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ARE THE MOONS OF NINNION A REPRESENTATION OF EARTHSHINE?

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ABSTRACT

The so-called “Ninnion Tablet” is a votive red-figured attic clay plaque, found in the Sanctuary of Eleusis and dated ca. 370 BCE. It is a private offering, not of the utmost artistic quality, with an original subject of mortals encountering the Eleusinian deities. The complex iconography has been extensively discussed in classical scholarship. A frieze depicting a series of lunar discs and crescents, which has not been given much attention yet, crowns the main scene. In the present paper, we examine these moons and conclude that they may be the oldest representation of the phenomenon of earthshine in western art.

KEYWORDS: Archaeoastronomy, Cultural Astronomy, Ancient Greek Vase Painting, Eleusinian Mysteries, Moon, Earthshine.

1. THE MOON AND THE MYSTERIES

The so-called “Ninnion Tablet” (Athens National Archaeological Museum 11036) is a votive red-figured attic clay plaque, found in the Sanctuary of Eleusis in 1895, and dated to 370–360 BCE (see Figure 1). It is the only known clay plaque depicting mortals upon their arrival in the Sanctuary (Skias, 1901; Mylonas, 1961, pp. 213–221 and references within). Since the revelation of the Mysteries’ secrets was punishable by death (and it is known that the law had been applied, e.g. Livy, *History of Rome*, 31.14.7) it is not so strange that there were not many willing people to leave descriptions and drawings. The particular votive panel was dedicated and probably hung within the Sanctuary, justifying Ninnion’s initiative to order it. The tablet was found during excavations in the debris of the renovation of the *Telesterion*, either at the end of the 4th or during the 2nd c. BCE.

The astronomical interest for the painting is the frieze depicting lunar discs. Out of 18 (or maybe 19) discs, 15 are preserved, completely or partially, divided in between with diglyphs. Each disc is circular, with a bowline dividing them into two parts. The smaller part is meniscus-shaped and covered in thin dark lines. The larger part is ellipsoid and has no lines; however, its colour is darker than the background of the meniscus. A thin horizontal line, that is difficult to see, divides horizontally the moons and the whole frieze. In the original paper discussing the finds, the discs were described as “drawings of the moon around the time of full moon” and the thin horizontal line as “a symbolic representation of the sky” (Skias, 1901, p. 23). Since then, there has been only one reference to the moons in the archaeological literature (Simon, 1966), where they are described as “bacchus rings” (Beazley, 1941); these are metal rings that tied the bundles of myrtle branches during the Eleusinian procession, as shown in the lower part of the drawing. The vertical antae of the tablet show a schematic representation of bacchus rings, similar to their display in Attic coins.

The basic myth of Eleusis (sourced from the Homeric Hymn to Demeter) describes the abduction of Persephone by Pluto and her return from Hades to Earth; but this may not be the version of the myth utilized for the Mysteries (Clinton, 1992, pp. 28–37). The presence of the moons in an Eleusinian context is relevant, as there are connections between Demeter (the goddess of agriculture), Persephone (her daughter) and Selene (the moon). For example in the Orphic Hymns, Selene is described as “light carrying”, “bull horned”, “fruit producing”, but also “mother of time”, “female and male”, and –of course– “waxing and waning”; Persephone is de-

scribed as “source of life”, “light carrying”, “shining” and “bull-horned”. In addition, Selene is connected to a good crop yield, as she “husbands the fruits with her light” (Porphyrios, quoted in Eusebius, *Praeparatio evangelica*, III 11, 32) and Persephone “supplies life to the universe” (Proclus, *Theologia Platonica*, VI 55, 5ff). Do note, that a most important part of the Eleusinian Mysteries were performed at night, under the moonlight (cf. Euripides, *Ion*, 1077–1086, where Selene is taking part in the ceremonies).

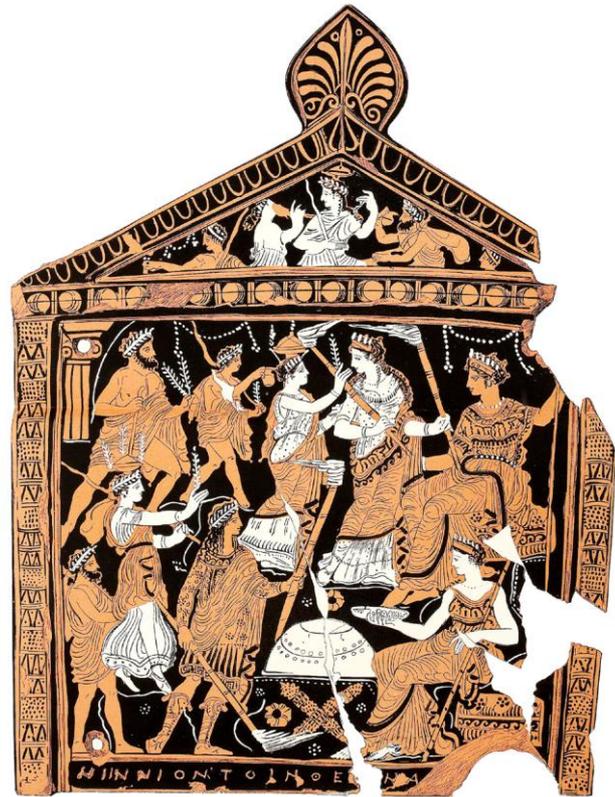


Figure 1. The Ninnion Tablet. Drawing by Emile Gilliéron père. Source: Skias, 1901, Pl. 1.

The Great Mysteries of Eleusis took place from 14 to 20 Boedromion (Mylonas, 1961, pp. 243–285; Robertson, 1988). Since the Athenian calendar was lunar-based, the Mysteries were timed with the full moon and a large part was conducted during the waning gibbous phase. The waning moon is wandering in the sky searching for its ravished portion, just as Demeter is searching for Persephone (Kerényi, 1967, p. 130). We have to admit, that irregular intercalation was frequent – thus the different *κατὰ θεὸν* and *κατ’ ἀρχοντα* days– so the intended timing with the moon did not necessarily occur (vd Waerden, 1960; cf. Aristophanes, *Clouds*, 612ff). Boedromion is approximately from mid-September to mid-October (Greswell, 1862, Vol. V, p. 590); as a result, the Mysteries are linked to the full moon of the autumnal equinox (Goldstein, 1973). At this period, the moon is rising for several nights in succession at nearly the

same hour, immediately after sunset. This full moon in Anglo-Saxon culture is referred to as “Harvest Moon”, being highly important to farmers as it enables them to lengthen the day’s work (Bartlett, 1911).

2. ICONOGRAPHY OF THE MOON

It is only in the 14th c. CE that we have more naturalistic drawings of the moon (Olson & Pasachoff, 2001); after the telescopic observations of Gallileo they became even more accurate. Strange as it seems, the particular way of drawing the moon in the Ninnion tablet has no concurrent iconographical parallel. The moon is drawn schematically as a meniscus in rings from Mycenae, Tiryns and Minoan Crete. In classical Greece –contrary to the plethora of astral images (Yalouris, 1980)– the moon is drawn mostly anthropomorphically (Gury, 1994). There are few cases depicting the moon in a meniscus form. We note: a crater from Ermioni (Athens National Archaeological Museum 1435; Karouzou, 1964, Pl. 2); an Attic skyphos (Kerameikos Museum 5880a-r; Knigge, 2005, Pl. 72.207); an Italian oenochoe (British Museum F573; Schauenburg, 1962, Pl. 21.1); an Italian crater (Copenhagen, National Museum 7030; Bazant, 1985, Pl. 38.63); the Nola hydria, regarded as depicting an eclipse in the constellation of Pegasus (Paris, Cabinet des Médailles 449; Gautschy, 2007, Figure 1).

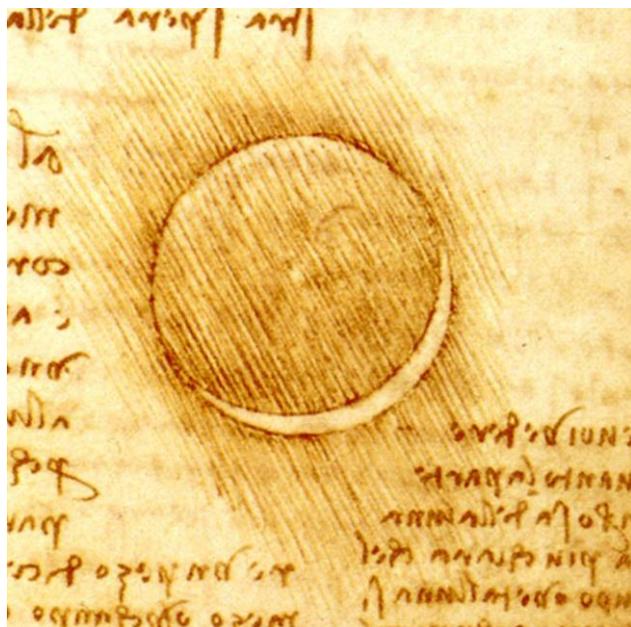


Figure 2. The earthshine drawn by Leonardo da Vinci. Detail from Codex Leicester Fol. 2r. Source: Wikimedia Commons (https://commons.wikimedia.org/wiki/File:Vinci_-_Hammer_2A.jpg)

But none of the above resemble Ninnion’s moons. The only close parallel located by the author, is in the “Codex Leicester” by Leonardo da Vinci, in a drawing representing the phenomenon of earth-

shine, and dated ca. 1506–1510 (see Figure 2). In that drawing, we notice a similar use of thin lines (although in the dark part of the moon). Earthshine has also been depicted in the “Last Supper” fresco by Pietro Lorenzetti in the Lower Church of San Francesco, Assisi, dated ca. 1316–1320 and in the “Death of Christ” by the Limbourg brothers dated at the same period as “Codex Leicester”. Drawings of earthshine are also found in late antiquity Syria: in the 2nd c. zodiac mosaic of Sephoris Synagogue, in a 3rd c. fresco from the Dura-Europos Synagogue, in the 6th c. Rabbula Gospels. A 13th c. painting of the ciborium at the central altar in the Coptic church of Haret Zuweila in Cairo, has wavy horizontal lines drawn on the moon disc. However, the Ninnion tablet pre-dates these works of art by many centuries.

On the other hand, we believe that the thin horizontal line in Ninnion’s moons has no astronomical significance. It is actually very pale and difficult to see and goes through the diglyphs as well as the moons. It was just drawn to assist the painter, a technique that can be traced back to earlier times (Lolos, 2010).

3. EARTHSHINE IN THE LITERATURE

Earthshine would be easily visible were it not overwhelmed by the brightness of the sunlit moon (Jackson, 1943). If Ninnion’s tablet really depicts the earthshine, we must examine if ancient Greeks knew this phenomenon. For this, we turn to the classical Greek literature and try to find relevant references.

There is an evolution of theories in pre-socratic philosophy regarding on how the moon shines (Kirk & Raven, 1957), but Anaxagoras (ca. 500–428 BCE) is credited for stating that the sun provides the moon with its light: *ἥλιος ἐντίθησι τῇ σελήνῃ τὸ λαμπρόν* (Plutarch, *On the Face Which Appears on the Orb of the Moon*, 929b). However, the moon does not take its light from the sun through reflection as we know today; rather the moon absorbs and stores light from the sun: *κύκλω γάρ που αἰεὶ αὐτὴν περιωὼν νέον αἰεὶ ἐπιβάλλει, ἔνον δὲ ὑπάρχει τὸ τοῦ προτέρου μηνός* (Plato, *Cratylus*, 409b). The moon shines with a combination of the “new light” and the “old light” that it gathered in the previous month (O’Brien, 1968). To this “old light”, we can attribute the earthshine. This is also a very plausible explanation of why the ancient Greeks called the first day of the month *ἔνη και νέα*, a word traced back to Hesiod: *πρῶτον ἔνη τετράς τε και ἑβδόμη ἱερὸν ἡμῶν* (Hesiod, *Works and Days*, 770). Prof. Martin Litchfield West beautifully translated *ἔνη και νέα* as “the old moon in the new moon’s arms”. It has even been proposed as an etymology of Selene: *ὅτι δὲ σέλας νέον και ἔνον ἔχει αἰεὶ, «Σελαενονεοάεια»* (Plato, *Cratylus*, 409c). Thus, ancient

Greeks were aware of earthshine, and they attempted to explain it.

Moreover, why 18 moons? They represent the 1½ year (Dowden, 1980) from the first initiation in the Lesser Mysteries during Anthesterion, until the rise to the highest grade the following year in the Great Mysteries during Boedromion: *ἀλλὰ τὰ μικρὰ τοῦ Ἀνθεστηριῶνος ἐτελοῦντο, τὰ δὲ μεγάλα τοῦ Βοηδρομιῶνος: ἐπόπτεον δὲ τοῦλάχιστον ἀπὸ τῶν μεγάλων ἐνιαυτὸν διαλείποντες* (Plutarch, *Demetrius*, 26.1).

The 18 moons seem as a direct reference to the Metonic cycle known since 432 BCE. However, it was not used in the Athenian calendar before the Hellenistic period (Müller, 1994), or at the earliest around 350 BCE (Morgan, 1996). During Ninnion's lifetime, the Athenians used Cleostratus' octaetiris; its intercalation rules do not fit the number or the

pattern of the moons in the frieze. As for the specific order of waxing and waning phases (see Figure 3), it is highly likely that the painter just made a mistake (Skias 1901, p. 23, footnote 1) at the 7th drawing and then made another deliberate one at the 13th in his attempt to complete the frieze in symmetry.

Our attempts at deciphering the moons on the Ninnion tablet, lead us to the conclusion that they cannot give us specific astronomical information for the creation of the drawing, or for dating the scene that it depicts (Dallas & Mitsopoulou, 2007). However, they reflect the traditions and beliefs of Greek town folk about the moon in the beginning of the 4th c. BCE. They also seem to be the oldest representation of earthshine in western art.

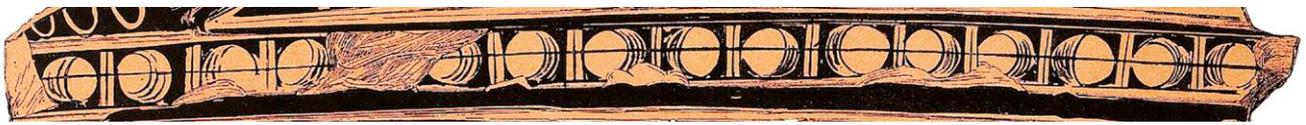


Figure 3. The moons of Ninnion. Detail of Figure 1, showing the moon frieze.

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