

Wanted: A Date with Herodotus

By Oliver R. Baker*

Herodotus comes down to us as the father of history and his fifth-century work, the Histories, is recognized as the first in an entirely new literary genre. But mid-fifth-century historiography is missing one of the most convenient of supranational tools—a reliable dating grid, or calendar—and Herodotus simply must make do as best he can without one. Although it was first suggested by a sixth-century Scythian monk, the axis of time along the now familiar BC/AD system is of comparatively recent adoption. Partly because of bitter doctrinal disputes over when Jesus of Nazareth was born—this system is never widely accepted until a seventeenth-century Jesuit scholar suggests that Anno Domini year one is just a convenient convention and by no means an agreement. When reading Herodotus today, particularly in an annotated edition in translation providing scholarly estimates of the Julian dates for the events under discussion, it is only too easy to be blissfully unaware of the author’s extreme dating handicap

Introduction

Just as there is no Archaic or Classical Greek word for biography, there is no word in Classical Greek or Latin for date—I mean a numerical, supranational, chronological date as in the children’s nursery rhyme, “In sixteen-hundred and sixty-six, London Town was burnt to sticks.”¹ This is a massive challenge to Herodotus and to all of his ethnically diverse oral sources in the Eastern Mediterranean when trying to tell him when something happened—how do they date events and communicate them to others? The simple answer is that they must rely on synchronicities—if they can find a pair that fits. When reading Herodotus today, particularly in an annotated edition that provides scholarly estimates of the Julian dates for the events under discussion, it is only too easy to be blissfully unaware of the author’s extreme handicap. Using synchronicities is not quite the same as trying to count from one to five when your vocabulary extends to only: one, two, three, another, and another—but you get the idea. Long winded little rhymes such as, “When Themistocles’ archonship was over and done; Miltiades sailed to Athens on the run” can never tell us much about exactly

*Tutor-Marker and Graduate Student, Simon Fraser University, Canada.

1. Conspiracy theorists continue to delight in what is to them the obvious evil *omen* that when this date is given in Roman numerals—the one thing we know for certain is that the Romans never did—MDCLXVI—we see all of their numerals in descending order of magnitude. Something very *bad* was certain to happen to someone somewhere during *that* year—such is the power of prophecy, superstition, and omen. Mnemonics such as: “I Value eXcesses, Let Caesar Destroy Mountains” may help.

when he sailed as the one that runs “In fourteen hundred and ninety-two, Columbus sailed the ocean blue.”²

Although Julius Caesar, like Herodotus an avid Egyptophile but of a somewhat different ilk, gives the Western world a calendar that actually works—albeit one likely adapted from the one used by the Egyptians for centuries beforehand—Caesar does not take it any further.³ Once the Romans get their seasonal year to match their festival year they are happy enough to use the conciliar year as their identification grid throughout their empire.⁴ At least they move away from the Archaic Greek luni-solar system of 354-day years with somewhat capriciously intercalated 384-day years every two or three years by doubling one of the months. The Romans also get their New Year to start shortly after the winter solstice; before then everyone’s New Year started on different days throughout the year, but usually one related to an important civic or religious festival, in turn related to an equinox or solstice.

Supranational Dates

But fixing the calendar—which incidentally makes celebrating birthdays and anniversaries possible—does not give the Romans a convenient system of supranational chronological dates; they retain the system with which they were familiar despite its clumsiness and obvious defects. One example from the second century of the Roman Empire will suffice to illustrate this. One of the more reliable surviving histories of Alexander the Great the *Anabasis of Alexander* was compiled in Attic Greek by the prodigious writer Lucius Flavius Arrianus of Nicomedia, who is more commonly known as Arrian.⁵ He describes Alexander’s succession to the Macedon throne as follows:

2. Not only are Archon lists for the sixth and fifth centuries incomplete, many of the entries are contradictory. Furthermore, the appointments span two of our Julian years running from July until June. So Themistocles’ term as chief magistrate, (*eponymous archon*) runs 493/492; and his term is followed by that of Diognetus 492/491, Phoenippus 491/490, and so on.

3. Denis Feeney, *Caesar’s Calendar* (Berkeley, CA: University of California Press, 2007), 42.

4. Using the Julian calendar reforms of the late first century, the usual dates for the solstices are between June 20/21 and December 21/22, and for the equinoxes March 20/21 and September 22/23. However, over a four-hundred-year cycle, the vernal equinox can fall as early as March 19 and the autumnal equinox as late as September 24. No matter, the Julian calendar with sixteenth-century Gregorian reforms at least narrows down the dates of these celestial events to one of three possible days in the four months of interest. But even today, if you want to do something special on say the first day of spring, rather than guess and only get close, you will have to look it up from a reliable source.

5. Arrian of Nicomedia (c. 86/89-c. 140/160), a Greek historian, public servant—serving variously as senator, consul, archon, and priest, military commander, and philosopher, was

Now we are told that the death of Philip occurred in the archonship of Pythodelus at Athens; then about twenty [years old], Alexander succeeded, as Philip's son, and arrived in the Peloponnesus (Arr., *Anab.* 1.1.1).

When he comes to describing Alexander's death, Arrian writes:

Alexander died in the hundred and fourteenth Olympiad and the Archonship of Hegesias at Athens. According to Aristobulus, he lived thirty-two years and eight months; his reign lasted twelve years and the same eight months (Arr., *Anab.* 7.28.1).

Should any of Arrian's many contemporary readers not have a list of Athenian archonships readily to hand they would just be left with the notion that Alexander III's short rule was quite some time ago; but not quite sure about how long ago? Of course, modern historians with access to many other documents and a supranational grid, are happy to inform us that Alexander III was born in 356 (probably in October), succeeded to the Macedon throne in October 336—the exact date of Philip's assassination was either not recorded, or has been lost—and that he died on the 10th or 11th of June, 323 BCE. The amount of archival sifting to reliably generate Alexander's date of death is likely mind-boggling.

Before Christ and Anno Domini

The axis of time along the now familiar BC/AD line is comparatively recent and its conception is generally attributed to the sixth-century Scythian monk Dionysius Exiguus [c. 470-c. 544]. Indeed the Dionysian Anno Domini system is used in the mid-eighth century by the Venerable Bede to date some events when he is compiling his *Ecclesiastical History of the English People*.⁶ Partly because scholars could never agree on the year of Christ's birth, let alone a particular month and day, it is not until AD 1627 that the Jesuit scholar Dominic Petavius seriously proposes the BC/AD system as the basis for a universal time-line for scholars and historians. He gets around the indeterminacy of an actual date for Jesus of Nazareth's birth by proposing that AD year one is simply a reference point—a convenient convention—but not a verifiable, let alone an agreed year for the event.⁷ However, despite its obvious convenience for future and past events,

one of the most distinguished and prolific authors of the second-century Roman Empire. Of his many known works the *Indica* and *Anabasis* have survived intact, the remainder of his works are extant only in fragments.

6. Feeney, *Caesar's Calendar*, 2007, 2-3.

7. Note that the abbreviation AD always precedes the year number, whereas for the secular systems BCE and CE always follow the year number.

Petavius' pre-set numerical grid does not come into universal acceptance until the eighteenth century.⁸

Establishing Synchronicities

Just how difficult it is to establish, let alone describe, a reliable chronology of events in the sixth and fifth centuries is illustrated by an anecdote about Xenophanes of Colophon (c. 570/560-478) who asks at a dinner, "How many years do you have my good man? How old were you when the Mede came?" In Julian terms, we now surmise that Xenophanes is talking about an event in Anatolia that occurred in 546/45.⁹ However, even today we often organise our thinking and recollections in terms of a striking event—for example, most of us can remember exactly where we were and what we were doing when two hijacked passenger aircraft were flown into the twin towers of the World Trade Center in New York City. Otherwise, for many of us, there would be no reason to remember anything about that particular Tuesday morning on 11 September, 2001. For many, the popular abbreviation of the date—9/11—signifies the event.¹⁰ In antiquity, even getting the right day is not very easy; unlike the Egyptians who start their new day at sunrise, the Greeks start their new day at sundown, whereas the Persians start theirs at midnight.¹¹

Of all ancient calendar systems those adopted by the Greeks are the most confusing even to Greeks at the time. They share a basic similarity from region to region as they are all luni-solar, but each city-state keeps its own version of a twelve-month calendar with a periodic intercalation of a thirteenth lunar-month. The Athenian or Attic calendar, despite being mired in mystery, is still the best

8. Until comparatively recently Parliamentary statutes in the United Kingdom were identified using only regnal years, as in: 2 Geo. 6 for an Act receiving royal assent over the period 11 December 1937 to 10 December 1938, and so on.

9. We know from Homer that the Lydians, whom he calls the Meiones (Maeonians), led by Mestheles and Antiphos, fought with the Trojans during the Trojan War (Hom., *Il* 2.864). Cyrus the Great besieged and captured the Lydian capital Sardis in 546; a year later the last Lydian king, Croesus, was dead. Admittedly confusing, but during the sixth century the terms Mede and Persian were often used interchangeably.

10. Remember that in the United States the date format is month-day-year—a convention of no great consequence until the month is abbreviated to a numeral and the year dropped. Ambiguity really dominates when the year is also abbreviated from four digits to two and the reader is then unsure whether the given date format is YY MM DD, YY DD MM; MM DD YY, MM YY DD; DD MM YY or DD YY MM.

11. See Benjamin Meritt, *The Athenian Year*. Sather Classical Lectures, volume 32 (Berkeley and Los Angeles, CA: University of California Press, 1961), 22. The Hebrews also started their new day at sunset. Although the Julian day started at midnight, the Roman Church followed Greek/Hebrew tradition until well into the nineteenth-century.

known and most intensively studied. The intercalary month usually comes after the sixth month, *Poseidon*, and is called *Second Poseidon*. *Hekatombion*, the first month, and hence the beginning of the year, falls in the summer after the summer solstice.¹² Other Greek city-states and regions start their New Year on different days; for example, Sparta and Macedon start theirs following the autumnal equinox, whereas Delos starts theirs following the winter solstice. Coming from Halicarnassus, which would have Dorian, Ionian, and Carian influences, we should not be surprised that Herodotus finds the Athenian calendar baffling.

Another Golden Rule: Always Blame the Athenians

For the historian inclined toward tidy orderliness, the regrettable fact is that the Athenians were stubbornly unwilling to adopt anything resembling a completely regular calendar, which makes reconstruction difficult. Their irregularity is not from lack of astronomical knowledge. In 432, the Athenian astronomer Meton instituted his nineteen-year cycle, fixing regular intercalations—whether Meton got this cycle from Babylonia or discovered it himself is not known. From that point onward, a small group of Greek astronomers use the Metonic cycle in their calculations, but this should be regarded as an astronomer's ideal calendar. Abundant epigraphical evidence demonstrates that in the civil calendar, while the archons inserted approximately the correct number of intercalary months over the long term, the specific corrections are somewhat arbitrary, inserted as the archons saw fit. This irregularity does not really affect the long-term workings of the calendar, but it does make things very confusing when trying to establish a precise date for an event. The Athenians seem to have taken a rather casual attitude toward their calendar. It appears they used neither a regular formula nor continuous direct observation to determine the length of the months. Most likely, they followed a general rule of alternating months (twenty-nine and thirty days long), subject to periodic correction by observation.

In addition to this calendar, which has been called the festival calendar, Athenians maintained a second calendar for the political year. This conciliar year divided the year into *prytanies*, one for each of the *phylai*, the subdivisions of Athenian citizens. The number of *phylai*, and hence the number of *prytanies*, varies over time. Until the end of the fourth century there were ten *phylai*. After that the number varies between eleven and thirteen, but usually twelve. Even more confusing, while the conciliar and festival years are basically the same length during the fourth century, such is not regularly the case in the fifth century.¹³

12. See Meritt, *The Athenian Year*, 1961, chapter ten for a discussion of the seasonal year and the conciliar year which began about midsummer and thus the epochal date depends on the summer solstice, 202-203, 216.

13. See Meritt, *The Athenian Year*, 1961, 135-137, 213-214.

Luni-Solar Chaos

Ordinary records of Greek city-states are dated according to the eponymous year of the person in power, be that the archon, ephor, king, priest of Hera, and so on. Unfortunately, for Athens, the list of archons is incomplete for the fifth century. Moreover, regional eponymous years are difficult to use when trying to correlate the various eras, a problem no less evident to the ancient Greek historians than it is to us. Late in the fifth century, Meton of Athens noticed something that the Babylonians had recognised since the sixth century or much earlier, that two hundred and thirty-five lunar months made up almost exactly nineteen solar years. Using modern measurements for the length of the solar year and the lunar month, the arithmetic is trivial:

$$19 \times 365.2425 = 6,939.6075 \text{ days (or about 6,940 days), and}$$

$$6,939.6075 \div 29.53059 = 234.9973 \text{ months (or about 235 months)}$$

Now everyone knows that the twelve-month lunar year—approximately 354 days—falls short of the solar year by just over eleven days. They also know that the lunar month is not exactly twenty-nine days long and that it varies in length. Accordingly, they had six *full* months of thirty days and six *hollow* months of only twenty-nine days, giving them a ‘short’ year.¹⁴ Consequently, the archons would somewhat capriciously insert a thirteen-month ‘long’ year of 384 days from time to time to keep their calendar in step with the seasons. And so in the sixth century—using neither the *metonic* cycle, nor the *octaeteris*—and in the early fifth century Athenians would repeat one month, usually the sixth month, Poseidon.¹⁵ But there was no prescribed rule for this intercalation and it is left up to the archon to decide. They do not even have a special name for this thirteenth month. Even after Meton’s observations became well-known, his regular system of seven intercalary years in every nineteen-year cycle is not scrupulously followed by the archons.¹⁶ But more confusion is to come as soon as Herodotus starts to inquire about events outside of Attica.

14. For the arithmetically challenged $6 \times 30 = 180$ and $6 \times 29 = 174$ ($180 + 174 = 354$).

15. The *octaeteris* comprises an eight-year cycle of 99 lunar months, where three of the eight years are thirteen full lunar months long.

16. Again the arithmetic is trivial $7 \times 384 = 2,688$ and $12 \times 354 = 4,248$ ($2,688 + 4,248 = 6,936$ which is only a few days short of the actual 6,939.6075 which was rounded up to 6,940).

Chacun Pour Soi

Although most of the calendars follow the same principles, virtually every fifth-century Hellenic city-state uses its own calendar with different month names, different beginnings to the year, and different intercalations. The Hellenes use luni-solar calendars with years of twelve or thirteen months. A month could be 'hollow' or 'full' having either twenty-nine or thirty days respectively. Intercalations seem to have been done as needed and arbitrarily. In any case there is no fixed pattern although several cycles were known to the Hellenes. According to Robert Hannah by the late fifth century the Athenians more or less follow the scheme developed by Meton of Athens and his colleagues. He writes:¹⁷

So over a period of nineteen years there were 6,940 days or 235 months, including seven intercalary months. Of the 235 months, the Greeks made 110 'hollow' (in other words, of 29 days each), and the remaining 125 'full' (of 30 days each). The imbalance between 'full' and 'hollow' months means that they cannot [simply] alternate throughout the cycle, but sometimes there would be two 'full' months in succession. Geminus—a first century mathematician—explains how the devisers of the cycle arrived at 110 'hollow' months: all 235 months are initially assigned 30 days each, which gives a total of 7,050 days to the 19-year period. ¹⁸ This overshoots the sum of 6,940 days of 235 lunar months by 110 days, so 110 months must each have one day omitted through the cycle, and they become 29-day months. To ensure as even a distribution of this omission as possible, he says that the Greeks divided the 6,940 days by 110 to get a quotient of [about] 63, so that the 110 days were removed at intervals of 63 days.

The years are named after the holder of a certain office whose term lasts one year. For Athens this is one of the archons, in Sparta one of the ephors. The twelve months of a common year bear different names from city to city. For most of the Greek and non-Greek city-states, neither all the names nor the exact sequence of the months are known, and often neither the beginning of the year, nor the name of the intercalary month. The diversity is astonishing.

Athenian Calendars

There were several calendars in use in Athens. The most important was the civil calendar. The beginning of each month in theory is determined by observation, in effect the day of the first visibility of the waxing crescent in the evening and

17. Robert Hannah, *Time in Antiquity* (London: Routledge, 2009), 35.

18. Actually Geminus' arithmetic is not quite right; this works better if the omitted day is every sixty-fourth one. But Herodotus is compiling and writing his *Histories* several decades before Meton and so he is obliged to follow a somewhat more capricious calendar where the adjustments are ultimately directed by the Archon.

becomes the first day of the month.¹⁹ This calendar is subject to manipulations by the Archons. There is even evidence of single days being repeated several times.²⁰ They might even add a few days to one month—perhaps to favour a festival with better weather—and subtract a few days from the next. Thus, due to intercalations for political rather than astronomical reasons, this calendar can be out of step with the actual seasons. Another calendar is the prytany calendar which is used to regulate the execution of certain offices by representatives of one of the so-called tribes. In the fifth century this calendar comprised ten months of thirty-six days, which ensures that it was always out-of-step with both the civil calendar and the seasonal or astronomical one.

And Elsewhere in the Hellenic World

We know almost nothing about the calendar used in Delphi. As in Athens, they may well have utilised more than one system. Even the actual names of the months used during the fifth century are uncertain. Scholars believe that Delphi took their New Year, like Athens, with the first new moon after summer solstice, either by calculation or from the first visibility of the thinnest of slivers of the waxing crescent moon. We know the names and sequence of months used in Boeotia from the fifth century onward, and that they are different from those used in Attica. However, scholars believe that the Boeotian New Year begins around the winter solstice. The sequence and names of the months in Miletus in Anatolia are known, but again they differ from those used in Attica. Their year begins after the autumnal equinox, possibly with the first visibility of the waxing crescent of the new moon. Our knowledge of the Spartan calendar is exceedingly limited. We know their names for only nine of the twelve months, and scholars have been unable to reconstruct a complete sequence. Nor do scholars know their mode of intercalation, which likely lay in the hands of the ephors. It is believed that the

19. The Athenian New Year starts on the first new moon following the summer solstice. The names of the twelve Athenian months along with their Julian equivalents are as follows. The first month of the Attic New Year is always *Hekatombion*, and the last month always *Skirophorion*:

<i>Hekatombion</i>	July/August	<i>Gamelion</i>	January/Feb
<i>Metageitnion</i>	August/September	<i>Anthesterion</i>	February/Mar
<i>Boedromion</i>	September/October	<i>Elaphebolion</i>	March/April
<i>Pyanepsion</i>	October/November	<i>Mounichion</i>	April/May
<i>Miamakterion</i>	November/December	<i>Thargelion</i>	May/June
<i>Poseidon</i>	December/January	<i>Skirophorion</i>	June/July

20. In those years with thirteen lunar months the sixth month is repeated simply as *Second Poseidon*.

Spartan New Year begins on the first new moon following the autumn equinox. These differences in when the New Year is celebrated make for difficulties when we transpose the date of an event into Julian terms.²¹

Another Pan-Hellenic Challenge for Herodotus

Herodotus has to do what he can without a Pan-Hellenic (calendar) grid, let alone a supranational one, and we see that in book 1 of the *Histories*²² he relies on a kings' list to map out the sequence of events in Lydia and Media—modern Turkey, Iraq, and Iran.²³ Arguably his first mention of the last Lydian king, Croesus, marks his transition from myth to history.²⁴ From Herodotus we know that Gyges rules for thirty-eight years.²⁵ His son, Ardys, rules for forty-nine years; and Ardys' son, Sadyattes, rules for the next twelve years.²⁶ He is succeeded in turn by Alyattes who, perhaps improbably, reigns for fifty-seven years.²⁷ Herodotus then describes how Alyattes' son, Croesus, then aged thirty-nine, ascends to the Lydian throne which he will hold for fourteen years before being captured when Cyrus' Persian forces besiege and take his capital, Sardis.

21. For example, the Battle of Marathon occurs in the late summer of 480; but because the Athenian New Year is celebrated on the first new moon following the summer solstice the battle takes place early during the Athenian year 480/479, conversely because the Spartan New Year is celebrated on the first new moon following the autumn equinox the battle takes place late during the Spartan year 481/480.

22. All quotations from the *Histories* are from the Andrea Purvis translation presented in Robert Strassler, *The Landmark Herodotus* (New York, NY: Random House, 2007).

23. See Hdt 1.7.4: his estimate for regnal generations—about five per century—where he writes “they governed for twenty-two generations, five hundred and five years” is not unreasonable. In England, for example, there have been thirty-nine monarchs between the ascension of William I in 1066 and the death of George VI in 1952—an average reign of just over twenty-years, or, near enough, five generations of monarch per century. This claim is inconsistent with that made by Herodotus in 2.142.1-2. However, in book 2 of his *Histories* he focuses on demonstrating that Egyptian history extends much further back than that of the Hellenes.

24. Hdt. 1.6.1-2. From a number of sources, several authorities claim that Croesus is born circa 596 and rules from 560 to about 547–546 when his forces are defeated at the battle of Thymbra just outside of his capital Sardis by Cyrus the Great. But there is no agreement as to whether he was quietly butchered, sacrificed on a pyre, retained as an advisor, or held under house arrest; and even the date of the battle is somewhat uncertain, some suggesting that it was after the fall of Babylon in 539. Hdt 1.26.1 and 1.86.1.

25. Hdt. 1.14.4. Gyges, the former bodyguard to his predecessor Candaules, who he assassinates, founds the Mermnad dynasty early during the seventh century.

26. Hdt. 1.16.1.

27. Hdt. 1.25.1.

And so this particular dynasty in the Lydian empire comes to an end after one hundred and seventy years, absorbed by another empire.²⁸ But although Herodotus gives us the sequence of Lydian monarchs, he does not completely link this dynasty to events in mainland Greece or elsewhere. But, in a digression about a war between the Lydians and Medes during Alyattes' implausibly long reign, and perhaps entirely by happenstance, he mentions an eclipse of the sun, one of only three mentioned in his *Histories*.²⁹ If Herodotus puts in this *rabbit-into-the-hat* then just over two-thousand years later, Petavius—a remarkable polymath—pulls this same *rabbit out-of-the-hat* to show that this astronomical event and therefore the ancient battle could be reliably dated back to 28 May, 585 BC. Or could he?³⁰ Herodotus reports only three solar eclipses, but the one his sources claim as visible from Anatolia in the autumn of 481 did not actually occur.³¹

We can begin to see the challenge that Herodotus faces as he gathers these oral traditions and tries to distil historical fact from legend while clearly identifying what he believes to be interesting but entirely mythical tales. Donald Wilcox writes:³²

In fact the generations have no quantitative aspect. They exist as pure indications of *the fact of duration* (italics mine); the relation among separate generations is discontinuous and extrinsic. But Herodotus was not indifferent to progressive and continuous elements of time. Alongside this episodic chronology he also drew up a linear sequence of years leading back to the dimmest recesses of known time. By this second chronology he conveyed the temporal dimension of Greek culture in a linear fashion. These two chronologies are fundamentally different in their orientation and function, though they combine to give Herodotus' narrative a richness and subtlety it would otherwise lack. By examining the episodic and linear chronologies in turn we can see more clearly the separate functions they served in Herodotus' work.

28. For a discussion of the challenges of generation values, see Rashid Ball, "Generation Dating in Herodotus," *Classical Quarterly* 29 (1979): 276-281. Of interest is Hdt. 1.74 where we learn that twenty-two generations of Heraklids govern Lydia for 505 years—roughly 23 years per generation—significantly less than the thirty-three or forty years used elsewhere in book 1 and book 2.

29. Hdt 1.74.1-2.

30. There was another total solar eclipse visible in the southern area of Anatolia on 19 May 557—some twenty-eight years later than the "Eclipse of Thales" which occurred on 28 May 585—which leads some scholars to infer that Alyattes' reign was not fifty-seven years. See Pamela-Jane Shaw, *Discrepancies in Olympiad Dating* (Stuttgart: Franz Steiner, 2003), 235. See also W. W. How and J. Wells, *Commentary on Herodotus* (Oxford, Clarendon Press, 1912), 1.1.74.2; evidently scholars differ.

31. See Eric Glover, "The Eclipse of Xerxes in Herodotus," *Classical Quarterly* 62, no. 2 (2014): 471-492.

32. Donald J. Wilcox, *Measure of Times Past* (Chicago, IL: University of Chicago Press, 1987), 54.

Wilcox overstates the case, or perhaps minimises the real challenges. Herodotus simply does not have the tools to address the two problems adequately.³³ This lack brings to mind the twelfth-century *Historia Regum Britanniae* written in Latin by the sometime bishop of St. Asaph, Geoffrey of Monmouth. He uses a curious system of synchronisms and only three Julian dates (*Anno Domini*) to give a pseudo-historical account of the history of the Britons from Brutus of Troy, the mythical late twelfth- early eleventh-century great-grandson of Aeneas, down to Cadualadrus, son of Caduallo, who he claims dies on April 20, 689.³⁴

Herodotus expresses his complete dissatisfaction with the Hellenic calendar by commenting that the Egyptians are the first to employ the solar year by dividing it up into twelve months of thirty days and adding five days each year beyond that number, whereas the Hellenes attempt to preserve the timing of the seasons by inserting an intercalary lunar month every other year. The passage from Herodotus reads:

As to all matters concerning the human world, they were in agreement. They said that the Egyptians were the first of all people to discover the year, by dividing up the seasons into twelve parts to total one year., and that they discovered how to do this from the stars. The Egyptians seem to me to be much wiser than the Hellenes in the way they regulate the timing of seasons. While the Hellenes attempt to preserve the timing of the seasons by inserting an intercalary month every other year, the Egyptians divide the year into twelve months of thirty days each and add just five days in every year beyond that number, and thus their seasons do return at the same periods in the cycle from year to year (Hdt 2.4.1).³⁵

Four centuries later the Romans wisely take their calendar clues from the Egyptians, not the Hellenes.

33. "It ain't necessarily so" with apologies to Ira Gershwin (*Porgy & Bess*, 1935). His first two dates are legendary: 156 for the death of king Lucius, and 542 for King Arthur's abdication in favour of Constantine. His third date, 689, for the death of Cadualadrus (Cadwaladr) is simply wrong; he actually dies in 682 (not 689) in Rome possibly of the plague. Geoffrey of Monmouth, "The History of the Kings of Britain: An Edition and Translation of *De gestis Britonum* (*Historia Regum Britanniae*)," in *Arthurian Studies* 69, edited by Michael D. Reeve, translated by Neil Wright (Woodbridge, England: Boydell & Brewer Press, 2007), 5.73, 11.178, 11.206.

34. The author confuses the Welsh ruler Cadualadrus / Cadwaladr with Caedwalla of Wessex who dies self-exiled in Rome in AD 689, having finally abandoned his kingdom to the seemingly never-ending Saxon invasions. Geoffrey of Monmouth, *The History of the Kings of Britain*, 2007, 11.206.

35. For a comparison between the Greek Solutions and the Egyptian Solutions to the luni-solar challenge, see How and Wells, "The History of the Kings of Britain: An Edition and Translation of *De gestis Britonum* (*Historia Regum Britanniae*)," 1912, 1.2.4.2-3.

Is Dating Even Important

Another example concerns establishing precisely when the naval battle off Salamis took place, and with it the most likely dates for the preceding land battle at Thermopylae and the naval engagements off Artemision. Quite inadvertently, with an oblique reference to a partial solar eclipse, Herodotus gives modern readers precisely what is needed to determine the date for the battle off Salamis in Julian terms.³⁶

The Karneian festival, or simply the Karneia (Κάρνεια), is an important festival in honour of Apollo; held near the end of their year and just before the autumn equinox, the beginning of the Spartan New Year. This nine-day Doric harvest festival is celebrated during the late summer and the ceremonies conclude on the full moon. Scholars disagree on how the ephors determine when to hold the festivities, but it is likely that in Julian terms they would have ended on the first full moon that falls between mid-August and mid-September.

Olympiad dating is interesting and certainly Pan-Hellenic, but we must recognise that it was not established until the end of the second century. Robert Hannah writes:³⁷

The four-yearly periods of the Olympic Games formed the basis of the best-known era, that of the Olympiads, which started traditionally in 776 BC. Its invention is associated with Timaeus (c. 350-260) and Eratosthenes (c. 285-194). As the Olympic year began in mid-summer, it straddled the second half of the Julian year and the first half of the next, so that, for example the third year of the sixth Olympiad (conventionally written as Ol. 6, 3) corresponds to the Julian years 754/3 BC.

The Olympiads were not numbered until the second century when Erasthenes decided that naming the 'year' after the winner of the stadia race was inconvenient—and that taking what we now know as 776 BC (Ol. 1, 1) as the date of the first Olympiad was much easier than remembering who won, or having access to a list of winners. That winners' list was as inconvenient to use as the Athenian list of past archons or the Spartan list of past ephors. Introducing his 1975 article on the uncertainties of Olympic dating, Stephen G. Miller writes:³⁸

36. "Cleombrotus had led the army back from the isthmus because as he was sacrificing to determine what to do about the Persians, the sun was darkened in the heavens" Hdt. 9.10.3. There was a partial solar eclipse visible from Corinth on October 2, 480. Scholars can confidently work backward from this astronomical event, a reliable, and useful *terminus ante quem* (TAQ) for the battle off Salamis. But solar eclipses can only occur when there is a new moon (moon is between the earth and the sun).

37. Hannah, *Time in Antiquity*, 2009, 48.

38. Stephen Miller, "The Date of Olympic Festivals," *Mitteilungen des Deutschen Archäologischen Instituts* 90 (1975): 215.

One of the greatest of the many paradoxes of classical studies must surely be that the precise date of Olympic festivals is not agreed upon. It is incredible that we do not know the date of an event which occurred with regularity for perhaps more than a millenium [sic], and which was constantly used in antiquity as a framework for time references. Much of our understanding of ancient chronology rests ultimately upon dates which are given in terms of Olympiads, and yet there is no general consensus as to the time when, every four years, the Olympic Games took place.

Miller further writes that:³⁹

The present status of scholarly opinion regarding the date of the festivals is perhaps most succinctly put by Bickerman, "the games were held every four years at the height of the summer. A more precise date is not possible."

All this, as Miller equally succinctly points out, raises the interesting question:⁴⁰

In the scholarship which has been devoted to the question of the date of the Olympia, one fundamental question has never been asked: how did the Greek world know when to assemble for the festival? One can, of course, suppose that the (σπονδοφόροι) *spondophoroi* (Elean citizens acting as games officials) were able to announce the sacred truce and the festival time throughout the Greek world, but one has only to consider the magnitude of such a task to realise that a common date known to every Greek, would have been desirable, if not necessary.

And this leads to the challenge, whose calendar are the Eleans using, if indeed they are using a calendar at all? We can say a little bit more; by the fifth century the Olympic festivities last for five days and are concluded on a full moon. But whether that full moon could fall as early as July, in August, or perhaps as late as September, remains under bitter dispute.

To return to the question about when, in Julian terms, did the second Greco-Persian War take place; there is an answer. In an appendix to his biography of Xerxes, titled "The Chronology of Xerxes' Advance through Greece" Richard Stoneman derives a workable schedule combining Herodotus' text with the certainties offered by the Persian New Year, and the partial eclipse of the sun observed from the isthmus at Corinth in early October 480.⁴¹

39. Ibid.

40. Ibid, 219.

41. Richard Stoneman, *Xerxes* (New Haven CT, Yale University Press, 2015), 226-228. For the year 480 (Thermopylae) the vernal equinox fell on March 25, the summer solstice on June 29, the autumn equinox on September 29, and the winter equinox on December 26. Similarly for the Julian year 490 (Marathon) the vernal equinox fell on March 27, the summer solstice on June 29, the autumnal equinox on September 29, and the winter solstice on December 27.

A TENTATIVE TIMETABLE FOR 480 BC

Late March	<i>Nowruz</i> festival in Sardis
Early May	Floating bridge construction and crossing of the Hellespont
10-19 August	Spartan <i>Karneia</i> : Leonidas advances northward [from Sparta]
12 August	Persian army advances from Therme [Chalcidice Peninsula]
14-19 August	75th Olympic festival ($776 + 4 - (4 \times 75) = 480$)
24 August`	Persian fleet battered by three days' <i>meltemi</i>
29-30 August`	Battle of Thermopylae
2 September	Attic month of Boedromion begins
2-4 September	Battle off Artemision: [more] storms
7 September	Persian army reaches Athens
8-29 September	Sack of Athens
29 September	Persian fleet reaches Phaleron
30 September	Battle off Salamis
2 October	Partial solar eclipse observed at defensive wall near Corinth

And what this really tells us is that somewhat inexcusably, despite their pressing need for fleet repairs, the Persians are in no hurry after their victory at Thermopylae to finish off the Peloponnesian Alliance. They wilfully let their tactical and strategic advantages slip away. With winter approaching and with it the end of the 480-campaigning season time is on the Hellenic side provided the Hellenes retain any measure of unity.

A Rough Chronology

Over the years classical scholars have inferred a number of reasonably reliable Julian dates for the events described by Herodotus. Also included in this list overleaf are some events and the dates of several notable individuals before the Hellenistic period just to show *who's who* in the Eastern Mediterranean and where they might fit in.⁴² Chronology is the union of historiography and arithmetic. Modern Western readers of Herodotus should not begin to feel too complacent, as we still have the remnants of a luni-solar calendar system when it comes to determining the date of the principle Christian festival. The First Council of Nicaea settled this once and for all time back in AD 325 with the simplest of all possible formulas, but they omitted to write down and individually sign-off on precisely what it was that they had all agreed upon. Following one interpretation using the Gregorian calendar, Easter Sunday can fall as early as March 22 and as late as April 25, but as is often the case: Satan lurks in the details. Their deliberations result in the agreement that Easter would be celebrated on the first

42. This list is adapted from Sarah B. Pomeroy, *Goddesses, Whores* (New York, NY: Schocken Books, 1975), vi. The Bronze Age is taken as 1600-1100; the Dark Age 1100-800; the Archaic Age 800-480; and the Classical Age 480-323.

Sunday after the first full moon occurring after the vernal equinox. Except if that first full moon fell on a Sunday then Easter would be the next Sunday. Simple enough—using the Julian calendar—if it was right—it was not quite. But the ecclesiastics wanted to settle the date for hundreds of years into the future and did not want to use astronomical predictions based on celestial observations—astronomers being of the same heathen ilk as astrologers—so they decreed a notational date for the vernal equinox (set as March 20) and compiled a list of notational or ecclesiastical full moons. Consequently, if we use the simple Nicaean formula, but with correct astronomical dates for the equinoxes and the cycle of full lunations, we can sometimes still get the “wrong” answer. Three-hundred and eighteen mitres and crosiers give neither assurance of wisdom nor infallibility.

A minor mystery posed by Herodotus appears in his commentary on Persian customs. He is explaining that the Persians celebrate their birthdays and that the biggest celebrations of all are those for their monarch. His challenge is that there is no Ionian Greek word that he can use to describe this sort of anniversary, so he settles for ἐγένετο meaning “come into being.”

APPROXIMATE JULIAN TIMELINE FOR HERODOTUS' HISTORIES AND AFTER

1600		
BRONZE AGE	1184	Traditional date for the fall of Troy
1100		
DARK AGE		
800		
	776	Traditional date for the first Olympiad Homer—late eighth century Hesiod—late eighth century
regnum	716-678	Gyges of Lydia
700		
	650-600	Draco, first Athenian legislator—Laws
600	594	Archonship of Solon
	590-519	Miltiades son of Kypselos
	590-529	Cyrus the Great
	554-489	Miltiades son of Kimon
	550-486	Darius the Great
	550-475	Atossa of Persia
	545-510	Tyranny of the Peisistratids
ARCHAIC AGE	535-475	Heraclitus
	523-456	Aeschylus
regnum	519-489	Cleomenes I of Sparta
	516-?	Gorgo of Sparta
	516-?	Artemisia of Halicarnassus
500		

	regnum	498-454	Alexander I of Macedon
		497-406	Sophocles
		490-479	Helleno-Persian Wars
	regnum	486-465	Xerxes I of Persia
		484-425	Herodotus
		480-406	Euripides
...480			Partial solar eclipse October 2, 480
		431-404	Peloponnesian War
		429-347	Plato
CLASSICAL AGE		428-354	Xenophon
400			
		384-322	Demosthenes
	regnum	359-336	Philip II of Macedon
	regnum	336-323	Alexander III of Macedon
323			

Of all the days of the year, one's own birthday is held in the most honour. On this day they claim the right to serve a larger feast than on any other day. The more fortunate among them serve the meat of oxen, horses, camels, and donkeys roasted whole in ovens, while the poor serve the meat of small animals such as sheep and goats. [2] They eat few main dishes, but consume many desserts, and the latter are not served as one course, but at intervals throughout the meal (Hdt. 1.133.1-2).⁴³

Herodotus goes on to jest that the Hellenes are always hungry as nothing worthwhile is served after the main course!⁴⁴ But the real mystery is that he does not explore myriad concerns over how the Persians are able to compute a birthday or anniversary—what sort of calendar did they use? Did they name and number their months?⁴⁵ We can speculate that they simply counted forward from a solstice or equinox.

In England the New Year did not commence on 1 January until passage of Lord Chesterfield's *Calendar (New Style) Act* of 1750; until then the country used quarter days with the legal New Year falling on Lady Day, 25 March.⁴⁶

43. The Greek for this passage reads as follows:

ἡμέρην δὲ ἀπασέων μάλιστα ἐκείνην τιμᾶν νομίζουσι τῇ ἑκάστος ἐγένετο. ἐν ταύτῃ δὲ πλέω δαίτα τῶν ἀλλέων δικαιοῦσι προτίθεσθαι: ἐν τῇ οἱ εὐδαίμονες αὐτῶν βοῦν καὶ ἵππον καὶ κάμηλον καὶ ὄνον προτιθέαται ὅλους ὀπτους ἐν καμίνοισι, οἷδὲ πένητες αὐτῶν τὰ λεπτὰ τῶν προβάτων προτιθέαται.

44. For further discussion on Persian dessert dishes and alcohol consumption, see How and Wells, *Commentary on Herodotus*, 1912, 1.1.133.1-4.

45. The ancient Persians used a solar calendar and their New Year—*Nowruz*—was then as now celebrated on the vernal equinox.

46. The Calendar (New Style) Act 1750 had two parts: the New Year would begin on 1 January rather than 25 March (Lady Day), and the calendar shifted by eleven days to align with the Gregorian calendar from 1582 already in use over much of Europe. Consequently the year 1752 began on 1 January; and, Wednesday, 2 September 1752 was followed by

Conclusions

That Herodotus does not have an orderly supranational dating system is largely irrelevant, no matter how frustrating modern readers find some of his chronological vagaries. By happenstance, when in book 9 of his *Histories* he notes the solar eclipse observed by Cleombrotus at the isthmus near Corinth he inadvertently gives future scholars a *terminus ante quem* for the battle off Salamis. Furthermore in book 1 he gives us a Lydian king list extending from Gyges down to Croesus, and since the latter was defeated by the Persian Cyrus the Great we can work backward from Xerxes et al to the late eighth century and begin to sketch-in approximate Julian dates. But there are many instances where much more certainty in the ordering of events might make our inferences over motives or causality more evident.

Examples abound. When does Miltiades capture the island of Lemnos and give it to Athens? If he does so early in the fifth-century, then he is an Athenian benefactor; but if he does it during the penultimate decade of the sixth century, then he is just a minor tyrant and sycophant—all the difference in the world. When does Cleomenes die? Is it before or after the battle of Marathon? And for that matter—when does the Battle of Marathon take place? Most scholars agree on the summer of 490, but not on which month, and some will even dispute the year. Like many a commonplace—why write down what everybody knows?⁴⁷ As we have seen, reports of lunar and solar eclipses can have both narrative significance and nail down historical events in time. However, in archaic Greece these astronomical events were not properly understood. Indeed it was only late in the fifth century that ἔκλειψις (*ékleipsis*) and related terms were specifically used to describe eclipses.⁴⁸ Perhaps Herodotus' sources were superstitious and reluctant to include references to these natural phenomena. After all, the Greeks regarded them as an indication of the displeasure of their gods.

Herodotus tells us the Spartans arrive in Attica too late to participate in the battle of Marathon, perhaps deliberately, but not when. Nowhere does he tell us who leads the Spartan contingent, although the Spartan army is almost invariably led out of the Peloponnesus and into battle by a king or a regent. So often we convince ourselves that Herodotus knows full well something that we now consider critically important, but for some reason—perhaps at the time it appears

Thursday, 14 September, but with the usual quarter days, originally based on religious festivals: Lady Day (25 March), Midsummer Day (24 June), Michaelmas (September 29) and Christmas (25 December) still retained for some contracts.

47. For a full discussion on whether we should accept the traditional date of September 12, 490, rather than August 12, 490 for Marathon, see chapter five of Donald W. Olson, *Celestial Sleuth* (New York, NY: Springer New York, 2013), 147-195.

48. Whereas lunar eclipses, when they occur, can be viewed from anywhere provided the moon is above the horizon, views of total solar eclipses are rare and always very much time and place specific.

far too much of a commonplace—he never sets it down in writing. Sadly, no one else does either, and now, millennia later, any chance of certainty is lost. Sometimes the arguments from Herodotus’ silences are less than compelling and are just maddening.

Herodotus does not have a convenient supranational grid to hand, nor evidently does he have any compelling reason to develop one. Remember his purpose as set out in his Proem is simply to explain the origin of the conflict between the barbarians and the Hellenes. His focus is on the eighty years from the Lydian king Croesus’ conquest of the Ionian city-state Ephesus in 559 down to Xerxes’ spectacular battle at Thermopylae, and the naval battles off Artemision and Salamis in 480; and to the decisive Persian defeats in 479 at Plataea and Mycale, so all of his focus is in the late Archaic age but within living memory. Notably, some four hundred or so years later, the Romans do not develop a grid either. In fact, the compelling reasons in the Western world to develop a supranational grid are not secular at all, they come from the Christian religion; but even then there is no great haste in the matter. As we have seen, it is another five hundred years after the creation of the Julian calendar that a Scythian monk determines that Anno Domini might make a sensible benchmark for such a future grid; but another eleven hundred years would drift by before our now quite familiar BC/AD time-line was seriously proposed, and still another one hundred and fifty years after that before its universal adoption. If necessity is the mother of invention, Herodotus has no need for a date—not that he would have eschewed one if such were readily available. We must not forget, Herodotus creates a completely new literary genre—accomplishment enough one would think.

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