

## CHAPTER 6

# THE CONSTELLATIONS OF ANCIENT EGYPT

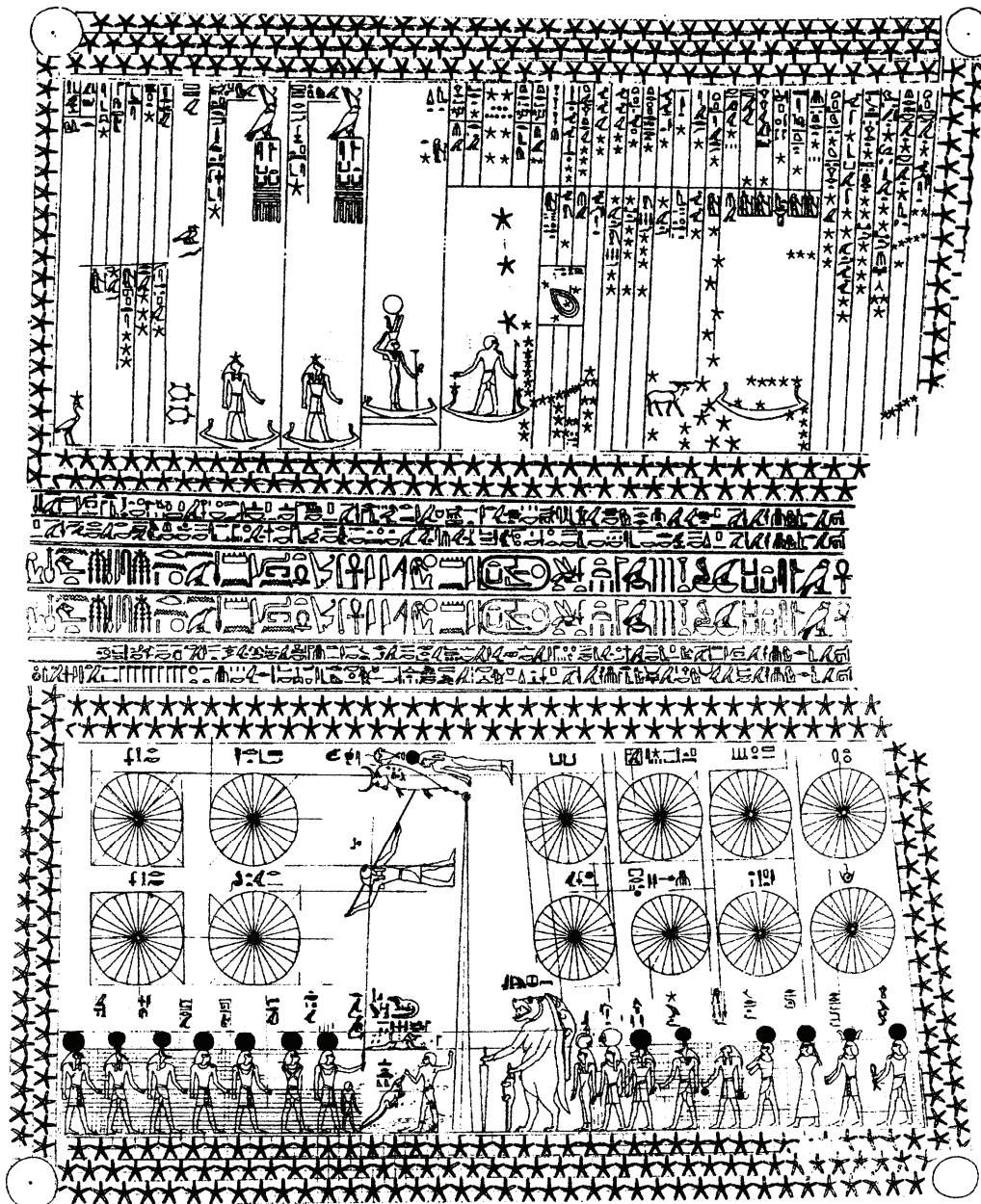
José Lull and Juan Antonio Belmonte

**Summary.** In this chapter we will study the constellations, asterisms and individual stars which populated the skies of ancient Egypt for more than three millennia. Two masterpieces of ancient Egyptian art, the astronomical ceiling of the tomb of Senenmut at Deir el Bahari in Luxor, and the circular Zodiac of the temple of Hathor at Dendara, will be used as the reference frameworks where our analyses will be outlined. By making very simple assumptions and using the information provided by the ancient Egyptian skywatchers in the decanal and Ramesside clocks, and in the celestial diagrams of the New Kingdom onwards, we will be able to uncover nearly three-quarters of the ancient Egyptian firmament. This celestial tapestry was populated by the images of animals, symbols and divinities that were most significant in understanding the Egyptian interpretation of the cosmos. Later, in the Zodiac, these constellations were amalgamated with those of the Mesopotamian (and Greek) tradition producing a collage that was to remain as the standard sky-lore during the Graeco-Roman period.

### 6.1. Introduction

The study of ancient sacred sources enables us to contend that the ancient Egyptians had a complete set of constellations covering the whole area of sky which could be seen from Egyptian latitudes. There were two dominant groups, one (probably) in the southern sky and another for northern declinations. The northern sky, as beautifully represented in some New Kingdom tomb ceilings, was full of constellations. Those took the form of a lion, a crocodile, a bull's foreleg (sometimes a complete Bull) or a female hippopotamus. The southern group was essentially formed by a belt of "constellations" known as the *decans*, individual stars or asterisms whose heliacal rising was presumably used for time-keeping, at least from the end of the Old Kingdom (c. 2200 B.C.), if not earlier, since some decanal stars or constellations, such as *s3h* (Sah) or *spdt* (Sopdet), are already mentioned in the Pyramid Texts. We know this group from the diagonal star-clocks decorating coffin lids (17 have so far come to light) of the First Intermediate Period and the Middle Kingdom, and also from later tombs and temple ceilings, including the famous Zodiac of Dendara. The system needed to be updated during the Middle Kingdom when the decanal star-clocks were presumably developed, although our only information about them comes from a later source known as the *Cosmology of Nut*, with two relevant extant copies in the cenotaph of Seti I at Abydos and in the tomb of Ramses IV (KV2).

However, in the New Kingdom (c. 1500 B.C.), the *decans* were no longer useful for time-keeping, due to the wandering nature of the civil calendar, and a new system was developed, using only the meridian (or near-meridian) transit of certain stars, belonging in some cases to huge constellations, such as the Female Hippopotamus (*rrt*) or the Giant (*nht*), and a few asterisms. These star charts have been found in the tombs of the last Ramesside pharaohs (c. 1100 B.C.; hence the name "Ramesside clocks or star-charts") in the Valley of the Kings (notably Ramses VI, VII and IX; KV9, 1 and 6, respectively), where they were painted for the benefit of the deceased king.



**Figure 6.1.** The ancient Egyptian view of the skies at the beginning of the New Kingdom, represented on the ceiling of the tomb of Queen Hatshepsut's favourite, Senenmut. This is the earliest complete representation of the Egyptian firmament reported so far (dated c. 1470 B.C.). The lower part represents the northern sky constellations in the centre of the panel, including the female Hippopotamus, the Lion or the Bull's Foreleg, surrounded by the 12 months of the civil calendar and, presumably, 15 or 16 of the gods of the moon cycle. The upper part includes the decans, starting with *tpy-<sup>c</sup> knmt* and finishing with *3st spdt* (represented as the goddess Isis-Sopdet), four planets and the so-called triangular decans. Notice also the southern constellations of Sah (represented by a man standing in a boat), the Sheep (*sit* or *srt*) and the Boat (*wi3*). It is the objective of this essay to establish reliable equivalents for these ancient constellations in the celestial vault. Adapted from Lull and Belmonte (2006).

The number and variety of documents of an astronomical character substantially increase during and after the New Kingdom. As we have mentioned, astronomical ceilings began to depict a complicated pattern, or “celestial diagram” as it is frequently called, in which lists of stars were combined with actual representations of both southern, such as Sah, Sopdet, *sit/srt* (Sit or Seret, the Sheep) or *wi3* (Wia, the Boat), and northern constellations such as *mshtyw* (Meskhetyu, the Foreleg), *m3i* (the Lion) or

ꜥnw (Anu, a falcon-head god). The best preserved, which could be considered masterpieces of Egyptian art, are those found at Thebes in the tomb of Senenmut (TT353, the oldest extant example, shown in Figure 6.1), the *Million Year Temple* of Ramses II (the Ramesseum) or the Valley of the Kings tombs of Seti I (KV17), Toutou (KV14), and again Ramses VI or Ramses IX. The clepsydra of Karnak, dated in the reign of Amenhotep III (c. 1380 B.C.) but possibly representing an older tradition, also depicts one of these singular diagrams.

After the New Kingdom, there are various useful sources for comprehending the Egyptian celestial vault. Among these, we might mention the celestial diagrams in the astronomical ceilings of the tombs of Pedamenope and of Montuemhat, in western Thebes, which date from the Late Period, and certain clepsydrae or coffins. Finally, during the Ptolemaic and Roman periods the documentation is again abundant, with new astronomical ceilings or various astronomical representations in the decorations of clepsydrae, coffins or sarcophagi.

The vast majority of these sources were diligently assembled by Otto Neugebauer and Richard Parker (hereafter N&P), two of the most respected scholars in the field of ancient Egyptian astronomy, in their remarkable *Egyptian Astronomical Texts (EAT)*. These volumes are still a basic source for any approach to the study of ancient Egyptian sky-watching. To “stand on the shoulders of these two giants” to pursue the objective of discovering the sky as viewed by ancient Egyptians has not been an easy task.

## 6.2 On the most ancient Egyptian skies

*To attempt to go further in the determination of the decans is not only of very little interest but would be necessarily imply ascribing to our texts an astronomical accuracy which they never intended to have (Neugebauer, 1969).*

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*Just as in the case of the decans, the crudeness of the underlying procedures is so great that only under severely restrictive assumptions could numerical conclusions be abstracted from the given lists. If we add the fact of obvious errors and carelessness in details in the execution of the texts as we have them, one would do best to avoid all hypothetical structures designed to identify Egyptian constellations from the analysis of the Ramesside star clocks (Neugebauer and Parker, 1964).*

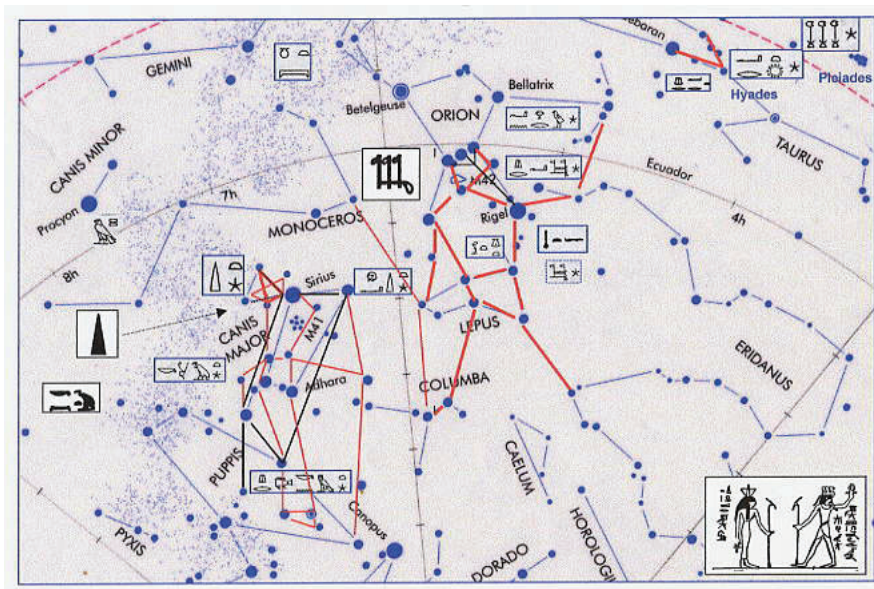
These (in our opinion) extremely unfortunate paragraphs were written by N&P in the 1960s. Despite the outstanding merits of these two investigators, their negative statements severely hindered any advance in the study of ancient Egyptian sky-lore for decades, especially when focussed on an astronomical point of view. Such advances, however, would have been highly desirable, especially because (in the words of N&P when referring to the Ramesside clocks) *this device seems to have appeared so profound and effective that it became destined to indicate the hours of night for all eternity on the ceilings of the Ramesside tombs*. Besides, the vacuum left by the null efforts of serious scholars in respect of these topics has opened up the field to cohorts on

“researchers” of the lunatic fringe, who have produced a large amount of pseudoscientific material supposedly based on serious “astronomical” data.

However, it is worth mentioning that several interesting (and some controversial) approaches to the problem have been made in the last few years, despite the explicit advice to the contrary by N&P. Even accepting that the various hypotheses should be treated warily, we believe that, given the existence today of computational facilities that were non-existent in the 1960s when those unfortunate paragraphs were penned, it may be possible to use decanal diagonal clocks and Ramesside star-charts, with the support of celestial diagrams and the necessary care, to identify at least some of the stars or asterisms included in these diagrams, and their respective constellations. The same approach could be argued for the Zodiac of Dendara.


This chapter aims to demonstrate that such an experiment is worthwhile. The authors, José Lull, an Egyptologist and amateur astronomer, and Juan Antonio Belmonte, an astrophysicist working in archaeoastronomy and a student of Egyptology, decided to prepare an earlier version of this essay and to continue with the study when they found that their hypotheses, although independently obtained from completely different experiments, neither having knowledge of the other’s work, suggested many common solutions and several points of approximation.

The authors have presented the details of their complete astronomical and iconographical approaches for sky location of this stellar-lore, and of the resulting hypotheses, in earlier works and we refer the interested reader to those publications. However, we concentrate here only on those identifications where our results are either completely coincident, or a consensus could be reached, or even where one of us accepted the other’s hypothesis, adapting or rejecting his own ideas. We also discuss certain less important points on which our opinions are clearly divergent. A summary of these can be found in Tables 6.1 and 6.2, respectively.




**Figure 6.2.** Image depicting the region of the sky from the Pleiades to Canopus where some of the most important ancient Egyptian constellations and asterisms have been identified. Note the correlation between Sah and the southern region of Orion. A Middle Kingdom representation of both Sah and Sopdet is presented for comparison in the bottom-right corner of the figure. Adapted from Belmonte (2002).

### 6.2.1. *The constellations of the northern skies*

As to the so-called northern constellations represented in astronomical ceilings and various coffins, both authors agree that  *mshtyw*, the Bull's Foreleg or Meskhetyu, ought to be identified with the asterism of the Plough, as already established in the 19<sup>th</sup> century by Le Page Renouf. This equivalence is accepted by most scholars, together with Sopdet as Sirius, or Sah as substantial parts of Orion (see Figure 6.2). However, on some occasions, this constellation is represented by a complete Bull or a foreleg with an attached bull's head. In such special cases, it might be extended to nearby areas of our constellation Ursa Major.

The representation of this constellation in the celestial diagram of Senenmut (see Fig. 6.1) is somewhat peculiar. In this case, three stars are represented in a row emanating from a very schematic representation of a bull. The last of these stars is coloured in red and encircled by a red ring. A long sharp object, in the form of an isosceles triangle, has its apex exactly on this red star, and this will be discussed later. We agree about the importance that ancient Egyptians would have placed on this particular star. Our proposal is that the star in question is Alkaid ( $\eta$ UMa), in agreement with other scholars such as Locher or Leitz. This star could have been used as a reference to establish the axes of several temples, such as that of Dendara, where Alkaid would presumably be the star mentioned in the hieroglyphic texts of the temple of Hathor as the *3h* of Meskhetyu; the celestial object at which the pharaoh was looking when stretching the cord in the foundation rituals. However, it is worth mentioning that we cannot fully dismiss Krupp's proposal that the *3h* was not a special star of this constellation but rather a special configuration of the stellar group in the celestial vault. This could be the moment when, after Alkaid had risen, the complete asterism would again be visible after being partially hidden below the horizon. Both situations are in fact indistinguishable from an astronomical point of view. However, we are almost convinced that other identifications such as Mizar, as proposed by Pogo, Muscida, as recently proposed by Etz, or, alternatively, Isler's suggestion that this encircled red dot is actually the sun, are wrong.

There is another northern constellation, common in celestial diagrams, which is difficult to identify because it is scarcely mentioned in any other type of astronomically related document. The constellation concerned is  *srkt*, the scorpion goddess Serket or Selkis, which is always located close to Meskhetyu. This lack of information is translated in as many presumable locations in the sky as the scholars who have tried to identify it: Beigel with minor stars of Ursa Major, Chatley in Coma Berenices, Davis in Virgo or Etz in the stars of Draco, including Thuban ( $\alpha$ Dra), the pole star during the Old Kingdom. Unfortunately, we must also stress our own lack of concurrence since Lull finds Selkis in Ursa Minor and Draco, with Polaris as her head, the Pointers as her hands and the body extending well into 14- $\eta$  and 12- $\iota$  Draconis, whilst Belmonte agrees with Davies and sees Selkis as represented by a sector of the Virgo constellation. There is, however, a point on which we do agree: we propose that the star mentioned in the Ramesside star-charts as *l3-nfr*, or the Beautiful Boy, ought to be identified with Spica ( $\alpha$ Vir). Curiously, as shown in Figure 6.3, this star may be represented twice in the Zodiac of Dendara, where it would appear as a wheatear in the hands of Virgo, presumably representing alien influences, and as a child in the hands of a goddess, located below the Virgin, perhaps following a local tradition. We will come back to this point in the last section of this chapter.

**Table 6.1.** Highly probable identifications of ancient Egyptian stars, asterisms or constellations, in approximately decreasing right ascension starting with Sopdet. For every star-group, the table presents its name in hieroglyphs and the transliteration, its name in English and the proposed identification with modern constellations and stars. The degree of coincidence between the authors is expressed in the first column (T: Total agreement; C: Close agreement; L: Lull's hypothesis accepted by Belmonte with a few doubts; B: Belmonte's hypothesis accepted by Lull with a few doubts).

|   |    | Constellation         | Translation                     | Identification                                      |
|---|---|-----------------------|---------------------------------|---|
| T |    | <i>spdt</i>           | Triangle                        | Sirius & its companions                             |
| T |    | <i>s3h</i>            | Sah                             | Parts of Orion. Head at the Belt (see Fig. 1)       |
| T |    | <i>ꜥrt</i>            | Jaw                             | Hyades Cluster, with Aldebaran                      |
| T |    | <i>h3w</i>            | Myriad or Flock                 | The Pleiades Cluster                                |
| C |    | <i>ꜥd</i>             | The Circle or Sheepfold         | Head of Cetus                                       |
| C |    | <i>sb3 n sꜥr</i>      | Star of fire                    | Capella   |
| T |    | <i>3pd</i>            | The Bird                        | Triangulum & Perseus                                |
| C |    | <i>ꜥryt</i>           | (The 2) Jaw(s)                  | Cassiopeia  |
| C |   | <i>nht</i>            | The Giant                       | From Aquila to the Square of Pegasus                |
| L |  | <i>tms n hntt</i>     | The Red One of the Prow         | Antares   |
| L |  | <i>srt</i>            | The Sheep or Goat               | Capricornus, perhaps extending to the area of Grus  |
| L |  | <i>wi3</i>            | The Boat                        | Sagittarius   |
| T |  | <i>sb3w ꜥs3w</i>      | Many Stars                      | Coma Berenices                                      |
| T |  | <i>rrt (3st d3mt)</i> | The Female Hippopotamus         | Big area near the Pole covering from Lyra to Bootes |
| C |  |                       | Crocodile on back of <i>rrt</i> | Area of Serpens Caput                               |
| C |  | <i>ꜥ nfr</i>          | Beautiful Child                 | Spica   |
| C |  | <i>mnit</i>           | Mooring Post                    | Area of Bootes, including Arcturus (see Table 6.2)  |
| T |  | <i>mshtyw</i>         | The Bull's Foreleg              | The Plough  |
| C |  | <i>3n(w)</i>          | Anu, an avatar of Horus         | From Lynx to Canes Venatici                         |
| C |  | <i>ipds</i>           | Its Own Count or Bright Star    | βCen (Hadar)  |
| C |  | <i>sbšsn</i>          | Sage's Star                     | αCen (Rigel Kent or Toliman)                        |
| C |  | <i>wš3ty bk3ty</i>    | Twins and Two Ladies            | Southern Cross                                      |
| C |  | <i>d3t</i>            | The Ferryboat                   | Area of Argo Navis.                                 |
| T |  | <i>hꜥp rdwy</i>       | Lying on His Feet               | Hydra   |
| T |  | <i>m3i</i>            | The (Divine) Lion               | Leo   |

|   |  |                    |                              |                            |
|---|--|--------------------|------------------------------|----------------------------|
| C |  | <i>hkw n sꜥk</i>   | The Plunderer                | Leo Minor                  |
| B |  | <i>sb3w nw mw</i>  | Stars of Water               | The Praesepe Cluster (M44) |
| B |  | <i>tpy-ꜥ sb3wy</i> | Predecessor of the Two Stars | Alhena, in Gemini          |
| B |  | <i>sb3wy</i>       | Pair of Stars                | Castor and Pollux          |
| L |  | <i>štwy</i>        | The Two Tortoises            | Procyon and Gomeisa        |
| C |  | <i>knmt</i>        | Cow?                         | Canis Major & Puppis       |
| C |  | <i>nwt</i>         | The Goddess Nut              | The Milky Way              |

**Table 6.2.** Identification of ancient Egyptian stars and asterisms where the agreement between the authors was not possible. For each constellation, the table presents its name in hieroglyphic, the transcription and the English name. The last two columns illustrate the disagreement between the authors on the proposed identification with modern constellations or stars.

| ★ | Constellation                         | Lull   | Belmonte   |
|---|---------------------------------------|--|--|
|   | Standing man of celestial diagram     | Gemini   | It may be identical to the Giant   |
|   | Triangular shape of celestial diagram | An astronomical instrument similar to a gnomon     | The constellation <i>mnit</i> of Ramesside clocks  |
|   | <i>mnitwy</i>                         | One of them is the <i>mnit</i> of Ramesside clocks | The posts held by the Hippopotamus. In Ursa Minor and Draco. They might represent the Celestial and Ecliptic Poles |
|   | The Mooring Posts                     |  | Virgo  |
|   | <i>srkt</i>                           | Ursa Minor   |  |
|   | Selkis Goddess                        |  |  |
|   | <i>kdtly</i>                          | Between Sgr and Sco                                | One of them might be Corona Australis  |
|   | The 2 Nets                            | CrA could be one of them                           |  |
|   | <i>hnwy</i>                           | Region of λ Sco                                    | αSgr & βSgr  |
|   | 2 Khanuwy Fishes                      |  |  |
|   | <i>tm3t</i>                           | In Corvus and Crater                               | In the area of Argo Navis  |
|   | The Wings                             |  |  |
|   | <i>3hwy</i>                           | Scheat and Markab, in the Square of Pegasus        | Faint Stars in the Area of Sculptor or Pisces  |
|   | The Two Spirits                       |  |  |
|   | <i>b3wy</i>                           | Alferatz and Algenib, in the Square of Pegasus     | Two stars in Cetus   |
|   | The Two Souls                         |  |  |

There is another important constellation in the celestial diagram which is frequently related to Meskhetyu: *nw*, Anu, a falcon headed god with a long spear harpooning the figure of the bull. According to Wainwright, this could represent Cygnus, although this view has been frequently questioned because of the large angular separation between Cygnus and the Plough. As in the case of Selkis, disagreements are common, and Anu has been located in the area of Ursa Major and Coma Berenices, in Ursa Minor or at the head of Ursa Major by Biegel, Davies and Locher, respectively. However, in this case, we have arrived at similar solutions. We agree that Anu ought to be found in a large area to the south of the Plough, including parts of Canes Venatici, Ursa Major and Linx, with Cor Caroli (αCVn) as the brightest star of the constellation.

Among northern Egyptian constellations there is one which is particularly representative, taking the form of a huge female hippopotamus with a crocodile tail on her back, as represented in Figure 6.4; on some occasions, she even carries an entire crocodile (as in Senenmut, see Fig. 6.1). This is occasionally named  $\text{𓆎} \text{𓆏} \text{𓆐} \text{𓆑} \text{𓆒}$  *3st-d3mt*, Isis-Djamet. As we will discuss later on, the same constellation can be found in the Zodiac of Dendara presiding over the sky (see also Fig. 6.3). In most representations, she holds in her hands one or two mooring posts in the form of a dagger or a small crocodile. Actually, this would have been a quite large group of stars and consequently would have covered a large fraction of sky.



**Figure 6.3.** Section of the Zodiac of Dendara, showing the northern constellation of the Bull's Foreleg or the Hippopotamus with one of the Mooring Posts and a few zodiacal constellations from Aries to Virgo. See text for further discussion. Photograph by J. A. Belmonte. Courtesy of the Louvre Museum.

Biegel found her in Boötes, with the crocodile extending to Corona Borealis and Hercules and the mooring posts in Coma Berenices. Pogo simply proposed Draco. Chatley also chose that region of the sky with areas of Boötes, Hercules, Lyra and Draco. Davies ranged as far away as Ophiuchus, Libra and Scorpio, as did Etz who located her in Auriga and its surrounding regions. Finally, Locher located Isis-Djamet in a small area of Draco, with the mooring posts located in the tail of the dragon and the Small Dipper, near the ecliptic and celestial poles, with which he suggested a probable connection.


Surprisingly, despite the many possibilities pointed out above, the authors agree that the location of the huge hippopotamus is in a large area between the constellations Boötes and Lyra, with the crocodile stretching on her back up to Serpens Caput. The head would be located approximately at the head of Draco. However, the most interesting point is that to make such an identification both of us have assumed the real possibility that this constellation is exactly the one that appears in the Ramesside star-charts with the name  $\text{𓆎} \text{𓆏} \text{𓆐} \text{𓆑} \text{𓆒}$  *rrt*, Reret, the Hippopotamus. This is a revolutionary point. This idea has never been seriously considered before because the shadow of N&P loomed so long over the scientific community: these scholars argued that the “two feathers”, mentioned as belonging to the constellation of Reret, were never depicted in the various representations of Isis-Djamet, and so the two constellations could not be the same. Besides, a tradition had also been well-established among Egyptologists since it was first proposed by Sloley in the 1930s, that the observations described in the Ramesside clocks were made by an observer, presumably an hour-priest, looking south

towards a second hour-priest acting as a reference frame. If so, Reret must be located in the southern skies and cannot be identical to the hippopotamus depicted in the northern skies. We will try to demonstrate that both arguments are wrong and aprioristic.

On the one hand, we have textual evidence that the hippopotamus in the northern sky is frequently called Reret, or *rrt wrt*, the Great Reret, the Great She-Hippopotamus. For example, in the *Book of the Day* (see Figure 9.16), compiled in the Ramesside Epoch precisely, there is a text stressing that the leg of Seth (presumably Meskhetyu) is attached to a pair of stone mooring posts by a golden chain held by Isis in the form of a hippopotamus, identified by the term *rrt*. This idea is beautifully expressed in astronomical ceilings such as that of Pedamenope (see Fig. 6.4). In a similar context, the Jumilhac papyrus mentions that *msht* is located in the northern sky and is kept there by *rrt wrt* so that it *can not travel among the gods* (i.e. the stars).

On the other hand, we have distinguished iconographic evidence that Isis-Djamet is simply an alternative name or an avatar of the female hippopotamus goddess Ipet, frequently represented with two feathers above her head and a crocodile tail on her back, as shown in Figure 6.5a. The celestial diagram of the temple of Deir el-Haggar in the Oasis of Dakhla is also relevant in this particular context, as demonstrated in Figure 6.5b.





Sloley's speculations can at last be put into quarantine, if not completely laid to rest, because what he interpreted as an hour-priest, acting as a reference, is wearing a ritual beard (see Figure 6.6). In ancient Egypt, beards were the prerogative of the gods; consequently, this figure would better be interpreted as a divinity (presumably a time god) rather than as any sort of priest. This clearly opens the way for new hypotheses, including the possibility that the Ramesside star-chart constellations might be located in the northern half of the sky, with such interesting consequences as, for example, the identification of Reret and Isis-Djamet and others that we shall discuss below.

Even accepting the northern location of Reret, the identification of the mooring posts accompanying the hippopotamus is far more complicated. This is because in most celestial diagrams two or three (see Figs. 6.1 and 6.4) or even only one (see Figure 6.7) of these elements are represented, while only one is explicitly mentioned as , *mnit* or Mooring Post -in the singular-, in the Ramesside star-charts. We have not been able to reach a consensus on this point.

For Lull, the two mooring posts on the hands of Reret (in the form of a dagger and of a small crocodile) would be the ones mentioned in the *Book of the Day*, and one of them, presumably the dagger (also present in the Zodiac, see Fig. 6.3), would be that of the Ramesside clocks. This would mean that the elongated triangular figure, located in front of them in most celestial diagrams, would not be another mooring post, as frequently interpreted, but rather the representation of an Egyptian astronomical instrument, similar to a gnomon, used to observe stellar culminations on the central meridian. That would be the image depicted in the tomb of Senenmut (see Fig. 6.1), with Alkaid at the apex of the device. Moreover, according to this interpretation, the first standing human figure in the left row of divinities (located behind the lion) might be holding a bay (an ancient Egyptian astronomical instrument), not a knife, and this could have been used as a complementary tool to the gnomon.

Belmonte does not agree with this hypothesis. For him, the mooring posts in the hands of Reret are located in the area of the tail of Draco and the Small Dipper (this would be the dagger), in agreement with Locher's proposal, and, in contrast, the Mooring Post constellation of the Ramesside clocks may be identified with the sharp triangle. Curiously, independently of its exact correspondence in the celestial diagrams

(the dagger for Lull and the sharp triangle for Belmonte), both of us estimate similar coordinates for this constellation and locate it among the stars of Boötes, including the bright star Arcturus, although for Belmonte, the apex of the constellation could be Alkaid, as depicted in the celestial diagram of Senenmut. This dichotomy is stressed in Tables 6.1 and 6.2.

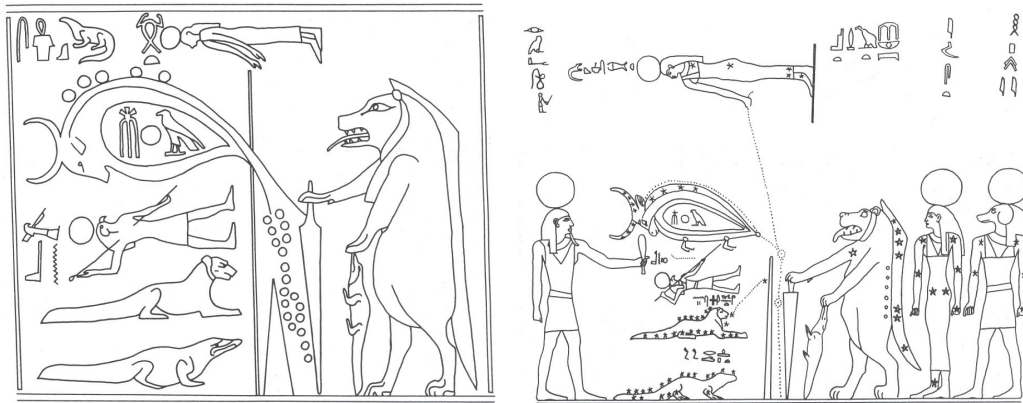
In various astronomical documents, including several astronomical ceilings, there is a set of constellations that apparently forms an interrelated group. These are a recumbent lion (some-times with a crocodile tail), a crocodile of similar size below him and, on some ceilings, a second, much smaller crocodile with a folded tail, located near Selkis. This crocodile receives the name of  *s3k* (Saq). Only in Senenmut (see Fig 6.1), a third crocodile called  *h3kw*, the Plunderer, is depicted above the lion, although this could simply be one of the names of either of the other two, presumably the smaller one. This idea is supported by the fact that, in the sarcophagus of Nekhtebef, the name *h3kw n s3k* is recorded. The lion below the Plunderer receives the explicit name of  *ntr rwty imi.snwy* or “the Divine Lion between them”. This adverbial location makes reference to the fact that the Lion is found between a pair of crocodiles, as stressed by N&P. The second and larger crocodile receives the name of  *h3p rdwy* or “That lying on his feet”, a standard epithet of the god Sobek whose best-known manifestation is that of a crocodile. In a few diagrams (Seti I, Tousre or Ramses VI), a bird is found near the Lion, as shown in Fig. 6.7.

A constellation *m3i* (the Lion) also appears in the Ramesside star-charts. As in the case of the hippopotamus, and for similar reasons, the identity of both lions has always been questioned. In the astronomical ceiling of Senenmut, after a modification of the celestial diagram in which the lion’s and the large crocodile’s positions were altered (see Figure 6.8), a standing unnamed human figure with hanging arms was located between the mooring posts and the Divine Lion group. He apparently intends to harpoon the large crocodile although the weapon is not depicted. This image appears in other ceilings, such as that of Seti I (see Fig. 6.7) or of later Ramesside kings -where the spear is depicted-, but is absent in many others (see, for example, Fig. 6.4).

Beigel saw the lion, and the bird, with the recumbent crocodile in the empty area of Ursa Major not included in Meskhetyu. Chatley located the large crocodile in Cassiopeia and Perseus, and the Divine Lion in Auriga. Locher found the small crocodile in the stars of Aries, Triangulum, Andromeda and Perseus, the Divine Lion in Perseus and Auriga, the bird at the Pleiades and the large crocodile in Taurus and Auriga. It was Davis, however, followed by Etz, who first identified the Divine Lion with Leo, the bird with Leo Minor, the large crocodile with Hydra and the small one with Cancer. For her, the unnamed man would be located in Gemini.

Following the same reasoning we have used throughout this paper, we accept the premise that *ntr rwty* and *m3i* are exactly the same constellation (both *rw* and *m3i* mean “lion” in ancient Egyptian, the former having a certain sacred character). As a corollary, we support the idea that the Lion can be identified with Leo. Consequently, it is most logical to find the Crocodile “lying on his feet” in Hydra and Saq in the empty area of Leo Minor. As a matter of fact, it is curious that three of the four crocodiles frequently found in the Egyptian celestial diagrams have been identified in areas of the sky where our classical view of the firmament, theoretically inherited from Greece and ancient Mesopotamia, also depicts reptiles: Hydra, Serpens or Draco (meaning snake in Greek and represented as such in Babylonian *kudurrus*). However, we have not been able to reach a consensus on the identification of the bird and the standing man of the celestial diagrams.

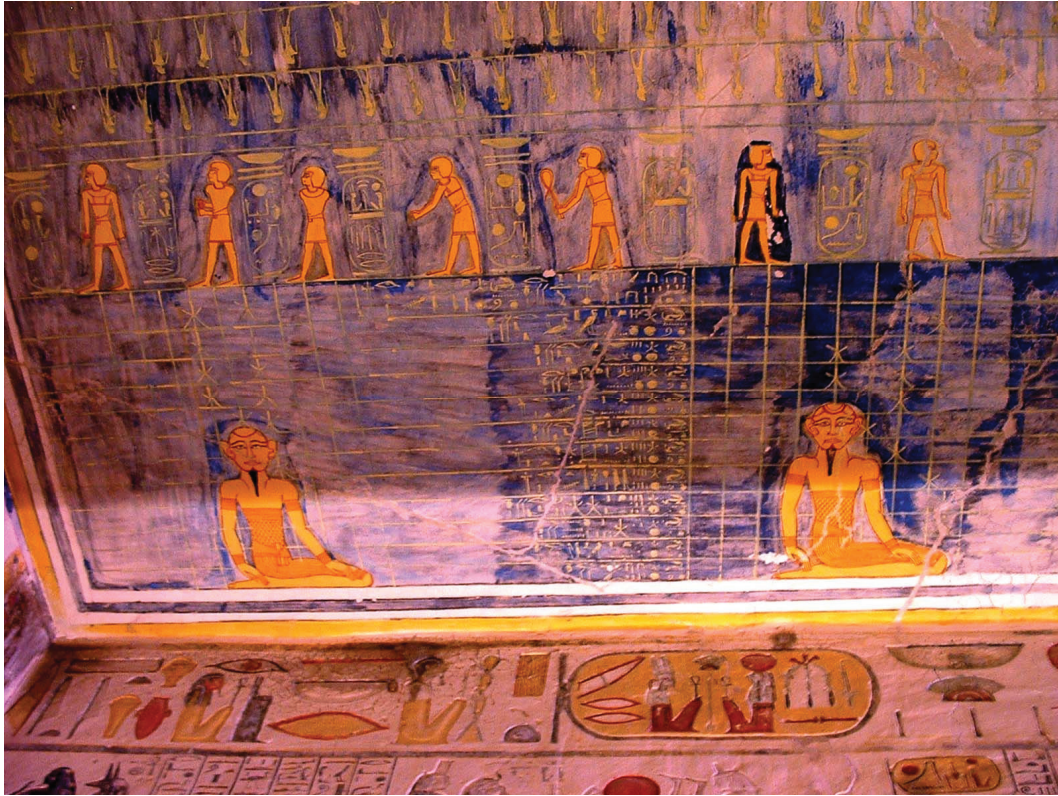
To close this line of argument, we first discuss two conspicuous constellations that are mentioned in the Ramesside star-charts, *nht*, the Giant or Nekht, and *3pd*, the Bird or Aped. Nekht is a gigantic constellation (hence its name) covering various hours of right ascension (hereafter RA). We agree about the location of this constellation as extending from Aquila, where his head and feathers ought to be found, and the square of Pegasus, where his pedestal could be located. The Bird follows the Giant in the star-charts and we have reached consensus and have located this fowl amongst the stars of Triangulum and Perseus.



**Figure 6.4.** The northern section of the celestial diagrams of the Million Year Temple of Ramses II (left) and the tomb of Pademeno (right), in western Thebes. Notice the absence of the standing man and the crocodile on the back of the Hippopotamus. Adapted from *EAT* iii.



**Figure 6.5.** Left (a), a female hippopotamus figurine representing the goddess Ipet with a crocodile tail, wearing a pair of feathers upon her head, as she is described in the Ramesside star clocks. Courtesy of the British Museum, EA13162. Right (b), part of the “astronomical ceiling” covering the sanctuary of the temple of Amon at Deir el Hagar, in Dakhla Oasis. This particular image shows part of the procession of gods associated with the twelve months of the civil year, including the goddess Ipet (for the eponymous month Paophi). Notice how she is depicted in the guise of the celestial she-hippopotamus Photograph by J. A. Belmonte.



**Figure 6.6.** Representation of a section of the star-charts in the corridor of the tomb of Ramses IX at the Valley of the Kings (c. 1100 B.C.). Notice the bearded seated figures and the hieroglyphic text column, devoted to one of the Egyptian fortnights (indicated in the first row) including the list of stars marking the twelve hours of the night. The original device, later depicted in the tombs of the Ramesside pharaohs, has been dated to c. 1500 B.C. Photograph by M. Sanz de Lara.



**Figure 6.7.** The northern skies as represented in the beautiful astronomical ceiling of the tomb of Seti I at the Valley of the Kings. Notice the similarities to and the differences from the celestial diagrams of Figs. 6.1 and 6.4. Photograph by M. Sanz de Lara.

The problem comes when a combination of the celestial diagram and the Ramesside star-charts is attempted. Belmonte has suggested a possible identification of the unnamed standing man, and perhaps the bird: the former with the Giant and the Bird with the latter. He postulates the hypothesis that the celestial diagram ought not to be seen as an actual map of the sky but rather as an artistic and symbolic representation (in accordance with the Egyptian *horror vacui*) where all the northern constellations, including those used in the Ramesside clocks, are represented. He has even argued that the later addition of the standing man in the diagram of Senenmut (see Fig. 6.8) could be related to the development of the Ramesside star clocks as a time-keeping device precisely in the time of this exceptional sage.

Lull, however, recognizes a certain sense of realism in the representation of the celestial diagrams and consequently proposes that the unnamed standing man is directly related to the large crocodile and, since this is located at Hydra, as we have agreed, that the man should be found nearby, presumably in the stars of Gemini. He also proposes the idea that, in contrast to the Giant, the standing man is never depicted with feathers (although we must recognize that this argument has proved fallacious in the case of Reret).

The case of the bird is somewhat different. Located near Leo in the celestial diagrams, it could easily be associated with Corvus. Actually, as can be seen in Fig. 6.3, and will be discuss afterwards, the Zodiac of Dendara shows Leo, Hydra (in the form of a snake, the large crocodile is absent here) and Corvus forming a group. If this is correct, then this bird can not be Aped and we must accept that there were two birds in the Egyptian firmament. However, as we shall see, the Zodiac of Dendara does show several alien influences (as with the zodiac itself), and perhaps the presence of Corvus and Hydra, in the form of a snake, simply reflects this fact. In our present state of knowledge, we do not feel able to favour any of these alternative options.

### 6.2.2. Other stars and asterisms of the time-keeping celestial charts

We now continue our analysis with those stars of the decanal belt and the Ramesside star-charts that have not so far been discussed because they do not appear among the northern constellations of the celestial diagram. Again, a summary of our concordances and our most serious discrepancies can be found in Tables 6.1 and 6.2, respectively.

We start with the decans, included in the diagonal decanal clocks, the *Cosmology of Nut* and later lists. We have started from two completely different approaches to the problem. Belmonte determined possible candidates from heliacal rising phenomena when these time-keeping devices were developed, presumably at the end of the Old Kingdom. However, Lull has taken the list of decans of the tomb of Senenmut as the reference frame for the determination of the presumed RAs of the different stars and asterisms. Nevertheless, our common view of several important identifications is quite significant.

We have agreed about the identification of most of the decans between Sopdet and *h3w*, Khaw, the Myriad, which we identify with Sirius and the Pleiades, respectively. Among these, we propose  $\beta$ CMa or Mirzam as *tpy-<sup>c</sup> spdt*, the Belt of Orion as Sah or its successor *ḥwt*, and the Hyades, with Aldebaran, as *ḥrt*. Nearby, *kd*, the Circle or Sheepfold, could be perhaps located at the head of Cetus.

Also of significance are our points of agreement concerning another important area of the sky, covered by the Milky Way, which today is scarcely visible from Egyptian skies, but which in ancient times was quite prominent in the southern horizon. We refer

to the bright stars  $\beta$ Cen (Hadar) and  $\alpha$ Cen (Rigel Kent) or the stars of the Southern Cross that, according to our results, ought to be identified with the decanal stars *ipds* and *sbšsn* and the double asterism *wššty-bkšty*, respectively. In the same area we propose to locate the Ferry Boat, *dšt*, in the Area of Argo Navis. The group of decans of the constellation *knmt* may also be found in Puppis and the southern areas of Canis Major. A far more complicated issue is the identification of individual stars or asterisms with single decanal stars within those constellations.

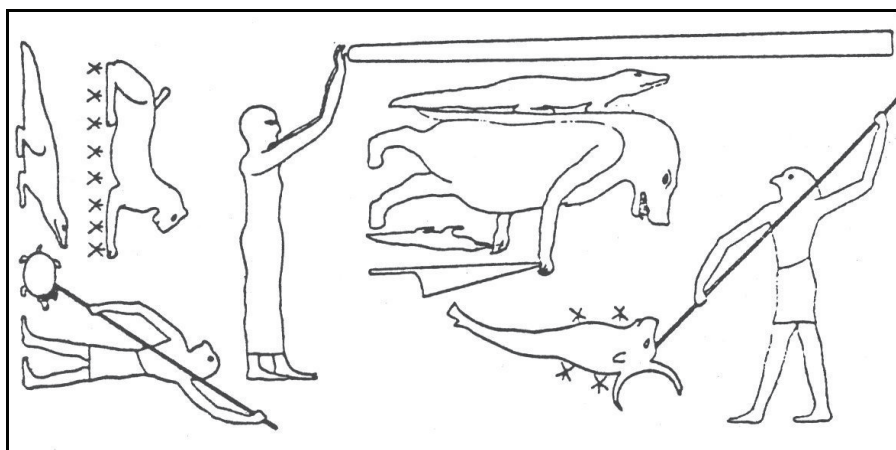


**Figure 6.8.** A sector of the northern constellations in the astronomical ceiling of the tomb of Senenmut at Deir el Bahari. There are obvious traces of an earlier positioning of the constellations of the lion and of the large crocodile (on the shoulder and at the feet of the standing man, respectively; even the hieroglyphs of the crocodile name can still be seen upon his skirt). For some reason unknown to us, both figures were erased and represented further to the left and higher up on a smaller scale. In their place, the figure of the unnamed “standing man” was painted. Perhaps this figure was alien to this way of representing the celestial diagram, with equivalent examples such as the Karnak clepsydra or the Ramesseum (see Fig. 6.3). However, it was typical of another kind of celestial diagram, with Seti I’s ceiling as the most representative example (see Fig. 6.7). This probably demonstrates the very unrealistic representations of the sky we are dealing with. See text for further discussion. Photograph by J.A. Belmonte.

However, for other groups our two approaches seriously diverge. In several astronomical ceilings there are represented a sheep, ram or goat (see Fig. 6.1) associated with the decans of the constellation of *sit* or *srt*, the Sheep. Locher reconstructed this constellation using stars of Capricornus and a few from Aquarius. Lull supports this idea. Belmonte, in contrast, located this constellation in the stars of Grus and Piscis Austrinus, further to the south. Another important constellation of the southern skies is *wš*, the Boat (see Fig. 6.1), which might or might not include in its design the group of decans of the constellation *hntt*, Khent, the Prow or the Front. According to Belmonte, the Boat could be found among the stars of Capricornus (which would have the appearance of an ancient Egyptian pre-dynastic boat) and, separately, Khent would be located in Scorpius. Lull, supporting Locher’s earlier hypotheses, finds the Boat with its Prow from Sagittarius to Libra, sailing on the waters of the celestial river, the Milky Way.

An important result of this latter approximation would be the identification of Antares ( $\alpha$ Sco) with the decan *tms n hntt*, the Red One of the Prow. This is an outcome that both of us are inclined to support. Belmonte accepts this hypothesis and, with more hesitation, the identification of the Sheep and the Boat with Capricornus and Sagittarius, respectively, despite his initial findings, on the basis that, given our present state of knowledge, it is quite difficult to establish the exact length of decanal hours. Actually, the whole operation of the diagonal clocks is far from being completely understood, as an alternative and suggestive hypothesis of Christian Leitz and a fairly recent and elucidating review about them by Sarah Symons indicate. Anne S. von Bomhard's most recent work on the topic would also be relevant.

One important topic analyzed by Lull in his work, but never tackled by Belmonte, is the identification of the so-called triangular decans of the coffin lids, located between the outer and inner planets in the later celestial diagrams (see Fig. 6.1). Among these, there is an asterism or constellation made up of a couple of tortoises,  $\overline{\text{A}}\text{B}$ , *stwy* or the Two Tortoises. This may be identified with the two bright stars of Canis Minor, Procyon and Gomeisa. In Figure 6.9, Lull finds support for this and other previous hypotheses. This image shows the northern constellations at the celestial diagram of the tomb of Petosiris at Atfieh, dated in the Late Period. A human falcon-headed figure is seen harpooning one of the tortoises, located just in front of the large crocodile, already identified with Hydra. For Lull, the standing harpooner would be identical with the standing man of earlier representations (see Figs 6.1 and 6.6) and would consequently be located in Gemini, although we have seen that Belmonte does not agree with this idea. In any case, between Hydra and Gemini, the only reasonable alternative for the tortoise would be one of the stars of Canis Minor.



**Figure 6.9.** Northern section of the celestial diagram in the astronomical ceiling of the Late Period tomb of Petosiris. One of the two celestial Tortoises is represented here. See the text for further discussion. Adapted from *EAT* iii.

However, it is with regard to the stars and constellations of the Ramesside clocks that our agreement may be seen as quite satisfactory. We have already proposed, despite some minor problems, reasonable identifications for the large constellations of Reret, the Lion and the Giant and the lesser ones of the Mooring Post and the Bird. We have also drawn attention to their equivalence with the same constellations depicted in the northern skies of the celestial diagrams, although our main discrepancy specifically concerns whether the Giant of the star-charts and the standing man of these diagrams represent the same celestial configuration.

Indeed, the parallelisms do not end there. In increasing RA, we also feel able to propose the following identifications:

- i. Cassiopeia with  $\epsilon_{ryt}$ . This is definitely not the same asterism as the one found in the decans under the name of  $\epsilon_{rt}$ , although parallelisms between the names of these asterisms, their proposed translation (jaws and jaw, respectively) and the forms of a W and a single V, for Cassiopeia and the Hyades, respectively, could perhaps be inferred.
- ii. One of the stars of the Pleiades with  $sb3 n h3w$ , the Star of the Myriad.
- iii.  $sb3 n s^{\epsilon}r$ , presumably translated as the Star of Fire, could correspond in RA to either Capella or Aldebaran. However, as Aldebaran is already located in the decan  $\epsilon_{rt}$ , we propose to identify the Star of Fire with Capella.
- iv.  $\pi$ Ori or one of its neighbouring stars is probably  $tpy^{\epsilon} s3h$ , the One Before Sah, and Rigel, or one of the stars of the Belt, is surely  $sb3 n s3h$ , the Star of Sah.
- v. Despite certain discrepancies in the determination of the RA, Sirius should be  $sb3 n spdt$ , but we could not reach an agreement on the identification of its follower,  $iy hr-s3 sb3 n spdt$ .
- vi. We now leap in RA to a position behind the Lion for our final concordances. These are the identification of the cluster in Coma Berenices with  $sb3w \epsilon33w$ , the Many Stars, and, as already stated, Spica with  $\epsilon3 nfr$ , the Beautiful Child.

The asterisms associated with  $sb3wy$ , the Two Stars, and  $sb3w nw mw$ , the Stars of Water, merit special discussion. On the one hand, Belmonte distinctly places the Two Stars in the celestial couple Castor and Pollux and the Stars of Water in the misty aspect of the Praesepe Cluster (M44), in the constellation of Cancer. On the other hand, Lull obtains a slightly different RA for these asterisms, not congruent with stars in Gemini or Cancer, and, moreover, he had already located the standing man in Gemini. However, even with these premises, we agree about the compelling logic of the former identification due to the striking parallelism between Egyptian names and celestial reality, as in the case of the Red One of the Prow.

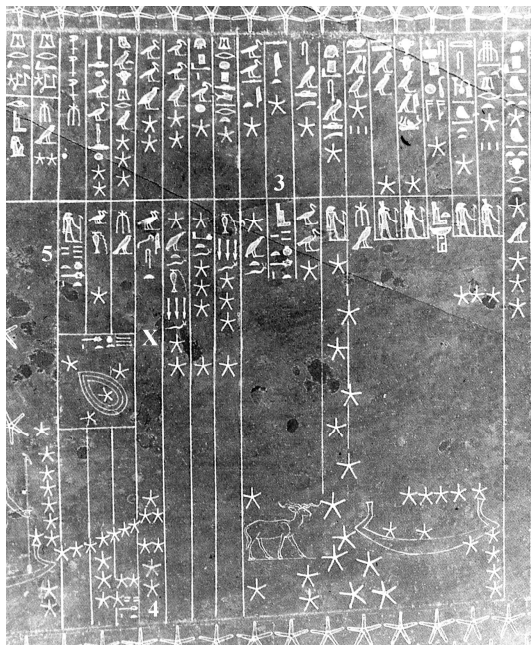
### 6.2.3. Stellar Clusters in the skies of ancient Egypt?

There are certain celestial objects which are often mentioned in the astronomical ceilings associated with the lists of decans which could be catalogued as rare. However, they do not appear in the diagonal clocks. These are designated with the term  $\overline{\alpha} \text{ } ht$  (*het*). This hieroglyph is usually translated as “body” in sentences such as “son of his own body” for some of the royal children. However, it can be also translated as “army, body or troop” when related to the army or even simply as “group”. Consequently, in an astronomical context, we could translate it either as a “group” of stars or as an abnormal celestial body that ancient Egyptians wanted to differentiate from the rest of the stars. Hence, we will tentatively translate *ht* as stellar cluster or simply cluster. The hypothetical identification of these clusters would be very rewarding since, providing we could achieve the task, they might serve as celestial milestones in confirming previous relationships between decans and real stars.

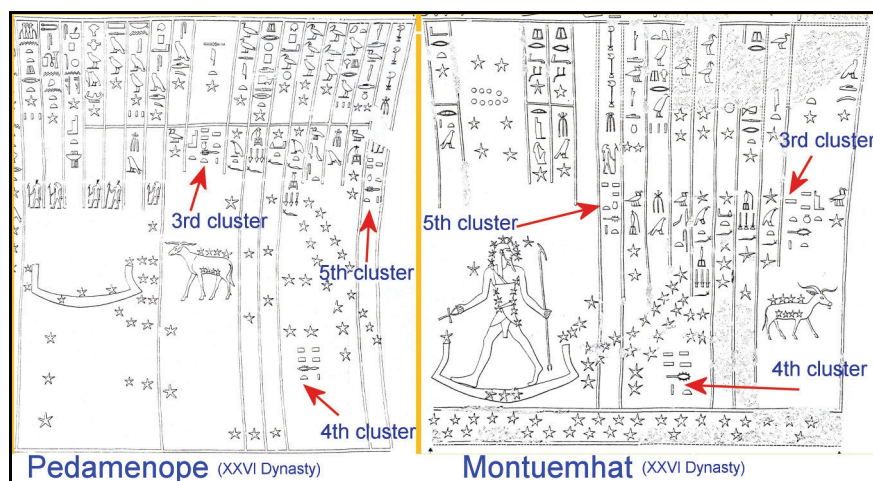
In the astronomical ceiling of Senenmut, these clusters, five in number, are intercalated within the list of decanal stars. We will first analyze the four  $\overline{\alpha} \text{ } ht$  associated with the standard decans. Figure 6.10 shows the correct spelling and the location of the 3<sup>rd</sup>, 4<sup>th</sup> and 5<sup>th</sup> clusters within Senenmut’s ceiling, while Figure 6.11 shows them in later ceilings of the 26<sup>th</sup> Dynasty where the spelling had been corrupted,

after several copies of copies had been produced. Senenmut's shows an additional representation of an important cluster which is not numbered but rather receives a proper name:  $\overline{\text{mw}} \text{ nwt } \underline{ht}$ , the "cluster of water". Table 6.3 offers a complete relation of the clusters and the celestial diagrams where they are presented.


The 3<sup>rd</sup> cluster,  $\overline{\text{3-nwt}} \underline{ht}$ , appears in relation to the decan  $\text{sit}$  "sheep", between  $\text{smd}$  and  $\text{s3wi sit}$  (see Fig. 6.10). Curiously, the first and second clusters are never represented, although they must logically be found to the west of the third. We will come to this point at the end of this section. The 4<sup>th</sup> cluster,  $\overline{4} \underline{ht}$ , appears in the diagram of Senenmut in a very strange position at the bottom of the decan list below  $\text{hntw hrt}$  and  $\text{hntw hrt}$ , decans 26 and 27, respectively, and closer to the northern constellations. It appears also in this peculiar position in other diagrams (see Fig. 6.11). We will deal with the presumed identification of clusters 3<sup>rd</sup> and 4<sup>th</sup> afterwards.






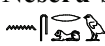







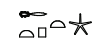

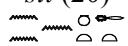


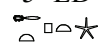

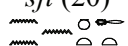




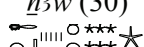
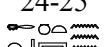


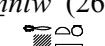


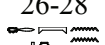



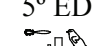




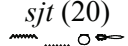

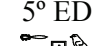







**Figure 6.10.** A sector of the decanal list and southern constellations in the astronomical ceiling of the tomb of Senenmut at Deir el Bahari. The 3<sup>rd</sup>, 4<sup>th</sup> and 5<sup>th</sup> *hets* or "clusters" are signalled by their respective numerals. The controversial "cluster of water" is marked by an X sign. See the text for further discussion. Photograph by J.A. Belmonte.









**Figure 6.11.** The same sector of the decanal list and southern constellations in the astronomical ceiling of a couple of tombs of the 26<sup>th</sup> Dynasty in El Assasif (Western Thebes). The 3<sup>rd</sup>, 4<sup>th</sup> and 5<sup>th</sup> "clusters" are signalled by their respective numerals. Notice the absence of the "cluster of water". Adapted from EAT III.

**Table 6.3.** The  *ht*, “stellar clusters” of the celestial diagrams of the New Kingdom and the Late Period. For each diagram, the term used to describe each cluster is presented. The X cluster (as in Fig. 6.10) stands for the controversial “cluster of water”. See the text for further discussions.

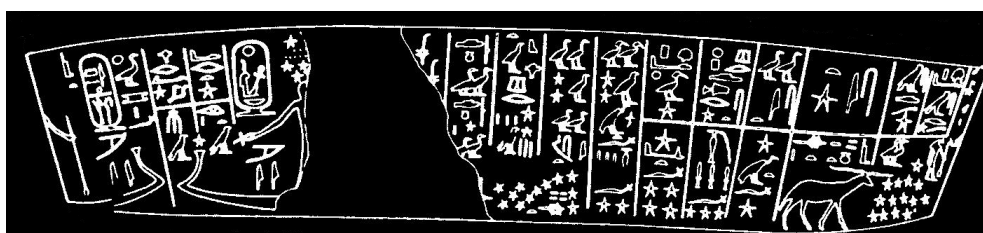
| CELESTIAL<br>DIAGRAM | 3 <sup>rd</sup> cluster<br> | 4 <sup>th</sup> cluster<br> | 5 <sup>th</sup> cluster<br> | X cluster<br>“water” <br>or 6 <sup>th</sup>  | Neseru's<br> |
|----------------------|--|--|--|--|---|
| Senenmut             | <i>šit</i> (20)<br>         | <i>hntw</i> (26-27)<br>     | <i>h3w</i> (30)<br>         | 26-30<br>   | 5° ED<br>    |
| Clepsydra AIII       | <i>šit</i> (20)<br>         | <i>b3wi</i> (25)<br>        |  |  | 5° ED<br>    |
| Seti I               |  |  |  | 26-28<br>   |   |
| Ramses II            | <i>šit</i> (20)<br>         | 25-27<br>                   | 28-30<br>                   | -  | 5° ED<br>    |
| Tousre               |  |  |  | 23-24<br>   |   |
| Ramses III           | <i>šjt</i> (20)<br>         |  |  |  |   |
| Ramesss VI           | <i>sr</i> (20)<br>         |  | <i>h3w</i> (30)<br>        | 26-27<br>  |   |
| Ramses VI            | <i>šjt</i> (20)<br>       |  | <i>h3w</i> (30)<br>       | 24-25<br>   |   |
| Ramses VII           | <i>srt</i> (20)<br>       |  | <i>kd</i> (28)<br>        | <i>hntw</i> (26)<br>  |   |
| Ramses IX            | <i>srt</i> (20)<br>       |  | <i>h3w</i> (30)<br>       | 26-28<br>   |   |
| Pedamenope           | <i>šjt</i> (20)<br>       | <i>b3wi</i> (25)<br>      | <i>h3w</i> (30)<br>       |  | 5° ED<br>  |
| Montuemhat           | <i>šjt</i> (20)<br>       | <i>b3wi</i> (25)<br>      | <i>h3w</i> (30)<br>       |  | 5° ED<br>  |
| Abu Yasin            | <i>šjt</i> (20)<br>       |  | <i>h3w</i> (30)<br>       |  | 5° ED<br>  |
| Harendotes           | <i>šjt</i> (20)<br>       |  |  |  |            |

Finally, the 5<sup>th</sup> cluster,  *5-nwt ht*, is almost always related to the decan  *h3w* “myriad” (decan number 30 in the list), which we have clearly identified as the Pleiades cluster (see Table 6.1). Hence we have a very logical situation where this spectacular asterism was identified by the ancient Egyptians as both the decan “myriad”, a very fitting name, and the “5<sup>th</sup> stellar cluster”, supporting the idea that  *ht*, ought to be translated as “cluster” or, at least, some sort of peculiar celestial object.

Now we will deal with the most problematic of all the clusters. This appears as  *mw nwt ht*, the “cluster of water”, in the astronomical ceiling of Senenmut, represented by a medium-size ovoid figure with 4 related stars (see Fig. 6.10). It occupies a large section of the list below decans  *hntw hr(w)* /  *hntw* (*hrw* (decans 26 and 27 of the list, respectively),  *kd* /  *s3wi kd* (28 y 29, respectively) and  *h3w* (decan 30). Obviously this presents a problem in relation to

our thesis since a “cluster” can not occupy so large a section of sky. Actually, N&P suggested, in our opinion wrongly, that this image may stand for one or various celestial objects of the Orion region (perhaps M42, the Orion nebula) which had been wrongly located. Alternatively, in a previous paper on the topic, Lull suggested that the term  $\overline{\text{mw}}$ , “water”, should be changed to  $\overline{\text{sis}}$ , “six”, and that the name of the cluster should be reinterpreted as  $\overline{\text{sis}} \overline{\text{ht}}$ , 6-*nwt ht*, i.e. the 6<sup>th</sup> stellar cluster. Belmonte, however, is of the opinion that there is no other evidence supporting this hypothesis and that perhaps this is an alternative name of the 4<sup>th</sup> or 5<sup>th</sup> cluster or even something completely different.

Belmonte and Shaltout have shown the close parallelism between the astronomical ceiling of Senenmut and the celestial diagram depicted in the clepsydra of Amenhotep III. In the corresponding section of the clepsydra (see Figure 6.12), the 3<sup>rd</sup> and the 4<sup>th</sup> clusters are plotted in the appropriate position. Unfortunately, the decoration is lost where the 5<sup>th</sup> cluster ought to have appeared but indeed there is no space for the depiction of the large elaborate figure accompanying the “cluster of water” below *hntw*, *kd /s3wi kd* and *h3w*. Figure 6.13 shows the decan section of the astronomical ceiling of the tomb of Seti I in the Valley of the Kings where *mw nwt ht* is depicted at the bottom of the column of the *hntw* decans. On the contrary, clusters 3<sup>rd</sup> to 5<sup>th</sup> are absent from the representation (see Table 6.3).


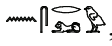






**Figure 6.12.** Same sector of the decanal list in the celestial diagram depicted in the decoration of a clepsydra dated to the reign of Amenhotep III. Unfortunately, the device is broken and the images lost where the 5<sup>th</sup> cluster might have been expected. See the text for further discussion.



**Figure 6.13.** A section of the decanal belt as represented in the astronomical ceiling of the tomb of Seti I. Notice the similarities to and the discrepancies with the celestial diagrams of Figs. 6.10, 6.11 and 6.12. The 3<sup>rd</sup>, 4<sup>th</sup> and 5<sup>th</sup> clusters are absent from the ceiling while the “cluster of water” is located at an unexpected position and written with an extra “n” sign  $\overline{\text{mw}} \overline{\text{nwt}} \overline{\text{ht}}$ . Photograph by M. Sanz de Lara.

Belmonte's hypothesis is that, as in the case of the standing man, or the absence of Mars in both Senenmut's astronomical ceiling and Amenhotep III's clepsydra, the former is a sort of hybrid between two different kinds of celestial diagrams (with Amenhotep III's clepsydra and Seti I's astronomical ceiling once more as reference examples, see Figs. 6.12 and 6.13) where the "clusters" of both representations are simultaneously depicted. It is the form of the cluster in Seti I's ceiling (as a handful of close connected stars) which would suggest that this "cluster of water" might be identified with the Pleiades, although this proposal is not necessarily correct. In the late Ramesside period, the confusion remained and the 5<sup>th</sup> and "water" clusters were even referred to in the same or strikingly similar terms (see Table 6.3). On the contrary, Lull's hypothesis would imply that the "6<sup>th</sup> cluster" ought to come after the fifth, but in a neighbouring region of the sky. He suggests the obvious alternative: the open cluster of the Hyades, including the lucida Aldebaran, which we have already identified as the decan *ʕrt*. However, this decan is not directly related to this "cluster" in any of the representations.

As shown in Figure 6.14, the astronomical ceiling of Senenmut shows an additional unnumbered "cluster" included within the list of the epagomenal, or triangular, decanal stars (hereafter ED) represented after the planets. This is defined by a nominal sentence  *ht pw*, i.e. "this is a cluster", in the column belonging to the 5<sup>th</sup> ED , *nsrw*, between the decans  *štw* "turtle" (o *štwi* "the two turtles", as represented in the diagram) and , *šspt* (4<sup>th</sup> and 6<sup>th</sup> ED, respectively).

The exact role of the EDs is still a matter of debate between the specialists, although they were apparently selected to be operative during the  (see Chapter 4), the epagomenals, named **πιαβοτ νροχ21**, "small month", by the Copts. Consequently, the identification of  may be problematic. Lull has proposed two alternatives. One is based on the list of Senenmut's ceiling and the identification of *štwi* with Procyon and Gomeisa (see Table 6.1). Neseru's cluster would be identical to M44, the Praesepe cluster and thus with the Ramesside, "Stars of Water", in a striking parallelism with the case of the Pleiades. However, M44 is far away from the decanal belt and actually belongs to the Ramesside time-keeping constellations, further north, imposing a serious doubt on this relationship. A second possibility relies on N&P's Seti IA family of decans, where Neseru would apparently stand between *tm3t hrt* and *tm3t hrt*. Under these circumstances, the open cluster IC2602, surrounding the 2.74 magnitude star θ Carinae, known as the "southern Pleiades", could be an interesting alternative. Indeed, this remains an open question. However, we will see that we have outlined the most reasonable alternatives for the case of the 3<sup>rd</sup> and the 4<sup>th</sup> cluster.

The vast majority of the lists, with the irrelevant exception of that of Senenmut, relate the 4<sup>th</sup> cluster to the decan *b3wi*. According to the Zodiac of Esna, this is connected to the easternmost section of the constellation of Pisces. Besides, although we have not reached an agreement on the identification of this decan, Table 6.2 shows that we have agreed on more or less the same right RA within the constellations of Pegasus (Lull) or Cetus (Belmonte). As shown in Figure 6.15, there is a celestial object in that region of the sky that might perfectly fulfil our expectations. This is M31, the Galaxy of Andromeda. Although not properly a stellar cluster (actually a cluster of billions of stars so far away that individual stars are not visible), the misty aspect of M31 is clearly distinguishable with the naked eye on clear and dark nights and has been known to any dedicated observer for a considerable time. In fact, this celestial region is empty of stellar clusters outside the Milky Way, a fact which may support this suggestive identification.

**Figure 6.14.** A sector of the southern sky in the astronomical ceiling of the tomb of Senenmut at Deir el Bahari, showing the planets and the epagomenal decans (EDs). The first narrow column from the right presents the ED Nesperu, stating explicitly in the lower section that it “is a cluster”. See the text for further discussion. Photograph by J.A. Belmonte.



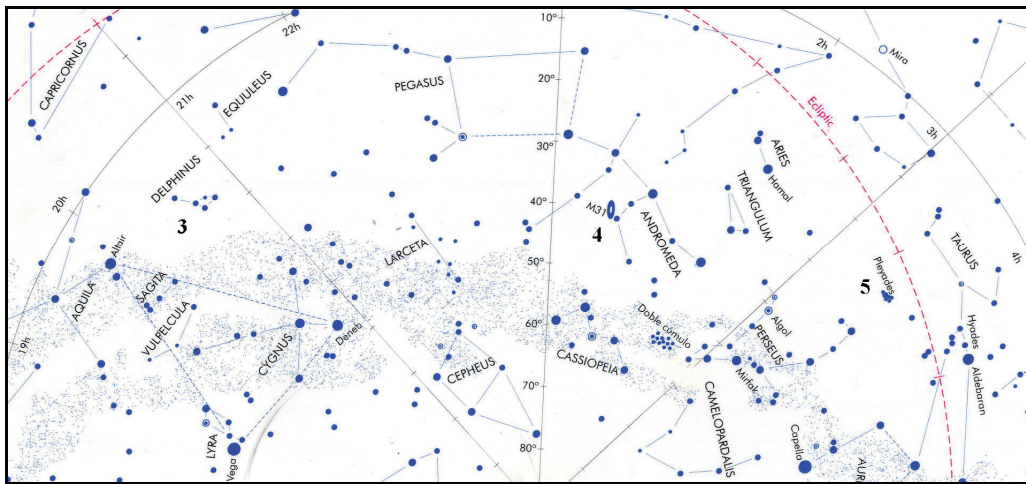
Finally, the 3<sup>rd</sup> cluster is present in all the lists and systematically related to the important constellation of *sit/srt*, the “sheep”, which we have agreed is found in the region of Capricornus. Figure 6.15 shows the corresponding heavenly region where any dedicated observer would identify the star clustering aspect of the Delphinus constellation as an excellent candidate for the 3<sup>rd</sup> cluster.

Summarizing, we feel able to present the following identifications for the celestial diagram decanal list “clusters”:

| <i>ht</i>                  | Cluster                 | Related Decan    | Cluster Identification |
|----------------------------|-------------------------|------------------|------------------------|
| ☾<br>○ ○ ○                 | 3 <sup>rd</sup> cluster | <i>sit / srt</i> | Delphinus              |
| ○ ☾<br>    ○ ○             | 4 <sup>th</sup> cluster | <i>b3wi</i>      | M31 (Andromeda Galaxy) |
| ○ ○ ☾<br>    ○ ○ ○         | 5 <sup>th</sup> cluster | <i>h3w</i>       | M45 (Pleiades)         |
| ☾ ☾ ☾ ☾ ☾ ☾<br>☾ ☾ ☾ ☾ ☾ ☾ | Neseru's                | <i>nsrw</i>      | IC2602 with θCar ?     |

Three of them are actual amasses of stars and the four of them are easily identifiable by their misty aspect. The problem remains open as to whether ☾ ☾ ☾ ☾ ☾ ☾, *mw nwt ht*, the “cluster of water” is identical to the Hyades (the “6<sup>th</sup> cluster”), as proposed by Lull, to the Pleiades, as defended by Belmonte, or something totally different but difficult to imagine in our present state of knowledge.

There remains a final question concerning the 1<sup>st</sup> and 2<sup>nd</sup> “clusters” not appearing in the decanal lists but whose existence could be explicitly inferred. In this respect, it might be interesting to consider a pair of asterisms in the Ramesside star-charts which we have reasonably identified with stellar clusters: *sb3w nw mw*, the “Stars of water”, with the Praesepe cluster (M44), already mentioned, and *sb3w ʕ3w*, the “Many Stars”, with the cluster of Coma Berenices (see Table 6.1). We speculate that these were actually the 1<sup>st</sup> and the 2<sup>nd</sup> cluster and that they were not mentioned in the decan lists of the celestial diagrams because they belong to a completely different set of constellations.



**Figure 6.15.** An image of the sky, showing the proposed location of the 3<sup>rd</sup>, 4<sup>th</sup> and 5<sup>th</sup> “clusters” of the decanal lists of stars. The three objects are peculiar and very conspicuous to any dedicated sky-watcher.

An important corollary of this hypothesis would be that the ancient Egyptian skywatchers did recognize several abnormal, tiny but conspicuous objects of the celestial vault, listing them and even using them as important time-keeping markers. However, we do not know what sense, if any, they give to these stellar amasses, although the name of one and the alternative of other (if Belmonte is correct) may offer a possible clue. These are precisely the most conspicuous stellar clusters of the northern skies, *sb3w nw mw* and *mw nwt ht*, the Stars and the Cluster of Water, M44 and M45 respectively. Their names would suggest that they were related to the supposed presence of water. Given their nebular or misty aspect, this idea may perhaps be extended to the rest of members of this strange but extremely interesting family of objects.

#### 6.2.4. Preliminary Conclusions: a Firmament above Thebes

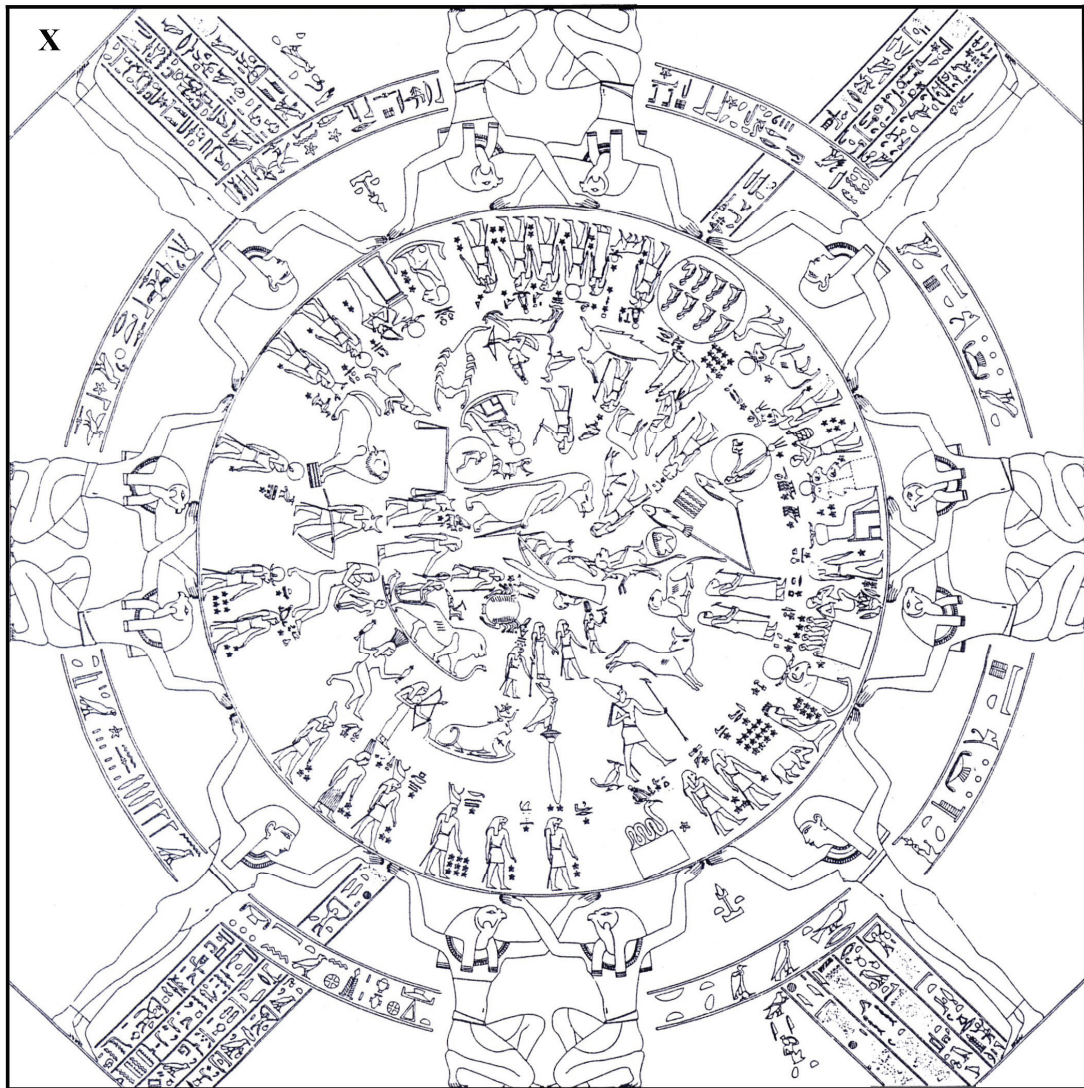
As a result of two different approaches, based on a series of independent and near-contemporary experiments (i.e., without a mutual exchange of ideas), we have been able to propose a series of identifications for a large number of ancient Egyptian stars, asterisms and constellations, as summarized in Table 6.1. We have confidence in these results and have been able to reach by a compromise a position where more than 75% of the most ancient Egyptian sky has been reasonably uncovered. This is a far more optimistic outcome than the alternative indicated by the pessimistic paragraphs of N&P cited at the beginning of this paper. However, we must emphasize that it will be difficult to establish reasonable alternatives for some other asterisms, such as the contiguous decans *3hwy* and *b3wy*, or constellations such as the scorpion goddess Selkis (see below the discussion on the Zodiac).

Nevertheless, the firmament above Thebes, as beautifully represented for the first time in the astronomical ceiling of the tomb of Senenmut at Deir el Bahari, will no longer be an unsolved mystery or an undeciphered challenge.

### 6.3. On the Zodiac of Dendara

The so-called circular Zodiac of the temple of the goddess Hathor in Dendara was originally on the ceiling of the chapel no. 2 on the eastern side of the terrace of the building. A plaster copy is on site today. During General Desaix’s expedition to Upper

Egypt in 1801, at the time of the Napoleonic invasion of the country, Vivant Denon explored the chambers of the temple and made the first drawings of this masterpiece, beautifully presented in the *Monuments of Egypt*. Once the images of the Zodiac were appreciated in Europe, they deserved a high degree of interest, with the result that in 1822 a secret expedition, with the agreement of the Pasha Mohammed Ali, travelled to Dendara and moved the huge sandstone piece to Paris, where since 1919 has been on view in the Louvre Museum.

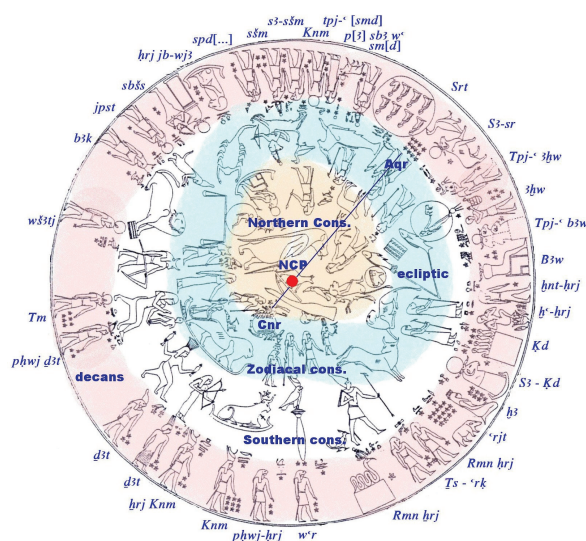


**Figure 6.16.** The Zodiac of Dendara. The circular celestial diagram itself has no other inscriptions than the names of the decanal stars. However, there is a long strip of text with astronomical significance starting in the south (upper-right) corner of the image that could help in understanding it. This reads: *(This is) the sky of gold, the sky of gold, (it is) Isis the Great, mother of the god (Horus), Lady of the Primordial Hill at Iunut (Dendara), (this is) the sky of Gold. His great divinities are the stars: Horus-son-of-Isis, his god of the morning; Sokar, his god of light; Ihy, his visible star; Osiris the Moon, Sah is his god; Sopdet is his goddess. They enter and exit (...?) of the Lower Valley.* Arguably, all of these entries should appear in the celestial diagram. Taken from Lull (2004); adapted from Cauville (1997).

The Zodiac is apparently a circular representation of the sky where the stars and constellations are depicted, sustained by the four goddesses of the four cardinal points assisted by four pairs of falcon-head divinities, as shown in Figure 6.16. The “constellations” are represented in high-relief in a disk surrounded by the 36 decans, represented by a series of standing divinities marching in an anti-clockwise direction, and identified by their names (see Figure 6.17). It is not at all clear if in Graeco-Roman times the decans were still used as time-keeping devices. However, it is quite clear that they were considered as internal divisions, in three parts, of the zodiacal constellations (or signs), completing a circle of 360°. This function is first attested in one of the celestial diagrams of Esna (Zodiac A) which is unfortunately destroyed but would have dated to the 2<sup>nd</sup> Century B.C.

The Zodiac of Dendara, presumably dated to c. 50 B.C. (see below), is the only celestial diagram with a circular form known in Egypt. This fact has suggested its identification with a heaven’s planisphere where the stars and constellations would be located in a generally realistic way. However, as we will hopefully demonstrate here, this is far from the reality and the planisphere of Dendara suffers from similar effects to those we have previously identified in earlier celestial diagrams, such as *horror vacui*, translocation of celestial objects or even, as we shall see (and this is peculiar to this zodiac), the duplication of certain constellations.

Hence, although it is not properly a zodiac (the corresponding constellations occupy a small but significant part of it, see Fig. 6.17), we shall save the classical denomination of this particular celestial diagram for the discussion below. The Zodiac can be divided into three sections by the ring of the ecliptic, the zodiacal constellations, the northern constellations and those of the south (see Fig. 6.17). Normally, each study of the diagram has followed an independent analysis of these three selected regions. However, in the essay we shall use a completely different approach. This is presented in Figure 6.18 and will consist of a series of suggested, and indicative, temporal phases in the elaboration of the diagram, taking into account the well-accepted fact that the Zodiac is actually a mixture of purely Egyptian and Mesopotamian constellations (or possibly Greek but many of these have an obviously Mesopotamian ancestry).



**Figure 6.17.** An idealized representation of the celestial diagram of the Zodiac where four clear regions have been identified. The decans are represented in a row of divine beings marching anti-clockwise in the outer ring. Their names in hieroglyphs, typical of the Graeco-Roman period and slightly different from earlier lists, have been transliterated. Adapted from Lull (2000).

### 6.3.1. The zodiacal and para-zodiacal constellations and the oldest Egyptian tradition

The zodiacal constellations would have been among the first to be depicted in the diagram (see Panel I of Fig. 6.18). These were represented as an elongated circle, certainly accounting for the ecliptic, with a centre located more or less in the head of Reret (see Panel II), where the pole of the ecliptic would actually be located, and far from the centre of the disk, equated with the northern celestial pole. This phenomenology is obviously associated with the inclination of the axis of rotation of the Earth to the axis of the orbit of our planet around the sun. This can be used to obtain a very approximate dating of the Zodiac to the middle of the 1<sup>st</sup> Century B.C. This dating is in rough agreement with the historical facts, as defended by Cauville, since the upper chapels of the temple of Dendara would have been built during the reign of Ptolemy XII Auletes (c. 80-51 B.C.), while the decoration of part of the temple was provided by his daughter and successor Cleopatra VII. However, the gigantic hypostyle hall was possibly finished and decorated in the Roman period.

The zodiacal constellations are easily distinguishable within the diagram. They were possibly unknown to the Egyptians before the Persian or Ptolemaic Periods when they were imported either from Greece or directly from Mesopotamia via the coast of the Levant. However, some of the figures do display a typical Egyptian *atrezzo*, such as Gemini, represented by the two primordial divinities Shu and Tefnut. We should remember that the Egyptians saw a pair of stars (*sb3wy*, see Table 6.1) in Castor and Pollux. Cancer is represented as a crab, although it is often represented by the scarab of the god Khepri in other diagrams (see, for example, Figure 6.19). Then comes the lion of Leo (*m3i* for ancient Egyptians, see Table 6.1) followed by Virgo handling the wheatear, representing the bright star Spica (these are typically Mesopotamian). Libra, however, as represented by the Scales is first attested in Egypt, where the autumnal equinoctial point was located in late antiquity. The figure of a child within a disk is located upon the scales. This is represented also within the sign of the horizon ☉ *akhet* (*3ht*) in the astronomical ceiling of the later hypostyle hall, as shown in Figure 6.19. We suggest that this might represent the god Hor-em-akhet, although Harpocrates, as suggested by Conman, cannot be discarded. After Libra, Scorpius, Sagittarius and Capricornus (where the Egyptians perhaps saw the Sheep, *srt*) have a typical Mesopotamian aspect, as represented in several Babylonian *kudurrus*. Aquarius is also depicted as an Egyptian divinity: the god of the Nile, Hapi. Pisces is depicted in the standard form, followed by Aries, the Ram, and the bull of Taurus, which is curiously represented in a very non-standard fashion, looking backwards and with its body extending to the east (see, for example Figs. 6.19 and 6.20). All these latter figures have no parallel with ancient Egyptian constellations.

The zodiacal constellations would have been sculpted at the same time, or even after some important and very ancient Egyptian counterparts as shown in Panel II of Fig. 6.18. These are primarily the Osirian Triad (as suggested by the Gemini displacement) and the northern constellations of Meskhetyu and the She-Hippo, *Reret* (*rrt*).

Sah is easily identifiable as the man holding a *was* sceptre as a personification of Osiris, and Sopdet (Sothis) is represented as a recumbent cow on a bark with a five-pointed star within her horns, which is obviously Sirius. The cow, a symbol of Hathor, suggests the assimilation of Hathor with Isis and hence with Sopdet herself. Most difficult, however, is the prominent figure of a falcon upon a pole (actually a *w3d* symbol) represented between Sah and Sopdet in a place where there is scarcely space for

more constellations within the sky (see Fig. 6.2). This is the well documented image of Horus-upon-his-pillar (*ḥrw ḥri w3d.f*) which completes the Osirian triad. There are two possible explanations.

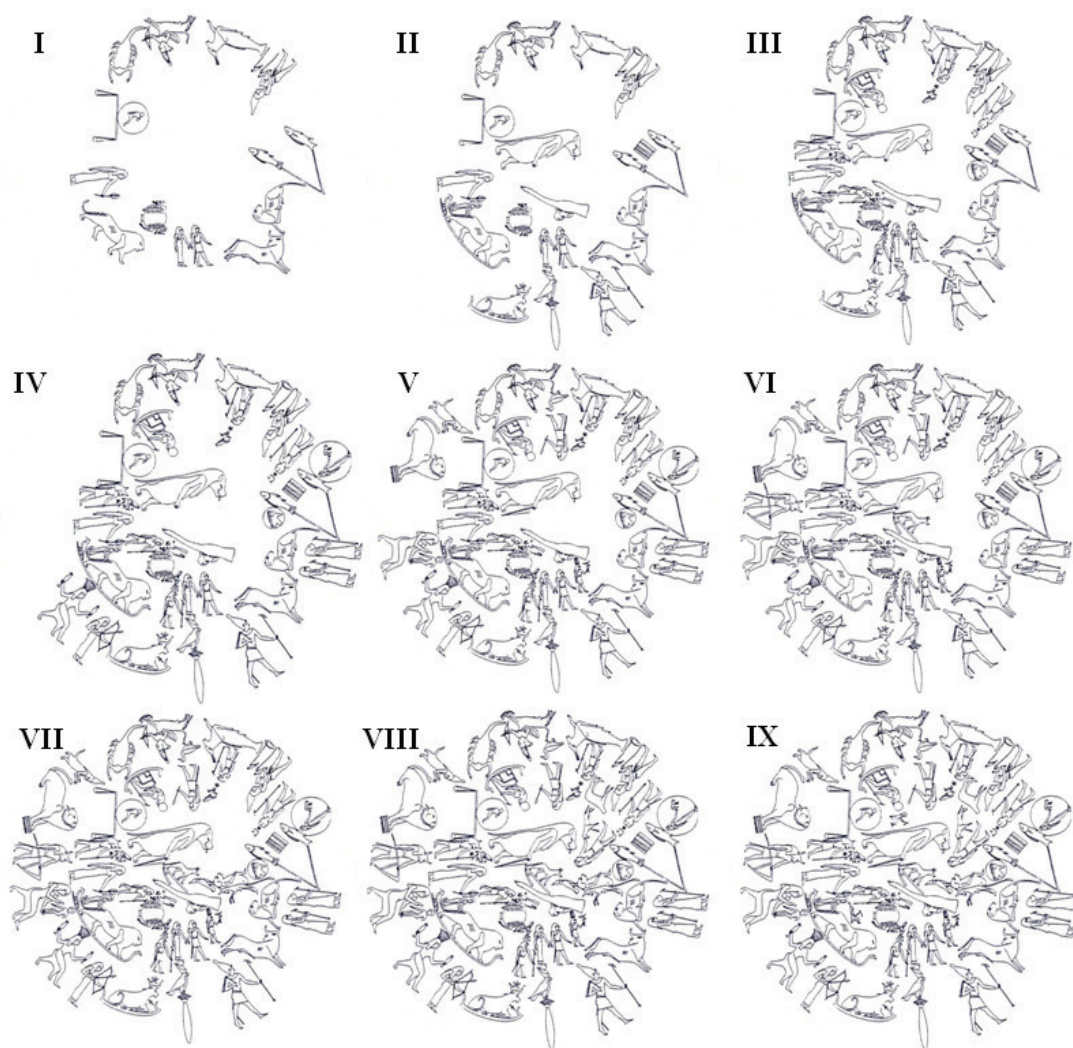
On the one hand, the figure may represent Horus as a third member of the Triad, already appearing in the Pyramid Texts as the grouping Sah-Sopdet-Sopdu, and having only a symbolic character either as Horus-who-is-in-Sopdet or as an archaic image of the Morning Star, since both images are possible interpretations of the Pyramid Texts. In this respect, it is curious to note that the hieroglyphic text encircling the Zodiac mentions Horus-son-of-Isis, God of the Morning, as one of the “stars” represented in the diagram (see Fig. 6.16). A second possibility is that this image of Horus represents another neighbouring celestial object that may be mentioned in the circular inscription, perhaps Ihy, the third member of the Dendara triad of divinities. In this case, an obvious candidate would be the bright star Canopus. In Chapter 8, the importance of Canopus will be discussed as being one of the stars towards which ancient Egyptian temples were orientated and we will recall the idea, mentioned by Allen, that Canopus may have some connection with the figure of the king, and indeed may be a personification of Horus. However, this would be contrary to physical reality where the rising of Canopus always follows that of Sirius; although when looking at the meridian crossing of the “Triad”, Canopus would be seen between Sah (southern Orion) and Sopdet (see Fig. 6.2.). Both hypotheses: symbolic character or an image of Canopus, are appealing and perhaps the solution may be a mixture of the two, a common solution for ancient Egyptian mentality.

The area surrounding the celestial pole is occupied by two ancient and traditional Egyptian constellations. The giant hippopotamus with a crocodile’s tail is surely *Reret*, the constellation often represented in the celestial diagrams and used for time-keeping in the Ramesside celestial charts. We have discussed her within this essay (see, for example, Figs. 6.1, 4, 5 or 7 and Table 6.1). The bull’s foreleg is undoubtedly Meskhetyu. However, the foreleg is not isolated since a small figure of a recumbent animal is represented attached to it. The Zodiac is the only case in the dozens of Egyptian celestial diagrams where this happens. This has been a matter of much debate between specialists who have seen on it either a ram or a recumbent lion, which may be identical to the lion of earlier astronomical ceilings. In our opinion, the answer is much easier.

The Zodiac is a composite diagram of both Egyptian and Mesopotamian-Greek traditions and probably was designed to be correctly interpreted by people of the two civilizations. Accordingly, this small recumbent animal is nothing else than a bear, indeed representing the constellation of Ursa Major to which the asterism of the Plough (i.e. Meskhetyu) certainly belongs. Hence what we are actually dealing with is a duplication of a celestial object in a peculiar mixture of Egyptian and alien traditions. We shall see that this idea can be supported by the various examples within the Zodiac where a similar phenomenology has been discovered.

In this respect, the same Panel II illustrates the presence of a series of what John Rogers has called the para-zodiacal constellations. These are a set of “constellations” that were frequently associated with the original zodiacal ones in the Mesopotamian astronomical texts, notably the MUL.APIN tables. Among them, we can cite KU, the Fish, identical to our Piscis Austrinus (PsA), ASH-IKU, the Field, in the Square of Pegasus, UGA, the Raven (Corvus), and MUSH, Hydra, normally related to the Lion and, finally, MA.GUR, the Bark (possibly Corona Australis), associated with the archer, Pabilsag. Surprisingly, or perhaps not, all these can be easily identified in the Dendara

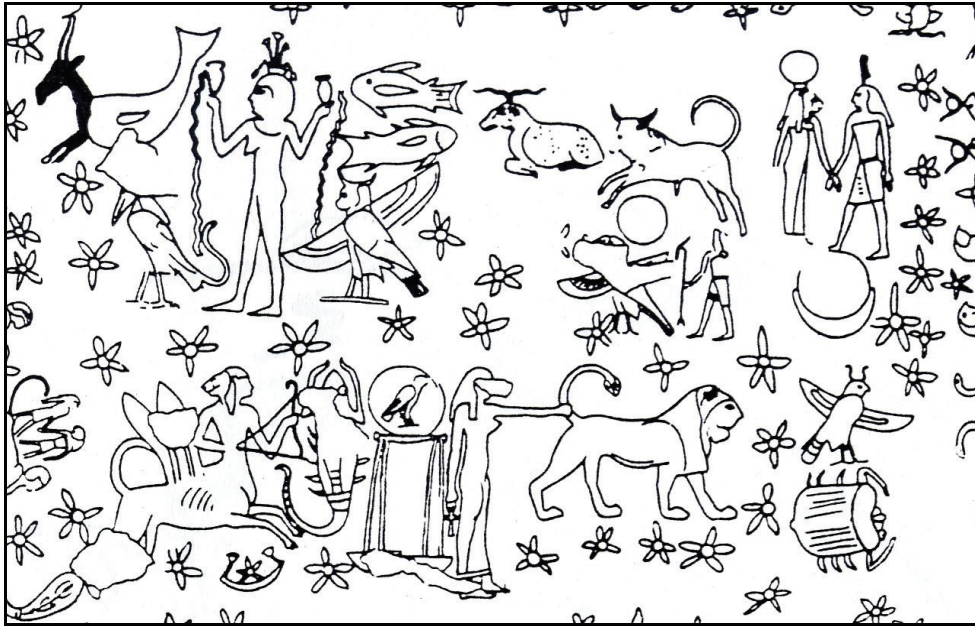
Zodiac with a fish at the bottom of the water-pouring Hapi, an inundated field in the middle of Pisces, a bird and a snake close to Leo and a small bark (much larger in other representations; see, for example, Figure 6.21) below the feet of Sagittarius. The parallelism is so striking that the solution is, in our opinion, self-evident. However, a special mention should be made in the case of the Bark. We have shown in Section 6.2 that the ancient Egyptians perhaps recognized a Boat or Bark (*wi3*) in the area of Sagittarius. Hence, we could identify this Bark as *wi3* (thus supporting the identification proposed in Table 6.1) and not as MA.GUR. However, another interesting possibility is that once again we are confronted by an image with multiple meanings that would be differently interpreted according to the background of the person (very likely at the time a priest) looking at the image.



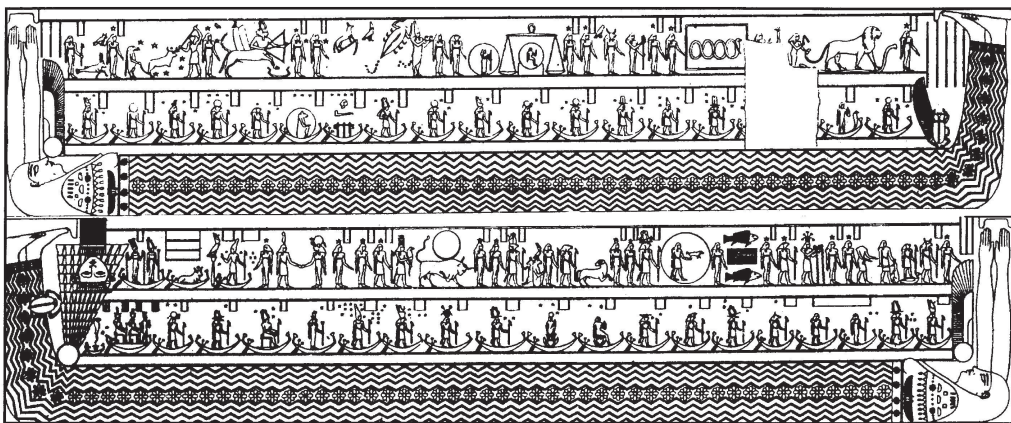
**Figure 6.18.** A hypothetical exercise of how the Zodiac was perhaps designed by successive stages of astronomical traditions and perceptions: alien zodiacal constellations (I), para-zodiacal and ancient southern and northern Egyptian constellations (II), the planets (III), “symbolic” drafts with other levels of significance (IV), traditional Egyptian constellations of the Ramesside star-charts (V), the celestial “adzes” (VI), filling gaps (VII and VIII), and bright-star representations (IX). Fig. 6.16 is Panel X, the complete Zodiac. See the text for further discussion.

Closely linked to the above is the last of the para-zodiacal constellations of the diagram which has no Mesopotamian counterpart. This is the small figure of a woman holding down the tail of the Lion, situated above Corvus. In later diagrams (see Fig.

6.19), it was obviously meant to represent Virgo and perhaps she was depicted twice on the Zodiac. However, an alternative and most interesting possibility arises looking at Figs 6.7 and 6.9. From these images, it is clear that Selkis (*srkt*) was seldom represented above and close to the Lion (*m3i*). In the Zodiac, this position may have been shifted towards the tail of the lion. Marginally, this idea might support the earlier hypothesis proposed by Belmonte that the ancient Egyptians recognized Selkis in the area of Virgo (see Table 6.2). However, even if Belmonte is wrong, and this is not Selkis, we shall still have a naïve alternative (see below).



**Figure 6.19.** A section of the astronomical ceiling of the tomb of the two brothers in Athribis, 150 Km. to the north of Dendara, representing the zodiacal constellations. Notice the female figure holding the Lion's tail, standing for Virgo, and Cancer in the form of a scarab instead of a crab. The Bark is represented below Sagittarius. Seven additional figures probably stand for the seven planets, including the sun and the moon. Adapted from *EAT* iii.



**Figure 6.20.** The two western- and easternmost sections of the imposing astronomical ceiling of the hypostyle hall of the temple of Dendara, representing the 36 decans in barks (second and fourth rows) and a mixture of zodiacal and traditional Egyptian constellations quite similar to those represented in the Zodiac. Indeed, this astronomical ceiling is possibly a later Roman Period copy of the former. However, a peculiarity of the diagram is that the constellation ʕn, absent in the Zodiac, is here represented interacting with Meskhetyu in the upper-left corner. Adapted from the *Monuments of Egypt*.

### 6.3.2. *Dealing with the planets and beyond*

As shown in Fig. 6.18, Panel III, all the five planets visible to the naked eye and known to the ancient Egyptians are represented in the Zodiac and identified by their Egyptian names in hieroglyphs. Mercury is in Virgo and its name was obviously inserted once Cancer and Meskhetyu were already sculpted. Bull-headed Saturn is between Libra and Virgo. Mars, Horus the Red, rides on Capricornus. Two-faced Venus is between Pisces and Aquarius. Finally, Jupiter is behind Gemini.

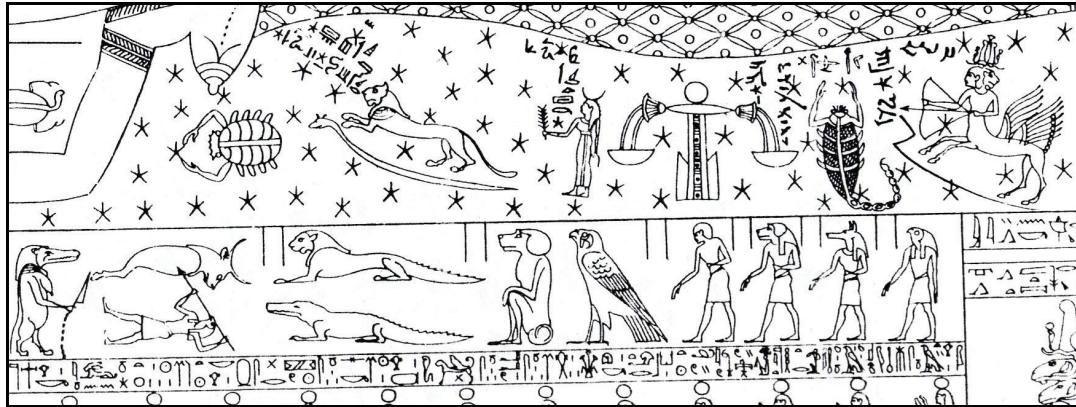
There have been long debates as to whether these positions are merely random or intentional. Of several proposals, two theories as to intention have been put forward. The first, proposed by N&P and recently defended by Conman, suggests that the planets are shown in their places of exaltation or *hyposomata*. Hence their position, although not random, would only have a symbolic and not an astronomical meaning. The second, defended by Aubourg in the context of an astronomical interpretation of other elements of the diagram (see below), suggests that the planets are located in those constellations where they were stationary near the epoch of construction of the temple in the middle of the 1<sup>st</sup> Century B.C. As a matter of fact, both hypotheses are compatible with each other within certain limits and may be considered as reasonable explanations of planets' positions within the diagram.

For Middle Eastern cultures, including those of classical Greece, the Sun and the Moon were also considered planets, although of a different category. In Egypt, however, it is quite obvious that the planets were considered to be at a lower level than the great Sun and Moon gods. Notwithstanding, the Egyptians may have tried to represent them within the Zodiac. Our preliminary proposal is that the Moon can be identified as the Eye of Horus represented above Pisces and that the Sun may be identical to the imposing falcon-headed figure above Scorpius. This is a familiar representation of the god Re-Horakhty when he is identified with Sokar travelling in the Duat, hence in the nocturnal sky, the realm of the blessed.

In Panel IV we have introduced a series of images pertinent to the discussion. These are the woman, placed within a circle holding a small pig or baboon below Pisces, and the two standing figures below Aries, holding *was* sceptres as the planets. Cauville and Aubourg have proposed the idea that the composite image below Pisces could be the symbolic representation of a solar eclipse that actually occurred in Pisces on March 7<sup>th</sup> 51 B.C., a date not too far away from the date of death of King Ptolemy XII. This would then offer a late dating for the Zodiac itself. This is indeed a sounding possibility and to our knowledge it has not been seriously contested so far. More problematic, however, is their second identification of the Eye of Horus with a lunar eclipse which also occurred in Pisces on September 25<sup>th</sup> 52 B.C., a few months before the former. Unfortunately, we have no evidence of how the ancient Egyptians represented eclipses but, while the first possibility may sound reasonable, the second looks fallacious because it might imply as a very dangerous corollary that any Eye of Horus inscribed within a circle may represent a lunar eclipse, a possibility that for us is completely out of the question.

A further problem is that of the two standing figures below Aries, a lion-headed man and a woman. According to Conman, these represent the other two planets of antiquity, indeed the Sun and the Moon, respectively. In making this claim, she relies on the fact that they are carrying *was* sceptres, like the “rest” of the planets and that the lion is a very old Egyptian solar symbol. Besides, this would locate the Sun in his sign of exaltation (Aries) and the Moon close to hers, Taurus; hence the seven *hyposomata*

would be accomplished. The main problem with this hypothesis, already recognized by Conman, is that the Moon is always a male god in ancient Egypt. It is in fact extremely difficult to find a reasonable alternative for the identification of these two figures (see below) and therefore we may accept Conman's hypothesis as another external influence on the Zodiac, presumably Greek, since the Moon was also male in Middle Eastern antiquity, where this tradition found a parallel with that of Egypt as represented by the Eye of Horus and Re-Horakhty; a further duplication of celestial images.



**Figure 6.21.** A snapshot of the celestial diagram represented in the coffin of Heter. Notice the large size of the Bark constellations extending along Sagittarius. A baboon and a falcon are represented behind some traditional northern constellations (see for example, Fig. 6.4), and followed by the four children of Horus. Adapted from *EAT* iii.



**Figure 6.22.** The last section of the astronomical ceiling in the hypostyle hall showing Satet and Anuket navigating the sky in the same boat. As in the Zodiac, Horus-upon-his-pillar is represented between Sah and Sopdet. Photograph by J.R. Belmonte.

In Panel IV, we have also included two further controversial personifications. In the astronomical ceiling of the hypostyle hall (see Figure 6.22) these are represented together in a boat following Sopdet, and are clearly identified with the goddesses of the first cataract Satet and Anuket, whose temples were found in the islands of Elephantine and Sehel, respectively. In the Zodiac, Anuket is easily identifiable but in the case of Satet, who is often identified with Sopdet, the question is not so clear. The figure does

not wear the typical tiara of the goddess but instead she is armed with a bow and an arrow ready to be shot. In Mesopotamia, Sirius was known as KAK.SI.SA, the Arrow Star, while large areas of Canis Major were seen as the Bow prepared to fire it. Perhaps we are facing the same situation as before, where the typical Egyptian constellation (Sopdet) is followed by an alien interpretation (Bow and Arrow) which, besides, sits well with an alternative Egyptian interpretation of the same image (Satet). So the constellation Canis Major and the star Sirius would also be represented twice in the Zodiac.

We turn now to Anuket. She is represented with a pair of *hst* vessels in her hands as if she were prepare to pour out the waters of the Inundation, occurring after the heliacal rising of Sirius, and perhaps her presence here is merely symbolic. However, an alternative theory connecting Anuket with Canopus has recently been proposed by the “fringe” author Philip Coppens. This is based on the similarity of the Arabic name of the star, Suhail سهيل, with the name of the island where Anuket’s temple was located, Sehel سهيل. This idea would have been interesting if *sehel* did not mean “sandy” in Arabic; however it is so and indeed is a very logical epithet for this island. If anyhow this interpretation were correct, we could be facing another double representation of a celestial body, in this case Canopus as Horus-upon-his-pillar and Anuket, both coming from the Egyptian tradition. This might sound unusual but would not necessarily be impossible.

### 6.3.3. Dealing with classical Egyptian constellations



Among the stars of classical Egyptian traditions as discussed in the first sections of this chapter, we have dealt, in order of antiquity, with the celestial bodies mentioned in the Pyramid Texts, the decanal stars and asterisms, the constellations of the astronomical ceilings and the individual stars and constellations of the Ramesside star-charts. Additionally, we have showed that some of the constellations of the ceilings could be identical to those of the Ramesside clocks. It has frequently been argued that the Zodiac could depict a series of celestial bodies of Egyptian traditional sky-lore. This is quite obvious in the case of the decanal list in the outer ring of the circle. We turn now to demonstrate that the second set of stars and constellations, those of the Ramesside stellar clock tradition, is also present in the Zodiac.

By RA, the Ramesside star-charts list the following conspicuous stars and constellations, starting with Sirius (*sb3 n spdt*, the Star of Sopdet): *sb3wy* (the Pair of Stars), *sb3w nw mw* (the Stars of Water), *mi3* (the Lion), *sb3w ʿs3w* (The Many Stars), *ʿt3 nfr* (Beautiful Boy), *mnit* (the Mooring Post), *rrt* (Reret, the She-Hippopotamus), *nht* (Nekhet, the Giant), *ʿryt* (Aryt), *3pd* (the Bird), *sb3 n h3w* (Star of the Myriad), *sb3 n sʿr* (Star of Fire) and, finally, *sb3 n s3h* (Star of Sah). In Table 6.1 we have offered reasonable identifications for all of them. Panel V incorporates series of depictions, including some already discussed, which will almost complete the list.

We have the Star of Sopdet and the Pair of Stars as represented in the star within the horn of the cow and the stars at the head of Shu and Tefnut. Then comes the Lion which we have identified with Leo. However, the Zodiac shows here one of its frequent duplications between alien and Egyptian traditions since the Lion is represented twice, as Leo and as the Lion placed below Libra (this idea was already defended by N&P). This second Lion has in its fore-paws the obvious representation of the Stars of Water. The Beautiful Boy can be found in the hands of a seated female figure below Virgo. We have identified him with Spica; hence this star is also represented twice in the diagram.

The lady holding him could be identical to Virgo and again we would have duplication. The Mooring Post is now found in the hands of Reret, with the bright star Arcturus in its apex. This pair of constellations was surely depicted as a group from the beginning. Leitz has proposed that a double of Reret could perhaps be found behind the double of the Lion, but this is highly unlikely. The Giant, Nekhet, would have extended from Sagittarius to Pisces. However, the presence of the name of Horus the Red already fills this space. Consequently, the Giant was represented with the mace in his hand in the empty space above Capricornus, followed by the Bird (*3pd*). We propose that the Star of Fire (Capella, see Table 6.1) is identified with the small standing figure holding a ram-headed sceptre to the right of Gemini. Finally, the Star of Sah, most likely Rigel, would be at the head of Sah (see Fig. 6.2).

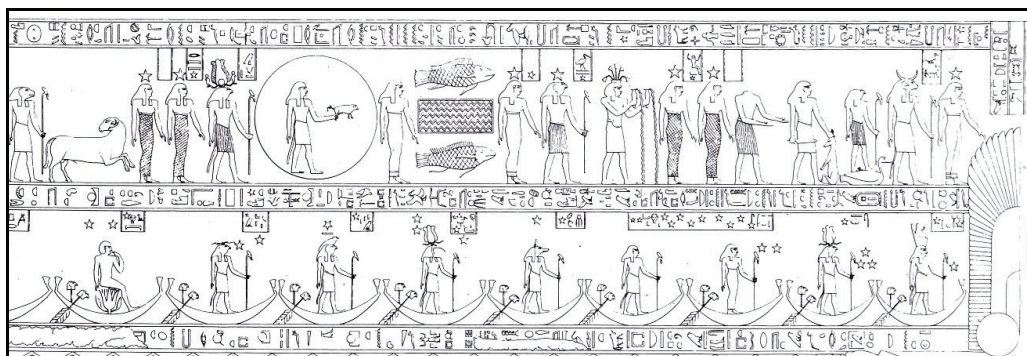
This series of proposals only leaves the Many Stars, Aryt and the Star of the Myriad without representation within the Zodiac. The Star of the Myriad is certainly a member of the Pleiades cluster. This has already been noted (and perhaps is represented by the seven stars in front of a kneeling figure, see Fig. 6.17) in the ring of decanal stars and also included within the Taurus constellations. However, it is odd that, considering the large number of duplications presented in the diagram, this important asterism has not been explicitly represented. Aryt ought to have appeared in the regions near Pisces. The translation of the name and the identification of this asterism are still problematic and we do not have an answer, unless it is found in the pair of standing figures below Aries, providing Conman's proposal was wrong. Finally, the Many Stars should be found behind Leo. This might offer two alternative explanations. On the one hand, the Many Stars could simply be identical to the strange figure behind the Lion which is below the Scales. On the other hand, this would offer a new interpretation for the controversial female figure standing on the tail of Leo (see above) that we could now identify with the Ptolemaic constellations of Coma Berenices and hence with the Many Stars. Including this possibility, the Zodiac would include at least 13 out of 14, if not all, individual stars and constellations of the Ramesside star-charts, clearly showing that it could indeed be considered as a classical Egyptian celestial diagram.

Panel VI now includes two figures, placed in a very peculiar grouping because both are associated with the representation of an adze. One is found precisely at the centre of the diagram. Consequently, it ought to be located at the position of the celestial pole. In Chapter 8, it will be shown how one of the celestial adzes used in various religious ceremonies, notably the Opening of the Mouth, may be identical to the Small Dipper (UMi), the other being an alternative representation of Meskhetyu. Although the form of both adzes is not the same ( vs. ), we suggest that the symbolism behind the representation might be identical. The Jackal depicted close to the adze is normally related to it and, since the discovery of the Zodiac, identified with an image of the god Wepwawt, the "Opener of the Ways". However, it is worth noting that this figure is totally absent in earlier celestial diagrams (see, for example, Fig. 6.1. or 6.7). Or perhaps not? We shall come back to this interesting topic later. Curiously, the image of the falcon-headed  $\epsilon_n(w)$ , conspicuously represented in earlier astronomical ceilings in this region of the sky, is absent from the Zodiac. However, it is present in close relation to Meskhetyu in the ceiling of the hypostyle hall (see Fig. 6.20).

The second figure holding an adze is that of a standing bull-headed divinity. According to Boll and Gundel, followed by Conman and Park, this ought to be identified with the constellation of Bootes, including the bright star Arcturus. We have largely argued that Arcturus is in the Mooring Post and that the region of Boötes is mostly occupied by the giant She-Hippopotamus, so, in principle, we should discard this

idea. Actually, it is extremely difficult to find an appropriate explanation for this “constellation”. We have three very speculative proposals.

Firstly, because of its location within the diagram, it could represent Centaurus (notice the bull-head) and the Southern Cross (the adze could include its stars). However, we already have a likely Egyptian counterpart for these stars (see Table 6.1) and, besides, we have shown that the diagram is far from being a realistic representation of the sky. Secondly, this could be an alternative representation (duplication again) of the stars of Ursa Major, including Meskhetyu, which is often represented as a complete bull (see, for example, Fig. 6.7.). The adze would then be an alternative representation of Meskhetyu itself paralleling the smaller adze and the Little Dipper. Two arguments could be advanced against this idea: on the one hand, we would have triplication instead of duplication (remember the Bear attached to Meskhetyu); on the other hand it is highly unusual to have a representation of such an important northern constellation so far and south of the Ecliptic. Third and lastly, the bull-headed figure is in the same row of a set of images that we have identified as constellations of the Ramesside star-charts. Considering that some of them are out of place, we could play with the idea that this is one of the unidentified stars or constellations of the group, either the Star of the Myriad or Aryt. However, the displacement would have been in this case of  $180^\circ$  to the opposite side of the diagram; such a situation, although not impossible, is indeed difficult to accept. We shall therefore consider the bull-headed “constellation” as one of the unsolved images of the Zodiac.



**Figure 6.23.** A section of the celestial diagram in the hypostyle hall showing the celestial objects represented between the constellations of Capricornus and Aries. The symbolic representation of an eclipse occurring in 51 B.C., as proposed by Auburg (see text), is also depicted here suggesting that this diagram was merely a later copy of the earlier Zodiac of the chapels of the temple terrace. Adapted from *EAT* iii.

#### 6.3.4. Filling empty spaces: the problematic constellations

Panels VII, VIII and IX (Fig. 6.18) and X (Fig. 6.16) are the last stages in completing the Zodiac following our particular approach. In Panel VII we have just included a composite figure of a baboon, a falcon and a peculiar animal in the empty space between the Moon and Meskhetyu. The strange animal has the aspect of an ass and is similar to some late representations, including those at Dendara, of the god Seth. The interpretation of this grouping is very difficult. Our preliminary idea is that such representation is merely symbolic, where each of the three animals stands as determinatives of the other figures next to them. The crowned falcon would confirm that the Jackal is Wepwawt, a manifestation of the falcon-head god Horus. The baboon would stand for the Moon, certainly a reasonable possibility. Finally, the ass would

identify Meskhetyu as the Leg of Seth. However, we should recognize that the composite figure is also present between Aries and Taurus in the hypostyle hall ceiling (see Fig. 6.20) a fact which may or may not suggest an independent character (this ceiling could be a bad copy of the Zodiac). Besides, a baboon and a falcon are represented in some later celestial diagrams, such as the one depicted in the coffin of Heter (see Fig. 6.21), in relation to some unmistakable representations of classical Egyptian constellations. The problem is not an easy one to solve.

The situation is also quite complicated in relation to the figures completing the large gap above the head of Reret (see Panel VIII). We have no idea of what these two figures (a man holding an animal and a headless human being in the form of the hieroglyphic sign  $\overline{mn}$ ,  $hn$ ) may represent, since their representation in the Zodiac is the first occasion they have ever been depicted. Both seem to be related since they are represented together and in front of Aquarius in the hypostyle hall, as shown in Figure 6.23. Unfortunately, the explanations offered so far by various authors, and even the identification with constellations in the “corresponding” region of the sky, are indemonstrable and difficult to falsify.

There is, however, an alternative explanation for this problematic set of figures. Figure 6.24 shows a detail of the astronomical ceiling of Senenmut (see also Fig. 6.1) where the four sons of Horus (Imset with human head, Hapy with the head of a baboon, Kamutef with that of a jackal and, finally, falcon-headed Kebehsenuf) are represented in a row, following Isis and Reret. This is the controversial part of the classical celestial diagrams where N&P chose to see representations of the days of the lunar month. Without entering the controversy (in some instances the Children of Horus could be interpreted as starry beings in the area of the northern celestial pole), it is at least striking to notice that we have a jackal, a falcon, a baboon and a human figure all together, near the head of Reret and in an obviously northern sky location. Indeed, it would be highly desirable for those texts suggesting the celestial situation of these divinities to be studied in greater detail.



**Figure 6.24.** The Children of Horus as beautifully depicted in the unfinished astronomical ceiling of the tomb of Senenmut. The presence of these four gods in several celestial diagrams and texts of an astronomical character would suggest that they could be seen in some of the real stars or asterisms of the celestial vault by the ancient Egyptians. Photograph by J.A. Belmonte.

Panel VIII shows how the Zodiac was almost completely full of figures at that stage. However, there were still some minor empty spaces where the artist (or the designer) still felt able to include a few small figures. One of these spaces is above Leo where the image of a seated Egyptian king was depicted. This we believe is a representation of the star Regulus,  $\alpha$  Leonis, called LUGAL, king in the MUL.APIN tables. Considering that some small figures in the diagram have been identified with bright individual stars, such as Capella or Regulus, we would tend to do the same in the case of a small seated female figure placed behind Reret (see Panel IX). In several celestial diagrams, Reret is followed by a representation of the goddess Isis which in this case is certainly not equivalent to Sopdet (Sirius). However, there is another very bright pale-white object in that region of the Firmament that would fulfil our expectations. Consequently, we propose that the seated lady is Vega, the brightest star of the northern celestial hemisphere.

### 6.3.5. Completing the Zodiac: a firmament above Dendara

To complete the Zodiac (Panel X, Fig. 6.16), we still need two extra figures, a miniature jackal just below the seated lady and a bird behind Sah. On the one hand, we suggest the idea that the jackal is another atypical para-zodiacal constellation. The MUL.APIN tables include two possible alternatives: UR.DIM, the Mad Dog, to the left of Scorpius, which is frequently identified with Lupus, and most likely UR.KU, the Dog, to be located to the south of Hercules, a position that would produce a reasonable fit with the position of our figure within the diagram. On the other hand, we speculate that the bird behind Sah would be the first depiction ever of the constellation of Columba. According to Allen, the first planispheres with the image of Columba could be dated to the 17<sup>th</sup> Century. However, Allen himself reports that in the scripts of Clement of Alexandria, a Columba is mentioned in connection with (Argo) Navis. This might suggest that a Columba constellation might already have been created in the centuries before and this could indeed be the bird represented in the Zodiac.

Figure 6.25 shows a visual diagram of our proposals where the various sets and perceptions of stars and constellations have been identified by the use of different colours. Our main conclusion would be that the Zodiac of Dendara is not a precise depiction of the sky in stone but rather a highly symbolic representation of the firmament where the zodiacal constellations would have been presented in a more or less realistic way, followed by the similarly realistic representation of some traditional local constellations, notably Meskehtyu and Reret. Around this basic grid, the planets, other para-zodiacal constellations and traditional Egyptian individual stars, asterisms and constellation, basically of the Ramesside star-charts, would have completed the picture in such a way that almost all the empty spaces will be replenished (to avoid *horror vacui*).

This particular task has been accomplished as a result of our previous success in identifying classical Egyptian constellations (see Table 6.1) and by following a series of basic rules such as: (i) presence of mixed but convergent alien (Mesopotamian and/or Greek) and Egyptian traditions; (ii) strong symbolism; (iii) duplication of several celestial bodies; and (iv) alteration -frequently drastic- of the position of some images in order to fill gaps. Using these basic premises, we have been able reasonably to identify almost 90% of the inner circular diagram of the Zodiac, a percentage even higher than the one obtained for the classical constellations.

We expect that new discoveries, other intelligent proposals, or more accurate interpretations of extant texts will help to disentangle the remaining 10%.



**Figure 6.25.** A colour-coded summary of our analysis of the Zodiac of Dendara. Zodiacal and para-zodiacal constellations are represented in dark and light green, respectively. The most important traditional Egyptian constellations are represented in yellow. The planets are scattered among these and coloured orange. The Bear of the Greek tradition (Ursa Major) is represented adjacent to Meskhetyu in pale yellow. The constellations of the Ramesside star-charts are depicted in deep-blue, including some of the zodiacal (e.g. *sb3wi* in Gemini) and the yellow Egyptian constellations (e.g. *sb3 n s3h* and *sb3 n spd*). The solar eclipse occurring in Pisces in March 7<sup>th</sup> 51 B.C. is depicted in dark brown. Satet and Anuket are coloured light and dark grey, respectively. The Small Dipper (Ursa Minor) can be found in deep purple, either including or not the image of the jackal. Regulus and Vega are the seated king and female figure coloured red, respectively. Finally, Columba, behind Sah, is coloured fuschia. This interpretation explains nearly 90% of the images of the Zodiac. However, some problematic representations, coloured in pink and light blue, purple and brown, respectively, are still quite controversial. These are largely discussed in the manuscript. See the text for further details.

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