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Museum of Art and Archaeology

UNIVERSITY OF MISSOURI

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Front cover:

Funerary Stele of Heliodora
Egyptian, Roman period, 2nd-3rd century CE
Terenouthis, Nile Delta region
Limestone with traces of pigment
(2011.25) Weinberg Fund and Gilbreath-McLorn Museum Fund

Back cover:

Frank Bernard Nuderscher (American, 1880-1959)
The Artery of Trade, ca. 1922
Oil on canvas
(2019.1.5) Transferred from Ellis Library Special Collections

The Funerary Stele of Heliodora, Astrologer*



Roger S. Bagnall, Cathy Callaway, and Alexander Jones

We publish in this article a funerary stele (Fig. 1) that from its external and internal characteristics can be said with confidence to have been found at Terenouthis, in the Egyptian Delta.¹ Although there are hundreds of such stelai published to date, and a considerable number of further examples known but not yet published, the stele in the University of Missouri Museum of Art and Archaeology belongs to a tiny group of such gravestones with unusual interest and, indeed, a unique description of the woman commemorated by it. The stele was acquired in 2011 from Charles Ede Ltd. in London;² its previous owner, a private collector in the UK, had purchased it before 1970. It was originally sold by Maurice Nahman, the famous Cairo collector and dealer, who died in 1948.³

Terenouthis

The site of Terenouthis⁴ (Pharaonic Mefkat, modern Kom Abou Billou in the governorate of Menufiya, Fig. 2), has been known to modern travelers since the seventeenth century.⁵ It is located on the western edge of the Nile Delta, two kilometers from the modern course of the Rosetta branch of the Nile and some sixty kilometers northwest of modern Cairo. Archaeological remains there go back as far as the Old Kingdom and as late as the Fatimid period, and the modern town of Tarrana is adjacent and perhaps overlying part of the ancient site. The earliest official excavations were conducted by the Egypt Exploration Society in 1887–1888. Enoch Peterson of the University of Michigan conducted a brief excavation of the site for five weeks in 1935,

*This article is dedicated to the memory of Robert A. Seelinger (1951–2018), who did a great deal of research for it. We express our gratitude to Raffaella Cribiore, Thierry Dechezleprêtre, Sylvain Dhennin, Todd Hickey, Andrew Hogan, Benton Kidd, Francesca Maltomini, Julie Marchand, and Terry Wilfong for their help at various stages of our work. The first draft of the section on the description of the stele was prepared by Callaway; those on the site and the Greek text by Bagnall; and that on *mathematike* by Jones.

¹Acc. No. 2011.25 H. 0.434 m. W. 0.380 m. Thickness (max.) 0.068 m. This stele is taller and wider than the typical stelai cited in Abd el-Al et al. 1985 p. 45, although generally of their type 2.3.1 (p. 44), and is certainly in their category of exceptionally large.

²Published in their catalogue: Charles Ede Ltd., *Egyptian Antiquities* (London: 2011) object no. 25 (no page numbers given).

³On Nahman see Bierbrier 2012 p. 397. The guest book from his shop, now in the Wilbour Library at the Brooklyn Museum, is available in scanned form at <https://arcade.nyarc.org/record=b1385698~S3arcade.nyarc.org/record=b138569>.

⁴Or Therenouthis, as it is more commonly spelled in documents from the area, in keeping with the tendency of the local dialect to prefer aspirated consonants.

⁵For a good overview of the history of the exploration of the site, written before the beginning of the recent French project, see Dhennin 2011. Dhennin 2014 gives an account of the pharaonic history of Mefkat and the temple of Hathor Mistress of Mefkat built under Ptolemy I and Ptolemy II, as well as a description of the Greco-Roman town and its necropolis, with further bibliography. Some further information on the archaeological work carried out by the French mission is given in Dhennin 2019.



Fig. 1. Funerary Stele of Heliodora. Egyptian, 2nd-3rd century, limestone with traces of pigment, H: 43.40 cm, W: 38.00 cm. University of Missouri, Museum of Art and Archaeology (2011.25) Weinberg Fund and Gilbreath-McLorn Museum Fund.

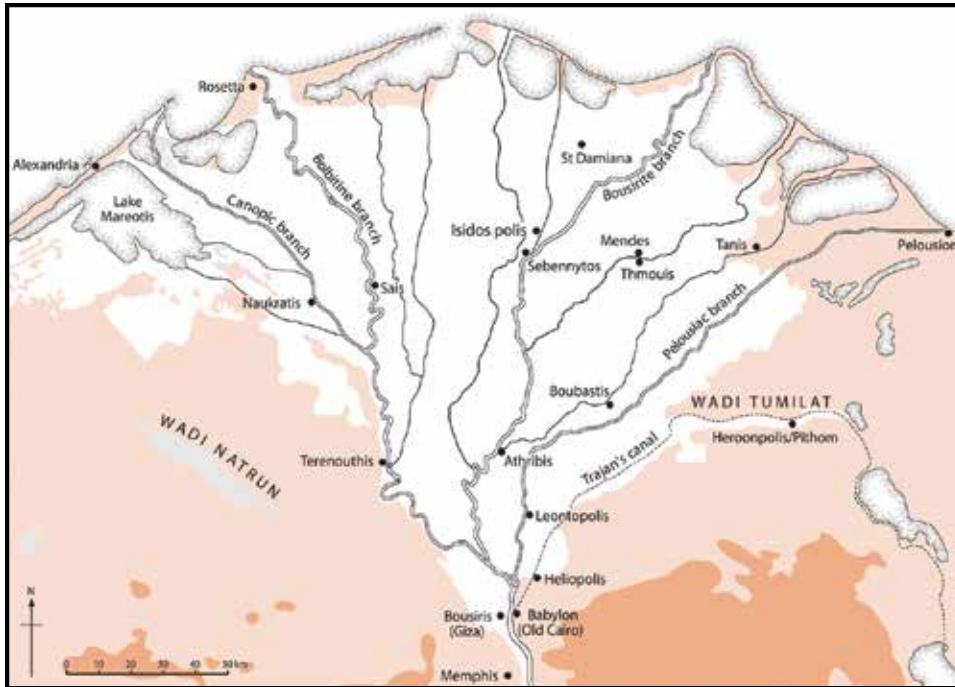


Fig. 2. Map of the Egyptian delta from Bagnall and Rathbone (2004) p. 79, fig. 2.6.1.

as a side venture from the Karanis excavations. Lack of adequate funding prevented continuation, but a large number of stelai and other finds were brought to the Kelsey Museum, with others remaining in Egypt. After that, no official excavations took place until salvage excavation carried out by the Antiquities Service in 1969–1975, at the time of the digging of an irrigation canal through the site. Finds from those excavations are in the Egyptian Museum in Cairo. None of these excavations has ever been fully published, but there are archival resources still available for studying them. Ceramic survey by Pascale Ballet and Marie-Dominique Nenna in the 1990s began to suggest significant value remained in the site. Some further work was also carried out by the (now) Supreme Council of Antiquities in 2006–2007. Since 2013, a survey and excavation project of the Institut français d'archéologie orientale and HiSoMA (Lyon), directed by Sylvain Dhennin, has resumed systematic work, documented to contemporary standards and even in preliminary articles helping to clarify many important issues about the site.

Terenouthis was part of the Prosopite nome (or administrative district). It was officially a village; Nikiou was the capital of the nome. But Terenouthis was a very substantial village of some significant wealth in the Roman period, thanks in considerable part to its location at a critical junction on the roads leading to Wadi Natrun from both Alexandria and the area of Memphis (later Fustat and Cairo). Wadi Natrun was, as its name suggests, a major source for natron, a complex sodium carbonate important in glassmaking and the processing of textiles, both important industries in Egypt. Surface survey and excavations

have produced many examples of a type of amphora identified as having been used for natron, and Terenouthis had production facilities for these amphoras.⁶ By contrast, the commonest wine amphoras of Late Antiquity, the LRA7, are virtually absent; it seems that Terenouthis did not need to import wine. It had a significant temple of Hathor, known at least from the Third Intermediate Period (ca. 1080–664 BCE), and its importance as a road junction was sufficient to warrant a Roman garrison in Late Antiquity, a cavalry unit mentioned in the *Notitia Dignitatum*. Much of the village site remains, preserved to a considerable height, offering possibilities for future excavation.

With its size, wealth, and long life, Terenouthis generated an extensive necropolis.⁷ Although much of it has been destroyed by the canal and modern agricultural development, it has been estimated that some six thousand to eight thousand tombs of all periods have been discovered. The tombs from which the decorated and inscribed stelai came are, as far as recorded, tombs built of mud bricks, of widely varying sizes and shapes, including truncated pyramids and even a large octagon. The stelai were built into these tombs, for example in niches under the vaulted roofs (Fig. 3). The date range of the stelai has been much debated, but the recent French work has made it increasingly clear, based on the ceramic evidence, that the brick tombs and associated stelai are to be dated to the first three centuries of our era, and perhaps as early as the end of the Ptolemaic period.⁸ Against and around them were dug many much simpler inhumation graves of the third and early fourth century, in some cases with a single coin buried in the individual's hand. From this observation it becomes very likely that the coins of the

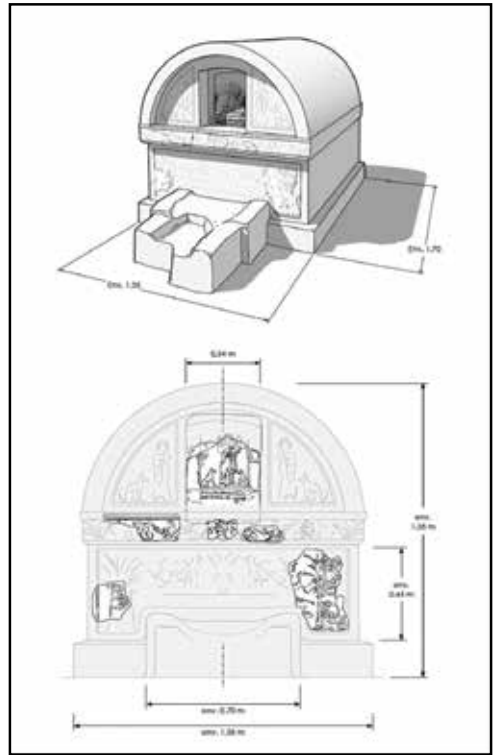


Fig. 3. Placement of a stele in the pediment of a tomb. Tomb of Isidora, Terenouthis. From Dhennin 2011 (based on archival photo in Michigan).

⁶ See Ballet 2007 for the production facilities; Dhennin 2014 and Marchand and Simony 2017 for the ceramic survey of the site, focusing on Late Antiquity and the early Islamic period; the amphora type is Late Roman Amphora 5/6.

⁷ Dhennin 2015 has useful reflections on the roles of cemeteries in the Hellenistic and Roman period.

⁸ See Le Roy et al. 2018, with excellent photos, and Dhennin 2011 for the drawing (his fig. 6) of the Tomb of Isidora, showing the place of her stele, adapted here in Fig. 3.

third to fourth century recovered by the Michigan excavations, for which no precise contexts were recorded, belong not to the brick tombs but to the subsequent inhumations; they are therefore not indicators of the dates of the stelai found.⁹

Some seven hundred stelai have been found in the excavations conducted by legitimate excavations or by clandestine diggers. The largest groups are those in the Kelsey Museum at the University of Michigan and the Egyptian Museum in Cairo, but others are scattered across the world in various museums and private collections. There is no complete repertory of the stones, but an inventory of those known down to 1989 was published, with an update in 1995, listing stelai in thirty-five collections across the world, not counting private collections; for many stelai no current location could be established.¹⁰ The number published since then is not large.¹¹ At one point in the late 1990s there were plans for a complete publication of Peterson's excavations that was to include a complete list of all the known stelai associated with the site, but this project has not been completed.¹²

Description

The funerary relief, now on display at the Museum of Art and Archaeology at the University of Missouri, is of limestone with traces of paint. It is chipped and broken around the edges and has other scattered small chips and surface abrasions; the woman's nose is damaged and there is chipping around the wrist of the garment folds on her left arm (Fig. 4). Only traces of the pigmented coloring remain. The front of the relief is somewhat darkened. The back of the stele is smoothed but otherwise plain; a rough-chiseled ledge extends across the bottom. On it is a woman carved in relief,¹³ within the façade of a building with a triangular pediment. The pediment has roof ornaments (*acroteria*) at the corners and rests on an architrave supported by two columns with



Fig. 4. Detail of Figure 1.

⁹ A preliminary study of the human remains from the third and fourth centuries appears in Le Roy et al. 2018.
¹⁰ Pelsmaekers 1989; 1995. This catalogue was announced as preliminary to a series of further studies on the stelai, but these have not appeared.

¹¹ Wagner 1996 is the only substantial group of inscriptions on stelai, published without any contextual information or description of the reliefs.

¹² Sylvain Dhennin informs us that a doctoral student of his has now undertaken to compile such a corpus.

¹³ The relief technique is identified as “dans le creux et incision” in Abd el-Al et al. 1985 p. 46; as “sunken relief,” Aly 1949 p. 59; as “hollow relief” in Hooper 1961 p. 5. This is the technique most commonly used for figures, in contrast to bas relief. This is also used for the funeral beds upon which the recumbent figures rest. Ancillary elements, such as architectural décor, funerary furniture, and statues of deities, are portrayed most often by incisions. The stelai are noted for their tireless repetition of two themes, as pointed out in Abd el-Al et al. 1985 p. 76: the deceased *orans* (praying) or the deceased recumbent, both alone (p. 46; resting on the left elbow, p. 50). Any variation is notable. Abd el-Al et al. 1985 provide a detailed typology for the different characteristics and details of the Terenouthis stelai and may be consulted for points for which we do not give detailed references. It has been suggested by El-Sawy et al. 1980 p. 356 that the relief was done by a different artist than the one who incised the objects under the *kline* along with the inscription.

capitals in the Egyptian style. At the bottom of the stele is an inscription in ancient Greek (discussed below), which identifies the person commemorated as Heliodora. Traces of red pigment are preserved on the pediment and on the two columns. A row of black squares marks the dentil course across the architrave.

The woman (we assume she is the Heliodora mentioned in the inscription) reclines on a mattress, propping herself up on her left elbow, which rests on two small cushions. The mattress and cushions are decorated by regular incisions. Her face and shoulders are fully frontal; her right knee is raised and that leg's unshod foot points to her right, resting on the mattress. The left leg is shown by a knee bump under her clothing; a top view of her left foot's toes can be seen, probably an indication that her ankles are crossed. Her left hand is empty, clenched in a fist and placed on her diaphragm area; some stelai show the deceased as holding an object, such as a wreath or lotus flower. In her right hand she holds up a footed two-handled cup. Very few stelai represent the deceased with jewelry.¹⁴

Heliodora has long hair (or a wig) appearing as a stylized pattern on her head, which could perhaps indicate a turban or head wrap. Notably, there is not a center part, which is common for this type of hairstyle. Her hair is placed behind the ears and then spreads out in two bundles of braids or curls that fall over her shoulders from behind her ears.¹⁵ She wears a long-sleeved chiton and a himation, both of which have many incised folds. The himation is drawn over her left shoulder and is placed over and behind her lap, so its end is not visible.

At the left of the composition is a statue of a jackal, an animal sacred to the god Anubis, sitting in profile atop a pedestal and facing Heliodora. Anubis is a protector and guide for the dead (Fig. 5). Other stelai from Terenouthis feature two jackals, some a statue of Horus, while some have no animal at all.¹⁶

Her mattress rests atop a couch or bed (*kline*), below which are two registers (Fig. 6). The lower one contains the inscription, while the upper one features two columns and three conventional elements of the "banquet" carved in relief. From left to right appear a carved leg with out-turned noduses, indicating support for the *kline* upon which Heliodora reclines; a simplified bunch of stalks, flowers, or a sheaf of wheat; an amphora on a stand; what looks to be a tripod pot; and another carved leg with noduses.¹⁷ This "usual funerary banquet scene" is a feature of many stelai and contains the same elements, with some variations.¹⁸

¹⁴ Abd el-Al et al. 1985 p. 60, section 5.11.

¹⁵ See Abd el-Al et al. 1985 p. 59, section 5.10.8. It has been suggested that this is an Egyptianizing hairstyle: "The shoulder tresses, being a remnant of the old Egyptian wig," Aly 1949 p. 64. Walker 1997 p. 143 suggests this as well, but of a different hairstyle.

¹⁶ See Abd el-Al et al. 1985 pp. 65–66, section 6.3.5. See Wilfong 2017 for more information on the representation of jackals on these stelai, as well as a discussion of the iconography associated with them, particularly in the Roman period.

¹⁷ Dhennin comments that the tripod pot is more likely a tripod table, on which there are usually three pots (absent here), decorated with swan necks. See for example Abd el-Al et al. 1985 pl. 29 note 114. The identification of the bunch of stalks is based on similar stelai, see Hooper 1961 p. 22; the suggestion that perhaps it was embellished by painting, see El-Sawy et al. 1980 p. 346.

¹⁸ Wagdy 2011 p. 375; cf. Aly 1949 p. 57. In Abd el-Al et al. 1985 the Arabic term *zir* has been preferred, instead of wine jar or amphora, based on the fact that the *zir* is still used in contemporary Egypt. For a list outlining the alternatives and sequential combinations possible for these elements of the funerary banquet accoutrements, see Abd el-Al et al. 1985 pp. 70–74, section 6.3.14.

THE FUNERARY STELE OF HELIODORA, ASTROLOGER



Detail

Fig. 5. Mummy Shroud, Egyptian, ca. 150 CE, tempera on linen, H: 206.00 cm, W: 103.00 cm. University of Missouri, Museum of Art and Archaeology (61.66.3) gift of Mr. Leonard Epstein. In the fourth zone, a Horus-hawk stands on a shrine, flanked by jackals, each standing on a mast and sail. Published: K. Parlasca, 1963. "A Painted Egyptian Mummy Shroud of the Roman Period," *Archaeology* 16, no. 4 (Winter) pp. 264–268.

The representation of Heliodora is typical of some of the stelai from Terenouthis and presents “a conflation of traditionally Egyptian and Greek motifs.”¹⁹ Certainly the jackal is Egyptian, as is her hairstyle, but the chiton and himation, typical dress for these stelai, is Greek. Expecting a drink from a relative is more of a Greek custom, according to El-Sawy et al., while pouring a libation is more Egyptian.²⁰ And of course, the inscription is in Greek.

The Greek Text

The inscription (Fig. 6) is disposed in four lines, three of which were cut in the uncarved register left below the relief register, and the fourth, with one word, cut into what should have been the unfinished lower edge of the stele. It reads:

Ἡλιοδώρα μαθηματ(ι)κὴ ἀγ-
νὴ ἀκατάγνωστος παρ-
θένος φιλάδελφος ὡς (ἔτῶν) νβ.
εὐψύχει.

“Heliodora, astrologer, chaste, without reproach, virgin, brother-loving, about 52 years old. Be of good courage.”²¹



Fig. 6. Detail of Figure 1, two registers below the *kline* with Greek inscription.

¹⁹. Criboire 1997 p. 6.

²⁰. El-Sawy et al. 1980 p. 353.

²¹. In line 1, the first eta of μαθηματικὴ has the form of pi; that is, the cross-stroke is placed much too high. This is presumably an error of the lapicide, as is the omission of iota. In line 3, the year sign has the customary L shape. The lettering in general is not highly skilled.

This is the second Heliodora to appear in a Terenouthis stele; a four-year-old of that name is also commemorated in an inscription.²² The name is not particularly common in the papyri, but neither is it rare. It presents no distinctive chronological or geographical profile. Our Heliodora is not given a patronymic, but this is the normal, although not universal, practice in the Terenouthis stelai. The stele does not have a date by regnal year, month, and day. This is less typical, but the omission of these elements occurs in roughly half of all of these stelai with an inscription well enough preserved to allow us to be certain. The age at death, fifty-two, is well above the median, but the Terenouthis stelai do commemorate individuals with ages in their seventies and eighties, and fifty-two is not especially remarkable in the overall series of ages. It does escape the age-rounding (to multiples of ten) common in the stelai as in papyrus documents, on which Hooper commented.²³

The distinctiveness of this stele lies in the rich series of epithets used to describe Heliodora. Many of those stelai that have Greek inscriptions contain no descriptive epithets for the deceased at all, and those that do for the most part favor banalities such as “died before their time” (ἄωρος), “good” (χρηστός), and “child-loving” (φιλότεκνος). Indeed, the stelai are on the whole of limited interest taken one at a time; rather, it is the overall corpus and groups of stelai that are rich in information. An example is the group of stelai dated to Hathyr 11 in year 20, a day on which more than forty residents of Terenouthis died, the overwhelming majority of them women and children. This has given rise to much debate, but it seems clear that some kind of disaster, such as a building collapse or ship sinking, that struck a social or religious gathering must have been responsible. The reign to which year 20 is to be assigned is not certain, but various criteria make 156 or 179 by far the most likely dates.²⁴

Heliodora’s stele is thus remarkable in presenting so much interest in itself, and particularly in the epithets. The published Terenouthis stelai contain no other examples of “chaste” (*hagne*), “without reproach” (*akatagnostos*), or “virgin” (*parthenos*; we reserve discussion of *mathematike* for the following section). There is one gravestone with *hagne*, said to be from Nikopolis at Alexandria, for a twenty-three-year-old woman named Julia.²⁵ And *parthenos* appears for a fifteen-year-old girl in an inscription uncertainly attributed to Alexandria (and which might actually come from Terenouthis) and in Memnoneia on an inscription for a sixteen-year-old girl in the Soter family.²⁶ In any event, both terms seem likely in these cases to refer to young women who were not yet married. In contrast, *akatagnostos* appears in funerary epigraphy only in other parts of the ancient world,

²² Appearing in *Supplementum Epigraphicum Graecum* (SEG) 28.1531; published in *BIFAO* 78 (1978) 53.

²³ Hooper 1961 p. 28.

²⁴ See Bingen 1987 and 1996, showing that the plague hypothesis put forward by Casanova 1985 cannot be correct.

²⁵ SB 1.2481, original publication by T. D. Neroutsos 1891 *Rev.arch.* 3 ser. 18 (343) no. 18.

²⁶ In Breccia, *Ischr.Alex.* 347 (= SB 1.2028; uncertainly attributed to Alexandria) for a fifteen-year-old girl and *IGRR* 1.5.1232 (Memnoneia, AD 109), the inscription for a sixteen-year-old girl.

never in Egypt.²⁷ It is used in Egypt, mostly in the form of the adverb ἀκαταγνώστως, in contracts from the fifth century on.²⁸

The only one of Heliodora's epithets to be found at all commonly is *philadelphos*, literally "sibling-loving," which appears in fourteen other stelai.²⁹ In three of the four examples from the Michigan excavations published by Hooper (nos. 43, 58, and 178), the deceased is a woman and also has the epithet "husband-loving" (φιλανδρος); three other examples are also female.³⁰ In SEG 28.1511, the person commemorated is a twenty-eight-year-old man named Herakleides, and in Hooper's no. 88 it is a seventy-three-year old man. Thus in all there are seven instances referring to women, five referring to men, and two uncertain.³¹ It is possible that we should see the stelai for women that use this adjective as referring to brother-sister marriages.³² In Heliodora's case, however, although she is brother-loving, she is stated to be a virgin, and *philandros* would not be appropriate. For a woman of fifty-two to be never married was highly unusual in Roman Egypt; already "from ages 26 to 32, 96 percent of women are reported as married or previously married (25 of 26); for ages 26 to 36, 93 percent (41 of 44)."³³ One must suppose that this highly unusual string of adjectives reflects distinctive life choices, presumably connected with her choice of expertise.

Any indication of profession is also relatively unusual in the stelai.³⁴ Only one occurs in Hooper's collection, an *othniopoles* (seller of linens) in his no. 44, perhaps leading him to overestimate the rarity of such titles. He cites a handful of other examples from other collections, including a seller of condiments (*artumatopoles*) along with his unnamed three-year-old daughter, and an eighty-two-year-old *himatiopoles* (clothing seller) in a stele in the Royal Ontario Museum.³⁵ A water-carrier (*hydrophoros*) is attested in one stele, but from more recent publications there are also a sailor, a priest, a goldsmith, a locksmith, a vegetable seller, and a clothing seller.³⁶

More relevant for our purposes are the *poietes* and *epigrammatographos*, poet and epigram-writer, and the son of a *hieroglyphos* (carver of hieroglyphs).³⁷ Also of interest

²⁷ Examples found in the PHI database (epigraphy.packhum.org) are I.Cret. 4.487 (= Bandy 8; Gortyn, fifth century, Christian); TAM 4.1.130 (Nikomedeia); SEG 4.12 (Syracuse, Christian period); SEG 32.928 (Piazza Armerina, c. 300); IGUR 3.1391 (Rome). All but the last are for women.

²⁸ PKöln 2.102, AD 418, is the earliest example found in a search of the Duke Databank of Documentary Papyri, consulted at papyri.info.

²⁹ See the chart at the end of this article.

³⁰ SEG 46.2170, Hooper's 64, SEG 48.2019, and SEG 48.2021.

³¹ In SEG 46.2170, 46, most of the name is lost, and what remains looks like a patronymic. In SEG 46.2170, 34, the name is Ἀχαις, Achaiis. This is corrected by the editor to Ἀχαιός, Achaios, masculine, but it could equally be the feminine Ἀχαιίς, Achaiis.

³² Certainly Hooper's translation "sister-loving" in these three cases is inappropriately specific; equally so is his apparent restriction (p. 30) to brothers in the case of men.

³³ Bagnall and Frier 1994 p. 113 n. 9.

³⁴ Hooper 1961 p. 27.

³⁵ The seller of condiments (ἀρτυματοπώλης) is in Edgar *Cat.Gen.* 27630; the stele in the Royal Ontario Museum is described in *AJP* 38 (1917) 417–19 (SB 3.6835).

³⁶ The water-carrier appears in *BSAA* 40 (1953) pp. 148–49, no. XXXIV = SEG 14.877; the sailor in SEG 30.1759; a priest in SEG 30.1760; a goldsmith in SEG 30.1761; a locksmith in SEG 46.2170, 2; the vegetable seller in SEG 46.2170, 33; and a clothing seller in SEG 48.2023.

³⁷ The poet and epigram-writer are attested in *BIFAO* 78 (1978) 237–38, no. 3 (= SEG 28.1493); the son of a carver of hieroglyphs (if the genitive is mistaken, the man may have been a carver himself) is in Edgar *Cat.Gen.* 27541 (= SB 1.4249).

is the *hymnetes*, or performer of hymns, whose name is given on the stone as Demetris, corrected by the editor to Demetrios. That may be correct (distinct feminine grammatical forms do exist for this role), but even given the relatively low standard of orthography and grammar in the stelai, we should perhaps not be too quick to assume that this was a man.³⁸ These show that an indication of a more learned profession was possible, even if both indication of profession and the exercise of such learned professions were uncommon. Also rare are other indications of status: one person described as a former *agoranomos* and gymnasiarch, and another, a former *agoranomos*, are two unusual cases.³⁹

Mathematike

We are confident that the epithet *mathematike* in Heliodora's inscription characterizes her as someone skilled in astrology. Together with *astrologos* and *genethliologos*, *mathematikos* was a well-established term for astrologer in the Roman period (likewise *mathematicus* in Latin), and perhaps the preferred term among astrologers themselves. One would not expect to find in Terenouthis a mathematician or a mathematical astronomer (of either sex), which are the other fairly common personal applications of μαθηματικός in the literature of Roman times.

So far as we are aware, this is the first known instance of a woman in the Greco-Roman world being designated an astrologer. What does it imply for her knowledge and education? Whether woman or man, an astrologer needed three kinds of knowledge. The first kind had as its nucleus the fundamental facts recorded in a client's horoscope—namely, the locations in the zodiac of the Sun, the Moon, and the five planets Saturn, Jupiter, Mars, Venus, and Mercury on the client's birthdate. Also required was the *horoskopos* or “ascendant,” the point of the zodiac that was rising at the moment of birth, and often the *mesouranema* or “midheaven,” the point that was crossing the meridian above the horizon. From this set of eight or nine indispensable astronomical facts were derived a larger set of astrological facts, which the astrologer could list in a written horoscopic document or display for the client using markers such as engraved gems on a board representing the zodiac and its subdivisions. One category of derived astrological data were *kleroi*, “lots,” which were points of the ecliptic calculated arithmetically from some combination of the astronomical data. The signs occupied by the Sun, Moon, and planets were also subdivided into smaller astrologically significant sections called “decans” and “terms” (*horia*), and into single degrees. Each of these subdivisions as well as the entire sign had one of the heavenly bodies as its astrological lord, which endows the relevant part of the zodiac with its own supposed powers. Lastly, situations were noted in which two or more heavenly bodies occupied a pair of signs at intervals corresponding to a diameter or to the sides of an equilateral triangle, square, or hexagon, called *schemata*, “aspects” (Fig. 7).

³⁸ SEG 48.2023; Δημητρῖς (Demetris), corrected by the editor to Δημήτριος (Demetrios). Δημήτρῖς is in general not as common as Δημητρία (Demetria), but it is not uncommon, though the form often indeed reflects the common omission of omicron from Greek masculine name endings in -ιος.

³⁹ The former *agoranomos* (a market overseer) and gymnasiarch (an official in charge of the gymnasium) are in Abd el-Al et al. 1985 pp. 32–33, no. 142 (= SEG 35.1666, year 42 or 44 of Augustus), and the former *agoranomos* is in SEG 48.2015 (photo in Dhennin 2014 fig. 9).

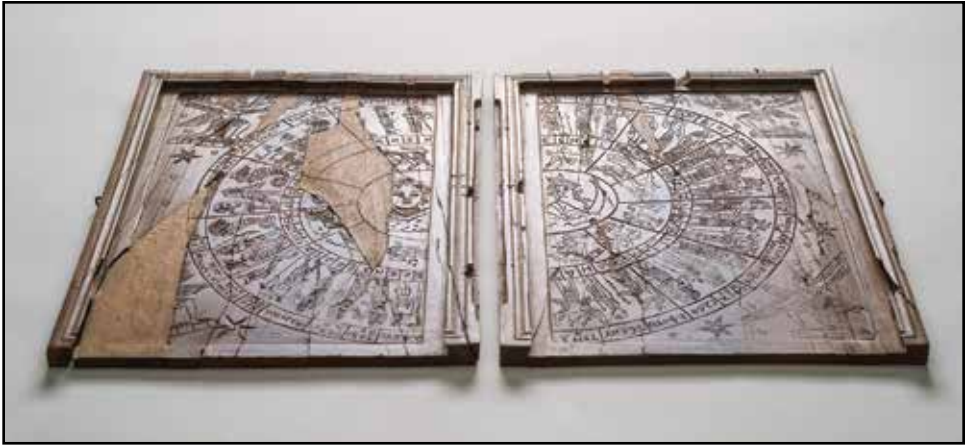


Fig. 7. Astrologer's boards for displaying a horoscope, ivory and wood, 2nd century CE. Concentric rings divide the zodiac into its individual signs, terms, and decans. Found with a nearly identical companion set, shattered in hundreds of fragments at the bottom of a well at the Gallo-Roman cult site of Grand (Vosges), but probably manufactured in Egypt. Musée départemental d'art ancien et contemporain, Épinal. Copyright Institute for the Study of the Ancient World / Guido Petruccioli, photographer.

Thus the astrologer had not only to grasp the fundamental structure of the zodiac and these somewhat artificial astrological relations but also to be able to determine the astronomical data by means of tables. For low-precision horoscopes, which specify only the signs occupied by the heavenly bodies and the ascendant and which account for the great majority of the horoscopes preserved on papyri, a set of almanacs acquired from some supplier would have sufficed for most of the data (Fig. 8). Anything more sophisticated would have needed a set of numerical tables and some facility with arithmetic, including the special techniques for operating



Fig. 8. *P.Tebt.* 2.274: fragments of a Greek planetary almanac on papyrus, from the Tebtunis Temple Library. The table recorded a computed position of each of the five planets Saturn, Jupiter, Mars, Venus, and Mercury for a date in each Egyptian calendar month over a range of years including 107–115 CE. Courtesy of the Center for the Tebtunis Papyri, University of California, Berkeley.



Fig. 9. PSI 15.1492: a Greek table on papyrus from Oxyrhynchus, recording computed day-by-day motions of Saturn expressed with base-60 fractions, to be used for calculating the planet's location in the zodiac on any given date. 2nd century CE. Copyright Istituto papirologico «Girolamo Vitelli», Florence.

with base-60 fractions (Fig. 9).

The second kind of knowledge concerned the potential significances of each of these diverse facts and their combinations for those individuals whose horoscopes exhibited them. This was the main subject matter of astrological handbooks, and it constituted a vast repertoire of information, too big for most people to commit to memory, so a typical astrologer would have required at least a modest library. This, however, provided only the raw material for the third kind of knowledge: that of how to put together a coherent narrative of individualized diagnosis and interpretation to deliver to the client.

One well-documented context of astrological practice in Roman Egypt was in Egyptian temples such as those of Tebtunis and Narmouthis in the Fayum.⁴⁰ Within these institutions, the skills of horoscopic and other varieties of astrology must have been taught from generation to generation as a specialized branch of traditional scholarship, and among the papyri traceable to the Tebtunis Temple Library are numerous astrological manuals (mostly in Demotic) and astronomical tables (in both Greek and Demotic). It is unlikely that Heliadora's education as a *mathematike* took place in a temple, but astrologers existed outside them too—as witnessed by the abundance of Greek astronomical and astrological papyri from Oxyrhynchus, a chiefly Greek-speaking city.⁴¹ The astronomical papyrus P.Fouad 267A (paleographically later second or early third century, certainly after 130) gives us a glimpse of how the computational aspects of horoscopic astrology were taught in what appears to have been a classroom setting. In all likelihood, this papyrus appears to be the not entirely successful

⁴⁰. Jones 1994 pp. 25–51; Menchetti 2009 pp. 223–239 and plates I–II; Winkler 2009 pp. 361–375.

⁴¹. For astronomical texts, tables, and horoscopes from Grenfell and Hunt's excavations at Oxyrhynchus, see Jones 1999. The great bulk of astrological papyri from the same collection remains unpublished.

efforts of a student to write down a teacher's oral explanations, with worked examples, of how to calculate the Sun's position and related quantities such as the lengths of seasonal hours for the date of a horoscope.⁴² We also have part of a series of lectures that Olympiodorus taught in Alexandria in 564, which were about the astrological data, again with worked examples.⁴³ It is hard, on the other hand, to imagine how one would learn the more subjective art of interpreting the data for the individual client other than through an apprenticeship.

Heliodora demonstrates that it was possible for a woman in Roman Egypt to have this education; but in what circumstances and how readily we cannot tell. Among divinatory traditions, astrology claimed a particularly intellectual status, and we know of several female scholars who worked in the mathematical sciences and allied parts of philosophy. These include the Pythagorean Ptolemais of Cyrene (date uncertain, not later than the third century) who wrote on music theory, the mathematics teacher Pandrosion who was a contemporary of Pappus of Alexandria (c. 320), and of course Hypatia (died 415) who wrote commentaries on mathematical and astronomical works.⁴⁴ The circumstance that Hypatia's father Theon of Alexandria (c. 360) was a prolific commentator in precisely the same fields suggests the possibility that Heliodora could have belonged to a family of astrologers and studied with a parent-teacher. We are so ignorant, however, about the composition of the astrological community outside of the tiny elite named in historical sources that it would be rash to presume that this was the only path for a woman to become an astrologer, or indeed that a female astrologer was an extreme rarity.

⁴². Fournet and Tihon 2014; Jones 2016 pp. 76–99.

⁴³. Boer, ed. 1962; for Olympiodorus' authorship and the genre of the text as lectures see Warnon 1967 pp. 197-217 and Westerink 1971 pp. 6-21.

⁴⁴. Ptolemais is quoted in Porphyry's commentary on Ptolemy's *Harmonics*, Düring, ed. pp. 23-25; Pandrosion is the addressee of Pappus, *Collection* Book 3.

THE FUNERARY STELE OF HELIODORA, ASTROLOGER

Table of Attestations of *philadelphos* in the Terenouthis Stelai

Reference	Name	Sex	Age	Adjectives
Hooper 43	Didyme	F	27	philandros, philadelphos, chreste, aoros
Hooper 58	Sarapous	F	14	aoros, ateknos, philandros, philadelphos, philophilos
Hooper 88	Eirenion	M	73	philoteknos, philadelphos, chrestos
Hooper 178	Athenarion	F	12	philoteknos, philandros, philadelphos, agathotate
<i>BIFAO</i> 72 (1972) 148, no. 8	Zenarion	M	7	aoros, eleeinos, philadelphos, philometor, philopator, chrestos
<i>BIFAO</i> 78 (1978) 245, no. 22 = <i>SEG</i> 28.1511	Herakleides	M	28	philadelphos
<i>SEG</i> 30.1763	Thasas	F	28	philoteknos, philadelphos, philophilos
<i>SEG</i> 46.2170, 34	Achais	?	60	philadelphos
<i>SEG</i> 46.2170, 46	lost	M	3	aoros, chrestos, philadelphos, alypos
<i>SEG</i> 46.2170, 64	Tapeteiris	F	32	chreste, philoteknos, philadelphos
<i>SEG</i> 48.2019	Heration	F	36	philoteknos, philadelphos
<i>SEG</i> 48.2021	Thaneutin	F	8	eleeinos, aoros, philopatria, philadelphos
<i>SEG</i> 50.1616]osas	?	35	philadelphos
Boston MFA 1984.256 in M.B. Comstock and C.C. Vermeule, <i>Sculpture in Stones and Bronze, Additions to the Collection of Greek, Etruscan and Roman Art 1971–1988 in the Museum of Fine Arts, Boston</i> (1988) 47 no. 37.	Herakleides	M	lost	philadelphos, philoteknos

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