Otta Wenskus

Some Remarks on the Athenian Festival Calendar and the Achievements of Meton

aus: Zeitschrift für Papyrologie und Epigraphik 225 (2023) 19–21

Some Remarks on the Athenian Festival Calendar and the Achievements of Meton

I. Practical problems posed by the Athenian calendar: Aristophanes, Clouds 615–626 and Peace 405–415

Aristophanes does not exaggerate when he has the chorus complain (Nub. 615–626) that too often the festivals were not held at the right time. This has nothing to do with the intercalation of months but, as the chorus makes clear, with the counting of the days of the lunar month. This observation is not new but has yet to find its way into the commentaries.[1] Neither this text nor the treaty of the truce of 423 between Sparta and Athens (quoted verbatim by Thucydides 4.118–119) is evidence of wilful tampering. All the commentaries agree that the same Julian day is meant by the Athenian date, the 14th Elaphebolion, and the Spartan one, the 12th Geraistios.[2] At first sight this looks as if either the Athenians started counting too early or the Spartans started too late, or both were off by one day, while the text of the treaty for what is commonly called the Peace of Nikias (Thuk. 5.19) shows that in 421 the Spartans started "too early" and/or the Athenians "too late". But there is no reason to suppose that days were intercalated or omitted on purpose by either side.[3] That sort of thing happens to users of lunisolar calendars because atmospheric conditions in particular often preclude any observation of the first crescent; let us bear in mind that Elaphebolion and the corresponding Spartan month (Geraistios in 423, Artemisios in 421) are spring months, and those can be quite rainy. I am not denying the possibility of "tampering"; I am just saying (like Dunn in particular) that those two treaties do not prove it occurred in those cases.[4] Both "tampering" and insufficient observational data could have yielded the same results. And calculating the date of any phase of the moon, let alone its first visibility, is far more difficult than most people realise, thinking as they do (if they think about it at all) that a lunar synodic month is about 29.5 days long, so the Greeks would usually alternate "full" months of 30 days and "hollow" months of 29 days. The problem is not only that 29.5 days is just a rough approximation – it is only the approximation for the **mean** synodic month. Today, "the actual time between lunations may vary from about 29.18 to about 29.93 days"[5] (we do not know the exact numbers for the 5th century B.C.). So the difference between the Athenian and the Spartan calendar may not have been anybody's fault, unless the gods themselves were to blame. In Aristophanes' Peace 405–415, Trygaios accuses Helios and

[1] See the erroneous explanation in A. Grilli, Aristofane. Le nuvole, Milan 2001 (and repr.), in his n. on p. 616. Not only does the text not support this view (and neither does that of Birds 992–1020), it is based on the erroneous premiss that Meton's and/ or Euctemon's proposal for a regular intercalation cycle was adopted for the regulation of the Athenian or any other Greek festival calendar as early as the fifth century B.C. This hypothesis was refuted in 1960 by B. L. van der Waerden, Greek Astronomical Calendars and the Greek Civil Calendar, JHS 80 (1960), p. 168–180, but few scholars seem to be aware of this even now. G. Toomer is, of course, but his claim that Meton never wanted to reform the calendar may have gone too far. According to Toomer, Meton and/or Euctemon intended "to provide a fixed calendrical scheme for recording astronomical data": Meton, Dictionary of Scientific Biography 9 (1981), p. 337–340, see p. 338, but, as Alexander Jones pointed out to me, it is hard to see what sort of astronomical research going on in Meton's time would have required such a rigid framework. F. M. Dunn's theory that Aristophanes is alluding to problems arising from the parallel use of the lunisolar festival calendar and the solar prytany calendar has much to recommend it: Tampering with the Calendar, ZPE 123 (1998), p. 213–231, p. 228. Jones further pointed out that, contrary to earlier claims, the Athenian calendar was intercalated, with some rare exceptions, in agreement with a 19-year cycle from the mid 4th century B.C. on, but unfortunately J. D. Morgan has only published an abstract of his The Calendar and the Chronology of Athens, AJA 100 (1996), p. 395. There still seems to be no evidence that such a calendar was used in Meton's lifetime, though.

[2] S. Hornblower, A Commentary on Thucydides, Vol. II, Oxford 1996.

[3] As K. Dover thought; see his commentary on Clouds, Oxford 1968 (v. 626).

[4] See W. K. Pritchett / B. L. Van der Waerden, Thucydidean Time-reckoning and Euctemon's Seasonal Calendar, BCH 85 (1961), p. 17–52, see p. 20, and Dunn (as in my note 1). Note that Dunn stresses that the word "tampering" is inappropriate, suggesting wilfullness or worse.

[5] Wikipedia "Lunar month", ch. "Synodic month", 3 march 2022.

Selene of theft, an accusation the spectators were, of course, not supposed to take at face value but which mirrors the irritation they must have felt every time the festival calendar and the phases of the moon were obviously out of step: V. 414 is particularly revealing: Helios and Selene have been quietly stealing some of the days for a long time, πάλαι. This adverb proves that in this case at least Aristophanes is not talking about any recent attempts at reforming the Athenian calendar. Saying that "the gods are at fault" is often just a way of saying "that is the way things are, and there is nothing we can do about it". Trygaios, eager to prove that the gods are not above thieving, wilfully disregards the fact that sometimes the years or the months are too long instead of being too short. True, those verses are cryptic, but if they are "evidence for some kind of confusion involving the calendars",[6] for once no human needs to take the blame. Astronomers are doing their best, now as then, but even they cannot invent an ideal calendar.

II. A remark on Meton in Aristophanes, Birds, 992–1020, and Phrynichos, Monotropos F 22

Aristophanes never presents either Meton or Euctemon as reformers (or would-be-reformers) of the Athenian festival calendar, for the reason mentioned in my n. 1. In his extant comedies Euctemon is not mentioned at all, while Meton is presented as a town planner well versed in geometry, and one interested in a topical geometrical problem: that of squaring the circle, which was, in the fifth century B.C., by no means synonymous with "trying to solve an insoluble problem". First of all, it is in fact possible to square the circle if one does not limit oneself to the use of ruler and compass. As Claas Lattmann argues, this or some similar restriction may have been imposed by Plato,[7] but even if it was in force much earlier it is worth noting that only much later than the fifth century B.C. (it is impossible to say when) mathematicians were beginning to lose hope that the problem of squaring the circle using only ruler and compass could be solved and then took the next step: attempting to prove that it could not be solved, until the year 1882, when Ferdinand von Lindemann proved that π is transcendent. So Tzetzes, in his scholion on Birds 1005a, while he is right in saying that Aristophanes is joking, was almost certainly wrong in assuming that his joke consists in the fact that ἀδύνατον τὸν κύκλον γενέσθαι τετράγωνον. The way Aristophanes' Meton goes about squaring the circle is ludicrous, but the enterprise as such was not, or, rather, it was not in the fifth century B.C. We know for a fact[8] that Meton's contemporary Hippocrates of Chios tried to solve the problem by squaring the lunes, thus making an important contribution to the science of geometry. Not that Aristophanes would have tried to understand the proof, but if he heard of this feat, and this is a distinct possibility, he may have yielded to the temptation to attribute to Meton one of the main interests of Hippocrates. In other words, the aristophanic Meton is a generic mathematician, just as the aristophanic Socrates is a generic fashionable intellectual.[9] Note that Meton not only practised mathematical astronomy but did so in plain sight, when he erected an instrument for observing solstices (a ἡλιοτρόπιον) on the hill of the Pnyx in Athens and, probably with this same instrument, observed the summer solstice in the year 432.[10] It stands to reason that he must have been a more public figure than Hippocrates of Chios and thus a more promising butt for Aristophanes' jokes. Since the prytany calendar was solar and the festival calendar lunisolar, knowing the exact date of the summer solstice may have been considered to be of some public interest.

However, this does not explain why the name of Meton occurs both in Aristophanes' Birds and Phrynichus' Monotropos F 22, PCG VII, p. 405 (where he is only mentioned), i.e. two plays produced at the very

[6] See Dunn (as in note 1) p. 228.

[7] Mathematische Modellierung bei Platon zwischen Thales und Euklid, Berlin/Boston 2019. Lattmann read an extremely interesting paper in Innsbruck in June 2022: Runde Vielecke und quadratische Kreise. Sophistische Mathematik zwischen Bildung und Wissen, which he is planning to publish in two parts. By the way, in his extant works Euclid never says that we should limit ourselves to ruler and compass.

[8] Thanks to Simpl. In Aristot. phys., p. 60, 22–68, 32 Diels.

[9] Note that scientific astronomy was considered a part of mathematics until the time of Johannes Kepler. For Socrates, see J. Althoff, Sokrates als Naturphilosoph, in: id., Philosophie und Dichtung im antiken Griechenland, Stuttgart 2007, 103–120.

[10] A scholion on Birds 997 (= FGrH 135 Philochoros 122) informs us that Meton erected an instrument for observing solstices on the hill of the Pnyx, and Ptol. Almagest 3, 1, 250 Heiberg that he, together with Euctemon and their pupils, observed the solstice of 432.

same festival, the City Dionysia of 414, almost eighteen years after the observation of the solstice, while it is attested in no other comedy. It is therefore probable that Meton caught the public eye again in the year 415 or thereabouts. Now, the scholion on Birds 997 informs us that Kallistratos said that in Kolonos (the one of the Agora) there was some astronomical monument or inscription of Meton: ἀνάθημά τι εἶναι αὐτοῦ ἀστρολογικόν, but that Philochoros (FGrH 135, 122) disagreed: ἐν Κολωνῷ μὲν αὐτὸν οὐδὲν θεῖναι λέγει but that Meton did establish a ἡλιοτρόπιον near the wall on the Pnyx. True, what Kallistratos wrote may have been an ad hoc explanation triggered by the toponym "Kolonos", but what if it is not? What if both Kallistratos and the second part of the Philochoros fragment were right? We do know of another astronomical achievement of Meton's: his solar (probably astrometeorological) calendar, which may have been a parapegma in the original sense of the term: a perpetual calendar on stone which used 365 or 366 holes, one for each day of the solar year, and at least one movable peg to link the date of the civil/festival year with the solar year. Meton could have put both the heliotropion and the parapegma on public display at roughly the same time, or he could have published the parapegma significantly later. The existence of an inscriptional parapegma of Meton's has been doubted recently, but I think the testimony of Kallistratos is an argument in favour of Rehm's view that Meton did indeed construct a parapegma and put it on public display.[11]

The usefulness of a public parapegma would have been obvious even then,[12] and even a simple list of phases would have been helpful. Both the most cautious and the most adventurous theory would thus explain the renewed interest in Meton, but his parapegma (or whatever it was) was superseded by the parapegma of Euctemon first and other parapegmata later, which would explain why Philochoros had never heard of it. It need not bother us that one of the speakers in the fragment 22 Kassel/Austin of the Monotropos, when Meton is mentioned, answers: οἶδ', ὁ τὰς κρήνας ἄγων. The scholiast cautiously comments that perhaps Meton built some sort of fountain,[13] but what if this is a part of Phrynichus' joke? If the speaker in question was the Monotropos, i.e. a loner, he may have easily mixed up Meton with somebody else. Or Meton was even more versatile than we suppose; note that the fragment seems to start with the mention of another project of Meton's: τίς δ' ἐστὶν ὁ μετὰ ταῦτα φροντίζων; True, the inscription mentioned by Kallistratos may have been an exposition of Meton's lunar intercalation cycle, but before its adoption by the Athenian polis its impact factor would have been negligible, and Meton certainly caught the public eye in 414 or shortly before. I therefore suggest that the reason may have been the publication of an inscriptional astrometeorological calendar.

Otta Wenskus, Institut für Klassische Philologie und Neulateinische Studien, Leopold-Franzens-Universität Innsbruck
Otta.Wenskus@uibk.ac.at

[11] In my Astronomische Zeitangaben von Homer bis Theophrast, Stuttgart 1990, 28 I followed A. Rehm, Parapegmastudien, Abh. Bayer. Akad. Wiss., Phil.-hist. Abt. N. F. 19, 1941, 7, n. 3, who assumed that Meton published his parapegma in the very year he observed the solstice, but D. Lehoux quite rightly pointed out that this was by no means sure: Astronomy, Weather, and Calendars in the Ancient World, Cambridge 2007, p. 96 n. 66, and I accepted this justified criticism in my review, AAW 65 (2012), 67–77, col. 70. In other words: Rehm was probably right in assuming that Meton constructed an inscriptional parapegma but incautious as regards the date.

[12] See my Astronomische Zeitangaben (as in n. 11) p. 131 for the fourth century B.C.

[13] For once Lattmann (as in n. 7) fails to convince me. He thinks the joke has something to do with the legend (which is not attested before Plutarch (Alc. 17.5–6; see also Nic. 13.7–8) but which must be older because Plutarch quotes conflicting versions) that Meton set fire to one of his houses because he did not want to be involved in the Sicilian expedition: p. 173; see N. Dunbar, Aristophanes. Birds, Oxford 1995, p. 551. In his n. 173 Lattmann unfortunately misquotes Toomer, implicitly attributing to him of all people the view that Meton's intercalation circle was adopted by the Athenian polis in 431 B.C.