Time and Mind: The Journal of Archaeology, Consciousness and Culture

Volume 5—Issue 1
March 2012
pp. 53–72
DOI:
10.2752/175169712X13182754067421

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The Snefru Projects and the Topography of Funerary Landscapes during the Twelfth Egyptian Dynasty

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Abstract

The topography of the pyramids of the twelfth dynasty is explored here in its full historical and chronological context, with the aim of highlighting connections between the architectural choices, religious ideas, and traditions inspiring the reigns of the Pharaohs of that period. There emerges a clear and close connection between the conceptual landscapes devised by the architects of these rulers, and the two "double" building projects carried out more than six centuries before by Snefru at Dahshur and at Meidum-Seila. This connection encompasses geometry, perspective, and astronomical alignments in the progressive planning of the pyramidal complexes, and it is confirmed by an important text of the period, the tale entitled *Prophecy of Neferti*. In such a context, an attempt can be made to interpret several architectural

and topographical choices that have remained so far unexplained. In particular, the funerary project of the last great king of the dynasty, Amenemhet III—who built two pyramids, one at Dahshur and the other at Hawara—appears to stem largely from symbolic, as opposed to practical, reasons.

Keywords: Middle Kingdom pyramids, conceptual landscapes, archaeoastronomy, archaeotopography

Introduction

Scattered on the ridge of the desert between Dahshur and the northern rim of the Fayoum oasis are the scant remains of the pyramids of the Middle Kingdom, for the most part constructed during the twelfth Egyptian dynasty (1991–1778 BC). The aim of the present article is to analyze the landscapes where such pyramids were constructed, in order to highlight the connections of their projects with the religious ideas and traditions inspiring the reigns of the Pharaohs who built them.

The twelfth dynasty pyramids were first studied at the end of the nineteenth century by De Morgan (1894) and Petrie (1890, 1891). Subsequently they were thoroughly re-excavated, so that today we have an excellent knowledge of their architecture (Arnold 1987, 1988, 1991, 2003; Stadelmann and Alexanian 1998). Their ruined state is due to erosion and to the spoliation that occurred over the centuries. What we can see today does not, therefore, do justice to the grandiosity of the original projects. Indeed, although there is no comparison with the magnificent stone pyramids of the Old Kingdom, the Middle Kingdom pyramids were designed and built to be a visible symbol of power and to convey a series of messages relating to the divine nature of the kings and their dynastic claims to kingship. It appears that such messages have still, at least in part, to be understood. In particular, a major problem is to understand the emerging role of Osiris in the funerary cult of the Middle Kingdom, and the simultaneous decline of the "Heliopolitan" Sun God Ra in favor of Amun, the solar divinity from the heartland of the kings, Thebes (see Figure 1 for a general map of Egypt). It is generally accepted that a reflection of this developing scenario can be seen in the evolving architectural choices made for the pyramids' projects and, in particular, for their interior arrangements (Lehner 1999). Several studies have shown, however, that in the architecture of the pyramids of the *Old* Kingdom, the topographical choices also had a fundamental importance in transmitting ideas and relationships of religious and/or dynastic origin (Lehner 1985; Jeffreys 1998; Goedicke 2001; Verner 2002; Magli 2009, 2010c); as a matter of fact, similar concepts were already in play in the funerary landscape of the first dynasties at Abydos (Richards 1999; O'Connor 2009).

This article explores the same issue in the case of the Middle Kingdom royal pyramids. In particular, we shall concentrate on the relationships between the twelfth dynasty monuments and the pyramids of Snefru because three twelfth dynasty pyramids were built within an already existing funerary landscape, which was inaugurated 600 years before by Snefru at Dahshur, two others were built in the Fayoum area, not far from another existing Snefru project at

Fig 1 Map of ancient Egypt. Image adapted by the author.

Meidum, and an important text written at the beginning of the twelfth dynasty, the tale entitled *Prophecy of Neferti*, legitimates the origin of the dynasty tracing it back to the reign of Snefru. As we shall see, it emerges that a series of topographical and geometrical relationships between the twelfth dynasty projects and the Snefru projects does exist. Such connections help to explain several unsolved issues about the topography of the twelfth dynasty monuments, and can be interpreted as a reflection of that peculiar mixture of "archaism and innovation" which is a fundamental characteristic pervading Middle Kingdom culture (Silverman et al. 2009).

The Royal Pyramids of the Twelfth Dynasty: A Brief Overview

We shall need here to consider all the known royal pyramids of the twelfth dynasty (see map of sites in Figure 2) together with their locations, and, for the ease of the reader, I have given below, as briefly as possible, the kings, their accession dates (the delicate issue of co-regencies is not addressed), and some information that will be absolutely essential later. As a reliable working framework, the chronology follows that of Baines and Malek (1984) adopted by Lehner (1999), to whom the reader is referred also for an authoritative, complete survey.

Amenemhet I (1991 BC) and Senwosret I (1971 BC)

Amenemhet I was almost certainly born in Thebes, where one of his predecessors, Mentuhotep II, built the first great funerary complex of the Middle Kingdom (Arnold 1979). The king left Thebes (where an unfinished tomb was probably begun for him) and chose to found a new capital and to be buried at Lisht, approximately mid-way between Meidum and Dahshur. As in the Old Kingdom, during the twelfth dynasty each royal pyramid had its own name (referring only to the monument, not to the complex as a whole). For Amenemhet I it is "The Places of the Appearances of

Fig 2 The pyramid sites of the Snefru projects (Dahshur, Meidum, Seila) and those of the twelfth dynasty kings (Dahshur, Lisht, El Lahun, Hawara). Image ©2010 Google Earth, ©2011 Digital Globe, ©2011 GeoEye. Annotations by the author.

Amenemhet." The pyramid is located very near the ridge of the desert, a rule always to be followed later. The complex clearly resembles those of the Old Kingdom, with a valley temple, a causeway, and a funerary temple located on the east side of the pyramid. The surface was cased with slabs of white Tura limestone, the same used for Old Kingdom pyramids, so that, once finished, the aspect of the monument did not differ substantially from that of its predecessors; the same holds for the height, which probably was around 55 m, comparable to Menkaure's at Giza. The entrance was in the north face at ground level, as was the standard in the sixth dynasty, with the chamber on the pyramid's vertical axis; however, as in Theban tombs, the chamber has a vertical shaft entrance.

Similarly the funerary complex of Senwosret I (1971 BC) is located at Lisht, about 1.5 km to the south of that of his father. The pyramid was called "Senwosret beholds the two lands" and included as many as nine queen pyramids. Again, with an estimated height of 61 m and a carefully laid casing of white stone, the pyramid was an imposing monument, constructed with the aid of a framework of radial walls. The causeway, originally unroofed, was rebuilt with a roof and with the addition of a series of standing statues of the king in Osiris form, testifying to the increasing importance of the Osiris cult. Indeed, it is in this period that this God, whose main cult center was in Abydos, emerges as the main divinity associated with the underworld. This process is strictly related to the so-called "democratization" of the afterlife, which originally was a prerogative of the king (see e.g. Shaw 2000).

Amenemhet II (1929 BC)

With this Pharaoh we enter a new phase of pyramid construction (Arnold 1993). In

Fig 3 The pyramids of Snefru at Dahshur: the Red Pyramid (foreground) and the Bent Pyramid (background). View from the northeast corner of the Red Pyramid. Photograph by the author.

spite of the fact that the new royal necropolis established at Lisht was readily available for the construction of further monuments, Amenemhet II did not choose to build his own (called "Amenemhet is Provided") near that of his father, but, rather drastically, shifted the building site to Dahshur. The Necropolis at Dahshur was already very old at that time. For 600 years the two giant pyramids built by king Snefru (2575 BC) had stood there (Figure 3). It is not known why Amenemhet II decided to abandon Lisht and select Dahshur; in their authoritative surveys, Lehner (1999) does not discuss the issue at all, while Verner (2001) says that this choice was made "for some reason." As we shall see in greater detail later, the most important reason is probably an explicit reference to Snefru's kingship. The monument lies to the east of Snefru's Red Pyramid and was surrounded by a huge rectangular enclosure oriented east–west. It is, unfortunately, in a completely ruined state due to severe despoliation, so that it is impossible to estimate its original height. Moreover, the mortuary temple is almost completely destroyed, but its position can be identified by the remains of two massive pylons on the east facade. The interior structure of the pyramid followed current prescriptions that stipulated that the entrance be in the middle of the north side. This was to be, however, the last time this kind of arrangement was used.

Senwosret II (1897 BC)

Senwosret II decided to construct his pyramid at El-Lahun, on the southern rim of the desert ridge just before the mouth of the Fayoum oasis channel. The choice of such a place is usually explained with an "interest in the Fayoum oasis" on the part of the king, who is credited with several drainage works in the area. As a matter of fact, it is certain that it was during the early Middle Kingdom that the Fayoum depression was reclaimed and transformed into a prosperous agricultural zone, by diverting part of the Nile flow through a channel leading to Lake Moeris. It is, however, unclear if the termination of these huge drainage

works—perhaps started by Amenemhet I—has to be ascribed to Senwosret II, though the presence of the king's pyramid at El-Lahun has often been put forward as proof of this. Perhaps the peculiar location of El-Lahun at the very mouth of the Fayoum channel and thus in a prominent position for all people entering the area might also strengthen this connection. The monument, originally around 50 m high, is relatively well conserved, also due to the fact that it is constructed on an outcrop of limestone. The rest of the pyramid is of mudbricks with cross-walls inserted to help stability. The casing is lost today and had probably already been removed at the time of Ramesses II (Figure 4).

The entrance, for the first time, was not located in the middle of the north side. It is instead in the pyramid courtyard near the east end of the south side. Clearly, concepts connected with the rebirth of the king in the circumpolar (northern) stars' region, which were mandatory in the Pyramid Texts of the Old Kingdom and consequently in the pyramid's architecture (Magli and Belmonte 2009), are lost here. Rather, it is probably the rise of the Osiris cult that influenced the architectural choices. It has in fact being suggested that the "interest for the south" is due to the fact that Osiris' tomb was supposed to be located in Abydos, the main cult center of this god, and that the interior arrangement originated by analogy with the god's "apartment" in the underworld.

Senwosret III (1878 BC)

The reign of Senwosret III can perhaps be considered the apex of the Middle Kingdom. His pyramid was a huge project, probably as high as 78 m, again located at Dahshur, northeast of the Red Pyramid (Arnold 2003). The entrance is near the northwest corner: from there a vertical shaft drops to a descending corridor; the corridor then turns two times and arrives at the burial chamber, containing a huge granite sarcophagus, decorated as a sort of miniature replica of the Djoser Step Pyramid enclosure wall at Saqqara. The room looks

Fig 4 The pyramid at El-Lahun, view from the east. Photograph by the author.

to have never been disturbed or ravaged in any way. No funerary equipment has been found, and no exploration has ever hinted at the existence of further royal chambers. For these reasons, the pyramid was perhaps not used for the king's burial: it was probably a *cenotaph*, an empty tomb with a symbolic meaning (Arnold 1979, 2003). The problem of the interpretation of cenotaphs is a very important and delicate issue in Egyptology; in Lehner's (1999) words they were "false tombs to ensure the presence of the king's spirit in the old home ground."

If the Dahshur pyramid was a cenotaph, the true burial of the king must have been in Abydos, where he built another funerary complex (Wegner 2007, 2009). The complex is located some 2 km to the south of the Abydos cult center of Osiris. It consists of a funerary town, a mortuary temple near the cultivation and an extended underground tomb. A strong reference to Abydos as the true burial place of the king comes from the interior arrangement of the tomb, which was sealed with hundreds of tons of blocking masonry. Further, the sarcophagus was concealed inside a wall of the burial chamber. Interestingly, the funerary complex incorporates already many of the elements that will appear in the eighteenth dynasty burials of the Valley of the Kings. Based on an analysis of the interior's design, it has been suggested that the tomb represents an archetypal expression of an "Amduat-tomb": a three-dimensional model of the twelve-hour passage of the Sun God into the netherworld (Wegner 2009). Another analogy is the fact that the complex is situated under a peak of pyramidal shape. The axis of the whole complex is oriented towards this peak, so that in a sense we have here a first example of a tomb associated with a natural pyramid, as of course will be the case in the New Kingdom with the Valley of the Kings located under the El Qurn peak of western Thebes. The place was devoted to Anubis and considered as sacred; indeed, the seal of the Abydos Necropolis bears the text *dw-Inpw* (*Mountain of Anubis).* Interestingly, the mountain-tomb is denoted here by the symbolic hieroglyph *dw* of two paired peaks  , while in the New Kingdom (e.g. in Papyrus Abbott) the royal tomb will be denoted by its "solar" counterpart *Akhet*  first introduced as the name of his pyramid complex by Khufu, the son of Snefru.

Amenemhet III (1844 BC)

Amenemhet III, "Great of power," was the last great king of the Middle Kingdom. Like that of his father, the funerary project of this king also comprises two monuments. This time both monuments are pyramids, one in Dahshur and one in the Fayoum, and—contrary to the situation with Senwosret III—the reasons for this "doubling" of the project are usually considered to be purely functional.

The Pyramid of Amenemhet III at Dahshur is today called the Black Pyramid (Figure 5). Although badly ruined, it is quite an imposing presence near the ridge of the desert to the east of the Bent Pyramid. The monument was probably 75 m high, and its substructure is fairly complex (Arnold 1987). It consists of two apartments, internally connected by a corridor and usually designated as the king's and queen's sections respectively. According to Arnold, the pyramid was closed around year 20 of Amenemhet's reign. It appears that

Fig 5 The Black Pyramid at Dahshur seen from the Valley Temple of the Bent Pyramid. Photograph by the author.

most of the corridors were filled in with stones and mudbricks, as was the case in Senwosret III's tomb in Abydos and was to occur as well in the other pyramid of Amenemhet III. Therefore, this filling was not due to concerns of the constructors about the possible collapse of the internal rooms, although there is no doubt that the monument presented serious structural problems, as we shall see in more details in next section. This is usually taken as the reason for the construction of another pyramid by the same king. The place chosen for this second pyramid is near the village of Hawara in the Fayoum. This place is *not* particularly favorable for a building site; in fact, it is a very poor position, being just a flat relatively low stretch of desert (Figure 6). The pyramid—constructed, as usual, in mudbricks originally covered by fine limestone—is relatively well preserved. The entrance is located on the south face near the southeast corner. Inside, the corridor leads north up to a dead end. As in the Abydos tomb of Senwosret III, a corridor hidden within the ceiling leads, through two other turns blocked by portcullises, first to an antechamber and then to the burial chamber.

With the death of Amenemhet III, the twelfth dynasty approached its end. There exist two pyramids that might still be ascribed to the dynasty, unfinished and dilapidated. They are located in Mazghuna, a few kilometers south of Dahshur, and—judging by the similarity of Mazghuna South with the pyramid at Hawara—may belong to the successors of Amenemhet III, Queen Nefrusebek and Amenemhet IV. Their ownership is not certain, however. Interestingly enough, two further unfinished mudbrick pyramids whose ownership is uncertain exist in Dahshur. One, located in Dahshur North, is probably a thirteenth dynasty pyramid, similar to that of king Khendier, located slightly to the north. The other is reported to be located in Central Dahshur, south of Amenemhet II's pyramid; its scant remains were, alas, badly destroyed for the construction of a pipeline, but reliefs bearing the cartouche of an Amenemhet (number unknown) were found there.

Fig 6 The pyramid at Hawara, the south side with the entrance. Photograph by the author.

The Interpretation of the Amenemhet III Project

Our analysis of the topography of the twelfth dynasty pyramids starts with the Amenemhet III project.

Usually, the explanation given for the construction of two pyramids in two completely different places is purely functional: it is thought that the Dahshur pyramid was considered unsafe due to structural problems and it was decided to build a new pyramid at Hawara. However, it is virtually certain that the construction of the Amenemhet III pyramid at Dahshur commenced during the co-regency of the two kings, when an enlargement of the Senwosret III complex there had not yet been carried out (Arnold 2003). If we believe that the Senwosret III pyramid was designed only to be a cenotaph and a family burial place, why was the Amenemhet III pyramid, located at less than 3 km distance and probably designed by the same architects, not so?

In fact, once one goes into the details of the "functional" explanation for the doubling of the Amenemhet III projects, problems arise. The main points are the following:

1 The Dahshur pyramid *was finished.* Why? Some scholars—such as Verner (2001)—adopt the view that the structural problems became evident "as soon as the monument was finished." This is clearly a *Petitio principii:* since the pyramid was finished, then the structural problems appeared after completion. From a technical point of view, however, it is impossible to assign a date to the cracking in relation to the progression of the building, because the *relative* progression between the construction of the substructure and that of the mudbrick mass is difficult to ascertain. What is clear is that, at a certain point, the weight of the building reached the limit of the subsoil resistance, which was perhaps

also affected by the proximity to the ground water level (Arnold 1987). The ground beneath the pyramid started to crack, and the substructure along with it (we have to rule out that it was the tunneling below the pyramid that was directly responsible for the cracking). As a consequence, extended fissures appeared and some of the corridors began to collapse; in particular, cracking occurred in the ceilings of the rooms located near, or directly under, the south baseline of the pyramid. The architects responded to this threat by reinforcing the corridors with wooden frames and mudbricks walls. Some of the emergency work was done in unfinished corridors, confirming that these dangerous events took place during construction. As a matter of fact, with these operations they managed to halt the collapse, and some of their repair work was clearly inspired by aesthetic principles rather than necessity. In particular, the basis of the king sarcophagus was carefully plastered with the aim of concealing from view the irregularity of leveling caused by the bulging of the floor.

2 The pyramid *was used as burial for the queens*. It makes little sense—at least to the present author—that the queens were to be buried in a structure considered unsound for the king.

3 The presence of unfinished or roughly finished corridors is a common feature of many of the Middle Kingdom pyramids, including Senwosret III's; therefore the collapsed state of some of them does not necessarily imply that the building was abandoned.

4 Cracking occurred also in the Senwosret III queen's burial chamber, and was carefully repaired before burial. Therefore, the architects of Amenemhet III were well aware of the risk of constructing in proximity of the Nile floodplain.

5 It is difficult to establish when the works at Hawara commenced. Interestingly, carefully buried in the pavement of the annexes of the temple of the Dahshur pyramid, a limestone and wood model was found (Arnold 1987). The model is quite accurate and represents the interior arrangement of a pyramid, with a miniature portcullis ready to be activated. It is abundantly clear, by making a direct comparison, that this model likely represents the interior rooms of the pyramid at Hawara (the only difference being that only one sliding slab is present, instead of three). Why was this model present in the center of the cult of the Pharaoh in Dahshur? The way it was buried resembles a foundation deposit, and so the most likely answer is the existence of a symbolic, as opposed to functional, relationship between the projects of the two pyramids.

6 Finally, even accepting for a moment the "disaster" theory, why was the building site for the new pyramid changed so drastically? Opting for a safer site nearby (e.g. the terrace about 1 km to the south where the Pyramid of Ameny Qemau of the thirteenth dynasty was later constructed) would allow the use of the preexisting service structures.

To sum up, the Hawara pyramid was constructed for *some* reason, and this does not seem to have been on account of the structural problems of the Dahshur pyramid. Why then?

As a matter of fact, in the 1960s (before Arnold's new survey of the pyramid: De Morgan in his hasty exploration was apparently not aware of such problems at all), Ahmed Fakhry (1974) wrote about the Black Pyramid as follows: "There is no doubt that the king was entombed in his pyramid at Hawara and that the Dahshur pyramid, in the necropolis of the Old Kingdom Pharaohs, was a cenotaph." As a possible explanation for the choice of Dahshur for the cenotaph—instead of Abydos—Fakhry mentions the fact that Snefru was deified and worshiped there during the twelfth dynasty, and that therefore the place was considered as sacred; an explanation worth considering for Senwosret III as well.

In the light of the above observations, Fakhry's hypothesis seems to be the most viable. Furthermore, it looks very likely that the Dahshur pyramid was designed *from the very beginning* to be a cenotaph. It is indeed easier to accept that the two projects, the cenotaph in Dahshur and the tomb in Hawara, were conceived of together, because otherwise the total discrepancy in design between the internal apartments of the two pyramids would be inexplicable. The subterranean rooms in Dahshur are actually unique in design, while those in Hawara are very similar to those of Senwosret II in El-Lahun, and therefore cannot be considered as the result of a later change in funerary ideas occurring during Amenemhet III's reign.

Can conceptual features of the landscape, and in particular the relationships with the Snefru projects, help us to understand the choices made for the twelfth dynasty pyramids—including a supposed "global" Amenemhet III project—and put them into a more coherent picture? In the next section the "chronological topography" of the Middle Kingdom royal pyramids is reviewed, with the aim of showing that this is indeed the case.

The Snefru Projects and the Topography of the Middle Kingdom Pyramids

In the Old Kingdom, the choice for the king's pyramid location reflected several criteria both of a practical and symbolic nature (Goedicke 2001; Barta 2005). In particular, the choice of the building site was in many cases indicative of the king's desire to be close to determined predecessors (think, for example, of Userkaf, who built his pyramid as close as possible to the Djoser complex in Saqqara, or to Niuserre, whose complex in Abu Sir is meticulously framed between those of his immediate antecedents). Further, explicit symbolism was embodied in the visual axes linking the dynastically related kings' monuments of Giza (Lehner 1985; Jeffreys 1998) and Abusir (Verner 2003) to Heliopolis, while in Saqqara, Shepsekaf built his huge tomb to be seen as a spectacular baseline for Snefru's "double mountains," Unas and Teti aligned on an axis that asserted an affinity with the Djoser complex, and the other sixth dynasty pyramids were connected by meridian alignments to those of the Saqqara central field (see Magli 2010a, 2010b, 2010c for full details and a complete list of references).

It is important to stress that nothing was "hidden"—or even worse, "esoteric"—in this kind of topographical connection

between monuments. On the contrary, the kings wanted to make explicitly visible their affinity with traditions, ancestors, or sacred sites through the architectural features of their funerary projects.

In the case of Amenemhet II, who was the first king to return to Dahshur, a fairly similar mechanism was in play. To substantiate a symbolic, as opposed to functional, reason for the choice of Dahshur, one might first cite a tale entitled *Prophecy of Neferti*. The *Prophecy of Neferti* is a text written during the early twelfth dynasty (Simpson 1972). The story takes place at the court of King Snefru where a sage called Neferti is introduced to entertain the king. The Pharaoh asks the sage to predict the future, and Neferti depicts a dark vision of the country in the grip of chaos. The vision alludes to several misfortunes, including what might be interpreted as a total eclipse. Indeed, the text reads: "Ra separates himself from men; he shines, that the hour may be told, but no one knows when noon occurs, for no one can discern his shadow … for he is like the moon in the sky" (the identification of eclipses in ancient records is quite a difficult and delicate problem (Baikouzis and Magnasco 2008); for the sake of curiosity, I should mention that a total eclipse actually occurred over Heliopolis during the first intermediate period, on June 29, 2159 BC (Julian).

Chaos will, in any case, end with "a king from the south," called Ameny, who will restore order. The text has a propagandist aim, since "Ameny" is clearly Amenemhet I. Interestingly, the tale is similar to that of the Papyrus Westcar, where a similar expedient—a sage predicting a new generation of kings—is used to justify the rise of the fifth dynasty. In the Westcar, the king "adopted" to lend legitimacy, as it were, to the new generation is Khufu. No doubt, the reign of Khufu represents an epochal breakthrough in the religious tradition and in the foundation of the divine power of the Pharaoh. Khufu is indeed the first of the "solar" kings, and he may even have represented himself as Ra (Stadelmann 1991; Hawass 1993). In the Westcar, it is thus Khufu who discharges the duty of sanctioning, legitimating the new generation of kings, the "children of the Sun God" of the fifth dynasty. In the case of the Neferti prophecy, the choice of the *last* great king before the solar tradition, Khufu's father Snefru, probably denotes the increasing distance between the Pharaoh doctrine of power and the solar, "Heliopolitan" ideas. Interestingly, the cult of Snefru in Dahshur was extensively revived during the twelfth dynasty, while no such revival is documented at Giza (see Malek 2000 and references therein).

All in all, Amenemhet II's choice—and the subsequent projects built by Senwosret III and Amenemhet III at Dahshur—were inspired by "archaism" in the sense of attempting to remain faithful to the Snefru tradition. The topographical and archaeoastronomical analysis of the site fully confirms this idea for all the three complexes, as we shall now see.

First of all, Amenemhet II's pyramid was located in a carefully chosen position with respect to Snefru's Red Pyramid. To see this, observe that if the line of the south base of the Red Pyramid is prolonged due east, it intersects a dense area of fourth dynasty tombs. Immediately to the south of this area, runs the north side of the temenos wall of the Amenemhet II pyramid. It would

seem, therefore, that the latter complex was situated in such a way as to obtain a perspective effect with the much higher (but more distant, in the desert) Red Pyramid of Snefru, thereby creating a visual—and symbolic—affinity (Figure 7).

The second pyramid constructed in Dahshur, that of Senwosret III, was planned to the north of that of Amenemhet II. The impressive artistic and symbolic value of the Senwosret III complex per se has been exhaustively discussed by Arnold (2003), and we will concentrate here on the topographical relationships with the other complexes. A first relationship holds for the Amenemhet II complex: a meridian axis that ideally connects the two complexes running along the west side of the temenos wall of Senwosret III and along the front (east) side of the temenos wall of Amenemhet II.

A second relationship between Senwosret III and the already existing projects can be found by using archaeoastronomical analysis. At the time of the construction of the Bent Pyramid and of the Senwosret III pyramid, the azimuths of the setting sun at the winter/summer solstice at Dahshur with a flat horizon were ~242°/298° respectively (sun azimuths do not depend on precession;

Fig 7 A satellite image of the Dahshur central field (monuments numbered in chronological order): 1. Bent Pyramid, 2. Red Pyramid, 3. Amenemhet II, 4. Senwosret III, 5. Amenemhet III. The white lines are drawn as aid to the eye to identify topographical connections; the reader should be warned that they might give a misleading impression of high precision. Image ©2010 Google Earth, ©2011 GeoEye. Annotations by the author.

they vary somewhat due to the variation of the ecliptic's obliquity, so that today they are slightly displaced). The causeway of the Bent Pyramid is orientated (from the Valley Temple to the pyramid) at 240°. This means that, for an observer looking along the causeway, the sun at the winter solstice was seen to disappear behind the huge mole of the pyramid and, as noticed by Belmonte (2009), the sun was seen to "lean" at the northwest corner of the pyramid by an observer positioned at the center of the Valley Temple, perhaps facilitating calendrical observations. The architects who designed the causeway of the Senwosret III complex chose to create a configuration *symmetrical* to that designed more than 600 years before for Snefru. Indeed the causeway is orientated at 298° (Arnold 1987), and therefore points to the setting sun at the summer solstice. Since the pyramid is slightly to the north of the junction between the causeway and the temple complex, the midsummer sun was seen to set framed between the southwest corner of the pyramid and the summit of the temenos wall. The name of the pyramid made reference to the *Ba* of the king as did those of the middle fifth dynasty complexes, perhaps emphasizing the solar connotations of the monument.

Finally, when the architects of Amenemhet III started the project of the king's pyramid, they took into account existing monuments in order to harmonize the new element in the already old funerary landscape and, one might be tempted to say, to keep *Maat*, the Cosmic Order, in the royal Necropolis:

1 Firstly, the existing meridian was taken into account: it actually runs along the west side base of the Black Pyramid (later, also the east wall of the thirteenth dynasty complex of Khendier in north Dahshur was aligned to it). To fix the position of the pyramid *along* the meridian, the project took into account the position of the Bent Pyramid to the west, and again the new pyramid was planned in order to create a perspective effect between the new and the old one, as was the case for Amenemhet II and the Red Pyramid.

2 Secondly, the slope of the pyramidion, which was recovered intact at the beginning of the last century and is now in the Cairo Museum, is 54° 30'. Interestingly enough, this is *the same slope* as the lower courses of the giant "counterpart" of the Black Pyramid, that is, the Bent Pyramid. Also the pyramidion found in pieces at the base of the Red Pyramid (today reconstructed near the temple-chapel on its east side) has the same slope. It has been proposed that this pyramidion was prepared for the Bent pyramid before the decision to modify its slope (Rossi 1999); another possibility is, however, that the summit of the Red Pyramid was capped with a pyramidion resembling in slope the lower courses of the Bent. Was it an attempt at creating the "harmonization" already effected in Snefru times? The upper courses of the Bent pyramid actually have the same slope as the Red Pyramid's courses, 43° 22'. To gain a complete picture it would be desirable to recover at least one casing block of

the Amenemhet I pyramid, in order to ascertain its slope.

3 A final clue to the "harmonization" of the king's project with preexisting ones is in the choice of the direction of the causeway, which runs due west. If we analyze the causeways at Dahshur from south to north we see that their orientations obey the following order: winter solstice sunset (Bent Pyramid), due west (Amenemhet III, Amenemhet I, and—probably—the unexcavated Red Pyramid's causeway), summer solstice sunset (Senwosret III).

To sum up, then, we should try to imagine what the Necropolis of Dahshur looked like after the Middle Kingdom additions. The landscape towards the Nile was quite different from today: Lake Dahshur extended to the south, in front of the desert ridge and of a (recently recovered) quay located in the wadi to the east of the Valley Temple of the Bent Pyramid (Alexanian et al. 2010). Visitors sailing on the Dahshur lake perceived a spectacular effect of perspective, with the two imposing monuments of Snefru in the background and their new companions, those of Amenemhet II and III, in the foreground. Aligned with these, further north, the imposing pyramid-cenotaph of Senwosret III towered above the whole area.

The "ideal" resemblance to the old Snefru project in Dahshur can therefore be said to have been completed with the termination of the Amenemhet III project there. If, as supposed by Stadelmann (1993), the Bent Pyramid was, if not devised as part of a coherent project, at least finished as a cenotaph, then the resemblance would strengthen once again the conviction that the Black Pyramid is a cenotaph as well.

We shall now move to the Fayoum, to investigate whether topographical-conceptual considerations can help to explain the choice of the building site at Hawara.

Amenemhet III's choice of the Fayoum area is usually justified by the "interest" shown by the king in the oasis, where he also built a temple and, according to Petrie, who discovered pieces of them, two huge quartzite colossi. However, as far as I know, the reasons for his specific option for Hawara are an enigma that nobody has ever dared to investigate. For instance, Verner (2001) says that the place is "not far from Senwosret II pyramid in Lahun." Actually, the two sites are 8.7 km apart, and this is clearly *very* far from the point of view of a building site. At Lahun there was plenty of space to build a new pyramid, in an already existing—"sanctified"—necropolis of a revered predecessor. Further, there were all the "infrastructures" needed for pyramid construction: accessibility of materials and a huge pyramid town which remained active long after the reign of the king. So, once the Fayoum area had been chosen, why did Amenemhet III move from El-Lahun to the relatively remote and unsuitable site of Hawara?

First of all, it must be observed that the two pyramids of El-Lahun and Hawara are inter-visible. Today it is simpler to see the huge mass of El-Lahun from Hawara than vice versa, but in ancient times the two monuments clearly "spoke" with each other. They actually stand as "paired sentinels" at the two corner ends of the strip of desert that is the prolongation to the south of the pyramid's fields ridge. Observe now that

midway between Lahun and Lisht stands the pyramid of Meidum, a project that was completed—if not initiated—by Snefru. Together with Meidum, the architects of this great king constructed yet another pyramid that is usually identified today as the "Seila pyramid" although the modern village of Seila lies quite far off in the Fayoum land plain. This small ("minor") step pyramid is located on a fairly prominent desert hill to the west of Meidum, overlooking the Fayoum. The true function of such "minor step pyramids"—seven are scattered along the whole country, up to Elephantine—is unknown; they do not have funerary chambers, and perhaps it was calendrical (Belmonte et al. 2005; Belmonte and Shaltout 2006). In any case, the only one that has been dated with certainty to the Snefru reign (thanks to a stela found in the excavations, see Lesko 1988; Swelim 2010) is Seila, which is also the northernmost and the only one to be precisely oriented to true north. But why was it constructed? In the present author's view, the main role of this small monument was as ideal companion to Meidum, which is much greater but located in the flat land, as "outpost cenotaphs" signaling royal power and authority in the approach to the capital, some 60 km further north. The two monuments indeed appear to be strictly correlated; today they are barely inter-visible with the naked eye, but in ancient times visibility was certainly better and they are only 10 km apart (Figure 8). Furthermore, it seems that Seila was meant to be placed on the same parallel as Meidum. The azimuth of Seila from Meidum is indeed about 3° south of west. A deviation from the parallel of 3° looks exaggerated by Egyptian standards; one only has to think of the orientation of the pyramids to the cardinal points, which was astonishingly precise in the Old Kingdom (Magli and Belmonte 2009). However, we should bear in mind that, while precise methods of meridian orientation using the motion of the stars around the celestial pole were available, no such methods existed for the alignment to a fixed point along the parallel (the parallel of the Meidum pyramid

Fig 8 The pyramid at Meidum viewed from the Pyramid at Seila. Photograph ©Juan Belmonte, by kind permission.

actually passes about 600 m to the north of the Seila pyramid).

To conclude, then, Meidum and Seila were *paired* monuments, mainly designed (or perhaps redesigned, as far as Meidum is concerned) to transmit a message of power. The proposal here is that, in addition to completing ideally—together with the existing Amenemhet II complex—a perfect "replica" of the Snefru project in Dahshur by building his first pyramid, the choice of Hawara allowed King Amenemhet III to complete ideally—together with the existing Senwosret II complex in El-Lahun—a second "replica": that of the Snefru project in Meidum. Indeed, if we look at the map (Figure 2) we see that El-Lahun and Hawara play the role of "sentinels of power" in a quite similar fashion to that played by Meidum and Seila. Seila is inter-visible with Hawara, to the extent that Petrie (1891) pointed out its prominent role and its connection with the Fayoum pyramids, a fact that actually led him to attribute Seila to the Middle Kingdom. He wrote that Seila "is a landmark of all this part of the country; and can be seen from Hawara, as a white heap on the hill top … is probably a building of the 12th dynasty."

Discussion

In a paper published in the 1970s, Alice and Thom Kehoe wrote that "the archaeologist must approach his data with the expectation of describing concrete objects that in reality had their primary cultural existence as percepts in topological relation to one another within the cognitive schemata of human beings" (Kehoe and Kehoe 1973; Flannery and Marcus 1996; Preucel 2010). Here, we have tried to follow such an approach treating as "objects" the twelfth dynasty pyramids and analyzing their mutual topography. It turns out that the latter can be better understood if symbolic, explicit connections of religious and dynastic nature between the various monuments are posited. As is already widely known, the emerging role of the "southerly" God Osiris comes into play considerably; however, it turns that out a key role is also played by "archaism" in the form of a close re-evocation of the Snefru tradition and, specifically, the topography of his monuments. This approach shows that Dahshur can be added to those spectacular examples of sacred places that have been the subject of a long and conservative tradition of viewing and enhancing the landscape in the course of many centuries, one key example being, of course, Stonehenge. Further, it helps in solving a series of topographical issues within the broader context of an already existing conceptual landscape; in particular, it furnishes for the first time a viable explanation for the building site at Hawara.

Yet, a difficult issue still remains, namely to explain satisfactorily the groundbreaking choices of Senwosret II. He decided to deviate from the building site inaugurated by his dynasty, Lisht, and from the traditional site revived by his father, Dahshur; moreover, he broke the tradition of an orientation to the north of the entrance to the pyramid, and planned a new "winding" arrangement of the interior chambers.

Both successors of this king were to have two tombs: Senwosret III had a pyramid tomb in the north at Dahshur but was probably buried in the southern one (at Abydos), and Amenemhet III too had a

pyramid in the north at Dahshur but was probably buried in the south (at Hawara). Was this tradition *also* established by Senwosret II?

Judging by the similarities between the internal arrangements of El-Lahun and Hawara, which prompts the thought that they are both "tombs to the south," one is led to speculate that perhaps also Senwosret II might have had a cenotaph "to the north." If this is true, perhaps part of the *previous* traditions—regarding building site and/or orientation—were preserved in it. This possibility has already been suggested by Arnold (2003), who noticed the peculiar structure of Petrie's Tomb 621, located to the north of the Lahun pyramid. This tomb—whose owner is unknown—has many of the peculiarities of a royal tomb; no burial remains have, however, been found in it, so it may be a cenotaph of the king; being "still" oriented to the north, it might be the "missing link" between the Amenemhet II and the Senwosret II pyramids. To this possibility we would like to add, however, yet another one. The pyramid at Lahun was called (exactly like those of Snefru in Dahshur), "Senwosret shines." It would not be surprising if the unfinished Middle Kingdom pyramid at Central Dahshur, which has no owner, or another as yet undiscovered pyramid there, might one day turn out to be a cenotaph of Senwosret II, thus making him the first king of the twelfth dynasty who had a "north" pyramid cenotaph in Dahshur and a "south" burial.

Acknowledgments

The author wishes to thank Juan Belmonte for his valuable comments to a first version of the present work. A careful reading of the final manuscript by Graham Robertson is also gratefully acknowledged.

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