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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The lunar calendar

The finer details of historical chronology depend on an understanding of local calendars. It has long been widely accepted that we have detailed control of the lunar calendar of the Neo-Babylonian and Achaemenid periods on the basis of the evidence of contemporary economic and astronomical records. The fundamental tables were printed forty years ago (Parker and Dubberstein 1956) and have never been seriously questioned. The principal problem involved is to determine the years in which a thirteenth lunar month, the 'intercalary' month, was added to bring the lunar year back into line with the solar year, and which intercalary month (second Ulul, month 6b, or second Addar, month 12b) was used. The first list of attested intercalary months for the period was published by F. X. Kugler[12] and was updated

on the basis of new material by Parker and Dubberstein (1956: 4–9). A point of particular interest is when the standard nineteen-year cycle of seven intercalations, known as the 'Metonic cycle' after the Greek astronomer Meton who introduced it to the Athenians in the late fifth century BC, was introduced in Babylonia. Historians of Babylonian astronomy have in recent decades come to the conclusion that the cycle was known to the Babylonians by about 500 BC, and indeed have regarded its recognition as one of the significant factors in the early development of mathematical astronomy in the fifth century BC.[13] Prior to this point, although the New Year never shifted far from the spring equinox it is not clear that any mathematical principle of intercalation was applied.

In this regard it is interesting to note how the evidence for intercalation in the royal archives from Persepolis complements the evidence from Babylonia. The Persepolis Fortification Tablets date to the years 13–28 of Darius I (Hallock 1969: 1 and 3), while the Persepolis Treasury Tablets date from year 30 of Darius I to year 7 of Artaxerxes I (Cameron 1948: 32).[14] The following table summarises the available data for this period. The figures for Babylonia include texts dated to the months Ulul and Addar which indicate that a succeeding intercalary month was expected by the use of ITU MN IGI-*ú* (*maḫrû*), 'first month MN'.

BC	Darius	Month	Economic texts (numbers only) Persepolis	Babylonia	Babylonian astronomical tables
509/508	13	12b	0	4	
506/505	16	12b	1	12	
503/502	19	6b	5	3	Sachs *et al.* 1955: no. 1393
500/499	22	12b	8	5	
498/497	24	12b	7	7	
495/494	27	12b	1	4	
492/491	30	6b	1	0	
490/489	32	12b	1	3	Sachs *et al.* 1955: no. 1422+
487/486	35	12b	0	2	
	Xerxes				
484/483	2	6b	3	0	
482/481	4?	12b	0	1	
479/478	8?	6b	0	1	
476/475	10	12b	0	0	Sachs *et al.* 1955: no. 1422+
474/473	12	12b	2	0	
471/470	15	12b	0	0	Sachs *et al.* 1955: no. 1422+
468/467	18	12b	0	0	Sachs *et al.* 1955: no. 1422+
465/464	21	6b	0	0	Sachs *et al.* 1955: no. 1419
	Artaxerxes I				
463/462	2	12b	0	0	Sachs *et al.* 1955: no. 1387
460/459	5	12b	1	0	Sachs *et al.* 1955: nos. 1422+, 1388

The principle of seven intercalations in nineteen years is observed (there were intercalations previously in the years 514/513 BC and 511/510 BC (years 8 and 11 of Darius I)). The series has to be completed from the astronomical tables just discussed, but these tables do not conflict with the available economic texts. Most interestingly, the pattern of intercalations is the same at Persepolis as in Babylonia. One wonders how this was achieved. Did Babylonian astronomers advise or instruct the Persian court? Or if the 'Metonic cycle' really had its genesis in this period, did Darius himself have a hand in its origin? It is not difficult to imagine the man who won an empire for himself and ordered the invention of a new cuneiform script for the Persian language instructing his scholars, 'Give me a calendar'. But such speculation may be too fanciful, and the astronomical argument probably stands on firmer ground.

It must be admitted, however, that there are still a few problems with the list of intercalary months during the later years of the Achaemenid empire. For instance, in the sixteenth year of Darius II (408/407 BC), three sources suggest an intercalary Ulul but one an intercalary Addar; in the sixteenth year of Artaxerxes II, two sources suggest an intercalary Ulul but one an intercalary Addar; and two sources (including a contemporary astronomical Diary) suggest an intercalary Addar in the twentieth year of Artaxerxes II (385/384 BC) whereas two other sources (including the Saros canon) attribute the intercalary month to his twenty-first year. These would be minor problems but for the fact that from the reign of Xerxes onwards the evidence from contemporary economic texts diminishes to a small trickle, and from about 370 BC onwards we are very largely dependent on the evidence of the Saros Canon, which, as was explained above, is in principle an expression of Babylonian eclipse theory of the Seleucid period, not history. Indeed it is clear from the evidence of the confused statements of another Babylonian text (BM 33809, unpublished; see provisionally Frame 1992: 18), apparently attempting to list years in which there was an intercalary Ulul, that at least some Babylonian scribes of the Seleucid period did not have access to accurate information about earlier patterns of intercalation. Thus while the chronology of the later Achaemenid period is not likely to be in doubt at any point by more than a month, more supporting evidence in the form of economic or other texts would be welcome.