

Birmingham Egyptology Journal

A map of Egypt reconstructed from the description of the country at Edfu

Gyula Priskin

Abstract

The description of the land of Egypt found on the enclosure wall of the Edfu temple is shown to refer to a map of the country that was devised to bring a symbolic numbers game into play based on the golden ratio. The ultimate purpose of the description and the resulting map was therefore not to reflect the actual size of Egypt, but to mark out an ideal setting for the country in mythical space. For the reconstruction of the map the relevant documents concerning ancient Egyptian cartography are reviewed.

Introduction

The bottom register in the inner north-eastern corner of the enclosure wall at Edfu has preserved a detailed description of the land of Egypt with both linear and surface measurements.¹ The text forms part of a larger scene which symbolically conveys the idea that the whole world is under the control of the principal local god, Horus of Edfu.² We see him, accompanied by his spouse and son, Hathor and Ihy respectively, as he hands over all the territories of the known world to the king and his wife, who in turn lead a procession of divinities bringing the produce of these lands (fig. 1). The series of offering-bearers starts with nine figures who, as is made clear by the accompanying captions, represent the nine bows that traditionally conceptualized the enemies of the Egyptian state, and thus the outside world.³ Next in line is Thoth holding in his left hand a document-case (*mks*) which contains an extensive inventory of all the lands of Egypt (fig. 2). In ancient Egyptian it is called *jmj.t-pr* and is perhaps best understood as the property deed outlining the inheritance the new ruler comes into when he takes over the kingdom from his divine fathers.⁴ With the acceptance of the property deed during the royal ritual called *šsp jmj.t-pr*, the king becomes legitimized on the throne of his ancestors and the gods.⁵ In the geographical procession under scrutiny here, the significance of the *jmj.t-pr* lies more in its description of Egypt as a topographical entity, and consequently the combination of the nine divinities and Thoth represent the entire world. The procession does not end with Thoth, however, but, reiterating the main theme, more

¹ Edfou VI 199,8-201,4.

² Vercoutter 1949: 121-122.

³ O'Connor and Quirke 2003: 11-13.

⁴ Wilson 1997: 75.

⁵ Wilson 1997: 75.

figures corresponding to different regions and the nomes of Upper Egypt present their offerings to Horus and his divine triad. This whole scene then provides the wider context of the passage that is the focus of this paper, the description of the land of Egypt in the document held by Thoth. I will begin by giving the transliteration and translation of the text with a few pertinent philological notes and comments;⁶ I will then interpret it from a new perspective based on the hypothesis that with its numerical data it in fact delineates a map of the country that is steeped in a kind of numbers game the Egyptians of the Ptolemaic age seemed to be fond of.

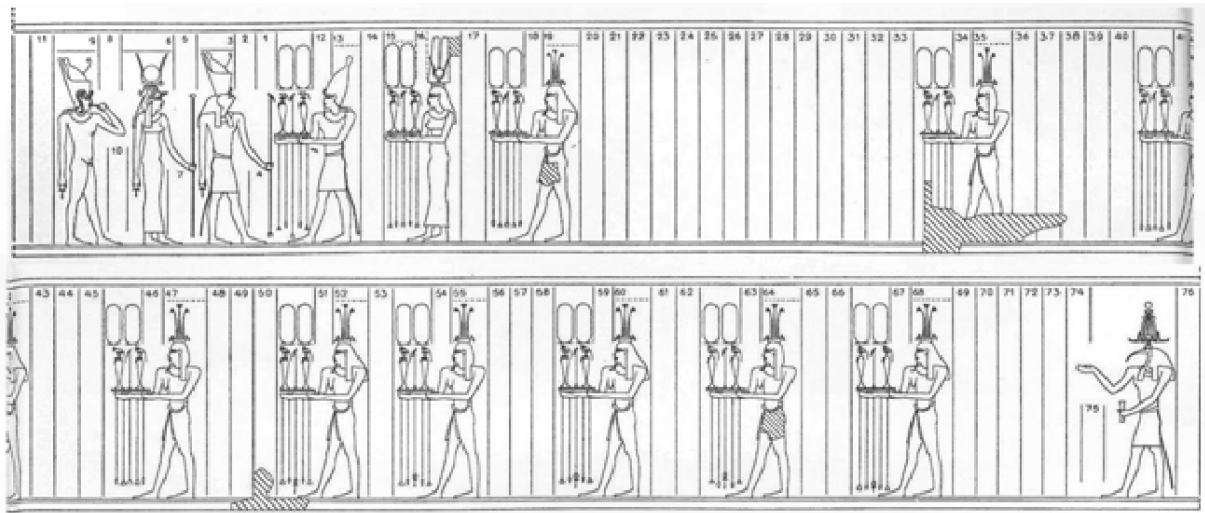


Fig. 1: Beginning of the geographical procession on the eastern face of the enclosure wall (Edfou X pl. clviii, © IFAO).

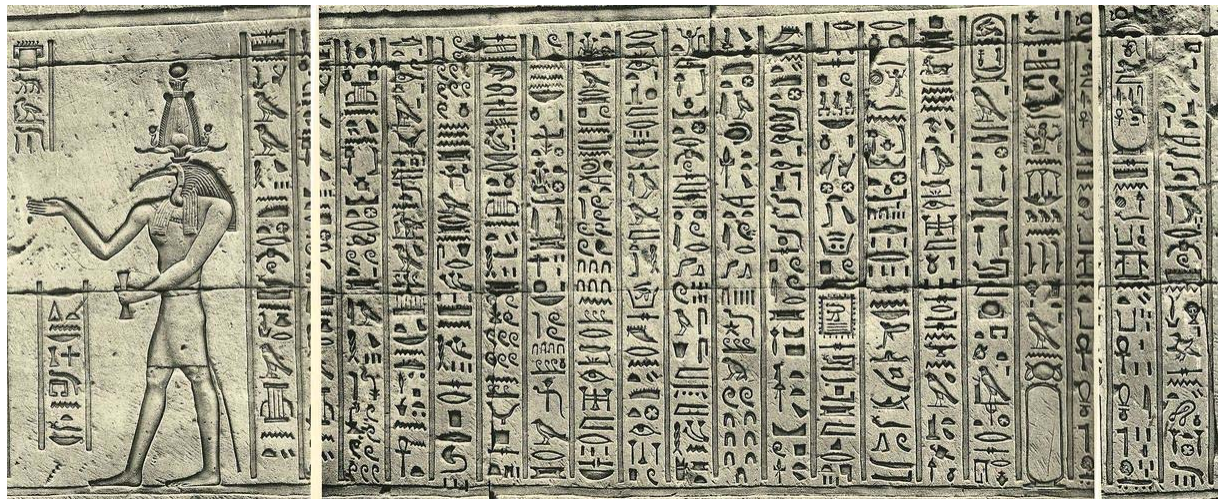


Fig. 2: The text recited by Thoth containing the description of Egypt (Edfou XIV pls. dlxxi, dlxxii, dlxxiii, © IFAO).

⁶ For detailed notes and commentary, see Schlott-Schwab 1981: 7-29 and Kurth 2014: 361-363.

Transliteration and translation

Bj.tj s3b dd mdw rdj=(j) n=k mks jmj(.t)-pr n jt=k smn(.t) n3 3h.w n Km.t r-3w=f mn hr Hr hnt nhh n p(3) hnt.j n 3bw r ph.www 3h.w <27000000> šsp pw n jr.t-Hr wp-st m dd(.t).n Dhwtj 3h(.t) st3.t š3 nb n <jt> bd.t n <nh> 9000000 (j)n mw n w3d-wr n s^rr mnḥ srp.t sšn sm.w nb(.w) rd hnt h^cpj <18000000> n st3.t wp-st jtr.w nb n šm^c.w mh.w h^wwj jmj.w r^c nb 2400000 n st3.t w3d-wr mh.w Mr-wr pw hⁿ hn.t=f mj.tt 6600000 n st3.t r mh.jr.t-Hr m r3.w=s nb(.w) r mh.jr.t-Wsjr m r3.w=s nb(.w) n šw m dbh.w=s dr-n.t(t) Km.t jr.t-Hr pw q3.w=s m 3bw r 3w=s gs (n) šn jtr.w 106 wsh=s m t3 m hn.t jmn.tt n(.t) Km.t r hn.t j3b.tt mj.tt jtr.w 14 dmd st3.t 27000000 dr-ntj Km.t dd r=s jr.t-Wsjr dfd=s pw jtr.w ^c3 dw jmn.tj dw j^cb.tj br.wj=s pw gs.w-pr.w nb(.w) n(.w) šm^c.w mh.w dbh.w pw m hnw=s prj h^cpj m qr.tj r nw=f hj=f n 3bw n mh 24 šsp 3 1/4 n nkn n ^cb jm=f jw h^cpj r jwh 3h.t r mh.jr.t-Hr m šs=s rdj=sn dmd n Hr-s3-3s.t jw^c.w mnḥ n (Wnn-nfr.w m3^c-hrw)| Hr Bhd.tj ntr ^c3 nb p.t s3b-šw.t prj m 3h.t hnt Wts.t-Hr r shr.t jb=f n ps.s.t=f rdj=f hh n hb(.w)-sd hfn.w n rnp.wt hr s.t-Hr n nsw.t bj.t ()| s3 R^c (Ptwlms ^cnh d.t)| smnh=f k3=f hnt.j k3.w ^cnh.w mj ntr.w tp.jw-t3 [hr] s.t Hr-s3-3s.t mrj=f d.t jw=w r 3w mn hr p3 snt-n-t3.wj⁷

The vizier. To be recited: I hand over to you the document-case and property deed of your father recording the cultivable lands of all Egypt as they are set down under Horus in eternity, from Elephantine to the marshes, 27000000 (setat) of land.^(a) It is the acceptance of the eye of Horus, in specification as Thoth said: All the fields with barley and wheat for sustenance, 9000000. As for the waters of the Delta with *sar* and *meneh* papyrus, *serpet* and *seshen* lotus, and all the vegetation grown by the inundation: <18000000> setat.^(b) In specification: All the rivers of Upper and Lower Egypt with the water found in them every day, 2400000 setat, the marshland of Lower Egypt, that is Lake Moeris with its canal likewise, 6600000 setat, to fill the eye of Horus with all its parts and the eye of Osiris with all its parts, lest any of its components be missing, because Egypt is the eye of Horus. Its length from Elephantine in its entirety, that is one side of its perimeter,^(c) is 106 iteru,^(d) its width on the land from the western river branch of Egypt to the eastern one is 14 iteru; 27000000 setat in total, since Egypt is said to be the eye of Osiris, the pupil of which is the Nile, and the western and eastern mountains are its whites, while all the temples in Upper and Lower Egypt are its components within it. The inundation of the Nile comes from the caverns on time, its height at Elephantine is 24 cubits 3 1/4 palms, there is no harm or impurity in it. The inundation arrives in order to water the land and fill the eye of Horus with its benefits. All this is given to Harsiese, the excellent heir of Wenennefer-true-of-voice, the great god, lord of the sky, Horus of Edfu with dappled plumage, who appears on the horizon at Edfu, so that his heart be content with his share and then grant millions of sed-festivals and hundreds of thousands of years on the throne of Horus to the king of Upper and Lower Egypt, son of Re, Ptolemy, and make his ka endure, first among the kas of the living, as he does it with the worldly manifestations of the gods, on the throne of Harsiese whom he loves eternally, as they are all set down in the Ground Plan of the Two Lands.

^(a) Though the measure is missing, from the other data in the text it is clear that setat is meant here. One setat is equal to the area of a square with sides of 100 royal cubits (about 2742 square metres).⁸

^(b) The number here is written 1800 or 1000 × 800 = 800000, but Kurth's emendation, based on the assumption that the sign for 10000 was omitted through oversight, is surely correct. Thus the number intended is 10000 × 1800 = 18000000.⁹

^(c) The reading of the group of hieroglyphs here ($\overline{\overline{\overline{\text{O}}}}\text{O}\alpha$) is quite ambiguous and several transliterations have been proposed: 1. *gs šn* 'the side (shore) of the sea', 2. *m sp.t šn* 'to the shore of the sea', 3. *m dd h(r) šn* 'namely, at the sea', 4. *mdw.t* 'the distance (of the sea/perimeter)', 5. *gs htm* 'one side of the fortress (i.e. Egypt)', 6. *gs (n) šn* 'one side of the

⁷ The transliteration is based on Kurth 2014: 361-363.

⁸ Wb. 4, 356.1; Helck 1980: 1200.

⁹ Kurth 1994: 255; Kurth 2014: 361.

perimeter'.¹⁰ This last wording seems to be the choice that makes the most sense,¹¹ and reading the sentence *q3.w=s m 3bw r 3w=s gs (n) sn jtr.w 106* as 'its length from Elephantine in its entirety, that is one side of its perimeter, is 106 iteru' accords well with my interpretation of the text as describing a rectangular map (see below). Though *sn* is primarily associated with the idea of a circuit,¹² it is also used for rectangular shapes.¹³

^(d) One iteru equals 20000 royal cubits of 0.5237 m (c. 10.4 km).¹⁴

Interpretation

Since the decoration of the enclosure wall was done sometime around the second half of the second century BCE and the middle of the first century BCE,¹⁵ the hieroglyphic text giving a comprehensive description of the country was recorded at this rather late stage of ancient Egyptian civilization. It is obvious, however, that the contents of the text hark back to precursors recorded as early as the Middle Kingdom, because the length of 106 iteru denoting the north-south extent of the country already appears in the inscriptions of Senwosret I's White Chapel at Karnak (beginning of the second millennium BCE).¹⁶ This textual tradition was then, from the New Kingdom onwards, continued on the votive cubit rods, and is also found in the Tanis Geographical Papyrus (second century CE).¹⁷ It must be emphasized, however, that all these sources in fact only contain the figure of 106 iteru referring to the length of Egypt, so the Edfu text reveals a great deal of new information that is not preserved elsewhere, such as the width of Egypt from east to west (14 iteru) and its size in terms of area measurements (27000000 setat overall, subdivided into smaller parts in the text).¹⁸

The persistence of the tradition that the length of Egypt is 106 iteru is further underlined by the occurrence of this figure in the works of ancient Greek and Roman authors.¹⁹ Herodotus (fifth century BCE) for example apparently cites it in a veiled manner when he states that the distance between the Mediterranean sea and Thebes equals $1500 + 4860 = 6360$ stades ($6360 \div 60 = 106$).²⁰ Strabo (first century CE), on the other hand, making reference to Eratosthenes, correctly informs us that the distance between the sea and Syene (Aswan) is 5300 stades ($5300 \div 50 = 106$),²¹ and in all probability the same figure was preserved in Cleomedes' account (second century CE) on how Eratosthenes measured the circumference of the earth, but here it would result from the sum of the distance between Alexandria and the area where the rays of the sun fall perpendicularly on the earth around Aswan ($5000 + 300$ stades).²²

Given that the Edfu text belongs to such a long-standing tradition, the question naturally arises as to how well the different measurements in it reflect reality. As for the 106 iteru, it is obvious that this figure, corresponding to about 1110 kilometres (106×10.4 km), cannot measure the north-south extent of the country along the straight line of a meridian passing

¹⁰ Schlott-Schwab 1981: 17-18, especially n. 82.

¹¹ Cf. Schlott-Schwab 1981: 8.

¹² Wilson 1997: 1014-1015.

¹³ Edfou IV 4,7; Edfou VII 18,6-8.

¹⁴ Borhardt 1921: 120; Gardiner 1957: 199; Helck 1980: 1200; Allen 2004: 101.

¹⁵ Edfou VI p. iii; Arnold 1999: 216.

¹⁶ Lacau and Chevrier 1956: 242-245.

¹⁷ Schlott-Schwab 1981: 3-4.

¹⁸ Schlott-Schwab 1981: 5.

¹⁹ See Priskin 2004a: 64-65 and Priskin 2006: 78-83.

²⁰ Herodotus *Histories* 2.7-9.

²¹ Strabo *Geographica* 17.2. For evidence indicating that in different strands of tradition either 60 or 50 stades made up one iteru (Greek schoinos), see Priskin 2004b: 60-63.

²² Cleomedes *The Heavens* 1.49-71.

through, for instance, Elephantine,²³ so according to the current general consensus it was obtained along the meandering course of the Nile.²⁴ It should be noted, however, that this is a modern supposition, and none of the ancient texts clarify exactly how this distance should be understood. At Edfu the text is somewhat ambiguous on this point; however, there is no indication that the distance of 106 iteru is that of the river Nile, except perhaps the designation of the unit of length itself, since it may etymologically be connected with the word *jtr.w* ‘river’.²⁵ Schlott-Schwab has also made an enquiry into the possible concordance between the area measurements of the Edfu text and the results of modern cadastral surveys of the Nile valley.²⁶ Although she believes that the two sets of data overlap each other quite well, her findings may not stand up to closer scrutiny, as she offers some idiosyncratic interpretations of the text (for example, for her the 27000000 setat equals half of the 106 by 14 iteru rectangle) and relies on an earlier reading of the text in which the surface of the Delta is erroneously equated with 800000 setat, in place of the correct value of 18000000 setat (see notes above).

In my opinion, however, instead of trying to reconcile the figures in the Edfu text with the actual size of Egypt in antiquity, research should take an entirely different path. Clearly, the text is included in a ceremonial and symbolic context,²⁷ not a utilitarian one, and its primary function was not to reflect reality, but to capture the image of an ideal world, just as the listing of the nine bows did, without concern for the geopolitical status quo of the time (as in fact some of the territories mentioned in the text originate from a traditional listing of foreign lands or had been lost for the Ptolemaic rulers by the first century BCE).²⁸ Even if some of the figures in the text perhaps come indirectly from actual surveys of the country, they are quite obviously round numbers and are in simple proportional relation to each other ($27000000:18000000 = 3:2$, $18000000:9000000 = 2:1$, etc.), reinforcing the impression that we are here dealing with a predominantly symbolic description of the country. The text ends by mentioning the Ground Plan of the Two Lands, an expression which either refers to the preceding text itself, or to the book (papyrus roll) known by this title,²⁹ but in the latter case the foregoing text is also an excerpt from that book.³⁰ This then suggests that to understand the symbolic meaning of the Edfu text, the figures in it must be construed as describing some kind of a spatial diagram or map of Egypt. Therefore we must first gain an understanding of the sort of maps and map-like documents that have come down to us from ancient Egypt, either recording smaller geographical units or the entire country.

Naturally, ancient Egyptian maps differ markedly from their modern counterparts which are the products of cartographic methodologies developed in the West from the fifteenth century CE onwards,³¹ but nonetheless they are similar pictorial representations of landscapes that were drawn up – according to iconographic conventions – in order to help their users to find their way in space.³² Some aspects of these pictorial representations may coincide with contemporary cartographic methods, while others are completely lacking.³³ The ancient documents that we tend to identify as maps are indeed first of all pictures where spatial

²³ See my discussion in Priskin 2004b: 58-60.

²⁴ Borchartd 1921: 120; Helck 1980: 1200; Schlott-Schwab 1981: 142.

²⁵ Schlott-Schwab 1981: 114.

²⁶ Schlott-Schwab 1981: 137-145.

²⁷ For other possible symbolic meanings of similar geographical processions, see Aufrère 2000: 80-81.

²⁸ Vercoutter 1949: 121-127.

²⁹ Schott 1990: 351-352.

³⁰ Cf. Kemp 1991: 100.

³¹ Quirke 2003: 171-172.

³² O’Connor 2012: 47.

³³ O’Connor 2012: 49.

relations are expressed according to the rules of ancient Egyptian iconography.³⁴ Among the most salient of these rules are that different viewpoints, for example bird's eye view and profile view, are employed simultaneously, space is divided into registers, and the pictures are supplemented by short or longer captions of text.

A thorough overview of all such ancient Egyptian maps would far exceed the scope of this paper, so here I will highlight only those documents that directly help us to reconstruct the map that presumably lies behind the Edfu text. According to one interpretational framework, ancient Egyptian maps fall into two categories. The first refers to documents that appear in a secular context and thus includes the Turin Geographical Papyrus, locating the gold mines of Wadi Hammamat in the eastern desert, and the building plans of the royal tombs in the Valley of the Kings that were recorded on ostraca or papyri.³⁵ These maps, which are perhaps the closest to their modern counterparts despite their lack of uniform scaling, all come from the New Kingdom settlement of Deir el-Medina.³⁶ However, the second group, comprising maps that appear in a religious setting – depicting either fictitious or real landscapes – bear much more relevance for us as it has been determined that the map outlined in the Edfu text must belong to this latter category.³⁷

The first map that deserves our attention is the depiction of the Field of Hetep (*sh.t-htp*), the land in the netherworld where the deceased strove to settle down in order to pursue an ideal life after death (because of the ambiguity of the word, the area may be understood as the field of peace/rest or field of offerings).³⁸ Originally composed around the beginning of the second millennium BCE, this diagram first appeared on Middle Kingdom coffins exclusively coming from Deir el-Bersha, the burial ground at Hermopolis, as Coffin Texts spell 466,³⁹ but afterwards had a long history in the form of the vignette attached to chapter 110 of the Book of Going Forth by Day (Book of the Dead) (fig. 3).⁴⁰ In Coffin Texts spell 466, just like in its later versions where the area was renamed as the Field of Reeds (*sh.t-j3r.w*), the Field of Hetep is shown as a rectangular space that is divided into horizontal registers by the blue strips representing water. At first only certain features of the landscape were drawn into the registers, but by the New Kingdom, scenes demonstrating the everyday activities of the blissful afterlife were also included. Both in the Coffin Texts and the Book of Going Forth by Day some of the captions labelling the pictures specified data about the extent of the area: 'in its length and width (this area) is 1000 iteru' (*jtr.w 1000 pw m 3w=f m wsh=f*).⁴¹ Consequently, with these short informative sentences the map of the hetep field not only pictorially represents the landscape but also records its measurements. This feature of the spell adds support to the conjecture that the Edfu text may also have been accompanied by a visual representation of the land of Egypt. It is worth noting that although the importance of the Book of Going Forth by Day began to wane towards the end of the first millennium BCE, the map of the Field of Hetep, essentially reduced to four plain registers without the waterways, was still preserved in some papyri produced as late as the first century BCE.⁴²

³⁴ Shore 1987: 117-118.

³⁵ Shore 1987: 121-127.

³⁶ O'Connor 2012: 49-50.

³⁷ Shore 1987: 117-121.

³⁸ Allen 2003: 24; Taylor 2010: 242.

³⁹ CT V 352I-362.

⁴⁰ Taylor 2010: 243.

⁴¹ CT V 353V.

⁴² For an example see Mosher 2001: pls. ii and 6.

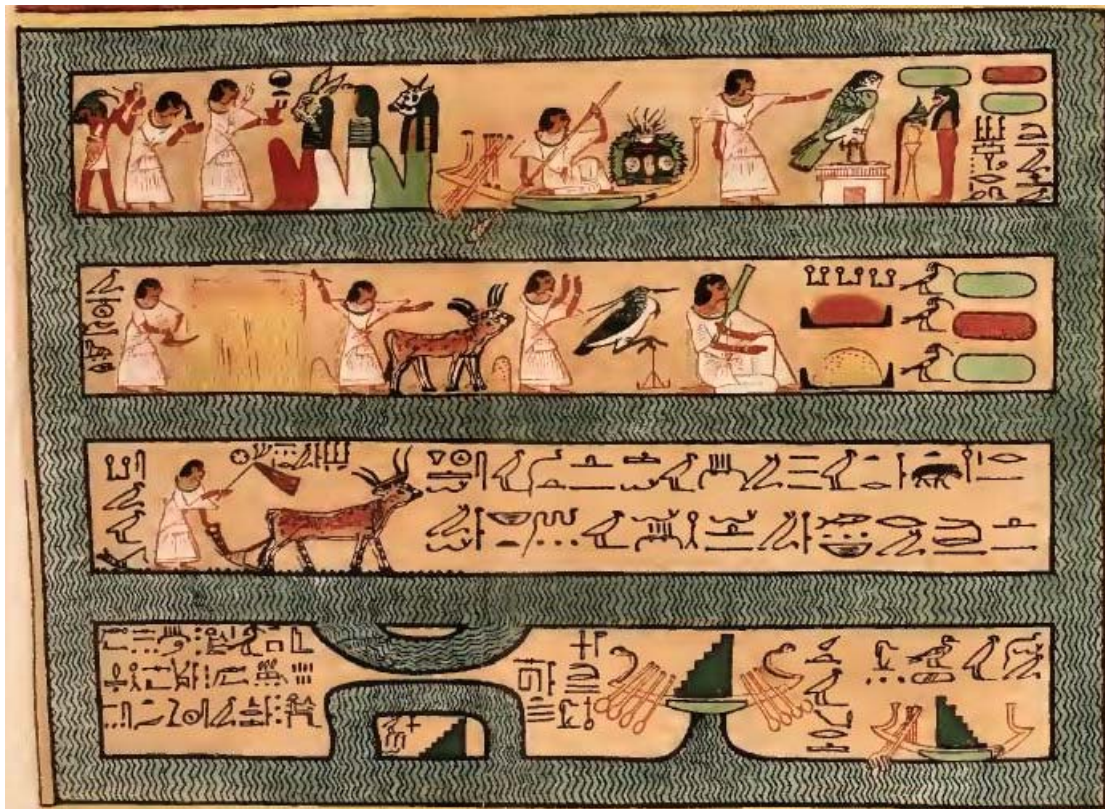


Fig. 3: The Field of Reeds in Ani's papyrus from the Nineteenth Dynasty (Budge 1913: pl. 35).



Fig. 4: The Book of Two Ways on Gua's coffin (© Trustees of the British Museum, www.britishmuseum.org).

The Coffin Texts that decorated the Deir el-Bersha coffins also included another composition known as the Book of Two Ways (spells 1029–1130),⁴³ which served as a kind of guidebook for the deceased to direct them through the paths of Rosetau, that is the underworld.⁴⁴ The Book of Two Ways was essentially a drawing executed on the underside of the coffins, the most important part (from which the designation of this group of spells originates) being the depiction of two meandering paths that lead through the different obstacles – primarily demons wielding a knife or other weapons – of the netherworld (fig. 4, right). Both paths are represented within a rectangular area: one, drawn in a dark colour, shows the way on land, while the other, drawn in blue, clearly refers to a path on water. This detail of the Book of Two Ways can easily be seen as the rendering of Egypt’s actual landscape, a river with its banks on the two sides.

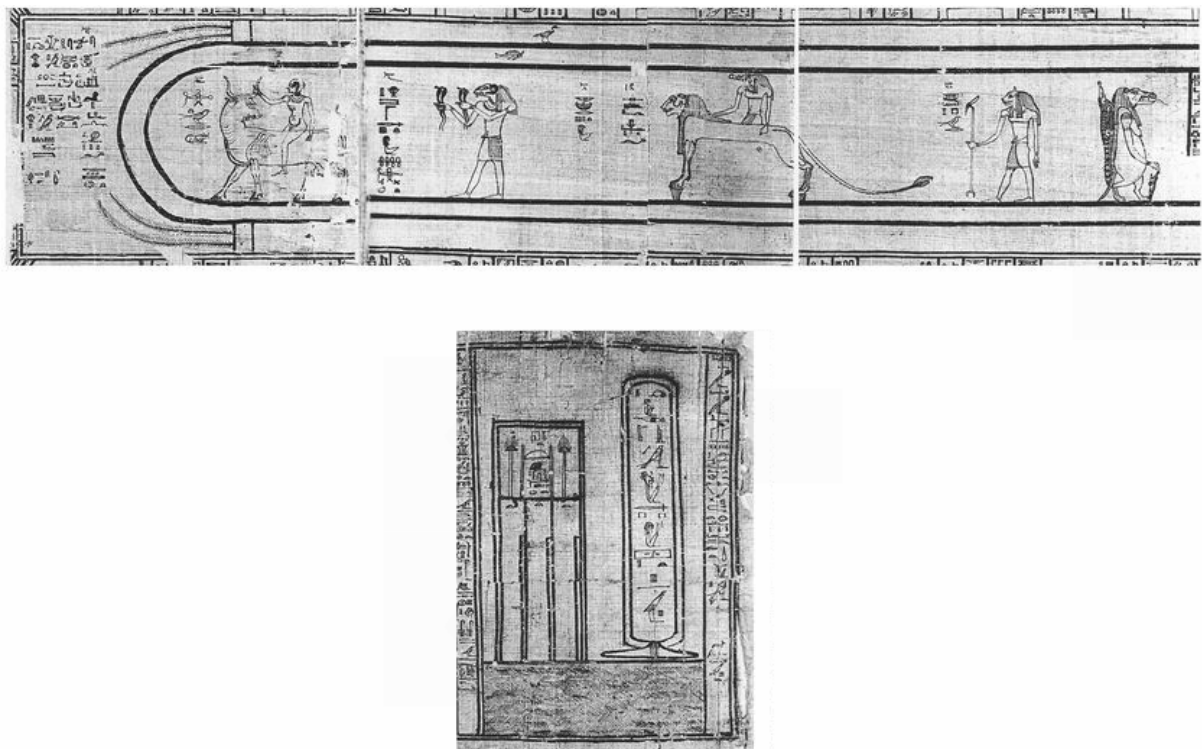


Fig. 5: Two representations of the Fayum on the Boulaq/Hood/Amherst papyrus: an elongated oval in a rectangle (beginning, top), and a rectangular body of water (bottom) (Beinlich 1991: pls. 10-12 and 33, © Otto Harrassowitz).

However, within the context of their religious literature the Egyptians not only made maps of imaginary, mythical landscapes, but in at least one instance such a document showing a real geographical unit also remains extant. It is the Book of the Fayum, dated to the second century CE, which enumerates the cult places of the Fayum, an oasis west of the Nile that is in direct contact with the river through the canal presently known as the Bahr Yusef. In the hieroglyphic version of the Book of the Fayum, written on papyrus (the Boulaq/Hood/Amherst papyrus), texts are interspersed with various pictorial representations of the region.⁴⁵ Some passages of the book, especially in the hieratic variants, are also

⁴³ CT VII 252a-471g.

⁴⁴ Robinson 2003.

⁴⁵ Beinlich 1991: 27-53.

concerned with measurements, although due to the obscure wording, these are often difficult to interpret clearly.⁴⁶ At one point, for example, it is stated that the distance between Elephantine and an unknown location in the oasis equals $61 \frac{2}{3}$ iteru (for the possible symbolic background of this number, see below).⁴⁷ A large part of the papyrus is taken up by a wide, flat oval included in an elongated rectangle showing the region that in reality is rather of a triangular shape,⁴⁸ in which are listed the divine beings of the Fayum, for example solar and crocodile gods, Mehetweret and Ihet cows (fig. 5, top).⁴⁹ In the closing scene at the end of the papyrus the region (or the lake forming its central element) is depicted as a rectangular body of water (fig. 5, bottom),⁵⁰ so here again a larger piece of landscape is represented as a rectangle. However, as in this picture the Fayum is equated with a lake, and the hieroglyphic representation of a temple is placed above it,⁵¹ the rectangle with water in it may also be interpreted as an enlarged hieroglyph, since in normal hieroglyphic script a lake is denoted by the figure of a rectangle (≡).

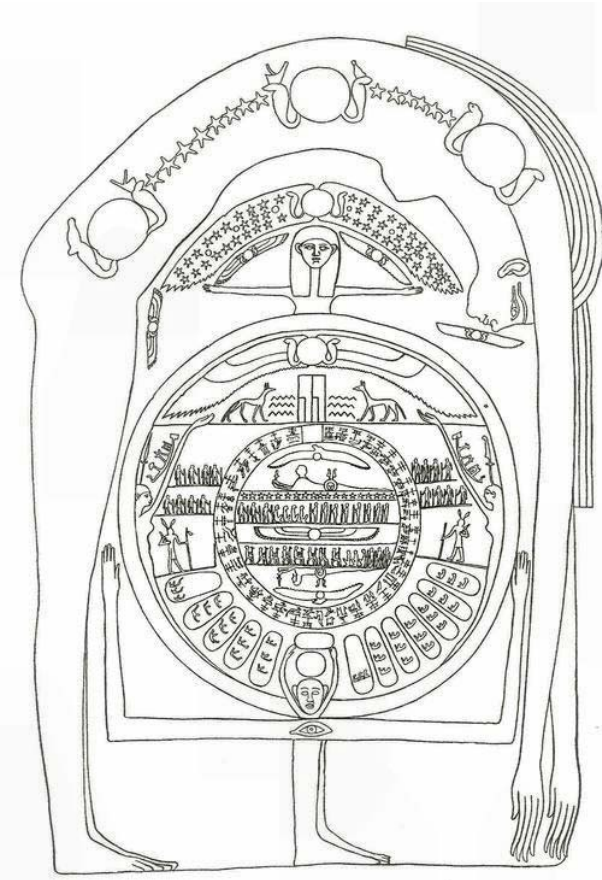


Fig. 6: The cosmographic drawing on Wereshnefer's sarcophagus (Ransom 1914: fig. 3).

Religious literature provides us with two further depictions which, unlike the Book of Fayum, do not restrict themselves to a particular area of the country but show the whole of Egypt. They would again hardly qualify as maps in the modern sense, but nevertheless show some basic spatial relationships. The first of these is the cosmographic drawing found on the sarcophagus lid of Wereshnefer, a member of the Egyptian elite who fulfilled various priestly duties, primarily connected with goddesses, at around the end of the fourth century BCE (fig. 6).⁵² Here the outermost

sphere of the world is defined as Nut, the sky goddess whose body the sun travels through during the night. Below her belly Shu is shown holding three winged solar discs, two smaller ones and a bigger one with stars. At the bottom, between Nut's hands and legs, appears Geb representing the earth and supporting the world represented by the central circle, itself divided

⁴⁶ Beinlich 1991: 229 n. 3, 231 n. 10, 239, 243 n. 12, 257 n. 4, 259 n. 6.

⁴⁷ Beinlich 1987; Beinlich 1991: 225-227.

⁴⁸ Tait 2003: 195.

⁴⁹ Beinlich 1991: 90-116.

⁵⁰ Beinlich 1991: 134-136.

⁵¹ O'Connor 2012: 70.

⁵² Ransom 1914: 118-120.

into several planes of existence. The winged solar disc at the top of the large circle and the horizontal registers of the innermost circle depicting the celestial regions (above) and the netherworld (below, upside down) belong to the same plane as Nut, Shu and Geb, while the other elements of the picture – to be rotated by ninety degrees, so to speak – show the earthly world as was known to the ancient Egyptians.⁵³ This part of the cosmographic drawing on Wereshnefer's sarcophagus displays close affinities with the description of Egypt on the enclosure wall of the Edfu temple and the world view outlined by the procession of divinities there. The rectangles with adjoining wavy lines in the topmost register of the circle, below the winged sun disc, are the pictorial representations of the two caverns from where the Nile flood originates on the southern border of the country. In a ring that touches on this point the emblems of the nomes are listed, so this part of the drawing stands for Egypt. On each side of the bigger circle we can see the figure of a woman with her arms stretching out; these women represent the eastern (left side) and the western (right side) directions. In the area that lies between the ring representing Egypt and the females denoting the eastern and western edges of the landscape we can see some other figures who embody the elements and powers of the world.⁵⁴ This tripartite division of the large circle is paralleled in the description at Edfu: Egypt is in the middle, flanked on the sides by the eastern and western regions ('since Egypt is said to be the eye of Osiris, the pupil of which is the Nile, and the western and eastern mountains are its whites'). The ovals at the bottom of the large circle are the lands surrounding Egypt, so these correspond to the nine divinities in front of Thoth in the Edfu processional scene.

It must be noted that this circular image of Egypt, though indeed quite unique (only one similar, very fragmentary depiction has come to light so far),⁵⁵ fits well into the tradition that represents the country by the listing of its nomes. Scenes that show the processions of personified nomes bringing their goods to a particular cult place are known as early as the Old Kingdom.⁵⁶ The nome emblems are also found in a tabulated form on the walls of Senwosret I's White Chapel where the length of 106 iteru for the country first makes an appearance. In this building the intention to reflect actual geographical arrangement is quite apparent, as the Upper Egyptian nomes are listed on the southern wall of the edifice, while the Lower Egyptian nomes are listed on the northern wall.⁵⁷

Some similarity can also be seen between the Edfu text and the map that was inscribed on the outer enclosure wall of the temple at Kom Ombo sometime during the second century CE (fig. 7). This representation belongs to a scene which in all probability shows the emperor Marc Aurelian presenting the wedjat-eye (the sound eye of Horus) and some associated cult objects to a god and goddess.⁵⁸ Among these objects we can see not only the much discussed surgical instruments but also, in accordance with the statement of the Edfu text that Egypt is the eye of Horus or Osiris and 'all the temples in Upper and Lower Egypt are its components within it', a representation of the country in a slightly trapezoidal shape, in which next to each item in the list comprising the chief cult centres of Egypt, starting from the north and moving south, are inscribed the fractional numbers of the eye of Horus ($\frac{1}{2}$, $\frac{1}{4}$, $\frac{1}{8}$ etc.) (fig. 7, right). Because of the fragmentary nature of the wall the list is not complete, but in all probability it is part of a 'recipe' that prescribes the amount of water needed from the listed localities for rinsing the Osiris figures fashioned from soil and grains during the annual Khoiak festivals.⁵⁹

⁵³ Allen 2003: 29.

⁵⁴ Allen 2003: 29.

⁵⁵ Clère 1958: 30-35.

⁵⁶ Wartke 1977: 149-154.

⁵⁷ Lacau and Chevrier 1956: 214.

⁵⁸ Kurth 1996: 149-152.

⁵⁹ Kurth 1996: 158-160.

Since the topographic list is oriented north-south, it surely conveys geographic information, too, and can also be conceived of as a kind of map.⁶⁰ The tapering of the bordering lines towards the south may be intended to reflect the landscape of the Nile valley that is narrower in the south than in the northern regions of the Delta.⁶¹ However, the lines may also be taken to represent the vessel that contains the fractions of the eye, corresponding to the hieroglyph that in Ptolemaic orthography can indeed stand for these elements (𓏏, see fig. 2 above).⁶²

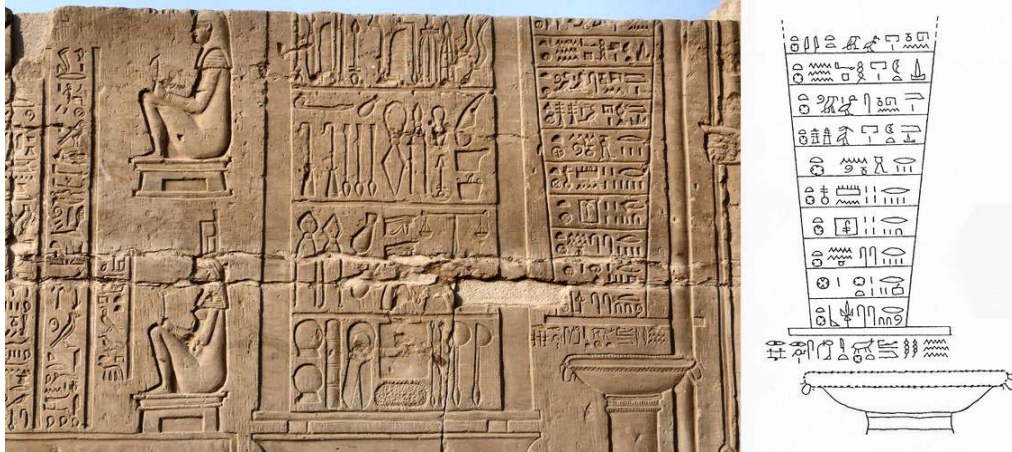


Fig. 7: The topographical list on the enclosure wall of the temple at Kom Ombo (© Ad Meskens, commons.wikimedia.org, and Kurth 1996: pl. 9c, © Otto Harrassowitz).

As the Edfu text mentions the inundation of the Nile and meticulously describes the watery parts of the country as well, the pictorial representations of the swelling river may also be of relevance to us. These images stem from the idea that the inundation is a heavenly snake that is prompted by the reoccurrence of the goddess Sothis (Sopdet), that is the heliacal rising of the star Sirius.⁶³ This event takes place in mid-July, and accordingly in two of the celestial diagrams of the Graeco-Roman era, the zodiacs of Esna (earlier temple) and Dendera, the astral snake embodying the inundation is placed in proximity of the constellation of Leo (fig. 8).⁶⁴



Fig. 8: Representation of the flooding Nile as a snake in the constellation of Leo on the ceiling of the pronaos of the Dendera temple (© Karen Green, www.flickr.com).

⁶⁰ Derchain 1995: 89-92.

⁶¹ Derchain 1995: 92.

⁶² Kurth 1996: 160-161.

⁶³ Kákosy 1981: 255-256.

⁶⁴ Kákosy 1981: 257.

The snake has a posture in which his body is made up of intertwining coils, perhaps making reference to the turbulent waters of the flood, but the resulting enclosed areas may also be suggestive of the formation of dry patches of higher ground that are not submerged by the water. A remarkable feature of these representations is the fact that the snake of the flooding Nile is contained within a rectangle. The whole picture then may be seen as an oblong tract of land with the waters of the inundation gushing in the middle of it.

Finally it should not be forgotten that the Edfu temple itself is a ‘map’ of Egypt, a three-dimensional representation of the country and the wider world. This identity is stated plainly by the inscriptions on the walls and is also expressed iconographically in its decoration.⁶⁵ To understand the map described in our text, however, it is more noteworthy that the inscriptions systematically record the dimensions of every architectural unit of the temple, just as they do in Edfu’s twin temple at Dendera.⁶⁶ It can be said that with these inscriptions providing exact measurements of their rooms, these edifices technically function as their own building plans in three dimensions. These plans do not have a practical or secular purpose but serve to symbolically demarcate the known universe and Egypt within it. The ‘Egypt’ thus created – similar to the description of the country in the Edfu text – has well-defined measurements and is realized in architectural form as a rectangular space (or a sum of rectangular spaces). These measurements, together with the other decorative elements of the temple, emphasize the moment of creation and the triumph of order over chaos.⁶⁷ In Egyptian cosmologies the created world emerged from a homogeneous, featureless mass of water as a *primaeva* hill. The allotment of land after the annual flood of the Nile, in addition to its obvious utilitarian purpose, was in a way a yearly re-enactment of this creative act after the recession of the indistinct aquatic world. This is the ideological explanation behind the practice of recording so accurately the dimensions of the Graeco-Roman temples, and the link between the measurements and creation is also established by some other texts which record the dimensions of sacred – real or mythical – buildings that once stood on the site of the Edfu temple.⁶⁸

The building inscriptions spell out the uniqueness of the architecturally created landscape with the following words: ‘Its length is perfect, its width is exact, all its plans are according to right reckoning, the perfection of the work has been done by Isden (i.e. Thoth) himself when Seshat and Khnum were with him’ (*q3w=s r nfr wsh=s r mtr snt=s nb r tp-hsb m jr.t nfr jn Jsdn ds=f S3.t Hnmw m-ht=f*).⁶⁹ The expression *tp-hsb* that occurs in the text is quite complex, and is variously translated as ‘right reckoning’, ‘correct method’, or ‘norm’.⁷⁰ Since the word is used in mathematical texts as well,⁷¹ it seems that use of the concept of *tp-hsb* is not restricted to simple numbers games or references to sacred arithmology, and it encompasses some mathematical relations as well. Two of these must be explained briefly in order to understand the true meaning of the Edfu map.

One example of what the Egyptians might have meant by ‘right reckoning’ comes from Dendera, but the relationship between its temple staff and that of Edfu – as evidenced by the coordinated cults of the two places and the annual festival of the Beautiful Reunion when Hathor of Dendera visited Edfu⁷² – was so close that we may assume that the same principles were also well-known in the latter location. A series of rooms at both Edfu and Dendera have

⁶⁵ Finnestad 1985: 3-10.

⁶⁶ De Wit 1961; Cauville 1990.

⁶⁷ Finnestad 1985: 10-14.

⁶⁸ Reymond 1969: 4-5; Kemp 1989: 100-101.

⁶⁹ Edfou VII 25,6-7.

⁷⁰ Wb. 3, 167.13-15 and 5, 291.1-11; Wilson 1997: 1137-1138.

⁷¹ Wb. 5, 291.1; Wilson 1997: 1138.

⁷² Finnestad 1997: 205.

a ground plan that conforms to a peculiar rectangle. One side of this rectangle equals the side of a right-angled triangle, while the other side corresponds to the hypotenuse.⁷³ In the case of the two rooms situated in front of the sanctuary of the Dendera temple the three sides of the original triangle are of 5, 12 and 13 units.⁷⁴ These dimensions delineate a special triangle whose perimeter and area are equal: $5 + 12 + 13 = 30$ and $(5 \times 12) \div 2 = 30$.⁷⁵ For a modern practitioner of mathematics this triangle may not hold a special value, but Plutarch's assertion that the death of Osiris fell on the seventeenth day of the month because this number separates two rectangles the perimeter and area of which are also equal (rectangles of 4 by 4 and 3 by 6) seems to lend weight to the view that the Egyptians deemed the relationship between the perimeter and area of a geometric shape important.⁷⁶ On the other hand, it is of course hard to tell how closely Plutarch's account reflects native Egyptian ways of thinking.

The other mathematical relation perhaps hinted at by the expression *tp-hsb* is the golden ratio. The first known formulation of this concept appeared in the *Elements*, the seminal work of the third century BCE Alexandrian mathematician Euclid, and it states that line AB is divided by point C in the golden ratio (division in extreme and mean ratio) if the ratio of the resulting shorter segment to the longer one is the same as that of the longer segment to the whole line (CB:AC = AC:AB).⁷⁷ From these humble beginnings a vast body of literature has sprung up in Western thought speculating on the significance of this ratio in aesthetics, nature, and possibly any other area of human knowledge.⁷⁸ Numerically expressed the golden ratio leads to the number ϕ which – depending on whether the ratio is seen from the smaller amount to the larger one or vice versa – can have the value 0.6180 (ϕ^{-1}) or 1.6180 (ϕ ; an irrational number, here approximated to four decimals). These are of course modern definitions of the golden ratio and it cannot be told with certainty how the ancient Egyptians conceptualized this relation. Present scholarly opinion usually opposes the notion that the Egyptians were familiar with the golden ratio.⁷⁹

However, knowledge and ritual use of the golden ratio is strongly suggested by the temporal scheme determining the building phases of the Edfu and Dendera temples. The building inscriptions not only record the dimensions of the edifices, but also report on the distinguished points in time when a particular objective of the construction project was achieved.⁸⁰ The majority of these dates can be put into a framework that seems to have been established with reference to the golden ratio.⁸¹ Thus for example the time that elapsed from the first foundation ceremony of the naos to the completion of the pronaos at Edfu is in the golden ratio with the period of time that separates this latter event from the foundation of the naos at Dendera (41286 days \div 25516 days = 1.61804).⁸² The golden ratio also seems to be manifest in the ground plan of the Dendera temple: the combined perimeter of the naos and pronaos there equals 618.7333 cubits.⁸³ Since the tradition preserved in the Coffin Texts and Book of Going Forth by Day states that the sky expanded for a length of 1000 iteru, the number 618 may have expressed the idea that the temple – and the land of Egypt represented

⁷³ Priskin 2001: 61-65.

⁷⁴ The two rooms, the *wsh.t-hr.t-jb* and the *wsh.t htp*, both measure 10 by 26 cubits. These dimensions correspond to the shorter side and the hypotenuse of a right-angled triangle whose sides equal 10, 24 and 26 cubits (divisible by 2 to get the Pythagorean triple 5, 12, 13).

⁷⁵ Priskin 2001: 64.

⁷⁶ Plutarch *De Iside et Osiride* 42.

⁷⁷ Herz-Fischler 1998: 1.

⁷⁸ Livio 2002: 1-11.

⁷⁹ Rossi and Tout 2002: 111.

⁸⁰ Cauville and Devauchelle 1984a: 31-45.

⁸¹ Priskin 2003a.

⁸² Priskin 2003a: 60-61.

⁸³ Priskin 2003b: 30-31.

by it – fitted harmoniously into the cosmic order.⁸⁴ In light of all this, it is entirely possible, too, that the length of $61 \frac{2}{3}$ (61.66666) iteru in the Book of Fayum derives from a cruder approximation of the golden ratio of the number 100, and should also be interpreted on a symbolic level. This claim is further supported by the more elaborate allusions to the golden ratio in a geographical context that are revealed when the map behind the Edfu text is deciphered.

Reconstructing the map described in the Edfu text

Acting on the foregoing observations about the achievements of ancient Egyptian cartography and the mathematical knowledge associated with the built landscapes of the Graeco-Roman temples, we can make an attempt to reconstruct the map outlined by the Edfu text. As has been demonstrated, geographical areas and landscapes have generally – with a few notable exceptions – been represented as rectilinear plans in the Egyptian tradition. The Edfu map must also take the shape of a rectangle since the north-south and east-west dimensions of the country are referred to by the same expressions (*q3* and *wsh*) as the ones that were used to denote the sides of the rectangular rooms and architectural units of temples and other buildings.⁸⁵ So Egypt must be represented by a rectangle of the dimensions of 106×14 iteru.⁸⁶ The relation between the area and perimeter of simple geometric shapes is deemed important in the building inscriptions and by Plutarch, and the Edfu text, besides meticulously detailing the area of Egypt, also makes an allusion to the perimeter of the country. In terms of these dimensions, the 106 by 14 rectangle has some special characteristics as its area and perimeter are proportionate to each other according to the rules of the golden ratio: the tenth of the area divided by the perimeter produces the number φ^{-1} ($1484/10 \div 240 = 0.61833$, see fig. 9, top). Therefore, though for us it might seem quite ordinary, this rectangle may have been highly esteemed by the Egyptians and they could have adopted it for the sake of putting their country into a symbolic space that through the language of mathematics expressed uniqueness and harmony.

That a wish to call up the golden ratio dictated the choice of the dimensions of the country is further indicated by the land measurements. In the Edfu text it is stated that the area of Egypt equals 27000000 setat. The area of the 106 by 14 iteru rectangle is, however, much larger than that, 59360000 setat (1484 square iteru). On the other hand it must not be forgotten that according to the inscriptions the 27000000 setat only applies to arable lands and the areas covered by water. Both the Edfu text and the cosmographic diagram on the sarcophagus of Wereshnefer represent larger Egypt in a trinary space: in the middle is found the habitable Nile valley that is flanked on both sides by the eastern and western deserts and mountains. The same idea is expressed, though more crudely, by the depiction of the Nile snake in the linear zodiacs of Esna and Dendera. The rectangle of 59360000 setat therefore shows this world made up of three parts, from which the middle region of the river valley takes up 27000000 setat. In accordance with the diagram of Egypt at Kom Ombo, let us now represent this region with a southwardly elongated trapezoid within the rectangle. Thus two border regions are formed in the east and west, each having an area of 16180000 setat (fig. 9, bottom). This value is again a simple multiple of the number associated with the golden ratio and propagates on yet another level that the land of Egypt is unique and fits harmoniously into the order of the universe.

⁸⁴ Priskin 2003b: 32.

⁸⁵ Cauville and Devauchelle 1984b: 23-26.

⁸⁶ Cf. Schlott-Schwab 1981: 143.

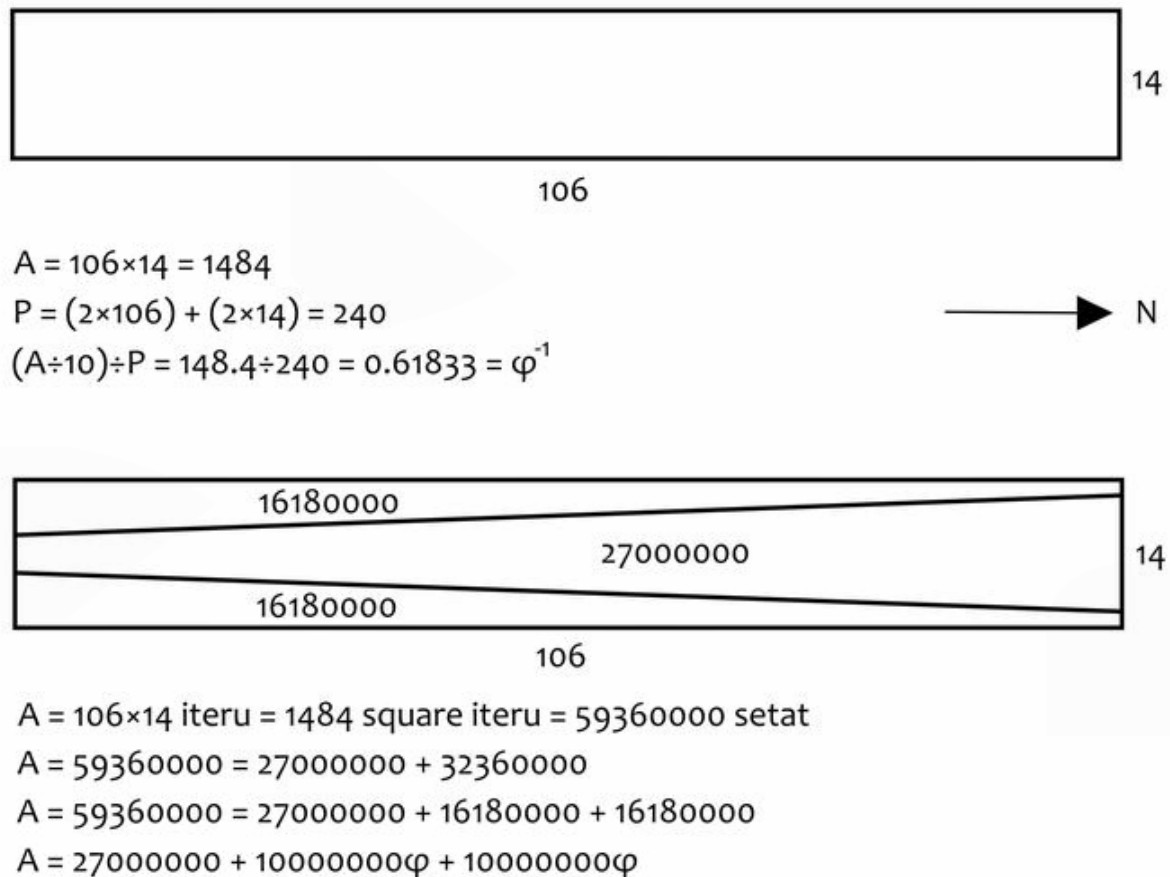


Fig. 9: Dimensions of Egypt as reconstructed from the description of the country at Edfu

Conclusion

The careful analysis of the description of Egypt at Edfu has shown that the numerical data incorporated into the text comes from a symbolic numbers game, rather than from the actual survey of the country. This numbers game, which becomes intelligible only when the map of the country is reconstructed from the clues included in the text, is rooted in the mathematical concept of the golden ratio, and the Egyptian scholars had surely made use of it in order to stress the unique and harmonious position of their land in the world. In doing so, they shared a common trait of human nature, as the desire to assign a special status for the territory occupied by one's own community is characteristic of every ancient high civilization.

Although the Edfu text belongs to a long tradition concerning the extent of Egypt, it contains a lot of new information about the width and area of the country. This may indicate that the text as it is inscribed on the enclosure wall at Edfu, and the idea of associating the description of the land with the golden ratio, was an innovation of the Ptolemaic temple architects of the third century BCE. The fact that the first written record of the golden ratio appeared contemporaneously in Alexandria testifies to the promulgation of this mathematical concept in Egypt at the time, and the only question is whether the golden ratio was a purely Greek invention or did Euclid rely on some native Egyptian knowledge for his theory of the division in extreme and mean ratio? The golden ratio, both in the temporal building scheme of the Edfu and Dendera temples, and the description of Egypt, features in a setting that claims

to perpetuate the cultural legacy of pharaonic Egypt. Also, through the number of 16180000 the map of Egypt seems to expose an interest in the arithmetic calculation of the golden ratio. The Greek mathematicians were primarily preoccupied with the geometric aspect of the concept, and in the West the numerical expression of the golden ratio was first dealt with only in early modernity.⁸⁷ Therefore I think it is far more likely that the Egyptians were familiar with the golden ratio before making any contacts with the Greeks. However, until conclusive evidence is put forward in that regard, this issue must remain a moot point.

Finally, a brief note is necessary concerning ancient Egyptian metrology. Since the symbolic numbers game characterizing the description of Egypt, at least concerning the area measurements, only works when the iteru is equated with 20000 royal cubits, the above reconstruction of the ground plan of the country constitutes yet another piece of evidence for this relation between the two measures of length, justifying the conviction of many an Egyptologist.⁸⁸

Acknowledgments

This paper is the written form of the presentation that I gave at a conference on ancient historical geography organized by the Department of Ancient Studies, University of Pécs, Hungary on 4 October 2013. I am extremely grateful to Jan-Peter Graeff for sending me the relevant excerpt from the next translation volume of the Edfu texts (Kurth 2014) prior to the conference, when the book was still in press.

Abbreviations

CT = de Buck, A. 1935-1961. *The Egyptian Coffin Texts* vols. 1–7. Oriental Institute: Chicago.

Edfou = Rochemonteix, M. de and Chassinat, E. 1897-1934. *Le temple d'Edfou* vols. 1-14. Institut Français d'Archéologie Orientale: Cairo.

Wb. = Eрман, A. and Grapow, H. (eds.). 1926-1931. *Wörterbuch der ägyptischen Sprache* vols. 1–5. Akademie-Verlag: Berlin.

Bibliography

Allen, J. P. 2003. 'The Egyptian Concept of the World', in D. O'Connor and S. Quirke (eds.), *Encounters with Ancient Egypt: Mysterious Lands*, 23-30. UCL Press: London.

Allen, J. P. 2004. *Middle Egyptian: An Introduction to the Language and Culture of Hieroglyphs*. Cambridge University Press: Cambridge.

Arnold, D. 1999. *Temples of the Last Pharaohs*. Oxford University Press: New York and Oxford.

⁸⁷ Livio 2002: 86-87; Herz-Fischler 1998: 157-158.

⁸⁸ See note 14 above.

Gyula Priskin: A map of Egypt reconstructed from the description of the country at Edfu

Aufrère, S. 2000. 'La liste des sept oasis d'Edfou'. *Bulletin de l'Institut Français d'Archéologie Orientale* 100: 79-127.

Beinlich, H. 1987. 'Das Iteru-Maß nach dem "Buch vom Fayum"'. *Mitteilungen des Deutschen Archäologischen Instituts Abteilung Kairo* 43: 1-5.

Beinlich, H. 1991. *Das Buch vom Fayum. Zum religiösen Eigenverständnis einer ägyptischen Landschaft*. Ägyptologische Abhandlungen 51. Harrassowitz: Wiesbaden.

Borchardt, L. 1921. 'Ein weiterer Versuch zur Längenbestimmung der ägyptischen Meilen (i-trw)', in K. Regling and H. Reich (eds.), *Festschrift zu Lehmann-Haupts sechzigsten Geburtstag*, 119-123. Wilhelm Braumüller: Wien and Leipzig.

Budge, E. A. W. 1913. *The Papyrus of Ani* vol. III: *The Papyrus of Ani Reproduced in 37 Coloured Plates*. Putnam's Sons: New York.

Cauville, S. 1990. 'Les inscriptions dédicatoires du temple d'Hathor à Dendera'. *Bulletin de l'Institut Français d'Archéologie Orientale* 90: 83-114.

Cauville, S. and Devauchelle, D. 1984a. 'Le temple d'Edfou: étapes de la construction, nouvelles données historiques'. *Revue d'Égyptologie* 35: 31-55.

Cauville, S. and Devauchelle, D. 1984b. 'Les mesures réelles du temple d'Edfou'. *Bulletin de l'Institut Français d'Archéologie Orientale* 84: 23-34.

Cleomedes, *The Heavens*, trans. A. C. Bowen and R. B. Todd. 2004. *Cleomedes' Lectures on Astronomy: A Translation of The Heavens*. University of California Press: Berkeley.

Clère, J. J. 1958. 'Fragments d'une nouvelle représentation égyptienne du monde'. *Mitteilungen des Deutschen Archäologischen Instituts Abteilung Kairo* 16: 30-46.

Derchain, P. 1995. 'Miettes (suite)'. *Revue d'Égyptologie* 46: 89-98.

De Wit, C. 1961. 'Inscriptions dédicatoires du temple d'Edfou'. *Chronique d'Égypte* 36: 56-97, 277-320.

Finnestad, R. B. 1985. *Image of the World and Symbol of the Creator: On the Cosmological and Iconological Values of the Temple of Edfu*. Studies in Oriental Religion 10. Harrassowitz: Wiesbaden.

Finnestad, R. B. 1997. 'Temples of the Ptolemaic and Roman Periods: Ancient Traditions in New Contexts', in B. E. Shafer (ed.), *Temples of Ancient Egypt*, 185-237. Cornell University Press: Ithaca.

Gardiner, A. 1957. *Egyptian Grammar: Being an Introduction to the Study of Hieroglyphs*. Griffith Institute: Oxford.

Helck, W. 1980. 'Maße und Gewichte (pharaonische Zeit)', in W. Helck, E. Otto and W. Westendorf (eds.), *Lexikon der Ägyptologie* vol. 3, 1199-1209. Harrassowitz: Wiesbaden.

Gyula Priskin: A map of Egypt reconstructed from the description of the country at Edfu

Herodotus, *Histories*, trans. A. D. Godley. 1966. *Herodotus* vol. 1. Heinemann: London.

Herz-Fischler, R. 1998. *A Mathematical History of the Golden Number*. Dover Publications: Mineola.

Kákósy, L. 1981. 'The Astral Snakes of the Nile'. *Mitteilungen des Deutschen Archäologischen Instituts Abteilung Kairo* 37: 255-260.

Kemp, B. J. 1989. *Ancient Egypt: Anatomy of a Civilization*. Routledge: London.

Kurth, D. 1994. *Treffpunkt der Götter. Inschriften aus dem Tempel des Horus von Edfu*. Artemis: Zürich.

Kurth, D. 1996. 'Die Ritualszene mit den medizinischen Instrumenten im Tempel von Kom Ombo (Nr. 950)', in M. Schade-Busch (ed.), *Wege öffnen. Festschrift für Rolf Gundlach zum 65. Geburtstag*, 149-164. Harrassowitz: Wiesbaden.

Kurth, D. 2014. *Die Inschriften des Tempels von Edfu. Abteilung I: Übersetzungen, Band 3: Edfou VI*. PeWe Verlag: Gladbeck.

Lacau, P. and Chevrier, H. 1956. *Une chapelle de Sésostris I^{er} à Karnak*. Institut Français d'Archéologie Orientale: Cairo.

Livio, M. 2002. *The Golden Ratio: The Story of Phi, the Extraordinary Number of Nature, Art and Beauty*. Review: London.

Mosher, M. 2001. *The Papyrus of Hor (BM EA 10479) with Papyrus MacGregor: The Late Period Tradition at Akhmim*. Catalogue of the Books of the Dead in the British Museum II. British Museum: London.

O'Connor, D. 2012. 'From Topography to Cosmos: Ancient Egypt's Multiple Maps', in R. J. A. Talbert (ed.), *Ancient Perspectives: Maps and Their Place in Mesopotamia, Egypt, Greece, and Rome*, 47-79. University of Chicago Press: Chicago.

O'Connor, D. and Quirke, S. 2003. 'Introduction: Mapping the Unknown in Ancient Egypt', in D. O'Connor and S. Quirke (eds.), *Encounters with Ancient Egypt: Mysterious Lands*, 1-21. UCL Press: London.

Plutarch, *De Iside et Osiride*, trans. J. G. Griffiths. 1970. *Plutarch's De Iside et Osiride*. University of Wales Press.

Priskin, G. 2001. 'The Dimensions of the Second Pyramid'. *Discussions in Egyptology* 49: 53-70.

Priskin, G. 2003. 'The Golden Ratio in Ptolemaic Temple Design'. *Göttinger Miszellen* 194: 59-64.

Priskin, G. 2004a. 'Herodotus on the Extent of Egypt'. *Göttinger Miszellen* 201: 63-67.

Gyula Priskin: A map of Egypt reconstructed from the description of the country at Edfu

Priskin, G. 2004b. 'Reconstructing the Length and Subdivision of the Ieru from Late Egyptian and Graeco-Roman Texts'. *Discussions in Egyptology* 60: 57-71.

Priskin, G. 2006. 'The Egyptian Heritage in the Ancient Measurements of the Earth'. *Göttinger Miszellen* 208: 75-88.

Quirke, S. 2003. 'Measuring the Underworld', in D. O'Connor and S. Quirke (eds.), *Encounters with Ancient Egypt: Mysterious Lands*, 161-181. UCL Press: London.

Ransom, C. L. 1914. 'A Late Egyptian Sarcophagus'. *Bulletin of the Metropolitan Museum of Art* 9: 112-120.

Robinson, P. 2003. "'As for Them Who Know Them, They Shall Find Their Paths'": Speculations on Ritual Landscapes in the "Book of the Two Ways", in D. O'Connor and S. Quirke (eds.), *Encounter with Ancient Egypt: Mysterious Lands*, 139-159. UCL Press: London.

Rossi, C. and Tout, C. A. 2002. 'Were the Fibonacci Series and the Golden Section Known in Ancient Egypt?' *Historia Mathematica* 29: 101-113.

Schlott-Schwab, A. 1981. *Die Ausmasse Ägyptens nach altägyptischen Texten. Ägypten und Altes Testament* 3. Harrassowitz: Wiesbaden.

Schott, S. 1990. *Bücher und Bibliotheken im alten Ägypten. Verzeichnis der Buch- und Spruchtitel und der Termini technici*. Harrassowitz: Wiesbaden.

Shore, A. F. 1987. 'Egyptian Cartography', in J. B. Harley and D. Woodward (eds.), *The History of Cartography* vol. 1: *Cartography in Prehistoric, Ancient, and Medieval Europe and the Mediterranean*, 117-129. University of Chicago Press: Chicago.

Strabo, *Geographica*, trans. H. L. Jones. 1932. *The Geography of Strabo* vol. 8. Heinemann: London.

Tait, J. 2003. 'The "Book of the Fayum": Mystery in a Known Landscape', in D. O'Connor and S. Quirke (eds.), *Encounters with Ancient Egypt: Mysterious Lands*, 183-202. UCL Press: London.

Taylor, J. H. 2010. 'The Perfect Afterlife', in J. H. Taylor (ed.), *Ancient Egyptian Book of the Dead: Journey through the Afterlife*, 238-261. British Museum Press: London.

Vercoutter, J. 1949. 'Les Haou-Nebout (𓆎𓅓) (suite)'. *Bulletin de l'Institut Français d'Archéologie Orientale* 48: 107-209.

Wartke, R. 1977. 'Zum Alabaster-Altar des Königs Sahu-Rē'. *Zeitschrift für ägyptische Sprache und Altertumskunde* 104: 145-156.

Wilson, P. 1997. *A Ptolemaic Lexikon: A Lexicographical Study of the Texts in the Temple of Edfu*. *Orientalia Lovaniensia Analecta* 78. Peeters: Leuven.