Mesopotamia and Iran in the Persian Period: Conquest and Imperialism 539-331 BC

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Achaemenid Chronology and the Babylonian Sources

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Babylonian and Achaemenid chronology according to Ptolemy

Prior to the discovery and interpretation of the Mesopotamian cuneiform inscriptions the fundamental source for the chronology, both relative and absolute, of the later Babylonian and Achaemenid kings (747–324 BC) was the king-list known as Canon Basileon, compiled by the astronomer Claudius Ptolemaeus (Ptolemy) of Alexandria (fl. c. AD 130–175) perhaps borrowing from the work of earlier astronomers of Alexandria. It was published in his Handy Tables, and survives in a considerably augmented form in Byzantine versions of Theon of Alexandria’s revision of the Handy Tables. The most recent edition is by G. J. Toomer (1984: 9–12).

Ptolemy’s Canon was compiled for astronomical purposes, to achieve consistency in citing and manipulating original astronomical data. So it deliberately uses two chronological conventions: the Egyptian year of 365 days and the era of Nabonassar (Babylonian Nabu-naṣir). The first year of each king’s reign was assumed to begin on the first day of the month Thoth preceding the actual date of the king’s accession. In the case of Nabonassar whose first full regnal year began in the spring of 747 BC, Ptolemy’s scheme equates to a beginning of his reign on 26 February 747 BC.

In his great astronomical treatise, the Almagest, Ptolemy explains that he uses the era of Nabonassar, ‘For that is the era beginning from which the ancient observations are, on the whole, preserved down to our time’ (Almagest III 7; Toomer 1984: 166). This corresponds with the fact that the earliest surviving Neo-Babylonian astronomical record apparently refers to the accession year of Nabu-naṣir. This text records four lunar eclipses actually observed in the years 747–746 BC. It is in fact the first record of consecutive astronomical phenomena
to bottom but sideways. Each tablet had parts of twelve Saros cycles on the obverse and part of twelve more on the reverse. The complete Saros cycle of thirty-eight eclipses (or possibilities) was divided up into segments and written on (probably) eight tablets, of which we have fragments of three. If the series be deemed to start with the first eclipse of the reign of Nabonassar (which is not yet proven) then the surviving fragment of Sachs et al., 1955: no. 1414 dealt with (at least) eclipses 34 and 35 of the cycle, Sachs et al., 1955: no. 1415 dealt with (at least) eclipses 16–20, and Sachs et al., 1955: no. 1419 dealt with (at least) eclipses 26–28. In all probability each table dealt with five eclipses, with a final tablet covering eclipses 36–38. On the lunar eclipse table fragment Bild 32234 (Sachs et al., 1955: no. 1419). Parts of five columns survive on each side. The numbering of the columns reflects the proposed overall scheme of 24 cycles. The eclipse possibilities are identified by month and year of the Babylonian or Achaemenid king and by day, month and year in the Julian calendar. Each column is eighteen years later than the previous column, and reading down the columns each eclipse possibility is no more than the previous probability.
chronological range of the series is proven by Sachs et al. 1955: no. 1414; although it is only the bottom left-hand corner of a tablet, its first preserved eclipse possibility (eclipse 35) is datable to 9 April 731 BC (in year 1 of Ukin-zer) and its last to 13 December 317 BC (in year 7 of Philip Arrhidaeus). While it would be presumptuous to suggest that these tablets represent Hipparchus' and Ptolemy's original Babylonian source, their source must have been something similar.

Two other features of this particular series of tablets are of interest. The times of eclipses are given, and, on each occasion in the preserved text where it is noted that an eclipse was not observed at Babylon, a precise time is given for the luni-solar opposition (syzygy); in many cases this time corresponds closely to the time of an eclipse observable somewhere on the earth's surface. The earliest attested predictions appear to be rounded (perhaps to the nearest hour); nevertheless we appear to be dealing with a surprisingly sophisticated eclipse theory already in the eighth or seventh century BC (Stephenson and Steele, forthcoming).

In addition the tablets apparently gave details, at the appropriate points, of the death of the reigning king. Such details are a useful supplement to the deductions which one can make from changes in the dating of contemporary economic texts. Only one such reference is preserved in this series of lunar eclipse tables (but see also below on the solar eclipse text BM 71537), but curiously, apart from a single brief citation (A. Sachs quoted in Parker and Dubberstein 1956: 17), it remains unpublished. It concerns the death of Xerxes, shortly after a partial lunar eclipse which can be dated to 5 June 465 BC (corresponding to the third month of Xerxes' year 21):

BM 32234 (Sachs et al. 1955: no. 1419) Rev. col. xvi
(the beginning of the eclipse report is lost)

ina [18?] [...]
40º GAR [R u ZALÁG] [TÚG] AN [GAR]
ina KI 4-AM ār šā PA ād KIN DIR
IZI têm} [ši]-ši-ši-dumu-ši GAZ-ši

'... in 18º [...]; 40º (duration) of onset, totality and clearing up], the "garment of the sky" was present; (the moon) was eclipsed in the area of the rear group of four stars of Sagittarius. (There was an) intercalary month Ulul. On the fourteenth(?) day of the month Ab, Xerxes - his son murdered him.'

Similar features appear in the only known example of a text detailing observed and possible solar eclipses in Saros cycles, BM 71537. Here too horizontal rulings separate successive eclipse possibilities and vertical rulings separate the eclipse cycles, but this tablet turns from top to bottom and the columns continue directly from obverse to reverse. Given the relative infrequency of observed solar eclipses, the small script employed and the very compressed format of this particular tablet, it seems possible that the entire eighteen-year cycle is contained on a single tablet. It is also possible that with twelve eclipse cycles on each side the tablet might have covered the time-span from Nabonassar to Philip in the same manner as