

## *Odyssey* 20.356–57 and the Eclipse of 1178 B.C.E.: A Response to Baikouzis and Magnasco\*

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**SUMMARY:** The recent argument of Constantino Baikouzis and Marcelo Magnasco that *Odyssey* 20.356–57 preserves a reference to the solar eclipse of 26 April 1178 B.C.E. has received widespread attention in generalist publications. Unlike Carl Schoch’s 1926 argument, which came to the same conclusion, the new argument cannot be dismissed on the basis of the passage’s context. Baikouzis and Magnasco require several other tacit assumptions, however, and many of these may be rejected with great confidence.

THE ASTRONOMERS CONSTANTINO BAIKOUZIS AND MARCELO MAGNASCO HAVE renewed the argument that *Odyssey* 20.356–57 may refer to a solar eclipse that is known to have taken place over Greece on 26 April 1178 B.C.E.<sup>1</sup> The present article rejects the hypothesis, and discusses in detail some of the diverse issues that surround this kind of argument.

The passage that purportedly refers to the eclipse is as follows (*Od.* 20.350–57)<sup>2</sup>:

And among them spoke godlike Theoklymenos:  
“You wretches, what is this evil upon you? Night enfolds  
your heads, and faces, and your knees below;  
wailing has blazed up, your cheeks are covered in tears;  
the walls and fine alcoves are spattered with blood;

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<sup>1</sup> Baikouzis and Magnasco 2008. All dates (except for citations of modern scholarship) are B.C.E. and refer to the Julian calendar.

<sup>2</sup> I follow the text of van Thiel 1991. All translations are my own.

the porch is full of ghosts, and the hall is also full;  
 they are going to Erebos beneath the dark; *the sun*  
*has perished from the sky*, and a harmful gloom is spread over.”

The idea that this passage refers to a solar eclipse was suggested (and rejected) in antiquity.<sup>3</sup> Among modern advocates of the eclipse interpretation, Baikouzis and Magnasco draw particularly on the argument of Carl Schoch that the passage refers to the eclipse of 1178.<sup>4</sup> Schoch’s argument rested on three main assumptions: that the passage does indeed refer to an eclipse; that this reference somehow survived centuries of oral transmission; and that the eclipse takes place between 10am and 12 noon.

Dörpfeld 1926 swiftly and firmly destroyed Schoch’s argument, largely on the basis of context. He pointed out that (a) Theoklymenos refers to souls descending to Erebos (Hades), where notoriously the sun does not shine, and that this fully explains the reference to the sun; (b) the subsequent conversation shows that there is no unusual darkness, especially 20.362, where the darkness of the hall is contrasted with the light outdoors; (c) the people addressed by Theoklymenos do not believe him; and (d) neither the narrator nor anyone else present refers to an eclipse. Dörpfeld might also have drawn attention to a second “eclipse” in *Il.* 16.567, which is more clearly metaphorical<sup>5</sup>; or commented on the speculative nature of Schoch’s timeline of the day’s events, without which the argument vanishes; or drawn attention to the centuries of oral transmission and reformulation. The rebuttal is very firm nonetheless, and most specialists would be content to let the matter rest there. But Dörpfeld’s reply appeared in a fairly obscure publication, and a few modern specialists have been willing to allow that the passage may in principle refer to an eclipse, if not specifically to the eclipse of 1178.<sup>6</sup>

<sup>3</sup> Herakleitos, *All.* 75.2–8; Plut. *De facie* 931e–f; [Plut.] *Vit. Hom.* 2.108; schol. B and V on *Od.* 20.356; Eust. *Od.* 14.161, 14.457, 19.307, and 20.357 (= 2.67.11–14, 2.84.25–32, 2.204.3–5, 2.241.11–16 Stallbaum). Of these Herakleitos, pseudo-Plutarch, and Eustathios accept the eclipse interpretation, though Herakleitos and Eustathios cast it as allegorical; Plutarch equivocates; both *Odyssey* scholia firmly reject it. Cf. schol. Arat. *Phaen.* 864, quoting *Od.* 19.307 in connection with solar eclipses.

<sup>4</sup> Schoch 1926a; 1926b; 1926c. Schoch was informed by a learned school-friend of the counterarguments given in the *Odyssey* scholia (n3 above), though he seems not to have been aware of their source (1926a: 19).

<sup>5</sup> [Plut.] *Vit. Hom.* 2.108 and Eust. *Il.* 16.567 and 17.367 (= 3.900.4–6, 4.65.13–21 van der Valk) see a reference to an eclipse at *Il.* 16.567, with subsequent references at 17.645–46, 21.334–35, and 23.212–13.

<sup>6</sup> Fotheringham (who supported an eclipse interpretation prior to Schoch, and reports several similar earlier arguments; 1921: 16–18) collaborated with Schoch and in May

Dörpfeld's first point, in particular, merits expansion. Dörpfeld followed the ancient scholiasts in arguing that, in context, there is no real doubt that Theoklymenos is reporting a vision of death and the underworld. Theoklymenos's words are vivid, but they are also a prophecy, mysterious and surreal: we cannot expect to take "walls spattered with blood" as a literal account of a historical event, nor a porch and hall that "are full of ghosts."<sup>7</sup> As a whole the scene has less in common with genuine astronomical references in Homer (which Baikouzis and Magnasco discuss; see below) than it does with the horrific crawling and lowing of the carcasses of Helios's cattle on the spit (*Od.* 12.394–96).

More specifically, as Dörpfeld pointed out, the ghosts' destination—"beneath the dark to Erebos," the underworld—is the one place in the mythical Greek cosmos that the Sun, personified as Helios, cannot see. It is in the world of the living that Helios sees and observes everything<sup>8</sup>; in ancient Greek thought "X (no longer) looks on the light" routinely means "X is alive (dead)"<sup>9</sup>; Hades is, on one etymology, literally "unseen" (ἀ- + ἰδε-) by the sun<sup>10</sup>; and at one point in the *Odyssey* Helios threatens to shine in the underworld if he does not receive recompense (*Od.* 12.382–83). The other vivid elements in Theoklymenos's vision also evoke death figuratively, namely the darkness that covers the Suitors, the spattering of blood, and the ἀχλύς ("gloom," 20.357),

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1926 presented the arguments of the latter in a Hellenic Society seminar (Anonymous 1926: xxi–xxii). Shewan 1928 also approves Schoch's argument. Pocock 1965: 55–63 independently argues for a historical eclipse, but dates it to 689 (on very weak grounds). Willcock 1966: 155 (reviewing Pocock), Austin 1975: 245–46, 281n8 (citing Shewan), and Levine 1983: 5–6 (citing Austin) all admit the possibility of an eclipse, but reject a historical one in favor of a figurative reading. Note that Shewan and Pocock err over the year notation (e.g., –1177 = 1178 B.C.E.).

<sup>7</sup> *Contra* Herakleitos, *All.* 75.3–4, who interprets the bloody walls as representative of the colors seen during an eclipse.

<sup>8</sup> Helios sees and hears everything on earth: *Il.* 3.277; *Od.* 11.109, 12.323. Darkness fills Hades: *Il.* 15.191, 21.56, 23.51; *Od.* 11.57, 11.155. The association between Helios's light and the powers of sight is linked to the notion that vision works by emitting rays from the eyes (cf. the use of φῶς, "light," as Helios's "eye," *Il.* 14.344–45; φάεα = "eyes," *Od.* 16.15, 19.417). A reader for *TAPA* draws attention to parallels to these "vision rays" in later Greek writers, e.g., Empedokles, fr. 84, 88, 89 DK; Pl. *Ti.* 45b–e; Euc. *Optics (pessim)*. For further references to Helios's vision and role as observer, see Vermeule 1979: 217n45; Clarke 1999: 272–73.

<sup>9</sup> *Il.* 5.120, 18.11, 18.61, 18.442, 24.558; *Od.* 4.540, 4.833, 10.498, 11.93, 14.44, 20.207; and plentifully in later poets (especially Eur. *Alc.*).

<sup>10</sup> See Clarke 1999: 167n18 for discussion of this and other etymologies.

all of which accompany or forebode death elsewhere in Homer.<sup>11</sup> The absence of the sun is first and foremost, then, a figurative way of evoking death.<sup>12</sup>

Baikouzis and Magnasco's more recent argument is wholly different. It is important to realize just how different. None of Dörpfeld's objections to Schoch's argument puts the slightest dent in the newer formulation. Baikouzis and Magnasco do not need to posit in advance that *Od.* 20.356–57 refers to an eclipse; indeed they require no assumptions at all about Theoklymenos's vision or its context.

Instead, their argument is based on several astronomical references spread throughout the *Odyssey*, in conjunction with a tabulation of the epic's internal chronology. 1178 matches their data points better than any other year between 1250 and 1115; and that year, it turns out, produces an eclipse on the expected day. Their five purported astronomical references are as follows, in "chronological" order:

1. Day –34: within a few days of Mercury's westernmost rise-time azimuth (*Od.* 5.44–54 and 5.148, Hermes' trip westward to Kalypso's island and return to Olympos).
2. Day –29 to Day –11: the Pleiades and Boötes are both in the sky at twilight, and Boötes sets later than the Pleiades (*Od.* 5.272–77).
3. (conjectural) Day –11: on or shortly after the Equinox (*Od.* 5.282–84, Poseidon's return from the Aithiopes, viz. the "earth"–shaker's return from the "southern hemisphere").<sup>13</sup>

<sup>11</sup> Levine 1983: 6 cites several parallels where darkness, blood, and ἀχλύς are associated with death or unconsciousness. Monro 1901: 196 adduces ἐρεβεννῆ νυκτὶ καλύψαι, "to conceal in gloomy night" meaning "to slay" (*Il.* 13.425); θανάτοιο μέλαν νέφος, "black cloud of death" (*Od.* 4.180; similarly *Il.* 16.350). See also *Il.* 16.567–68, where Zeus spreads out "night" in the daytime to create ὀλοὸς πόνος ("deadly suffering") in the battle over Sarpedon's corpse. Voigt 1978 lists all cases where death is poetically described by an ἀχλύς obstructing vision. *Contra*: a reader for *TAPA* draws attention to Voigt's argument (1978: 1764) that in *Od.* 20.357 ἀχλύς refers to darkness concealing the sun. But this is the only instance where Voigt sees that specific meaning in ἀχλύς; it should certainly be understood with the usual sense of ἀχλύς, i.e., the obstruction of an individual's vision, namely Helios's (cf. n8 above): this is ἀχλύς in the normal sense of darkness "auf oder vor den Augen," and its occurrence "bei Sonnenfinsternis" is not intrinsic to the word's function. Regardless, to understand a literal darkness in *Od.* 20.357, but not in *Il.* 16.567 or any other poetic image referring to "night," involves special pleading.

<sup>12</sup> The same observation appears (more tersely) in several commentaries: Monro 1901: 196; Ameis, Hentze, and Cauer 1911: 68; Russo 1992: 124–25; Rutherford 1992: 234.

<sup>13</sup> Baikouzis and Magnasco 2008: 8826 regard this reference as "far more conjectural" than the others, and so only use it "for additional confirmation."

4. Day –5: Venus rises at least 90 minutes before the sun (*Od.* 13.93–95).
5. Day 0, the day of the bow contest: new moon (*Od.* 14.161–64, 14.457, 19.306–7).

It is always exciting to see interdisciplinary work that unites two fields as disparate as astronomy and Homeric studies, but so far only a scholarly silence has greeted the new hypothesis. That silence is inappropriate.

First, the argument is scientific in ways that Schoch's was not. Schoch used a tendentious literary interpretation (that *Od.* 20.356–57 describes a solar eclipse) as the basis for a firm factual claim (that the *Odyssey* preserves a reference to the 1178 eclipse). Baikouzis and Magnasco require no assumptions at all about how *Od.* 20.356–57 should be read; Theoklymenos's vision comes into the picture only as a *post hoc* consideration.

Second, new generalist literature has assumed that Baikouzis and Magnasco are correct. The initial publication of their argument garnered considerable media attention, being reported in news media worldwide via the Associated Press and Agence France-Presse; one recent book on historical eclipses quotes their argument, though without committing to its validity (Vaquero and Vázquez 2009: 188); an online catalogue of historical eclipses published by NASA unreservedly equates *Od.* 20.356–57 with the 1178 eclipse (Espenak 2009a); so too does the Wikipedia article on the *Odyssey* (2011), going so far as to claim that this argument “places” the fall of Troy in 1188. This last is probably the most widely used source of general information on the *Odyssey*: we are likely to see the 1178 date returning to haunt discussions of the *Odyssey* for some time to come.

Third, in the natural sciences there is usually a presumption that if a hypothesis stands up to preliminary tests, as Baikouzis and Magnasco's certainly does, it stands until it is superseded or refuted. In other words, there is a presumption that the argument is correct. Perhaps classicists have not previously commented on Baikouzis and Magnasco in detail because they have assumed that the new argument, like Schoch's, is merely a matter of literary interpretation. It is not. If the argument holds water, its merits should be acknowledged; if not, it will not go away by itself.

The following discussion traces some of the implicit assumptions relating to Baikouzis and Magnasco's astronomical references. Baikouzis and Magnasco themselves outline two of these: the first, that the movements of gods in the *Odyssey* represent the movements of heavenly bodies, is dealt with in the discussion of Reference 1 below. Their second stated assumption is that the poet of the relevant Homeric passages was interested in astronomy, and may be presumed to have tried to report astronomical observations accurately.

This assumption is undoubtedly valid. Early Greek poetry displays a consistent interest in heavenly bodies. Astronomy provides a basis not only for Hesiod's poetic farming almanac (*Op.* 381–617) but also for numerous poetic images in Homer.<sup>14</sup> Other early poets, such as Archilochos and Stesichoros, even referred to solar eclipses<sup>15</sup>; and there is no doubt that their eclipses are specific and authentic historical events. The main differences from the Homeric case are that their references to eclipses are far more explicit, and that their eclipses are all contemporary or near-contemporary events. It is perhaps tenable that an advocate of the eclipse interpretation in *Od.* 20.356 who argued for a seventh-century eclipse, like Pocock 1965: 55–63, should be taken more seriously. Be that as it may, Baikouzis and Magnasco are on firm ground when it comes to the general character of their evidence.

However, their argument depends on several further implicit assumptions, and most of them do not stand up to scrutiny. Below I discuss each of the five astronomical references in order, and then three more general matters that relate to multiple references.

#### REFERENCE 1: HERMES' VISIT TO KALYPSO IN THE WEST (*OD.* 5.44–54, 148) = MERCURY'S WESTERNMOST RISE-TIME AZIMUTH

Baikouzis and Magnasco 2008: 8827 regard this as a weak point in their argument on the grounds that the earliest association of Hermes with the planet Mercury is in Plato (*Ti.* 38d). In fact there are no parallels in any ancient Greek texts—even in Aratos's epyllion on astronomy, the *Phainomena*—for gods' movements on earth serving as a figurative representation of the movements of heavenly bodies.

Even if this kind of imagery were paralleled, Baikouzis and Magnasco's argument is premised on cherry-picking the movements of some, but not all, deities who may represent heavenly bodies.<sup>16</sup> A satisfactory form of the argu-

<sup>14</sup> See Richardson 1993: 108–9 on *Il.* 22.25–32, with examples and bibliography.

<sup>15</sup> Archil. fr. 122 West; Stesichoros fr. 271 Page. These probably refer to the eclipses of 6 April 648 and 19 May 557, respectively. Plut. *De facie* 931e also cites Mimnermos (= fr. 20 West; possibly the same as Archilochos's eclipse) and Kydias (date uncertain; possibly fl. c. 500, or otherwise contemporary with Aristophanes; if the former, perhaps the eclipse of 1 Sep. 488?).

<sup>16</sup> *Contra* Baikouzis and Magnasco 2008: 8826: "We have not chosen the references to pursue: the ones we have examined are all we have found."

ment would also accommodate the motionlessness of Zeus (purportedly = the planet Jupiter) on Olympos throughout the epic; the *westward* motion of Poseidon (earth) in *Od.* 5.282–84 (not northward; see the discussion of Reference 3, below); Demodokos’s story of Ares (Mars) and Aphrodite (Venus) in *Od.* 8, presumably a conjunction of these planets, if it were to be interpreted in astronomical terms; a further conjunction of Helios (sun) and Zeus (Jupiter) in *Od.* 12.374–90, seven years prior to the main narrative of the *Odyssey* (in the same passage Helios threatens to set in the underworld permanently and never rise again); and a meeting between Poseidon (earth) and Zeus (Jupiter) in *Od.* 13.125–58, following which Poseidon travels to the land of the Phaiakians (13.159–60). Ideally it would also accommodate another supposed eclipse at *Il.* 16.567.<sup>17</sup>

I do not mean to suggest that any of these hypothetical references are tenable. Indeed, most of them are meaningless in astronomical terms (movements of the earth; the sun setting permanently; conjunctions involving the earth or sun). I cite them to make clear how selectively the data have to be treated in order to obtain a coherent argument. There is no better reason to interpret Hermes’ movements in astronomical terms than there is to interpret Helios’s threat to set forever as an authentic astronomical event. In other words, this reference is not only baseless; it is also tendentious.

## REFERENCE 2: THE PLEIADES AND BOÏTES BOTH IN THE SKY AT TWILIGHT (*OD.* 5.272–77)

*Od.* 5.272 refers to “the Pleiades and late-setting Boïtes” being in the sky simultaneously. Baikouzis and Magnasco 2008: 8825, following MacDonald 1967: 324–25, interpret “late-setting” to mean “setting later than the Pleiades” or at least “setting late in the course of the night.” They therefore take the line as implying a constraint that this part of the *Odyssey* (the seventeen days of Odysseus’s journey from Scheria up to his shipwreck) must take place between 17 February and 4 April. Two issues arise with this reference. One relates to the meaning of ὀψὲ δύνοντα, “late-setting”; the second is to do with the formulaic, or repeated, text in these lines.

The vagaries of English translation have caused a misunderstanding of ὀψὲ δύνοντα. Ὀψέ does not mean “late” in a comparative sense, but in an absolute sense: “late in the day”; “too late”; “late in life.” The Greek for “setting later” would be ὕστερον δύνοντα. Ὀψέ also does not mean “in the early morning”:

<sup>17</sup> See n5 above.

the primary meaning is “late in the day,” whence “in the evening.” Comparison with other uses (especially *Il.* 21.232, ὀψὲ δῦων, the sun setting late) cements this interpretation.<sup>18</sup>

On this more correct basis, some other modern advocates of the eclipse interpretation have favored a setting in autumn. Austin argues that Odysseus’s departure from Ogygia takes place between 19 September and 8 November.<sup>19</sup> Pocock 1965: 61 argues for late autumn to winter on the basis of several passages, of which the most convincing concerns the ripe grapes on the vine outside Kalypso’s cave (5.68–69). Conversely MacDonald—whom Baikouzis and Magnasco follow—has argued for a setting in the second half of May, though this is also incompatible with the March–April setting required for the 1178 eclipse. MacDonald’s argument is based on a reference to a reaping match in *Od.* 18.366–70: Hes. *Op.* 383–84 indicates that the time for reaping is 11 May.<sup>20</sup> MacDonald neglects the lines immediately following: *Od.* 18.371–75 (a ploughing match) would, based on the same Hesiodic passage, give us a setting in November (the time for ploughing is 31 October). There is no coherence here, and none of these options is compelling. The default position has to be the same as that of Hainsworth 1988: 277, namely that—as the repetition discussed below indicates—this is “general astronomical, not specifically navigational or seasonal, data.”

The second problem is that much of this reference is a verbatim repetition of *Iliad* 18.486–89, part of the description of Achilles’s shield (*Od.* 5.271–76)<sup>21</sup>:

... sleep did not fall on his eyelids  
as he looked at *the Pleiades and late-setting Boötes*  
*and the Bear, which they also call the Wagon,*  
*which turns in place and keeps watch on Orion,*  
*and alone never sinks in the waters of Okeanos;*  
for thus the glorious goddess Kalypso told him ....

The question of how repetitions of this kind should be understood is a problematic one, but there is a general presumption that the repetitions (italicized above) are not geared towards the context in which they appear.

<sup>18</sup> See Hainsworth 1988: 277–78 for a more detailed account of possible interpretations of *Od.* 5.272, ὀψὲ δῦοντα.

<sup>19</sup> Austin 1975: 240–42, calculating by the constellations’ rising/setting dates for the year 432.

<sup>20</sup> MacDonald 1967: 217. On the Hesiodic correspondence, see West 1978: 255–56 for the calendar dates.

<sup>21</sup> Baikouzis and Magnasco 2008: 8824 notice the repetition but do not comment on its significance. *Il.* 18.486 is also identical to Hes. *Op.* 615.



It is reasonable to expect a certain awareness of the issues surrounding repetitions in any research relating to Homer. At the very least, commentaries should be consulted; and two recent commentaries caution the reader that the above repetition implies problems.<sup>22</sup> Repeated phrases, lines, and passages are perhaps the most striking, certainly the most omnipresent, element of Homeric style. Scholars in antiquity developed their own tactics for dealing with them, and the problem of interpreting their significance has been at the heart of modern Homeric studies since at least Hermann's *De iteratis apud Homerum* (1840).

There are two modern schools of thought on what repetitions of this kind imply. The older, analytic school of thought used repetition as one of a set of criteria for determining which parts of the Homeric poems are late interpolations. The underlying principle was that repetition implied copying: if two passages appeared in different places in Homer, this was understood as implying that one was an imitation of the other, inserted by a later poet or copyist. This principle was applied on an *ad hoc* basis, and is now normally rejected because it tends to lead to excessive deletion of repeated lines.

The newer, oralist school of thought interprets repetition as an intrinsic aspect of bardic performance in the oral tradition that preceded the composition and/or transcription of the Homeric epics. In this view, repeated phrases, episodes, and other elements of Homeric narrative served two primary functions: first, as mnemonic devices that aided in the reproduction of a long epic; second, as part of a performing poet's conceptual toolkit, to assist in "composition in performance." Repetitions of all kinds—formulaic phrases, formulaic lines, repeated passages, type-scenes—therefore represent traditional elements in a received tradition of epic performance. Opinions vary as to the extent to which the poet(s) of the Homeric epics used these elements consciously, e.g., whether a given formulaic epithet represents an intention by the poet to express a specific meaning, or is merely an indication of a poet operating on a kind of "automatic pilot." Parry and Lord tended towards the latter interpretation; one recent study (Friedrich 2007) tends towards the former, though even then only in cases of breaches of economy. But there is a widely-agreed principle that the poetic value in repetition derives not just

<sup>22</sup> Hainsworth 1988: 277, commenting on 5.272–77; de Jong 2001: 138 on 5.269–81. Hainsworth's conclusion has been quoted above. (Cf. Ameis, Hentze, and Cauer 1920: 166, who are more willing to engage with astronomical reconstructions.) Baikouzis and Magnasco appear not to have consulted commentaries; they report that their investigation into modern analysis of the Homeric text consisted of checking footnotes in translations (2008: 8824).

from the content of what is repeated, but also from the fact of repetition itself. This principle has underpinned much of the last half-century of Homeric scholarship, and should not simply be ignored.

In the analyst view, the passage is simply copied from *Il.* 18, and *Il.* 18 is the original context of the passage.<sup>23</sup> In the oralist view, the passage is a traditional trope. In both cases there is a presumption that *Od.* 5.271–76 is not geared to the context in which it appears. Its role in Baikouzis and Magnasco’s internal chronology violates this presumption.

### REFERENCE 3 (CONJECTURAL): POSEIDON’S RETURN FROM THE AITHIOPE = THE EQUINOX (*OD.* 5.282–84)

Baikouzis and Magnasco are tentative about their third astronomical reference, and do not rely on it for their argument. They take Poseidon as representing the earth on the basis of his epithet “earth-shaker” and association with earthquakes. This reference suffers from the same weaknesses as Reference 1, above.

The reference is in any case erroneous. As the *Odyssey* itself tells us, the mythical Aithiopes are not in the south, but at the extreme edges of the earth, “some at Hyperion’s [the sun’s] setting, others at his rising.”<sup>24</sup> It is also clear that Poseidon is returning from the east, since he comes via the Solymoi mountains in Lycia (5.283).

### REFERENCE 4: VENUS RISES AT LEAST 90 MINUTES BEFORE THE SUN (*OD.* 13.93–95)

In *Od.* 13.93–95 the Phaiakian sailors see Venus (“the brightest star”) rising as they deposit the sleeping Odysseus on land; shortly afterwards Odysseus awakes and sees the island covered in mist that Athene has poured around (13.187–96) and that the goddess later dispels (13.352). Baikouzis and Magnasco interpret this as indicating that Venus rises at least 90 minutes before the sun.

It is not very clear why 90 minutes should be the specific period indicated, but this does not greatly impact on Baikouzis and Magnasco’s argument. As their supporting information shows, the constraining nature of this reference

<sup>23</sup> Although both epics use traditional language, tropes, conventions, and stories, various linguistic pointers indicate that there is at least some sense in which the *Iliad* is slightly earlier, according to the relative chronology of Janko 1982.

<sup>24</sup> *Od.* 1.22–24, explicitly; also, the Aithiopian leader Memnon is the son of Eos, the dawn, 4.188. On the duplication of the Aithiopes in the east and west see Nakassis 2004, esp. 220–21; see also Nadeau 1970; Nagy 1979: 205–7; MacLachlan 1992. The earliest use of the term “Aithiopian” that may refer to the region south of Egypt is in Hekataios (*FGrH* 1 F 326, 327).

does not lie so much in the specific interval between Venus's and the sun's risetimes as in whether Venus is in the sky at all just before dawn at the relevant season. There are solid reasons for rejecting their choice of season (see discussion of Reference 2, above), but that is the only objection to this reference.

#### REFERENCE 5: NEW MOON ON THE DAY OF THE BOW CONTEST (OD. 14.161–64, 14.457, 19.306–7)

Of the five references, this one is on the firmest ground. A new moon is a necessary condition for a solar eclipse, as ancient advocates of the eclipse interpretation were well aware; and the passages cited provide clear indications that there is a new moon within a couple of days of the bow contest. In the second and third passage Odysseus, in disguise, predicts that Odysseus will return “this very *λυκάβας*, when one moon/month is waning and the next is beginning” (14.161–62 = 19.306–7). It is not entirely certain whether *λυκάβας* means “year,” “month,” or some other ritual period, but that makes no difference for the purpose of this discussion.<sup>25</sup>

There are, it must be said, competing interpretations of book 20's setting at the new moon. Austin sees an eclipse in Theoklymenos's words too, albeit only a symbolic one, but he takes the new moon as a reference to the festival of Apollo Noumenios (“Apollo of the New Moon”), and interprets that as an integral part of Odysseus's return story (1975: 239–53).<sup>26</sup> More speculatively—though no more so than the eclipse interpretation—it is imaginable that the new moon is linked to Odysseus's reprisal for the debts that the Suitors owe him: classical Athens had a well-documented practice of calculating interest and collecting debts at the new moon.<sup>27</sup> This latter link is unsubstantiated, though; and more importantly, these alternatives undermine the eclipse interpretation *per se*, and not the logic of Baikouzis and Magnasco's argument. There is no reason to call the fifth astronomical reference into doubt.

<sup>25</sup> See Russo 1992: 91 for discussion.

<sup>26</sup> Seaford 1994: 32–33 outlines further alternative interpretations, with bibliography.

<sup>27</sup> Debts collected: Ar. *Nub.* 16–18, 756, 1131–36, 1178–1200. Monthly calculation of interest: Dem. 37.4–5. Cf. *Od.* 22.61–64, Odysseus announcing the penalty for the Suitors' defaulting on their debt: “... not even if you were to repay me all your inheritance, ... even then I would not keep my hands from the slaughter until the Suitors pay recompense for all their trespass.” The link is suggested by Herakleitos's use (*All.* 75.5) of the Attic phrase *ἔνη καὶ νέα* (“the old and new [moon]”) in connection with the supposed eclipse, the same phrase that Aristophanes uses; Wilamowitz 1927: 43 also adopts the phrase *ἔνη καὶ νέα* in connection with Odysseus's return home (without citing Herakleitos). Cf. also Aesch. *Ag.* 763–67, a debt repayment that is even more metaphorical than the one in the *Odyssey* but is still expressed as interest (*τόκος*) accruing at “the old and new” (*τίκτειν ὕβρις μὲν παλαιὰ νεάζουσιν ... ὅτε τὸ κύριον μὴ φάος τόκου*).

## GENERAL ISSUES 1: ARCHEOLOGY

Baikouzis and Magnasco confine their investigation to the period 1250–1115. This constraint is based partly on ancient writers' testimony as to the date of the supposed Trojan War (on the assumption that a Trojan War actually occurred); and, more importantly, on the belief that Homeric Troy can be equated in a meaningful sense with the archeological layer known as Troy VIIa or VIi.

All of the relevant ancient writers are at least seven centuries later than the supposed Trojan War, which means that for the first few centuries after the posited event there were no intermediate written sources that could bolster the credibility of later authors. In the matter of information that has supposedly survived several centuries of oral transmission and constant reformulation, the burden of proof is very much on someone who wishes to show that the information is authentic. Even the eclipse interpretation is rejected by ancient writers as often as not<sup>28</sup>; so Baikouzis and Magnasco should not want to stake too much on their authority. In short, the testimony of ancient sources is neither here nor there.

Archeological evidence is important, however. Baikouzis and Magnasco's assumption that Homeric Troy is Troy VIIa reflects popular perception, and Troy VIIa is certainly the most popular candidate because of the evidence of fire in that archeological layer. However, Troy VIh has certainly not been discounted. The VIh period is when Troy was at its wealthiest, and while the structural damage to the walls of Troy VIh may be the result of an earthquake, Bryce suggests that a traumatic earthquake could have been the trigger for an invasion.<sup>29</sup> More specifically, some have been tempted to see the "Tawagalawa letter" as referring to military conflict over Troy between a Greek state or states and the Hittite empire. This letter, sent to an unnamed king of Ahhiyawa by the Hittite king Hattusili III (ruled 1267–37)—or, as Gurney 2002 has suggested, one of his predecessors Muwattalli II (ruled 1295–72) or Mursili III (ruled 1272–67)—mentions a prior disagreement over Wilusa<sup>30</sup>; and it is widely accepted (though there is no direct evidence) that Ahhiyawa and Wilusa were the Hittite names of a Bronze Age Greek state and of Troy, respectively.<sup>31</sup> If

<sup>28</sup> See n3 above.

<sup>29</sup> Bryce 2006: 64–68; he gives a concise summary of the evidence on how both archeological phases came to an end.

<sup>30</sup> On the Tawagalawa letter, see further Bryce 2005: 290–93; 2006: 185, with references.

<sup>31</sup> For Ahhiyawa = a Greek state, see (with references) Bryce 2005: 57–60; 2006: 100–6. For Wilusa = Troy, see Bryce 2006: 83–86, 107–12. In addition, there is little reason to doubt the conjectured equations *Ahhiyawa* = Gk. \**Achaiwi-* (*Achaia*), *Wilusa* = Gk. \**Wilios*

this disagreement was a war—and there is no certainty of that—this could place a historical “Trojan War” as early as the start of Muwattalli’s reign, i.e., in the 1290s, or even earlier. These arguments are not remotely conclusive, of course. Troy VIIa is just as strong a candidate (or as weak, depending on one’s point of view); and the arguments in favor of a historical Trojan War are convoluted and rely on very indirect evidence.

Unlike many of the other issues discussed here, this one can be easily resolved, by the simple step of extending the period under investigation: namely, to investigate the period 1350 to 1250 as well. There were several solar eclipses in that period<sup>32</sup>; note, though, that, according to the logic of Baikouzis and Magnasco’s argument, an eclipse is not a prerequisite for identifying a specific year but only to be considered *after* analysis of other Homeric astronomical references (if any are in fact tenable).

#### GENERAL ISSUES 2: NUMBERS OF DAYS IN THE ODYSSEY

Baikouzis and Magnasco’s argument stands or falls with their tabulation of the internal chronology of the *Odyssey* (2008: 8824). One problem with this is that Homeric narrative expresses intervals of time in Odysseus’s homecoming in a highly poeticized manner. The biggest problem is posed by this passage (*Od.* 5.278–80):

*For seventeen days* he sailed, crossing the sea,  
*but on the eighteenth* there appeared the shaded hills  
of the land of the Phaiakians.

(*Ilios*); but it is best to regard these linguistic equations as following from the geographical identifications of Ahhiyawa and Wilusa, not as evidence for them. These matters have been enmeshed in a vehement and partisan controversy in a subset of German-language scholarship within the past decade, so for Hittite documentary evidence I cite Bryce, a relatively conservative authority without direct involvement in the controversy. Bryce accepts the equations, while repeatedly cautioning that they could in principle be overturned by new discoveries.

<sup>32</sup> According to the NASA “Five millennium canon” (Espenak and Meeus 2007: A79-A88; cf. the larger maps given by Espenak 2009b), there were four eclipses almost directly over Ithaca in the period 1350 to 1250, namely 8 January 1340 (total eclipse), 24 June 1312 (total), 14 April 1281 (annular), and 27 September 1261 (annular). Uncertainty in  $\Delta T$  (the difference between Terrestrial Dynamical Time and Universal Time) means that in this date-range there is an uncertainty of 5.1° to 6° longitude (Espenak and Meeus 2007: 17–18 and ad loc.; Espenak and Meeus use Huber’s model for calculating uncertainty, with 501 as calibration year), so numerous partial eclipses should also be taken into account.

(Odysseus repeats this detail to Arete at 7.267–68, though there he omits the days of swimming after the shipwreck.) In this passage the numbers seventeen and eighteen carry a value that is largely, if not entirely, poetic. Compare the Achaeans' grief for Achilles (*Od.* 24.63–65):

*For seventeen nights* and also by day we  
wept for you, both the immortal gods and mortal men;  
*but on the eighteenth* we gave you to the flames.

As with Reference 2 (compare above), we are here dealing with formulaic repetition. But though it is less extensive here, this repetition is no coincidence; and it cannot be explained away by positing that book 24 is an interpolation. Use of “typical numbers” in this way is not an isolated occurrence.<sup>33</sup> Compare:

From there I was borne *for nine days, but on the tenth night*  
the gods put me ashore on the island of Ogygia. (*Od.* 7.253–54 = 12.447–48)

From there I was borne *for nine days* by dangerous winds  
over the fish-filled sea; *but on the tenth* we disembarked. (*Od.* 9.82–83)

*For nine days* we sailed by nights and also by day,  
*but on the tenth* our native land appeared. (*Od.* 10.28–29)

*For nine days* I was borne, but in the darkness of *the tenth night*  
a great rolling wave put me ashore in the Thesprotians' land. (*Od.* 14.314–15)

We also find “for six days ... and on the seventh ...” repeated in three places (*Od.* 10.80, 14.249, 15.476). It is clear that Homer, or the formulaic system, likes some numbers better than others—after all, not all numbers scan. Their poetic function reaches a maximum when Odysseus counts off the fruit trees his father gave him (*Od.* 24.336–44): the particularity of his catalogue serves as a recognition token, rather than as a record of historical data. In a (very unusually written) interpretation of this last passage, Henderson (1997, esp. 101–8) characterizes numbers in the *Odyssey* as an ostentatious symbol of objectivity and accuracy; he shows that this kind of symbolism is particularly important when the context has no other means of creating an impression of precision.

A more rigorous study by Hawke (2008, esp. 42–48) has come to similar conclusions, noting that Homeric narrative has “a rather loose sense of quantity in general, at best a rudimentary command of both cardinal and

<sup>33</sup> See de Jong 2001: xix, with bibliography.

ordinal numbers” (42–43), and that arithmetic operations “are all but absent” (46). Moreover, according to Hawke’s data, the distribution of references to the cardinal numbers 1 to 10 in Homer is very different from that seen in natural languages.<sup>34</sup>

This is not to say that we must automatically reject every number in Homer as a falsehood; but it does make it impossible to unravel the literal value of numbers from their poetic function. We can observe that if the poet uses a large number, it is at least possible that he intends a large number; but anything more specific than that is ruled out.

### GENERAL ISSUES 3: THE INTERNAL CHRONOLOGY OF THE ODYSSEY AND ITS COHERENCE

This last issue is a rather abstract one, but fundamental nonetheless. Baikouzis and Magnasco’s argument requires that the *Odyssey* have a rigidly strict internal chronology; but *if viewed strictly*, that chronology is incoherent at a very deep level. The most widely-cited tabulation of the *Odyssey*’s internal chronology is that of Édouard Delebecque.<sup>35</sup> Baikouzis and Magnasco adjust Delebecque, apparently to allow for a chronological problem in book 15,<sup>36</sup> but this step is not enough to resolve the problems.

Some problems with epic chronology are obvious. Thus, the *Odyssey* portrays Telemachos as a young man seemingly in his teens, though Odysseus left Ithake twenty years ago, and Achilles is a young man in the *Iliad*, and usually appears in the pictorial record as an unbearded youth, but his son Neoptolemos takes part in the sack of Troy. The internal chronology of the

<sup>34</sup>Hawke 2008: 58–60; cf. Dehaene-Mehler 1992, with data for natural languages. In natural languages, for cardinal numbers up to 10 number term frequency peaks at 1 and 10, with a steady decline over the range 1–9. Homer has peaks at 2 (even without counting dual forms) and 9; a decline in the range 2–5; an *increase* towards 9 except for a sharp dip at 8; and a *decline* at 10. In the range 10–20, Homeric language, like natural languages, has peaks at 12 and 20.

<sup>35</sup>Delebecque 1958, opposite p. 12; more comprehensively Delebecque 1980: 22–25. In fact Delebecque’s 1958 tabulation is almost identical to earlier tabulations: Butcher and Lang 1885: xvii–xxiv differ only in counting the storm of 5.279–389 as three days (the day of the shipwreck, then two nights and two days of swimming) instead of two.

<sup>36</sup>The book 15 problem is that, according to a strictly sequential chronology, Odysseus spends four nights at Eumaios’s farmstead, but Eumaios claims at 17.515–16 that he spent three nights there. See further Olson 1995: 96–98; Rengakos 1998: 58–62. Baikouzis and Magnasco’s adjustment interprets Odysseus’s travels as taking place simultaneously with the Telemachy, and so they take it that at the start of book 15 the chronology steps backward in time a day.

*Odyssey* is equally difficult. According to a *strict* chronology, Telemachos fritters away an entire month in Sparta without explanation, and it is disputed how, and whether, this should be resolved. Similarly, it is hard to resist the notion that the two councils of the gods, in books 1 and 5, are a reduplication of a single story element.

Most attempts to solve these problems have revolved around one of the various interpretations of Zieliński's rule, the principle that Homeric narrative tends to present simultaneous actions as though consecutive. Baikouzis and Magnasco adopt a hybrid chronology, where the storylines of Telemachos and Odysseus are simultaneous, but each storyline has a strict internal chronology of its own. But this only removes a week from Telemachos's sojourn, and leaves the councils of the gods dangling. Moreover it runs into the problem that the council of the gods in book 5 refers to the events of books 2–4 in the past tense (5.18–20); in Baikouzis and Magnasco's hybrid chronology these events should be three weeks in the future. So much for strict chronology.

There is no general agreement on how to interpret Zieliński's rule, as Scodel has pointed out in a recent survey.<sup>37</sup> Should we, for example, understand it as an organizational tool at the poet's disposal, where the poet's original conception is of simultaneous actions, but he reorganizes them as consecutive; or is it about story comprehension, so that the poem's audience is expected to reinterpret consecutive actions as simultaneous<sup>38</sup>; or is it, as Danek 1998 has argued, that neither the poet nor the audience are thinking about simultaneity, as such, at all? Even Zieliński's own discussion is open to opposing interpretations: Olson 1995: 102 reads Zieliński as proclaiming that the storylines of Telemachos and Odysseus are conceived as simultaneous, while Danek 2009: 276–77 understands Zieliński as insisting that they cannot be simultaneous.<sup>39</sup>

Different interpretations posit differing degrees of “hardness” or “softness,” if you will, in the secondary reality of the narrative. These terms are not technical jargon: I use them *ad hoc*, simply to illustrate that we have a spectrum of viewpoints. At the “hard” end of the spectrum, we have the “documentary fallacy” (criticized by Waldock 1951: 11–24), that is, literalist

<sup>37</sup> Scodel 2008. Another survey (de Jong 2007: 30–31) is unsympathetic to Zieliński's rule altogether, e.g., seeing *Od.* 5.18–20 as conclusive evidence that the book 5 council of the gods is later than the Telemachy in some absolute sense.

<sup>38</sup> Patzer 1990: 154 interprets Zieliński as arguing that both are the case.

<sup>39</sup> In the former view, Zieliński's rule and Delebecque's “law of succession” (see below) are separate and incompatible; see also Richardson 1990: 93–94. In the latter view, by contrast, Zieliński's rule is just a milder form of Delebecque's “law”: see also Scodel 2008: 107, 107n1; Graziosi and Haubold 2010: 5.



readings that treat fictional events and persons strictly as though they were historical ones. This is the kind of “hard” secondary reality that Bradley notoriously envisaged when he tried to trace Hamlet’s movements at the time of his father’s death (1905: 403–6). At the opposite end of the spectrum, we have readings that insist on the absolute *unreality* of the story world, where logic and verisimilitude are irrelevant.<sup>40</sup> Under certain circumstances either extreme may be appropriate: it makes sense to treat a historical document as “hard,” and an Aristophanes play or a Lewis Carroll story as “soft.” But this is not an either-or matter, where the story *either* has verisimilitude *or* it does not. Usually, a sane reading will fall somewhere in the middle.

Zieliński was content to divide matters into “actual sequence” (“wirkliche Handlung”) and “narrative sequence” (“scheinbare Handlung”) and to leave it at that.<sup>41</sup> This implies a relatively “soft” secondary reality. Delebecque, by contrast, considered the chronology so “hard” that he referred to a “law of succession” (“loi de succession,” 1958: 16, 145), which he described as “rigorous” (“rigoureuse,” 1958: 145) and which Olson 1995: 93 has even labeled “Delebecque’s Iron Law.” To make sense of Telemachos’s dawdling in Sparta—a month of “dead time” (“temps mort”)—Delebecque 1958: 18–30 resorts to treating it in psychological terms. In that kind of reading it is not only the chronology that is rigid; the fictional characters, too, have the minds of flesh-and-blood individuals. Delebecque 1958: 23–24 even discusses how the crew of Telemachos’s ship occupy themselves during their leader’s absence. Such an extreme view is an easy target, so it should be remembered that Delebecque was not arguing against Zieliński—whom he does not even discuss<sup>42</sup>—but just trying to make a unitarian argument that the Telemachy is an integral part of the *Odyssey*. This does not make his argument more reasonable, but it does make the rigidity of his “law” more explicable.<sup>43</sup> A reasonable revision of Delebecque would entail interpreting episodes of “dead time” not as a “hard” reality where the character’s inaction needs explanation, but as a moderately “soft” reality where dead time simply does not count: that is, Telemachos in Sparta is not concretized, since his time there is not narrated explicitly.<sup>44</sup> On

<sup>40</sup> Danek 2009: 276, on Homer, comes close to advocating this: “there is no hidden reality for us to uncover.”

<sup>41</sup> See Zieliński 1901: 419–41; the opposition emerges gradually as his discussion progresses, and becomes explicit from 432 onwards.

<sup>42</sup> Delebecque 1958: 148 lists Zieliński in his bibliography, but does not discuss his work.

<sup>43</sup> See Olson 1995: 95n12 for examples of readings that follow Delebecque in positing a very “hard” secondary reality.

<sup>44</sup> Danek 1998 expresses a view similar in spirit to this, but much more subtle. Ingarden 1973: 50–63 popularized the use of the term “concretization” to refer to a reader’s inferences

that view, the month in Sparta is not so much a month in which Telemachos does nothing, but a kind of narrative blind spot, since it never comes under narratorial focus; the same would go for other dead spots in the chronology. In more recent discussions the pendulum has swung away from Delebecque, and it is now the fashion to favor readings slightly to the “soft” side of center.<sup>45</sup> The pendulum could swing too far, of course: if we were to insist that the narrative is purely a textual surface, with no depths and no room for recovering a poetic conception, then there would be no room for seeing the two councils of the gods as related at all.<sup>46</sup>

Baikouzis and Magnasco occupy the “hard” extreme. Not only do they insist on recovering an extremely “hard” secondary reality; they actually claim that it *is* reality. True, they do not insist that every non-astronomical incident in their hybrid chronology is a historical event. But they do insist that the *Odyssey* has a recoverable chronology, one that is rigid and reliable, and one whose rigidity is not softened by the doubling of the divine councils, or by Athene’s past-tense reference to a future Telemachy. Whatever one thinks of Zieliński’s rule, the chronology of the *Odyssey* is not as recoverable as all that.

To sum up:

- Reference 1 lacks support for the interpretation required of it, and if that support existed, there are several other astronomical references that would also have to be taken into account.
- Reference 2 is erroneous on linguistic grounds and deeply problematic on formulaic grounds.
- Reference 3 has the same problems as Reference 1, and is also erroneous on separate grounds.
- Reference 4 suffers from the *Odyssey* poet’s vagueness about the season, but is not truly essential in any case.
- Reference 5 is the only wholly tenable reference.

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about a story’s secondary reality when explicit evidence is absent. For some alternative models see Schank and Abelson 1977 (“scripts”); Eco 1979: 31–33 and 214–19 (“inferential walks” and “possible worlds”).

<sup>45</sup> Patzer 1990, 1996: 93–97; Rengakos 1995, 1998; Olson 1995: 91–119; Danek 1998. Nünlist 1998 adopts a slightly “harder” reading, but still much “softer” than Delebecque.

<sup>46</sup> Cf. Auerbach 2003 [1946]: 6–7, on another part of the *Odyssey*: “never is there a form left fragmentary or half illuminated, never a lacuna, never a gap, never a glimpse of unplumbed depths. And this procession of phenomena takes place in the foreground ....” Rengakos 1998: 62–66 argues that the two councils seem similar only because they are based on the same conceptual “Typus.”

- The date-range for the historical eclipses examined is too narrow.
- The chronological relationship between all five references is based on false premises on formulaic grounds, and deeply problematic in other, separate, respects.

In conclusion, the attractiveness of Baikouzis and Magnasco's argument should be pointed out. Their hypothesis is framed as an argument based on the chronology of the *Odyssey*, but its real appeal comes from its striking coherence, and from the lure of interpreting almost anything as historical information where there is a dearth of historical data. This latter temptation is essentially a Euhemeristic urge. It can often lead to an over-optimistic view of how central one's evidence is (Baikouzis and Magnasco 2008: 8828):

The whole poem might then be structured to follow what the stars dictate, because the references mandate how long Odysseus has to build his raft, when he should be sunk, or how long he must remain hidden in Ithaka before revealing himself.

But an argument from coherence is at best epistemologically problematic—especially when that coherence is illusory, as we have seen<sup>47</sup>; and when dealing with the historical reality (if any) that underlies a poetic text like the *Odyssey*, the fact that we *want* to fill in gaps in history carries no evidentiary weight, either. And in any case, assigning a central evidentiary role to Homer runs the risk of confirmation bias.

Baikouzis and Magnasco themselves stress that their argument is conjectural. There is an important distinction here, and it is not a matter of skepticism or cynicism, but of logic. A conjecture is something that is unproblematically controvertible by new evidence; affirmative evidence is something that becomes problematic if new evidence contradicts it. Baikouzis and Magnasco's argument is certainly not affirmative evidence that the *Odyssey* refers to the 1178 eclipse; the considerations presented here show that it is not a plausible conjecture either. These are two separate arguments, though, and one hopes that the appealing character of the eclipse interpretation will not mislead future discussions of the “eclipse”—if any—into conflating them.

<sup>47</sup> Baikouzis and Magnasco try to avoid making an argument from coherence: “the coherence of the phenomena ... suggest[s] (*post hoc*) that these astronomical references ... may be the work of the same hand” (2008: 8828, my emphasis).

## WORKS CITED

- Ameis, K. F., Hentze, C., and Cauer, P. 1911. *Homers Odyssee für den Schulgebrauch erklärt*. Vol. 2, Part 2. 10th ed. Leipzig: Teubner (repr. 1964, Amsterdam: Hakkert).
- 1920. *Homers Odyssee für den Schulgebrauch erklärt*. Vol. 1, Part 1. 13th ed. Leipzig: Teubner (repr. 1964, Amsterdam: Hakkert).
- Anonymous 1926. "Proceedings: Session 1926–1927." *JHS* 47: xviii–xxxvi.
- Auerbach, E. 2003 [1946]. *Mimesis: The Representation of Reality in Western Literature*. Tr. by W. R. Trask. Princeton: Princeton University Press.
- Austin, N. 1975. *Archery at the Dark of the Moon: Poetic Problems in Homer's Odyssey*. Berkeley: University of California Press.
- Baikouzis, C. and Magnasco, M. O. 2008. "Is an Eclipse Described in the *Odyssey*?" *Proceedings of the National Academy of Sciences of the United States of America* 105: 8823–28.
- Bradley, A. C. 1905. *Shakespearean Tragedy: Lectures on Hamlet, Othello, King Lear, Macbeth*. 2nd ed. London: Macmillan.
- Bryce, T. 2005. *The Kingdom of the Hittites*. 2nd ed. Oxford: Oxford University Press.
- 2006. *The Trojans and their Neighbours*. London: Routledge.
- Butcher, S. H. and Lang, A. 1885. *The Odyssey of Homer Done into English Prose*. London: Macmillan.
- Clarke, M. 1999. *Flesh and Spirit in the Songs of Homer: A Study of Words and Myths*. Oxford: Clarendon Press.
- Danek, G. 1998. "Darstellung verdeckter Handlung bei Homer und in der südslawischen Heldenlied-Tradition." *WS* 111: 67–88.
- 2009. "Apollonius Rhodius as an (Anti-)Homeric Narrator: Time and Space in the *Argonautica*." In Grethlein, J. and Rengakos, A. eds. *Narratology and Interpretation: The Content of Narrative Form in Ancient Literature*. Berlin: de Gruyter. 275–92.
- Dehaene, S. and Mehler, J. 1992. "Cross-linguistic Regularities in the Frequency of Number Words." *Cognition* 43: 1–29.
- de Jong, I. J. F. 2001. *A Narratological Commentary on the Odyssey*. Cambridge: Cambridge University Press.
- 2007. "Homer." In de Jong, I. J. F. de and Nünlist, R. eds. *Time in Ancient Greek Literature: Studies in Ancient Greek Narrative*. Vol. 2. Leiden: Brill. 17–37.
- Delebecque, É. 1958. *Télémaque et la structure de l'Odysée*. Aix-en-Provence: Ophrys.
- 1980. *Construction de l'Odysée*. Paris: Les Belles Lettres.
- Dörpfeld, W. 1926. "Die Datierung des trojanischen Krieges." *Die Sterne* 6: 186–87.
- Eco, U. 1979. *The Role of the Reader: Explorations in the Semiotics of Texts*. Bloomington, IN: Indiana University Press.
- Esenak, F. 2009a. "Solar Eclipses of Historical Interest," NASA Eclipse Website, <http://eclipse.gsfc.nasa.gov/SEhistory/SEhistory.html> (accessed 10 March 2010).
- 2009b. "Five Millennium Catalog of Solar Eclipses," NASA Eclipse Website, <http://eclipse.gsfc.nasa.gov/SEcat5/SEcatalog.html> (accessed 10 March 2010).
- and Meeus, J. 2007. "Five Millennium Canon of Solar Eclipses: -1999 to +3000 (2000 BCE to 3000 CE) (revision 1.0). NASA Technical Publication TP-2006–214141," NASA Eclipse Website, <http://eclipse.gsfc.nasa.gov/SEpubs/5MCSE.html> (accessed 10 March 2010).

- Fotheringham, J. K. 1921. *Historical Eclipses: Being the Halley Lecture Delivered 17 May 1921*. Oxford: Clarendon Press.
- Friedrich, R. 2007. *Formular Economy in Homer: The Poetics of the Breaches*. Stuttgart: Steiner.
- Graziosi, B. and Haubold, J. 2010. *Homer: Iliad Book VI*. Cambridge: Cambridge University Press.
- Gurney, O. R. 2002. "The Authorship of the Tawagalawas Letter." In Taracha, P. ed. *Silva Anatolica: Anatolian Studies Presented to Maciej Popko on the Occasion of His 65th Birthday*. Warsaw: Agade. 133–41.
- Hainsworth, J. B. 1988. "Books V–VIII." In Heubeck, A., West, S., and Hainsworth, J. B. A *Commentary on Homer's Odyssey*. Vol. 1. Oxford: Clarendon Press. 247–385.
- Hawke, J. G. 2008. "Number and Numeracy in Early Greek Literature." *SyllClass* 19: 1–76.
- Henderson, J. 1997. "The Name of the Tree: Recounting *Odyssey* XXIV 340–2." *JHS* 117: 87–116.
- Ingarden, R. 1973. *The Cognition of the Literary Work of Art*. Tr. by R. A. Crowley and K. R. Olson. Evanston: Northwestern University Press.
- Janko, R. 1982. *Homer, Hesiod and the Hymns: Diachronic Development in Epic Diction*. Cambridge: Cambridge University Press.
- Levine, D. B. 1983. "Theoklymenos and the Apocalypse." *CJ* 79: 1–7.
- MacDonald, T. L. 1967. "The Season of the *Odyssey*." *Journal of the British Astronomical Association* 77: 324–27.
- MacLachlan, B. 1992. "Feasting with Ethiopians: Life on the Fringe." *QUCC* 40: 15–33.
- Monro, D. B. 1901. *Homer's Odyssey: Books XIII–XXIV*. Oxford: Clarendon Press.
- Nadeau, J. Y. 1970. "Ethiopians." *CQ* 20: 339–49.
- Nagy, G. 1979. *The Best of the Achaeans: Concepts of the Hero in Archaic Greek Poetry*. Baltimore: Johns Hopkins University Press.
- Nakassis, D. 2004. "Gemination at the Horizons: East and West in the Mythical Geography of Archaic Greek Epic." *TAPA* 134: 215–33.
- Nünlist, R. 1998. "Der Homerische Erzähler und das sogenannte Sukzessionsgesetz." *MH* 55: 2–8.
- Olson, S. D. 1995. *Blood and Iron: Stories and Storytelling in the Odyssey*. Leiden: Brill.
- Patzer, H. 1990. "Gleichzeitige Ereignisse im homerischen Epos." In Eisenberger, H. ed. *Ἐρμενεύματα: Festschrift für Hadwig Hörner zum sechzigsten Geburtstag*. Heidelberg: Winter. 153–72.
- 1996. *Die Formgesetze des homerischen Epos*. Stuttgart: Steiner.
- Pocock, L. G. 1965. *Odyssean Essays*. Oxford: Blackwell.
- Rengakos, A. 1995. "Zeit und Gleichzeitigkeit in den homerischen Epen." *A&A* 41: 1–33.
- 1998. "Zur Zeitstruktur der *Odyssee*." *WS* 111: 45–66.
- Richardson, N. 1993. *The Iliad: A Commentary. Volume VI: Books 21–24*. Cambridge: Cambridge University Press.
- Richardson, S. D. 1990. *The Homeric Narrator*. Nashville: Vanderbilt University Press.
- Russo, J. 1992. "Books XVII–XX." In Russo, J., Fernández-Galiano, M., and Heubeck, A. *A Commentary on Homer's Odyssey*. Vol. 3. Oxford: Clarendon Press. 1–127.
- Rutherford, R. B. 1992. *Homer: Odyssey Books XIX and XX*. Cambridge: Cambridge University Press.

- Schank, R. and Abelson, R. 1977. *Scripts, Plans, Goals and Understanding: An Inquiry into Human Knowledge Structures*. Hillsdale, NJ: Erlbaum.
- Schoch, C. 1926a. "The Eclipse of Odysseus." *The Observatory* 49: 19–21.
- 1926b. "Die Datierung des trojanischen Krieges und der Irrfahrten des Odysseus." *Die Sterne* 6: 88.
- 1926c. *Die sechs griechischen Dichter-Finsternisse*. Private publication through Berlin-Seglitz.
- Scodel, R. 2008. "Zielinski's Law Reconsidered." *TAPA* 138: 107–25.
- Seaford, R. 1994. *Reciprocity and Ritual: Homer and Tragedy in the Developing City-state*. Oxford: Clarendon Press.
- Shewan, A. 1928. "Two Ancient Eclipses." *CW* 21: 196–98.
- van Thiel, H. 1991. *Homeri Odyssea*. Hildesheim: Olms.
- Vaquero, J. M. and Vázquez, M. 2009. *The Sun Recorded Through History: Scientific Data Extracted from Historical Documents*. New York: Springer.
- Vermeule, E. 1979. *Aspects of Death in Early Greek Art and Poetry*. Berkeley: University of California Press.
- Voigt, E.-M. 1978. "Ἀλλύς." *LfrgE* 1.9: 1762–64.
- Waldock, A. J. A. 1951. *Sophocles the Dramatist*. Cambridge: Cambridge University Press.
- West, M. L. 1978. *Hesiod: Works and Days*. Oxford: Clarendon Press.
- Wikipedia 2011. "Odyssey." Wikipedia, <http://en.wikipedia.org/w/index.php?title=Odyssey&oldid=459398042> (accessed 9 November 2011).
- Wilamowitz-Moellendorff, U. von 1927. *Die Heimkehr des Odysseus*. Berlin: Weidmann.
- Willcock, M. M. 1966. Review of Pocock 1965. *CR* 16: 153–55.
- Zieliński, T. 1901. *Die Behandlung gleichzeitiger Ereignisse im antiken Epos*. Leipzig: Dieterich'sche Verlagsbuchhandlungen (repr. from *Philologus* Supp. 8: 405–49).