

On the Concomitancy of the Seemingly Incommensurable, or Why Egyptian Astral Tradition Needs to be Analyzed within Its Cultural Context

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As it is well known, the famous historian of astronomy Otto Neugebauer held a very low opinion of Egyptian astronomy. More precisely, he coined the (in)fa-
mous statement “Egypt has no place in a work on the history of mathemat-
ical astronomy”.¹ How did he arrive at such a harsh judgment and to which
degree is it justified? Neugebauer’s dictum was, obviously, a counterpoise to
the high renown which the Egyptians enjoyed in Greek and Latin texts as far
as astronomy was concerned. It went hand in hand with his high esteem of
Mesopotamian astronomy.

For the evaluation of Egyptian astronomical knowledge, much was decided
at the time when Neugebauer early in his career, in the late 1930s, collabo-
rated in the edition and commentary of two papyri with astronomical con-
tent, namely papyrus Carlsberg 1 with a text on celestial matters, especially
the decans,² which partially reproduced textual material already attested in the
Osireion of Abydos under king Seti I, and pCarlsberg 9, a schematic calculation
of lunar months.³ In resuming what sort of astronomy he got out of them and
the already known demotic Egyptian planetary tables, he commented on their
primitive state which could in no way match the contemporary Mesopotamian
testimonies of highly developed mathematical astronomy.⁴

Perhaps even harsher, but also less well known than Neugebauer, is a remark
by Bartel Leendert van der Waerden. He remarked that the whole decan astron-

1 Neugebauer (1975: 559).

2 First edition Lange and Neugebauer (1940), see below for more recent editions and discus-
sions.

3 First edition Völten and Neugebauer (1938); later Neugebauer and Parker (1969: 220–225);
additional fragments in Zauzich (1974); Hoffmann (1997). For the interpretation of the text,
see lastly Depuydt (1998), Krauss (2012: 27 f.).

4 Lange and Neugebauer (1940: 73.75).

omy was a product of the Middle Kingdom and later was simply copied down without updating. The Egyptian scholars were supposed to have nothing more advanced than long surpassed theories on the decans at hand, or else they would have provided something better for the mighty king Seti I.⁵

Perhaps the most noticeable point about Neugebauer's and van der Waerden's statements is what remains unstated because it was considered as self-evident, namely that the only possible reason an Egyptian at Tebtunis in the Roman period could have studied a text on the decans was to gain astronomical knowledge. This is far from self-evident. For example, nobody would argue that Otto Neugebauer or Bartel L. van der Waerden must have had a very low competence in astronomy because they studied a very simple and schematic way of dealing with the decans in an ancient Egyptian papyrus.

As a matter of fact, by now, including unpublished texts whose existence is known to me, there is clear evidence for an enormous amount of quite different texts relating to astral lore which were in circulation in Graeco-Roman Egypt. I will try to present them in a typological order, because a purely chronological arrangement according to the date of the preserved manuscripts does little justice to the chronology of the real historical development—too much is distorted by the chances of preservation.⁶ At the outset, I can already state that Egyptian temples play an important role as far as astrology in Graeco-Roman Egypt is concerned,⁷ and material from temple libraries will be at the core of this paper, especially from Tebtunis in the south of the Fayum area.

At Tebtunis, we have remnants of two papyrus copies of hieroglyphic inscriptions which originally were engraved in some tombs of the Early Middle Kingdom in Assiut, Middle Egypt. They preserve, among other texts, a version of the so-called "classical sky image" comprising also the decans, Egyptian stellar entities corresponding roughly to a third of a zodiacal sign.⁸ This is a complex image with text which dominated our record of preserved astronomical decoration of monuments for many centuries. However, the latest safely dated attestations are from about the third century BCE.⁹ Afterwards, private mon-

5 Van der Waerden (1968: 24).

6 For overviews of unpublished material see Ryholt (2005: 152f.); Winkler (2009); I am basing myself on direct knowledge of the manuscripts.

7 Jones (1994: 39–46). See also Evans (2004: 24–36), who tries to link astrology mainly to the Serapis temples, although this is hardly warranted by the evidence. See also Dieleman (2003).

8 Osing and Rosati (1998: 22–24).

9 The coffin of Harendotes can be dated quite precisely to the reign of Ptolemy III because the owner has titles linking him to the dynastic cult of the Ptolemaic kings, see Quaegebeur (1995:

uments tended to abandon the decans altogether (in the Roman period they often have recourse to the “modern” concept of the zodiac), whereas in public monuments, only the Seti I B- and the Tanis-family of the decans with their special, and quite different, iconographies remained in use. So, we have to pose the question what purpose these papyrus copies served. The most likely explanation is that they formed part of the cultural memory which continued to be copied. We have to take into account, for this question, that the astronomical decoration only forms part of a substantially larger body of copies of the decoration of several tombs in Assiut of the early Middle Kingdom. Somehow they entered a stream of tradition and became a canonical item of the culture.¹⁰

Somewhat similar are attestations of some constellations as well as the decans in a fundamental work compiling religious knowledge which normally goes under the only partially justified title of “geographical papyrus”.¹¹ By now, we have attestations in one hieroglyphic papyrus from Tanis,¹² as well as one hieroglyphic¹³ and two hieratic papyri from Tebtunis.¹⁴ It is likely to have originally comprised, in the astronomical section, the decans according to the Tanis- as well as the Seti I B-family. It should be stressed that this is a fundamental text assembling traditional Egyptian knowledge, with a strong religious background.¹⁵

The religious background is equally strong in a badly preserved semi-demotic text from Roman period Tebtynis which discursively treats the decans and other astral phenomena by linking them with mythological background.¹⁶

I would also like to mention a very substantial composition which is stylized as a dialog between Imhotep, the well-known sage who was divinized in Egypt, and a king.¹⁷ It concerns the temple, and more particularly, the correct times for festivals as well as the symbolic meaning of certain parts of the temple. A substantial part is given to astral phenomena. The text speaks of sun, moon and the five planets, mentions seven places of rising (obviously linked to them)

142–144); Verhoeven (2001: 82). The tomb of Petosiris at Atfih which is quite schematically dated to 150 BCE by Neugebauer and Parker does not really allow a close dating.

10 For other material from this batch, it can also be demonstrated how the Assiut inscriptions became a cultural model, see Kahl (1999).

11 Lastly studied by Leitz (2014).

12 Petrie and Griffith (1889: pl. IX).

13 Osing and Rosati (1998: 25f.; pl. I).

14 Osing (1998: 221–224, pl. 23).

15 Stricker (1944); Yoyotte (1960); Osing (1999).

16 Quack (2004).

17 Quack (2014: 54–57).

and gods appearing in the sky. It is obvious that this important role of celestial phenomena accords with the substantial role of astral motives on the ceilings of Egyptian temples especially of the Late Period, but at the current state of analysis of this composition, I would prefer to decline delving more in the details.

In order to develop this point a bit further, I would like to say a bit about astral motives in the actual archaeological record. On the public monuments (i.e. mostly temples), planets are normally shown either in their astrologically determined "places", or in their equally astrologically determined hypsomata. Private objects (mostly coffin lids or tomb ceilings) usually display the planets and constellations at the moment of the birth of the owner. There is less difference between those two decoration concepts than it seems at first, because the position of the planets in their "places" is actually nothing other than their position at the moment of the birth of the world.¹⁸ Public monuments, being connected with the world as a whole and not merely with a specific person, obviously chose that positioning.

There is also an evident religious background in the composition which served as starting point for Neugebauer's position. By now we have a substantially better knowledge of what is actually attested. The text, called "fundamentals of the course of the stars",¹⁹ is a composition aiming originally at giving a religious background to all phenomena of the sky, not only the stars, but also the sun, the moon with its phases, probably the planets,²⁰ and in one section even the migratory birds. It is, in its core parts, a very old text, probably going back to the Old Kingdom (third millennium BCE).²¹ It combines pictures with accompanying texts. At the time of its oldest preserved copy, in the Osireion at Abydos under Seti I, the text already had suffered considerably in transmission, with garbled writings, errors in the calendar dates, and major lacunae in some sections. At Tebtunis, the text appears in several quite different forms. There are fragments of a version with drawing and hieroglyphic text of which only small parts survive. Then there are three different papyri transmitting the text in hieratic writing without images. Finally there are two different papyri which give parts of the text with a demotic translation and a commentary, drawing on quite a number of Egyptian books which are explicitly cited. One of those

¹⁸ For a more detailed argumentation, see Quack (in preparation).

¹⁹ New edition von Lieven (2007), see there 125 f. for the question of the title. A substantial discussion of this text will appear in Quack (in preparation). The proposals by Klotz (2011) are quite completely erroneous.

²⁰ This has been disputed by Leitz (2008/2009), but see von Lieven (2012).

²¹ Disputed by Werning (2013). A detailed reply will be published elsewhere.

two papyri is pCarlsberg 1 which was used by Neugebauer as a principal witness for his negative judgment of Egyptian astronomy. The text can be better understood if we situate it as a case where the Egyptians struggled to make sense of their old cultural traditions.²²

Perhaps this is the right point to discuss also in more detail pCarlsberg 9 which was the second Egyptian text which considerably influenced Neugebauer's position. By now, it should be clear that the practical application of this papyrus is about the service of priests in the temple.²³ There are not only some comparable texts in Greek language²⁴ but also good evidence that the phyles of priests on duty in the temples rotated according to a schematic calendar which could be off for some days as far as astronomical accuracy is concerned but had the great advantage of allowing an easy advance planning. A good point of comparison might be modern calculations of the Easter day which are also quite schematic and not infrequently actually violate what is astronomically defined as the Sunday after the first full moon in spring. Nevertheless they continue to be used in our culture without in any way constituting proof of low astronomical competence. We can be fairly certain that this method of schematic lunar dates was developed in Egypt itself because it functions only with the Egyptian year of 365 days, but no leap-day.²⁵

We have documentation for several astronomical Tables in demotic Egyptian, planetary as well as lunar positions.²⁶ Normally, they show the application of mathematical methods and are thus comparable in structure to the astronomical cuneiform texts from Mesopotamia.²⁷ Indeed it is not unlikely that they came about under Mesopotamian influence, but regardless of the

22 To some extent, this can be compared with the situation in Mesopotamia where the old Omen Series *Enūma Anu Enlil* received new commentaries even in the Seleucid Period, see Frahm (2011: 129–166 and 332–338), when it was by no means the most up-to-date collection of astral knowledge.

23 Lippert (2009); Bennet (2008); Krauss (2012: 23–43).

24 Neugebauer and Turner (1949–1950) (pRylands 666).

25 Turner and Neugebauer (1949–1950: 83). A different opinion (derivation from Mesopotamia) is held by Spalinger (1994a: 57 note 15 und 59 note 42); Spalinger (1994b: 11–13).

26 Neugebauer and Parker (1969: 220–252 u. 254 f., pl. 65–79); for the planetary table of pBerlin 8279 see the additional fragment published by Hoffmann (1999); for a lunar ephemeris see Hoffmann and Jones (2006/2007). Unpublished fragments of astronomical nature can be found in the papyrus collection of the EES in Oxford, especially a primary lunar table (Edition together with A. Jones in preparation). An overview mainly of the Greek-language material but including the demotic Egyptian tables and with further references is given in Jones (1999).

27 For those see Neugebauer (1955); Ossendrijver (2012).

“copyright”, the important point I would like to make is that in Egypt in the Roman period, up-to-date mathematical astronomical tools were available. In turn, the remark by Alexander Jones that Egypt was likely the place where the Greeks encountered the mathematical astronomical methods derived from Mesopotamia,²⁸ gains in probability from the ongoing exploration of the demotic sources. In that perspective, Graeco-Roman Egypt should no longer be seen as a backwater, but as a hotbed of technological transfer.

Tables are based on procedure texts indicating how to calculate the positions of the planets. There actually are at least a few demotic papyri of this nature. One of them, badly preserved and from Roman period Tebtunis (now in Florence), has already been published by Neugebauer and Parker.²⁹ Another one, about the way of calculating the rising of Venus, has been found during the recent excavations of the Franco-Italian team at Tebtunis and is still unpublished.

Demotic Egyptian Horoscopes in rather substantial quantities are known by now.³⁰ They cover the time from about the end of the Ptolemaic period till the late second/early third century CE. I do not intend to make a formal statistical analysis of them because the documentation is strongly distorted by a few exceptional find-spots like Narmouthis. Still, it can be noted that in the earlier phases, demotic horoscopes can rival in number with the Greek ones but drop out after the early third century CE while the documentation in Greek language continues much longer. This goes hand in hand with the

²⁸ Jones (1994: 46–48).

²⁹ Neugebauer and Parker (1969: 250–252). The number “44” they give it does not correspond to the actual numbering system. Their decipherment and translation can be improved in a few places. Most notably, l. 4 at the beginning read [*hr*] *hr ip* ‘the number of days comes about’, in l. 6 and 7, *liry* can only be the imperative ‘make’ (the interpretation as participle advocated by Neugebauer and Parker is excluded because no main verb is following).

³⁰ The ones then known are assembled in Neugebauer (1943); new editions are Neugebauer and Parker (1968); Nur el-Din (1974: 264 f. T. 25) (Nr. 333, see for that Quack (1994) and Goebis (1995)); Parker (1984); Devauchelle (1987: 137 f.); Ross (2006a); Ross (2006b); Ross (2009a); Ross (2009b); Ross (2011); Quack (2008/2009); an unpublished one from Elephantine will be published by F. Hoffmann. See also the list of birth dates in Hoffmann (1995); Gallo (1997: 89 Nr. 84); similar Greek ones in Baccani (1989); Baccani (1995); Bastianini and Gallazzi (1995); Pintaudi (2011–2012); in OMM 1229, see Menchetti and Pintaudi (2007: 234–241 and 265–269). Raw data as well as documentation of the life of astrologers is presented in Menchetti (2009) with some problematic translations; for example, OMM 1198 understand l. 6f. rather “which are worthy to get the impious one in distress” and l. 10f. rather “his time of life is (written) below it”; OMM 1545, l. 3 read *hfti* “enemy” instead of *ll*, as demonstrated by Quack (2006/7: 178).

increasing abandonment of demotic Egyptian writing from the third century CE onwards in general.³¹ Another point worthy of notice is that all demotic Egyptian horoscopes published so far are written on ostraca while the Greek ones typically are written on papyrus, in a few cases as graffiti on walls.³² That might be an indication that there was a difference in wealth between clients preferring demotic Egyptian and those preferring Greek. This divide does not necessarily have to be based on ethnicity; it is likely that the Egyptian elite in the Roman period was largely bilingual.

Of course, tables as well as procedure texts constitute nothing more than the tools an astrologer needs to establish the horoscopes as such. For interpreting them, other manuals are needed which provided what the position of a planet in a zodiacal sign or in a house etc. really means.

The number of demotic astrological treatises³³ is remarkably large, but up to now has been little known because most of the important manuscripts are still unpublished, and they have rarely been the favorite choice of editors. Given that there is a special paper by Andreas Winkler in this volume, I will not go into too many details. Globally, there are several different types. The first category of astrological texts includes those concerned with universal (judicial) astrology—predictions for the king and the country. They might announce things such as military success of one kingdom against the other, the death of rulers, the positive or negative things happening to their children and their courtiers, drought or high Nile inundations and other meteorological phenomena (e.g. wind or rain), good or bad economic prospects, even the prospect of wild beasts, birds, crocodiles etc.³⁴ Among these, by far the most typical are predictions based on the heliacal rising of Sirius. One published specimen with the preserved title *nꜣ šhn.w n spt.t* “the prognoses of Sirius” is the demotic papyrus Cairo CG 31222,³⁵ dating to Roman Imperial times (about 2nd century CE). The preserved part treats the position of the planets in different zodiacal signs at the time of the heliacal rising of Sirius. There are probably at least 11 additional unpublished manuscripts of this type in Copenhagen, Florence, Ann Arbor, New Haven, London and Oxford.

Other texts of universal astrology include a treatise in the Vienna collection¹¹ which derives prognoses from eclipses and other events of the moon, dating to

31 Zauzich 1983; Yiftach-Firanko (2008).

32 See the material in Neugebauer and van Hoesen (1959) and Baccani (1992).

33 For Demotic astronomical and astrological texts, see the general overview in Hoffmann (2000). See also the (incomplete) enumeration of demotic astrological texts in Ross (2007).

34 For an overview see Quack (in press a).

35 Hughes (1950), improved translation in Quack (in press a).

about the late first century CE and coming from Soknopaiou Nesos.³⁶ This treatise, or at least the first part of it, is quite certainly derived from Mesopotamian models. In view of the specific correlation between the Egyptian calendar and the Babylonian month names, the archetype is likely to date to the time from about 625–482 BCE. Potentially helpful is also that Kim Ryholt could identify a partially destroyed royal name in the text as that of king Nekhepsos of the Saïtic period,³⁷ whose rule from 610–595 falls squarely into the time-frame set by the astronomical dates for the correlation of the months. Also a specific linguistic feature in the formation of the conditional clause is in accord with an early date of the composition.³⁸ All told, we can with some degree of confidence say that this is a case of the transfer of astral knowledge which took place probably during the final years of the Neo-Assyrian Empire, or perhaps just its aftermath when it was exactly king Nekhao II (Nekhepsos) who came to the aid of the last Assyrian throne pretenders.

Another category of astrological treatises are decanologies, specifying the destiny of children born under the influence of one of the 36 decans of Egyptian tradition. It should be stressed that the demotic treatises known to me never are zodiologies, and that shows a certain tenancy in keeping to Egyptian traditions. A small fragment of one such text (PSI Inv. D 39) has, rather inadvertently, already been published by Neugebauer and Parker,³⁹ several more are completely unpublished.

There are Demotic Egyptian texts operating with the position of the planets in either the zodiacal signs—in this case without differentiating according to decan—or the 12 ‘places’ of the so-called *dodecatropos*. Two manuscripts of the latter type have been published. The first is P. Berlin 8345, dating as a manuscript probably to the first or early second century CE.⁴⁰ Much less reliable is the edition of the second astrological treatise, papyrus Vienna D 6614,

36 Edited by Parker (1959). Some useful corrections can be found in the review by Williams (1966); an improved translation of the better preserved passages will be given in Quack (in press a). For the date, see Quack (2000: 85 n. 10) as well as Stadler (2004: 28f.). The date in the late second or third century CE given in the original edition is certainly too late.

37 Ryholt (2011: 62).

38 Quack (2000).

39 Neugebauer and Parker (1969: 252 f., pl. 80 c). In principle, Neugebauer and Parker defined that astrological treatises were outside the limits they had set themselves (1969: 217). I could add several new pieces directly joining to the fragment they published, and there are numerous further fragments of the manuscript mainly at Florence but also at Copenhagen and Berlin.

40 Photograph published (without detailed commentary or translation) in Spiegelberg (1902: 97); English translation and philological discussion by Hughes (1986), for one detail, see

also of the Roman period, which was not even recognized as such in its first edition.⁴¹ One point, however, should already be obvious. In phraseology and terminology, the Demotic astrological treatises are very close to the Greek and Latin ones; much closer than e.g. the cuneiform “proto-horoscopes”. Most importantly, this concerns the *dodecatropos* which is of fundamental importance for Hellenistic and later astrology but completely unknown in cuneiform texts. Evidently, decisive steps towards shaping ancient astrology into what we know as typical came about on Egyptian soil, and this is reflected in Demotic as well as Greek texts.⁴²

While the birth-astrology treatises known so far in Demotic Egyptian date to the Roman period, especially the second century CE, according to information I owe to Kim Ryholt, recently during the Franco-Italian excavations at Tebtunis, fragments have turned up from a Ptolemaic-period manuscript which is also remarkable by giving fairly specific case-studies about the factual destiny of men borne under certain constellations.

Concerning the relation between tables and astrological manuals, there is a very important point to be made. Most of the tables are in Greek language and script, and this fact concerns Oxyrhynchus⁴³ as well as (to a smaller degree) Tebtunis (from where we have one very substantial astronomical almanac).⁴⁴ By contrast, astrological manuals are quite a bit better attested in demotic Egyptian. At Tebtunis, where we have dozens of them, that is immediately obvious. Even at Oxyrhynchus, the number of published astrological treatises in Greek is not very high,⁴⁵ while I know of a number of unpublished ones in demotic Egyptian. Even more importantly, it would be a grave mistake to differentiate between the languages (and scripts) in a way which attributes everything Greek to a “Greek” culture distinct from the Egyptian one, and

Quack (1999: 41). German translation with further improvements in Quack (2008: 368–370). An unpublished small fragment of the manuscript is kept in the Heidelberg papyri^{us} collection.

41 Reymond (1977: 143–157, pl. VI); identified as an astrological text by M. Smith in Hughes (1986: 69); several important improvements in reading by Smith (1985: 111–114); a proposal for the reading of the title can be found in Quack (2002: 90f.). Additional unpublished fragments of the same manuscript are at Aberdeen (inv. 191).

42 See also the discussion by Greenbaum and Ross (2010).

43 For information about Egyptian-language manuscripts from Oxyrhynchus, see Quack (in press b).

44 Manfredi and Neugebauer (1973); Jones (1998); Jones (2001).

45 See Haslam, Jones, Maltomini and West et al. (1998: 130–175). Still, according to oral information by Alexander Jones, there is a substantial body of unpublished Greek papyri of this type.

perhaps even constructs an opposition between a more “scientific” Greek and a more “superstitious” Egyptian tradition. The fallacy of such an approach can be highlighted by looking in more detail at the manuscripts themselves: One of the demotic Egyptian astrological manuals from Oxyrhynchus is written on the back of a Greek commentary to a philosophical treatise of Aristotle. The large Greek astronomical almanac from Tebtunis has demotic religious texts on the back, and even on the recto, there is a short hieratic Egyptian pen trial which remained unidentified in the *Editio princeps*⁴⁶ but which I could identify as the beginning of a fundamental Egyptian manual on the ideal temple. Thus, it should be obvious that there is no great divide, but that Greek astronomical treatises could be in the hands of Egyptian priests, and those making use of demotic Egyptian astrological manuals were steeped in Greek philosophical thinking.

So, in order to conclude my paper, I would like to present some results. We can by now demonstrate that during the Roman period, especially at Tebtunis which, due to its exceptional preservation of texts, can serve as a case study, there was a wealth of texts in Egyptian language concerning astral lore available. They range thematically all the way from the more culturally and religiously significant to the then cutting edge of mathematical calculation of planetary positions. It is only by carefully situating each single one of them in its place of relevance that we can ever hope to gain an adequate picture of what celestial phenomena and their interpretation meant to the ancient Egyptians. To focus exclusively on the supposedly ‘astronomical’ nature of texts in decontextualizing them is not an appropriate way to deal with them.

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46 Manfredi and Neugebauer (1973: 101).

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