of the temple shows the mythological symbols of the punishment to the enemies of Re, Osiris and the queen. Four calves step on Osiris tomb, to prevent it from being found by his enemies. In the next scene, Hatshepsut, in the form of triumphant sphinx, walks over different ethnic types of suppliant bodies and twisted members of the defeated enemies. A part of the mythological composition 'hunting with net' has remained, which is a symbol of the protection of Re and Horus against Seth and other enemies.²⁸

The figure of the hunter has disappeared but, according to Alliot's study of the allegory, usually Re's sons, Horus, Thoth or the king, handled the net to carry out this task.²⁹ Horus hunted with a net for his eye *udjat*, after it was pulled out by Seth. The allegory became the symbol of the struggle against adversaries, but also of the fight against the disorder at the universe, including the lunar-solar disagreement, since returning the eye to Re, or Horus, represented the union of the eyes, the sun and the moon, at the face of the sky-god.³⁰

As the Egyptian monarch was the god Horus, his duties included keeping the order of the universe, as well as of the celestial bodies and the synchronism of their movements. Following Alliot, this royal mission was symbolized by the composition 'hunting with net'. The allegory was very appropriately represented in this building that, according to my interpretation, is a symbol of the lunar-solar synchronism, as well as an astronomical tool to keep it. On the other hand, as Seth's netting occurred during the night, the arrangement of the picture at the northern wing of the funerary temple agrees with my identification of its nocturnal function.

3.3 *The upper register of the Books of the Afterlife and the upper terrace of the northern wing of the temple*

The upper register of the *Books of the Afterlife* is dedicated to general celestial phenomena.

The upper terrace of the northern wing of the temple offers several texts, which repeat the events depicted at the central terrace, describing the miraculous destiny of the queen, crowned by her father Amun-Re. This reiteration could indicate that the already mentioned deeds were also happening at the celestial level, and agrees with some repeated events in the central and upper registers of the *Books of the Afterlife*.

3.4 *The southern wing of the temple*

The southern wing of the temple complements the nocturnal travel of the northern wing and illustrates a diurnal journey of Hatshepsut, as a sort of original version of *Book of the Day of the Afterlife*. After the queen's renaissance at the sunrise, while linked to the cyclical movements of the celestial solar courtship, she wished for the eternal repetition of the best events of her lifetime, which are recorded at the southern terraces of the temple.

27. Hornung, *op. cit.* (ref. 2) 63, 64, 84, 86, 87, 99, 110, 111, 126-130, plates 48-50, 61, 62, 73-77.

28. Naville, *op. cit.* (ref. 3) VI, 8 ff; Desroches Noblecourt, *op. cit.* (ref. 18) 344-346.

29. On the meaning of the ritual hunting and fishing with net, Alliot, "Rites de la chasse au filet aux temples de Karnak, d'Edfu et d'Esneh", *Revue d'Égyptologie*, V (1946) 57-118; Desroches Noblecourt, "Poissons, tabous et transformations du mort", *Kemi*, 13 (1954) 33-42.

30. Hart, *A dictionary of Egyptian gods and goddesses* (14th ed.), New York, 2004, 87; According to an Egyptian hymn "the left eye has been united to the right eye and the moon comes in the fixed time, without irregularity with the celebration of each of its phases", in Herbin, 1982: 259.

According to the text near the depiction of the transportation of two obelisks,³¹ after her funerary catharsis, Hatshepsut desired to become so attached to the solar course that she calls herself Reit, that is, female sun-god, Re. As the god, she trusted to rise every day between a pair of obelisks, the traditional solar symbol, as well as to occupy her throne forever, ‘the holy offspring of her father Amon Re... her rays shine like the god of the horizons, being Reit she is brilliant like the solar disk... she raised two obelisks in granite... the rays of the sun shine between them...’

Dedicating two obelisks to Amon was one of the most enjoyable events of the queen’s life that she aimed to repeat forever. The journey to Punt was a similarly pleasant event of Hatshepsut life that she chose to ceaselessly renew after death. The travel was represented at the middle terrace of the temple, linked to the texts alluding to the queen’s worship like the sun, during her cyclical return, which is compared to the solar orbit,³² ‘they say, imploring her Majesty... lady Re, shining like the solar disk... she had no equal among all the gods who were before, she is living like Re, eternally... Amon, who loves him, for he transferred to her... the orbit of the solar disk, all that encompass Keb and Nut...’

3.5 *The northern Anubis Chapel*

The northern Anubis Chapel that was added to the central terrace is one more element to connect the North wing of the temple with the lunar aspects that the god represents.

3.6 *The southern Hathor Chapel*

The southern Hathor Chapel that was attached to the central terrace offers one more proof to validate my viewpoint on the solar character of the South wing of the building, where the goddess, ‘the solar eye of Re’ was venerated as Hatshepsut celestial mother. Some of the texts mention the daily renewal of the queen and her everlasting life, as Hathor herself, relating her condition after death,³³ ‘... thou art born and renewed every day, on the arms of thy father Amon... I have begotten the sacred cow living eternally...’

3.7 *Southern and northern enclosures*

Southern and northern enclosures of the main courtyard, at the upper level, are also linked to the northern Hatshepsut lunar catharsis, after death, and to the southern queen’s solar revival, linked to the sun.

3.7.1 *The southern enclosure*

The southern enclosure of the main courtyard is bonded to the daylight journey of the sun and to the cyclical Hatshepsut activities, during her lifetime and during her celestial revival, as well as to the solar worship of the renewed queen’s and her royal ancestors. The chapels of the compound were dedicated to venerate the god Amon, Hatshepsut and her father, Tuthmosis I, respectively.

At the chapel dedicated to her own cult, the queen appears ready to enter to the night hours to the right, the north side, and leaving the day hours to the left, the south side of the wall, like a cyclical setting and rising with the sun. Some of the texts at the walls say³⁴ ‘... offerings are made to her among you gods; the libations to Hatshepsut are of wine, as to Re. Hatshepsut goes round the sky like Re, she travels over

31. Naville, *op. cit.* (ref. 3) VI, 4-8.

32. Naville, *op. cit.* (ref. 3) III, 16-19.

33. Naville, *op. cit.* (ref. 3) IV, 2-4.

34. Naville, *op. cit.* (ref. 3) IV, 9.

the sky like Thoth... Hatshepsut was conceived in the night, she was born in the morning, and now she is among the followers of Re, the ancestors of the morning star’.

3.7.2 The northern enclosure

The northern enclosure of the main courtyard has a complex interpretation as a symbol of the nocturnal hours and of the lunar year, since it includes the so-called solar altar. There are two contradictory features at the open air courtyard of the solar altar that remain confusing for many Egyptologists. In addition to the representation of the second nocturnal hour at the entrance and the lack of allusion to the diurnal hours, surprisingly, only a partial worship of the sun-god could be carried out in this altar, since the high eastern wall of the dependence completely put out of sight the rising solar disc, Khepri, while the huge western rocky cliff of the temple entirely hides the setting sun, Atum.

Obviously, this altar would only allow worshipping the sun-god in the zenith. That is to say, the midday sun, which rays the dead Osiris was forever waiting at the afterlife, to be able to rebirth as the syncretism Osiris-Re, the corpse and the soul of the sun, respectively.³⁵

My following interpretation is based on the importance, regarding the *Books of the Afterlife*, of the episode about the Osiris’s judgment of the dead, as the prelude to make possible the deceased shearing of the perpetually repeated union of the sun’s corpse and *ba*, represented by Osiris and Re, respectively, to become ‘the United One’, ‘The Twin Souls’.³⁶ In view of the character of funerary 12-gate *Book of the Afterlife* that I attribute to the architecture and to the representations of this building, the features of the so-called solar altar enclosure make sense as the central scenery for Hatshepsut judgment, and then for the union of Re with her dead body, which was Osiris,³⁷ to be activated.

The platform at the centre of the room symbolized the podium where Osiris presided over the funerary judgment, as well as the meeting point for the identification of the god and the deceased in only one corpse, and for the fusion of them with the sun, i.e. the unification of Hatshepsut-Re dead body and soul.

At the depths of the nightly underworld, that was one of the main preliminary steps for the resurrection of the departed, linked to Re, to be operated, and so occupies a special central position at the 5th and 6th hours of the *Books of the Afterlife*.³⁸

From this point of view, the altar is in fact solar, but dedicated to the nocturnal sun, i. e. to worship the union of the solar corpse, Osiris, with the solar soul, Re.

The following interpretations on the features of the northern compound agree with my view of the central platform as osirian throne, as well as lunar-solar altar for the ‘United One’, Osiris-Re-Hatshepsut:

A) The high eastern wall of the enclosure and the huge western cliff only allow the midday sun and the midnight moon to be seen. The fusion of the midday sun, Re, with the lunar Osiris is represented at midnight in the *Books of the Afterlife*. Probably the altar had a function like the funerary false door of the tombs, for the relationship between the living and the dead, that is to say, to facilitate the union of the living sun, Re, and the dead sun, Osiris, at midnight and, maybe, at midday too.

B) The depiction of the second hour of the night, at the eastern wall, makes sense at the enclosure of a lunar-solar altar. Since the arms and legs of the sky goddess, leaning on both western and eastern horizons, respectively, represent the first and the last gates of the *Book of the Night*, the first and

35. Hornung, *op. cit.* (ref. 2) 62 ff; Hart, *op. cit.* (ref. 30) 151 ff.

36. Hornung, *op. cit.* (ref. 2) 37, 58, 62, 88, 89, plates 29, 34, 45.

37. Hart, *op. cit.* (ref. 30) 151 ff.

38. Hornung, *op. cit.* (ref. 2) 37, 58, 62, 88, 89, plates 29, 34, 45.

the last hours were never depicted.³⁹ At the entrance of the northern complex of the temple, the second hour of the night is the actual beginning of a funerary account, where the altar represents the central episodes of Osiris's judgement and Osiris-Re's union.

C) The podium resembles the Osiris's throne, depicted in the 6th midnight hour of the *Book of the Gates*,⁴⁰ both with nine stairs, which were used by the nine assistants of the god.⁴¹

D) A chapel to Anubis, the god who played an essential part at the Osiris's judgement, was included at the room of the lunar-solar altar. The controversial duplicity of Anubis chapels, here and at the middle northern terrace of the temple, makes sense in the already commented funerary context of the three-register *Books of the Afterlife*. Their upper register contains general celestial events and some of the divinities are also depicted at the central one, which is specifically dedicated to every hour.⁴² There is a similar duplicity about Hatshepsut's miraculous conception and crowning at the depictions of the central terrace and at the texts of the upper terrace.

E) In an independent chapel next to the altar, the ithyphallic figure of Amon-Re embracing the queen is similar to the representations of Osiris-Re's unification of several funerary books.⁴³ This chapel is devoted to Hatshepsut's fusion to Osiris-Amon-Re, before her spiritual resurrection linked to the sun. The duplicated Amon-Re chapel, at the southern wing of the main court, makes sense as dedicated to the already renewed sun-god Amon-Re.

F) Both sides of the door, between the lunar-solar altar and the hall with the representation of the second hour of the night, there are one and two columns, respectively. That asymmetrical arrangement is confusing for many Egyptologists.⁴⁴ At the context of funerary account on the lunar afterlife that I attribute to this enclosure, perhaps the asymmetrical columns could be connected to the events of the 3rd or the 4th hours, since they are placed between the symbols that I believe correspond to the 2nd, 5th, and 6th hours of the night. Relating to it, I can only conjecture that several groups of three figures that appear at the lower register of the 3rd hour in the *Book of the Night*⁴⁵ could have some connexion to the three columns. In fact, the figures at the *Book of the Night* contain the similar patterns, already commented, on the child birth process on a bed and offering the child to god, which I have linked to the allegory of the theogamy, represented at the middle northern terrace of the temple. Other way, as the three columns are separating the events of different hours, at both sides of a door, perhaps they could evoke the three upright snakes that appear at the gate of every hour in the *Book of the Gates*.

4. Hatshepsut funerary temple, an astronomical tool

4.1 The central body of the building

There is a double row of square pillars, outside, and 16-side columns, inside, at two of the terraces, shaping the gates of the building, in front of the engraved walls. The architect of the temple did not ignore the excellent opportunity for astronomical observation that the clear-cut shadows of the square pillars cast on the 16-side columns and walls of every terrace. On the contrary, probably the asymmetrical placing of

39. Hornung, *op. cit.* (ref. 2) 123.

40. Hornung, *op. cit.* (ref. 2) 63, 70, plates 29, 34.

41. Hart, *op. cit.* (ref. 30) 163.

42. Hornung, *op. cit.* (ref. 2) 27 ff.

43. Hornung, *op. cit.* (ref. 2) in the *Enigmatic Book of the Netherworld*, 78, 81, fig. 42; in the *Book of Caverns*, 89, plate 45; 94, plate 51; in the *Book of the Earth*, 105, plate 56; Wilkinson, *Todos los Dioses del Antiguo Egipto*, Madrid, 2003, 119.

44. Naville, *op. cit.* (ref. 3) VI, 25 suggested one column could have been removed to facilitate the entering to the enclosure.

45. Hornung, *op. cit.* (ref. 2), plate 73.

external rows of pillars and internal lines of columns, at two of the three terraces, had a deliberate aim in facilitating the observation of the shadows. Senenmut's interest on planetary and stellar cycles is evident in the astronomical depictions of his tomb, in the lunar-solar symbolism of the temple, as well as in the accurate orientation of the building to the winter solstice that Karkowski observed.⁴⁶ At the winter solstice, the first solar rays can be seen just at the centre of the western wall of the main sanctuary, at the upper courtyard.

During the dawn of the winter solstice, the shadow that every external pillar cast on the wall of the terrace entirely covers each internal column, due to the accurate orientation of the building to the most southern sunrise at the eastern horizon. From the time of the winter solstice on, the location of the sunrise slowly moves every morning at the eastern horizon towards the North, till it reaches the most northern point at the summer solstice. Then, the situation of the point where the sunrise occurs starts to come back towards the most southern point of the eastern horizon, at the winter solstice. Simultaneously, the shadows of the external pillars also advance, and then retreat, on the internal columns, which 16 sides are a good measure to calculate the degree of progress.

The temple was an excellent tool to observe the path of the sun along the year and to calculate the length of it, by registering the time the sunrise takes to come back to a determinate point at the eastern horizon,⁴⁷ in this case, to the most southern point, the winter solstice. It was also a good instrument to establish the season's fixed periods, by connecting them to solstices and equinoxes.

46. Fig. IV; Karkowski, *Queen Hatshepsut and her Temple 3500 years after* (Szafranski ed.) Warsaw, 2001; I had the opportunity to witness Karkowski's observation, while I was a member of the Polish Epigraphic Team at Hatshepsut's Temple, thanks to his kind invitation.

47. As Wells and Spalinger support, the observation of solstices and equinoxes probably was the main Egyptian method to establish the length of the year, among other techniques, such as the scrutiny of the Nile's floods and the study of averages of several number of lunar years that Neugebauer and Parker respectively suggested, as well as the register of the star Sothic's heliacal risings, generally accepted. Spalinger, "Thoth and the calendars; Under the moon of earth", in *Revolutions in time* (Spalinger ed.), San Antonio, Texas, 1994, 45-61, pp. 47, 48; Wells, *op. cit.* (ref. 2) 13, 14, the author comments on the ancient Egyptian capacity to determine the length of the year, conceiving the simple method based on the observation of solstices and equinoxes, which were also registered at Stonehenge, as described by Hoyle, Hoyle, *On Stonehenge*, San Francisco, 1977, 66.

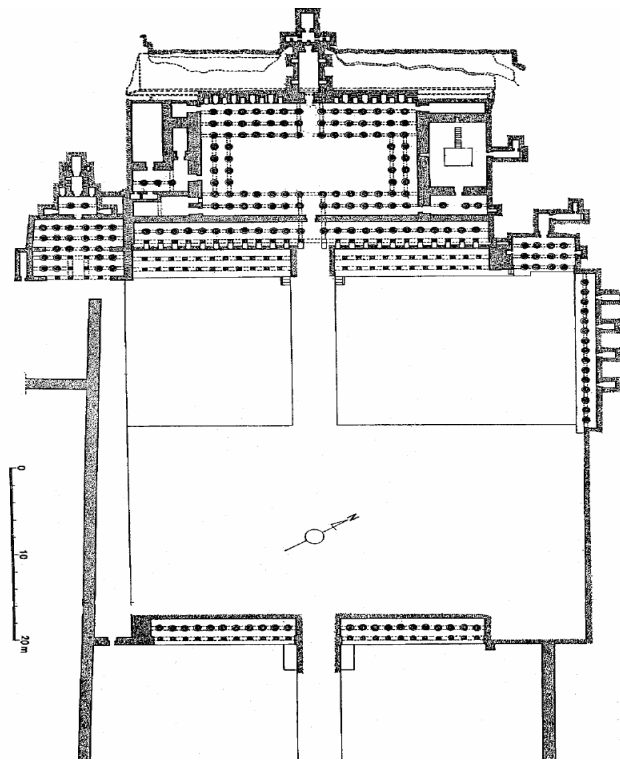


Figure III: Hatshepsut Temple plan

Wilkinson, Mariette and Naville maintained that two pedestals at the lower terrace, before the entrance of Hatshepsut temple, could have supported obelisks.⁴⁸ There is no document to confirm their suggestion, but registering the movements of the sunrise shadow of any vertical element on those platforms, such as obelisks, or Hatshepsut osirian sculptures, as the ones at the upper terrace, could serve to the observation of the solar progress along the year.

Two obelisks that the queen erected at the temple of Karnak were a superb complement for the accurate observation of the exact sunrise to determine the winter solstice. The two monoliths, in front of Hatshepsut funerary temple, were covered with electrum. Their brightness could be seen at the western shore of the river, according to the inscriptions made by the queen at one of the obelisks.⁴⁹ Along the year, as the sunrise was approaching towards the most southern point of the eastern horizon, it probably could be seen just between the two shining obelisks, at the winter solstice, from the western place of the river, where Hatshepsut temple is situated.

4.2 *The perpendicular 16-door portico*

Apart from the already commented structural components of the temple's main body, there is a perpendicular 16-door hypostyle portico at the north wing of the middle terrace that could have had both

48. Naville, *op. cit.* (ref. 3) I, 4, 10.

49. Lichtheim, *Ancient Egyptian Literature*, vol. I: *Old and Middle Kingdom*, Berkeley, Los Angeles, London, 1975, 25 ff. "She made as her monument for her father Amun... two great obelisks of hard granite of the South, their upper side being of electrum, of the best of all foreign lands. Seen on both sides of the river, their rays flood the Two Lands when Aten dawns between them, as he rises in heaven's light land".

astronomical and spiritual significance as well. As there is no symmetrical element at the southern wing of the building, the porch could evoke the intercalary month to be added to the lunar year, in every certain number of civil years, to synchronize them, since it is only appended to the northern wing, which I associate to the nights and to the lunar years.

The symbolism of the 16-gate structure seems obscure in astronomical terms, since a 30-door portico should be expected to allude to the days of the intercalary month that I suggest. As several authors have pointed out, there are reasons to think that some initial design of a longer portico, including more doors, was never finished. Naville proposed that the queen left the portico uncompleted before passing away,⁵⁰ since the porch only covers a part of the middle terrace, but a larger number of columns should be expected to reach its East edge, to be balanced. Wysocki⁵¹ observed that the last column of the portico is pressing over the ceiling of Merit Amon's tomb, which is under it. The author thinks that some initially planned longer structure was never finished to prevent it from collapsing on Merytamun's tomb.

On the other hand, perhaps a deliberately projected 16-door portico could not be discarded, due to the reiteration of that number in the following elements of the temple:

A) The 16 doors of the portico are delimited by 16-side columns and many other columns of the temple are also 16-side.

B) Hathor chapel of the temple has 16-side 16 columns. The pillars and columns of its hall also total 16. At Hathor chapel, the queen's crowning was represented in front of 16 gods.

The full moon festival was celebrated either the 15th or 16th of every lunar month, depending on its 29 or 30-day length. Additionally, according to the ancient Egyptian belief, 8 gods Heh supported the sky with both hands, which means 16 bases of the firmament.⁵² The pharaoh, as the god in charge of 'keeping the order at the universe', was the earthly representative of the 8 Heh. That was the mission that Hatshepsut aimed to accomplish by using the structure of her temple as astronomical tool, since that 'order of the universe' included the synchronism of the solar and lunar cycles.⁵³

The number 16, 4 times the 4 cardinal points, has been largely associated to spiritual beliefs, from the origins of the humankind till our time. Symbolic 16-element vegetal, geometric, zoomorphic or anthropomorphic figures appear, from ancient Egypt, Mesopotamia, Greece, Rome, China or Japan's walls, ceilings, columns or ritual ceramics, to one of the most significant buildings of today's western spirituality, the Vatican's Basilica, which has 16 segments at the dome, with religious images.

In my opinion, the architectural symbol of the intercalary lunar month could have been initially projected as a 30-gate porch, but it was never completed, to prevent it from collapsing on Merytamun's tomb. Due to that danger, the intercalary month could have been intentionally evoked by means of the actual 16-gate portico, alluding to 16 divinities and to the full-moon festival, celebrated the 15th or 16th every month, as well as to the royal mission to support the sky, like the 16 hands of the 8 gods Heh. That was Hatshepsut's task to 'keep the order at the universe', including the spiritual and scientific activities to reach lunar-solar synchronism by using the temple as funerary and astronomical instrument.

An unpublished sketch, at the wall behind one of the doors of this perpendicular portico, reminds the religious and astronomical task of the queen.⁵⁴ It offers the image of a deity, may be the queen, as a snake







50. Naville, *op. cit.* (ref. 3) VI: 14.



51. Wysocki, "The Temple of Queen Hatshepsut at Deir el Bahari: The raising of the structure in view of architectural studies", *Mitteilungen des Deutschen Archäologischen Instituts*, 48 (1992) 234-254, p. 1.

52. Gardiner, *op. cit.* (ref. 1) 449, C11; Hornung, *op. cit.* (ref. 2) 149.

53. Alliot, *op. cit.* (ref. 29) 57-118.

54. Fig. IV; I appreciate the kind permission to publish this graffito, authorized by the Director of the Polish Mission in Hatshepsut's Temple, Dr. Karkowski.

crowned with the solar disc between horns,  following the pattern of Hatshepsut cryptographic name⁵⁵ that appears at several walls of her temple. The crown name of the queen, Maat ka Re  was cryptographically represented by the cobra  symbol of the goddess Maat, standing on the  sign, corresponding to kA, with Re's solar disc  over her head .

In the 26 by 31 cm. sketch at the portico, the sign *ka* is lacking, or perhaps damaged,  under the snake,  which is standing over a confuse structure, inside an enclosure, in front of a board-game with three draughtsmen over it. The cobra is probably playing senet with an invisible opponent that is outside of the great door of the room. According to Plutarch's version of the Egyptian myth,⁵⁶ Thoth played *senet* with the moon and won a part of her nocturnal visibility, to form the five epagomenal days to be added to the civil year. In this case, Thoth's task to try lunar-solar synchronism seems to be carried out by the deified Hatshepsut.

The drawing is very different from the graffiti included at Laskowska-Kusztal's study⁵⁷ on the testimonies of medical pleads and gratitude, written by pilgrims during the Greek Period at the building, once it was reused as *sanatorium* and dedicated to Imhotep and Amenhotep-son-of-Hapu. The drawing is not unplanned, but adapted to the artistic Egyptian canon. Its author probably knew the cryptographic name of Hatshepsut. This design could be the previous sketch to some official engraving of the temple, which was interrupted when the queen passed away, or during the posthumous humiliation that so deeply affected many elements of her building. Such interpretation agrees with the reasons that Naville⁵⁸ and Wysocki⁵⁹ offer to think that the queen left a longer portico uncompleted.

55. Drioton, "Deux Cryptogrammes de Senenmout", *Annales du Service des Antiquités de l'Égypte*, 38 (1938) 237-239.

56. Plutarch, *De Iside et Osiride* (Gwyn Griffiths trans.), Swansea, 1970.

57. Laskowska-Kusztal, *Deir El-Bahari III. Le Sanctuaire Ptolémaïque de Deir el-Bahari*, Varsovia, 1984.

58. Naville, *op. cit.* (ref. 3) VI, 14.

59. Wysocki, *op. cit.* (ref. 51) 1.

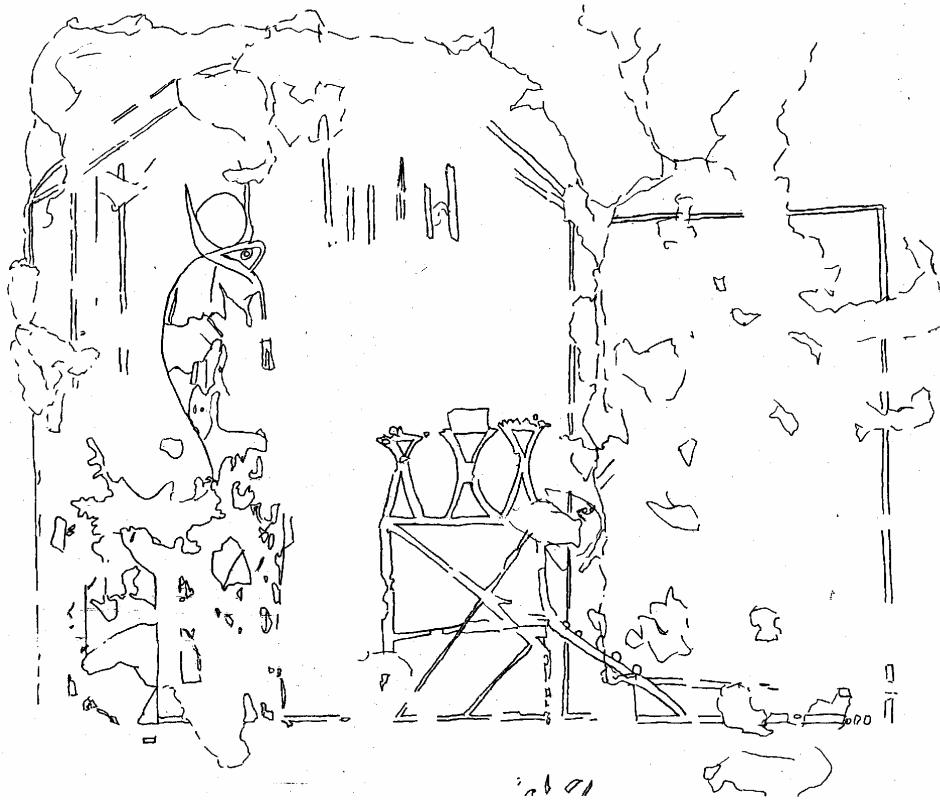


Figure IV: Sketch at the wall of the perpendicular portico

4.3 Leap year

As a last consideration, even if there is no evidence to think that the Egyptians had ever added any fraction of time to compensate the difference of roughly one day every four years, between the natural year and their 365-day civil year,⁶⁰ I can not accept that all the monarchs were able to passively accept the so-called ‘wandering year’ and the progressive divergence between the natural agricultural cycles and the three seasons, which names are linked to the Nile’s agricultural function, without trying to adjust the calendar, in such a way that the season ‘inundation’ really corresponded to the Nile’s flood, the season ‘emergence’ to the coming out of the fields from the water and ‘dryness’ to the lack of water in the fields.

There are continuous literary references to the Egyptian’s yearning for synchronism between the civil year and the natural phenomena. Their imbalance was thought to be consequence of chaotic political and spiritual circumstances. Equally, there are constant mythological allusions to the importance of recuperating Re and Horus’s loosing eye, i.e. to the ‘union of the two eyes’, the sun and the moon,⁶¹ and to

60. Parker, *op. cit.* (ref. 2) 51 ff, 54 ff; Neugebauer, *A History of ancient mathematical astronomy*, (3 vols.) Berlin, Heidelberg, New York, 1975, p. 560, as well as most of the authors.

61. Herbin, “Un Hymne à la Lune Croissante”, *Bulletin de l’Institut Français d’Archéologie Orientale*, 82 (1982) 237-282, p. 259.

the royal mission to keep the correspondence of the lunar and solar cycles at the calendar, as a part of the king's mission 'maintaining the order of the universe'.⁶²

As Hatshepsut temple offers the possibility to accurately establish the length of the natural year, by registering the exact concurrence of solstices and equinoxes, it is very difficult to believe the incompetence of Senenmut to observe that it was delayed in roughly one day every four years, after several accumulated periods, given that he was deeply acquainted with calendrical matters of his society and culture.

Perhaps some monarchs updated the conventional 365-day annual cycles by starting their kingdom, and the first day of the official calendar, at the beginning of a natural year, to be able to calm the popular confusion, due to the lack of lunar-solar synchronism. In fact, I agree with Naville's proposal⁶³ to interpret the following text, engraved at the middle northern terrace of Hatshepsut temple, as alluding to the queen's reform of the calendar: Tuthmosis I, during the crowning ceremony of her daughter, says 'In the day of the festival of her crowning, when the first day of the year and the beginning of the seasons should be united... the first day of Thoth, the beginning of the year, the beginning of the seasons, united by the queen of the Upper and Lower Egypt...'

The innovative structure of the queen's temple, a design that was never repeated, reminds the front hypostyle portico of the next Mentuhotep's funerary temple, significantly modified to be used as astronomical observatory to establish the length of the year and as a symbol of Hatshepsut and Senenmut aspiration to obtain the lunar-solar synchronism. May be such astronomical tool allowed the queen to update the official calendar by introducing some new method that was ignored later, due to the posthumous humiliation of her name and memory at the building, from Tuthmosis III and some of his successors.

If we assume that the double set of 3-level 12 gates of the temple simultaneously corresponds to the 3-register 12 doors of two funerary books, as well as to 3-decan 12 months of the lunar-solar year and that the pair of 5-gate chapels represent the 5 epagomenal days, with a possible allusion to the lunar intercalary month in the perpendicular 16-gate portico, what could symbolize a small size gate, depicted at some plans at the southern wing,⁶⁴ broking the perfect symmetry of the central body of the building? In my opinion, that asymmetrical small door could represent the difference, of roughly one day every four years, between the natural year and the Egyptian civil year.

62. Alliot, *op. cit.* (ref. 29) 57-118.

63. Naville, *op. cit.* (ref. 3) III, 7, 8.

64. Naville, *op. cit.* (ref. 3) VI, 30, plate CLXIX; Wysocki, *op. cit.* (ref. 51) 238 (26); Desroches-Noblecourt, *op. cit.* (ref. 18) 332, 333.