PARTHIAN CALENDARS AT BABYLON AND SELEUCIA ON THE TIGRIS

By

G.R.F. ASSAR

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INTRODUCTION

Concealed in a large number of both unedited and published Babylonian cuneiform texts of the period 555-331 B.C. are several hundred citations of intercalary months. These have served to identify the true structure of the late Babylonian lunisolar calendar and its regulating cycle of intercalations. We now know that beginning with the third year of Cambyses in 527 B.C., this calendar was stabilised by an octaeteris whereby three additional months were intercalated during an eight-year cycle. We also know that at the start of the nineteenth year of Darius I in 503 B.C. the octaeteris gave way to a far more accurate scheme consisting of seven intercalary years in a nineteen-year period.

The epigraphical evidence pertaining to the application in Mesopotamia of the reformed Babylonian calendar after the fall of the Achaemenid Empire in 331 B.C. is relatively abundant. We have a substantial number of cuneiform tablets from the Macedonian, Seleucid and Parthian periods that are dated according to this calendar though with differing eras under the latter two epochs.

Insofar as the numismatic evidence is concerned there are no known Seleucid coins from the mint of Seleucia on the Tigris noting both the year and month of the issue. On the other hand, the extant coins confirm that after Mithridates I conquered Mesopotamia in 141 B.C. the Parthians utilised the Macedonian style of the Seleucid calendar for dating their regal coinage struck at that same mint. This calendar had already been synchronised with the Babylonian scheme before Alexander III died in 323 B.C. Yet prior to the reign of Phraates IV the Seleucia mint restricted the practice to a single date either of the year or month of the emission.

Among numerous Parthian coins from Seleucia on the Tigris, there were known, prior to 1991, only four tetradrachms struck during embolismic (intercalary) years. Of these, the earliest lacked the mintage date while the remaining three gave no indication of the name of the intercalated months but provided three different year dates.

Despite their unquestionable importance, these dates contributed little knowledge to a satisfactory reconstruction of the Seleuco-Macedonian calendar and its intercalary cycle.

The fortuitous presence in a hoard of Parthian tetradrachms, discovered in mid 1991*, of a small number of coins from several embolismic years other than those already known, vastly extended our knowledge and so occasioned a thorough reassessment of this calendar. Two of these bear, in addition to their year dates, the month names either in full or abbreviated for convenience. These are respectively supplemented by EM and ΕΠΠΟ, the latter being a degenerated truncation of ἔμβολομος, to signify the intercalary quality of the accompanying months. We now have incontrovertible evidence that the Parthian calendar at Seleucia on the Tigris too was regulated by the well-attested Babylonian nineteen-year intercalary scheme with seven embolismic years in its cycle. We can further show that in 48 B.C., under Orodes II, the Parthians retarded this calendar and began the year with the month Hyperberetaios rather than the traditional Dios. Finally, we can reveal that in A.D. 67 the Parthian calendarists restored the Seleuco-Macedonian calendar to its original state and again took Dios as the first month of the year. I should, nevertheless, stress that in establishing the organisations of the Babylonian and Macedonian calendars, I have had to rely on a great volume of material in several public and private collections. This would not have been possible without the support of Messrs Christopher Walker, Deputy Keeper of the Department of the Ancient Near East at the British Museum, who permitted me repeated examinations of the cuneiform tablets he supervises, and David Sellwood, for his indispensable advice and permission to access his extensive collection of Parthian coins.

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I. THE REFORMED BABYLONIAN CALENDAR

The time lapse between two consecutive conjunctions of the earth, the moon, and the sun is termed the *synodic month* or *lunation*. It is, on the average, 29.53059 days long but can vary by about thirteen hours depending on the velocities of the earth and the moon. This is the month of the calendars and was known to the Babylonian astronomers of c. 700–500 B.C. with roughly the same accuracy as the modern value.

The earth, in its turn, orbits the sun and returns to conjunction with an appropriately chosen fixed star after 365.25636 days (365° 6′ 9″). This is known as the *sidereal* year and was the solar year of all Babylonian lunisolar calendars.

For a complete revolution around the sun, e.g. two consecutive crossings of an equinoctial point, the earth requires 365.24220 days (365° 5′ 48″). This is the *tropical* year which determines the succession of seasons.

The difference of almost 20 minutes between these two solar years is primarily due to the precession of the equinoxes to the west at the rate of approximately 50.26″ of an arc-degree per annum. This remains virtually undetectable in the course of only a few years. But the cumulative disparity becomes perceptible over several millennia, e.g. 60 days in about 4300 years.

It is obvious from the above figures that a solar year is about eleven days longer than twelve months (354.37 days) and roughly nineteen days shorter than thirteen. Accordingly, it would be practically impossible to make up a lunation from a constant number of days or a solar year from a whole number of months or even of days. This natural discord eventually became a fundamental problem for the early Babylonian astronomers who struggled for centuries to stabilise their lunisolar calendars.

The Sumerians who settled in Mesopotamia around 3000 B.C. devised a simple calendar with twelve months of 29 or 30 days long depending on the apparition of the lunar crescent. The names of their months varied from city to city and were often derived from agricultural activities and feasts in honour of deities. The extant records confirm that by the reign of the Babylonian king Ḫammurabi (c. 1792–1750 B.C.) uniformity was imposed and the calendar months were given names that are essentially the same as the Aramaic ones known from the Jewish calendar (Table 1). At the same time, the fiscal requirements of the central government demanded certain stability in the calendar. This gave rise to the introduction of extra months to keep the lunar and solar years in approximate accord. Sumerian records as early as c. 2400 B.C. give evidence of the intercalation of a month from time to time to retain the traditional month of barley harvest in the harvest season (April/May). But, in order not to disturb the divinely instituted succession of the months, the name of the intercalated month was derived from the one immediately preceding it. A letter from Hammurabi to the governor of Larsa in southern Mesopotamia gives:

Since the year has a deficiency, let the month that is beginning be registered as the second Uitila.

At the same time, he hastens to add that tributes must arrive in Babylon on the 25th day of the intercalary and not that of the following normal month Tašritu.

The Babylonians of the first millennium B.C., possessing a mathematical basis for detailed astronomical computations, made greater advances in the field of practical astronomy. Some of their records were transmitted to the Assyrians, whose astronomers sent systematic reports to the royal court from around 700 B.C. although making no clear distinction between the astronomical and meteorological phenomena. However, the Assyrian court astronomers were already aware that solar and lunar eclipses were only possible at the end and in the middle of a month respectively. Pottery reports that Babylonian eclipse records were available to him from the time of Nabunassar (747–734 B.C.).

The first month of the Babylonian lunisolar calendar was Nisanu whose neomenia occurred about the time of vernal equinox. Each year comprised twelve months of 29 or 30 days long depending on the observation of the new moon. This was alternated with years of thirteen months when intercalation was necessary.

For dating individual years, the early Babylonians employed two different methods. In the first of these, each year was named after its outstanding event, e.g. the victory of a king over his rival or the building of a temple. In the second, they counted up the number of regnal years of their rulers. These methods would have been thoroughly reliable had all the dated documents survived with no scribal errors or omissions. Sadly, they have not.


### TABLE 1. Correlation of Months in the Sumerian, Babylonian, Macedonian and Julian Calendars.

<table>
<thead>
<tr>
<th>No.</th>
<th>Sumerian¹</th>
<th>Akkadian (Babylonian)</th>
<th>Julian¹</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>BÁRA-ZAG-GAR-RA</td>
<td>Nabu</td>
<td>Mar-Apr or Apr-May</td>
</tr>
<tr>
<td>II</td>
<td>GUŠ-SI-SÁ</td>
<td>Aššur</td>
<td>Apr-May or May-Jun.</td>
</tr>
<tr>
<td>III</td>
<td>SIG₂-GA</td>
<td>Samu</td>
<td>May-Jun. or Jun-Jul.</td>
</tr>
<tr>
<td>IV</td>
<td>ŠULURU</td>
<td>Dūlu</td>
<td>Jun-Jul. or Jul-Aug.</td>
</tr>
<tr>
<td>V</td>
<td>NE-NE-GAR-RA</td>
<td>Abu</td>
<td>Jul-Aug. or Aug-Sep.</td>
</tr>
<tr>
<td>VI</td>
<td>KIN-ŠANNA</td>
<td>Ululu</td>
<td>Aug-Sep. or Sep-Oct.</td>
</tr>
<tr>
<td>VI₂</td>
<td>DIRI-KIN-ŠANNA</td>
<td>Atrašā Ululu</td>
<td>(September-October)</td>
</tr>
<tr>
<td>VII</td>
<td>DUG₂-KU</td>
<td>Taššu</td>
<td>Sep-Oct. or Oct-Nov.</td>
</tr>
<tr>
<td>VIII</td>
<td>API-ŠE-A</td>
<td>Aralšamu</td>
<td>Oct-Nov. or Nov-Dec.</td>
</tr>
<tr>
<td>IX</td>
<td>GAN-GAN-Ĕ</td>
<td>Kiššumu</td>
<td>Nov-Dec. or Dec-Jan.</td>
</tr>
<tr>
<td>X</td>
<td>A-B-Ĕ</td>
<td>Šešu</td>
<td>Dec-Jan. or Jan-Feb.</td>
</tr>
<tr>
<td>XI</td>
<td>ZIZ-A</td>
<td>Šeššu</td>
<td>Jan-Feb or Feb-Mar.</td>
</tr>
<tr>
<td>XII</td>
<td>ŠE-GUR₂₄-KU³</td>
<td>Addaru</td>
<td>Feb-Mar or Mar-Apr.</td>
</tr>
<tr>
<td>XII₂</td>
<td>DIRI-ŠE-GUR₂₄-KU³</td>
<td>Atrašā Addaru</td>
<td>(March-April)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>No.</th>
<th>Seleucid and Parthian (Original Calendar Before Retardation)</th>
<th>Parthian (After Retardation 487 B.C. - A.D. 667)</th>
<th>Julian¹</th>
</tr>
</thead>
<tbody>
<tr>
<td>VII</td>
<td>Artemisios</td>
<td>Xandikos</td>
<td>Mar-Apr or Apr-May</td>
</tr>
<tr>
<td>VIII</td>
<td>Daisios</td>
<td>Artemisios</td>
<td>Apr-May or May-Jun.</td>
</tr>
<tr>
<td>IX</td>
<td>Panemos</td>
<td>Daisios</td>
<td>May-Jun. or Jun-Jul.</td>
</tr>
<tr>
<td>X</td>
<td>Laos</td>
<td>Panemos</td>
<td>Jun-Jul. or Jul-Aug.</td>
</tr>
<tr>
<td>XI</td>
<td>Gorpiaios</td>
<td>Laos</td>
<td>Jul-Aug. or Aug-Sep.</td>
</tr>
<tr>
<td>XII</td>
<td>Hyperberetios</td>
<td>Gorpiaios</td>
<td>Aug-Sep. or Sep-Oct.</td>
</tr>
<tr>
<td>XII₂</td>
<td>Hyperberetios-Emboliomos</td>
<td>Gorpiaios-Emboliomos</td>
<td>(September-October)</td>
</tr>
<tr>
<td>I</td>
<td>Dios</td>
<td>Hyperberetios</td>
<td>Sep-Oct. or Oct-Nov.</td>
</tr>
<tr>
<td>II</td>
<td>Apellios</td>
<td>Dios</td>
<td>Oct-Nov. or Nov.</td>
</tr>
<tr>
<td>III</td>
<td>Aduasiaios</td>
<td>Apellios</td>
<td>Nov-Dec. or Dec-Jan.</td>
</tr>
<tr>
<td>IV</td>
<td>Peritia</td>
<td>Aduasiaios</td>
<td>Dec-Jan. or Jan-Feb.</td>
</tr>
<tr>
<td>V</td>
<td>Dystros</td>
<td>Peritia</td>
<td>Jan-Feb. or Feb-Mar.</td>
</tr>
<tr>
<td>VI</td>
<td>Xandikos</td>
<td>Dystros</td>
<td>Feb-Mar or Mar-Apr.</td>
</tr>
<tr>
<td>VI₂</td>
<td>Xandikos-Emboliomos</td>
<td>Dystros-Emboliomos</td>
<td>(March-April)</td>
</tr>
</tbody>
</table>

1. The Sumerian month names were subject to local variation and often abbreviated to BÁR/BAR; GUŠ/GUD; SIG₂/SIG₂; ŠU; NE/IZI; KIN₂; DUG₂/DUL₂; API; GAN; AB; ZIZ and ŠE. The two intercalary months too were given as KIN₂-KĀM, KIN-Saharan, KIN-DIRI and DIRI-ŠE, ŠE-DIRI, ŠE-DIRI₂, ŠE-ŠE-s₂, ŠE-ar-s₂, ŠE-ar-s₂, and other variants. Occasionally, XII₂ and VI₂ are simply represented by A and KIN₂-A, respectively, in certain astronomical records.

2. According to the year and intercalary month of the cycle, the Babylonian and Macedonian months cover two different periods in the Julian calendar.

3. The Macedonian months were: AIOΣ, ΑΠΛΑΛΑΙΟΣ, ΑΥΑΝΑΙΟΣ, ΠΕΡΙΠΟΣ, ΔΥΣΤΡΟΣ, ΤΩΝΔΙΟΣ, ΑΡΤΕΜΙΣΙΟΣ, ΔΑΙΞΙΟΣ, ΠΑΝΗΜΟΙΟΣ, ΛΟΙΟΥ, ΓΟΡΠΙΑΙΟΣ, ΥΠΕΡΒΕΡΕΤΑΙΟΣ. An intercalation was signified by the addition of ΕΜΒΟΛΙΜΟΣ (inserted) to the month name although the latter is often omitted. The same month names or their variants and abbreviations appear on dated Parthian coins in their genitive form. Hence ΔΙΟΣ, ΑΠΙΛΑΛΑΙΟΣ, ΑΥΑΝΑΙΟΣ, ΠΕΡΙΠΟΣ, ΔΥΣΤΡΟΣ, ΤΩΝΔΙΟΣ, ΑΡΤΕΜΙΣΙΟΣ, ΔΑΙΞΙΟΣ, ΠΑΝΗΜΟΙΟΣ, ΛΟΙΟΥ, ΓΟΡΠΙΑΙΟΣ, ΥΠΕΡΒΕΡΕΤΑΙΟΣ, and ΕΜΒΟΛΙΜΟЙ.
It has been suggested that as a result of centuries of observations the Babylonian astronomers under Nabunad of 235 lunations and 19 solar years have practically the same number of days. However, proof for this is lacking and the inspection of extant evidence reflects a complete absence of cyclic intercalation prior to 527 B.C.

After the conquest in 539 B.C. of 527 B.C., the founder of the Achaemenid dynasty, Cyrus II (559–529 B.C.), adopted the Babylonian calendar with its rudimentary intercalary scheme. But with the reign of his son and successor, Cambyses (529–522 B.C.), a regular scheme brought the anticipated stability and superseded the empirical intercalations of the past two millennia. In the third year of this king, starting in Nisānu 527 B.C., a second Ulūlu (VI₂ hereafter) was intercalated followed by an intercalary Addaru (XII₂ hereafter) in his fifth and eighth years (525/4 and 522/1 B.C.), respectively. This is the first indubitable occurrence of the octaeteris count in which years 1, 3, and 6 of an eight-year cycle were intercalary.

The second and third cycles began in 519 and 511 B.C. and ended in 512 and 504 B.C., respectively. However, this scheme entailed a deficiency of about 1.6 days in eight years (99 lunations × 29.53059 days – 8 × 365.2422 = 1.59 days/8 years) and thus called for a more accurate approach to prevent a persistent slippage in the date of the Babylonian New Year’s Day.

The expected fourth cycle commenced on 1 Nisānu 503 B.C., the nineteenth year of Darius I (522–486 B.C.). This date inaugurates the widely attested Babylonian nineteen-year intercalary cycle whose original discovery and application have been incorrectly but habitually attributed to the great Greek astronomer Meton who, on 27 June 432 B.C., introduced a similar scheme at Athens for astronomical purposes.

The improved Babylonian method stipulated seven intercalations every nineteen years beginning with a VI₂ in year 1 and a XII₂ in years 3, 6, 9, 11, 14, and 17. It thus drastically reduced the residual error of the calendar to about one day in 219 years (235 × 29.53059 – 19 × 365.2422 = 0.087 day/19 years) and ensured that the first year of each cycle remained practically coincident with the vernal equinox.

The evidence from dated cuneiform texts of the Achaemenid period suggests that at first the Babylonians failed to thoroughly appreciate the merits of their newly formulated scheme and violated its rules in several occasions. Beginning in 503 B.C., they intercalated a XII₂ in year 4 rather than 3 and a VI₂ in year 12 instead of a XII₂ in year 11 of the first cycle. In the next, starting in 525 B.C., a VI₂ instead of a XII₂ was intercalated in year 1 while the fourth and fifth cycles, beginning in 446 and 427 B.C. respectively, had a XII₂ rather than a VI₂ in their first years. Finally, year 5 instead of 6 in the seventh cycle had a XII₂. While these anomalies cast some uncertainty over the application of a regular cycle before 370 B.C., there is little doubt that with the termination of the octaeteris in 503 B.C., the subsequent groups of seven intercalations were implemented on a nineteen-year periodicity.

In 331 B.C. Alexander III marched his army into Babylon and thus brought the Macedonians and Greeks into contact with a calendar far superior to any used for civil purposes in the Greek cities. Naturally, it was the Macedonian that had to be equated with the Babylonian calendar and follow its enhanced cycle of intercalations. Proof for this is found in two contemporary cuneiform records. The first is a small fragment of an Astronomical Diary whose month and year number are lost but restored, on astronomical grounds, to Aiāru 323 B.C. It reports the death of Alexander in his fourteenth regnal year as follows:

Obv. 8: .... 29 LUGAL NAMmāt ....
.... (On) the 29th (day), the king died; ....

Given that according to the Macedonian reckoning this happened on 29 Daisios, the above text very strongly implies that the two calendars had been synchronised before Alexander died on 10/11 June 323 B.C.

The second record, supported by the non-contemporary “Saras Canon”, confirms that Alexander’s year 13 had a XII₂ beginning on 15/16 March 323 B.C. Considering that Daisios was already equated with Aiāru in 323 B.C., this demands that the Macedonian intercalary Xandikos be coincident with XII₂ of the Babylonian calendar two months earlier.

The alignment of these four months renders the assimilation of the two systems complete and proves that the Macedonians had unambiguously adopted the Babylonian intercalary scheme prior to 323 B.C. However, there remained a minor but notable difference between the two calendars. While the Babylonian began the year with 1 Nisānu in spring, the Macedonian started six months earlier with 1 Dios in autumn (Table 1). This meant that the first six Babylonian
months had the same year number as those in the second half of the Macedonian year while the ones in the second half of the Babylonian remained one year behind those in the first half of the Macedonian calendar.

After Alexander's death, his half-brother, Philip III Arrhidæus (323–316 B.C.), succeeded as king. He was a half-witted man and the only member of the Macedonian royal house that had escaped Alexander's wrath. Before long, Philip was imprisoned by Alexander IV (316–312 B.C.), the posthumous son of Alexander from Roxané daughter of Oxyartes, a Sogdian noble and snaprat of the Hindukush region. But cuneiform texts confirm Philip as the principal sovereign since there are no Babylonian records in the name of joint rulers and the earliest texts acknowledging Alexander IV as king² come from Philip's eighth regnal year (316/5 B.C.). Meanwhile, the recipient of Alexander's signet ring, Perdiccas, emerged among his marshals as the regent of the empire. Yet these appointments failed to procure peace and stability. The kingdom was quickly divided and Alexander's generals fought one another for over thirty years to gain a bigger share of it (wars of the Diadochi).

One of these warlords was Seleucus (312/1–281 B.C.) who had been ordered by Alexander in 324 B.C. to marry Apame, daughter of the Sogdian satrap Spitamenes. With the assassination of Perdiccas in 321 B.C., Alexander's old viceroy of Europe, Antipater, assumed the role of regent of Philip III and Alexander IV, and appointed Seleucus satrap of Babylon. However, the entire situation changed when Antipater died in 319 B.C. and left his office not to his son, Cassander, but to an officer of his own generation, Polyperchon. Philip and his wife were murdered by Olympias, mother of Alexander III, in late autumn — early winter 317 B.C., but Cassander eliminated her, gained control of Macedonia, and imprisoned Alexander IV and Roxané. Fearing the rising power of Antigonus Monophthalmus, the "One-eyed" marshal of Antipater's army and the satrap of Phrygia and Lycia, Seleucus fled to Ptolemy in Egypt in 316 B.C. In the meantime, Antigonus consolidated his position in the east and then turned west to attack Ptolemy. But the defeat of his son, Demetrius Poliorectes, in 312 B.C. at Gaza afforded Seleucus the opportunity to return to the east at the head of a small army given to him by Ptolemy. In the late summer or early autumn 312 B.C. Seleucus was welcomed into Babylon and re-established his dominion there. Shortly after, in 311 B.C., he began enumerating his satrapal years in Babylon. This point later became the antedated epoch of the Seleucid Era according to the Babylonian reckoning (SEB). Yet cuneiform records continued to be subscribed to Alexander IV down to 306/5 B.C. with sporadic references to Seleucus as the "General" of the army.¹³

Seleucus' struggle with Antigonus for control of Babylon appears to have lasted until February/March 305 B.C. when he finally prevailed and took the title "king". A small fragment of an astronomical tablet in the British Museum establishes the first year of Seleucus' kingship and probably gives a brief account of the final battle between the two contenders.¹⁴ The relevant line of the record reads:

Col. II.12: [MIJ]-7-KAM 'I-uh-ak LUGAL šI 31-i
MI-1-KAM
[Ye]ar 7 (of SEB), King Seleucus, which is year 1 (of his kingship)

It is evident from this double-dated text that at that point in time Seleucus had not yet formally backdated the beginning of his rule to year 1 SEB. But this may have happened shortly afterwards since, starting with year 8 SEB, documents from the remainder of his reign are all singly dated¹⁵ as though he had been king from 1 Nisanu (2/3 April) 311 B.C.

The introduction of this scheme meant that there would be no double-dated records from years 2–25 of Seleucus’ original kingship (8–31 SEB) save an isolated reference to his year 4 in an Astronomical Diary fragment which equates with 10 SEB (302/1 B.C.).¹⁶

Following the assassination of Seleucus in year 31 SEB,¹⁷ his son and co-regent from 294 B.C., Antiochus I (281–261 B.C.), continued to count his father's regnal years.¹⁸ The succeeding Seleucid kings followed his example and so finally ended the millennia long practice of dating by accession and regnal years in Babylonia.

An inspection of the extant Seleucid cuneiform tablets confirms that these too were dated on the reformed Babylonian calendar and followed its post 370 B.C. intercalary cycle.¹⁹ For example, the VI₂ in 170 SEB²⁰ was 6 × 19 = 114 years later than the one in 56 SEB²¹ which in turn came 6 × 19 = 114 years after the VI₂ in year 35 (370/69 B.C.) of Artaxerxes II.
(405–359 B.C.). At the same time, the XIIo in 77 SEB was 3 x 19 = 57 years later than that in 20 SEB (both corresponding to year 3 of their respective cycles).

In the mid-summer of 141 B.C., the true founder of the Parthian Empire, Mithradates I (c. 171–132 B.C.) defeated the Seleucid forces and conquered Mesopotamia. A partially preserved cuneiform text reports the victorious march of the Parthian army into the royal city of Seleucia on the Tigris and from there to Babylon on 28 Simanu 171 SEB (7/8 July 141 B.C.).

It also gives the earliest example of the double-dating formula whereby Seleucid and Arsacid Eras were concurrently used after the Parthian triumph in Babylonia:

Rev. 3: .... [MU-1-me-7-K]ĀM ša ši-i MU-1-me-1,11-KĀM .... .... [year 107], which is year 171, ....

The epoch of the Arsacid Era (AE) was 1 Nisānu (14/15 April) 247 B.C. This is taken to be either the "fictitious" accession year of the eponymous founder of the Parthian dynasty, or the insurrection date of the Aparni tribe led by their chieftain, Arsaces I (c. 238–211 B.C.).

Having examined several hundred tablets of the Parthian period, I can now confirm that in a number of cases the scribes evidently truncated the customary formula and recorded only a single Seleucid, but not Arsacid, Era date. The earliest of these is found on the lower edge of an Astronomical Diary for year 175 SEB (137/6 B.C.) where the excerpted date reads:

'MU-1-me-1,15-KĀM 'Ar ša-ka-a LUGAL Year 175, King Arsaces.

while the latest forms the colophon of an Almanac from year 355 SEB (A.D. 44/5):

[meš-hi ša KUR-šaš] ša 3š-UDU-IDIM-aš ša MU-3-me-55-<KĀM>
[Measurements of the entries of the planets (into zodiacal signs) for year 355 (throne name, Arsaces, excluded).]

At the same time, there appears to be a sizeable number of published texts with erratic double dates. Yet fresh collation of the original records have revealed that in reality no more than three are the result of scribal neglect causing the two epochal dates to be either 63 or 65 years apart instead of 64. The remainder are due solely to modern copyists' errors.

As for the regulating cycle of the calendar, we have a handful of contemporary Parthian cuneiform records in the period 172–305 SEB (140/39–76 B.C.) with intercalary months. Upon further analysis these prove to be harmonious with the nineteen-year cycle after 370 B.C. and thus ensure the uninterrupted application of the Babylonian scheme under the Arsacid rulers.

Sadly, the latest attested intercalation of the Parthian epoch is from year 305 SEB (7/6 B.C.) while the most recent cuneiform record is dated 385 SEB (A.D. 74/5). It is, therefore, impossible to ascertain whether or not the Babylonian intercalary mechanism remained unaffected in the intervening years. Nevertheless, the months in the last few astronomical records from 342–385 SEB (A.D. 31/2–74/5) have Babylonian names and appear in their original calendrical order. This enhances the likelihood that the regulating cycle of the calendar too persisted down to the last days of cuneiform writing in Babylonia and perhaps long afterwards.

II. THE MACEDONIAN STYLE OF THE Seleucid Calendar

After assuming the royal title in 305/4 B.C., Seleucus I backdated his first regnal year to 1 Nisānu 311 B.C. on the Babylonian calendar. At the same time, he employed the Macedonian reckoning and pushed his accession year to 1 Dios 312 B.C. (owing to the difference between the Macedonian and Babylonian beginnings of the calendar year). This became the antedated epoch of the Seleucid Era according to the Macedonian calendar (SEM). It was employed by the Seleucid court and the Greek cities of the realm for dating official and administrative documents. However, there are no records from Babylonia during its entire period of occupation by the Macedonian and Greek forces (331–141 B.C.) with either an embolismic or a Macedonian and its equivalent Babylonian month. We are, therefore, left to surmise that the synchronised scheme, probably authorised by Alexander well before his death, may have lasted until Mithradates I finally expelled the invaders in 141 B.C.

With the advent of the Parthians we are on firmer grounds although paucity of evidence persists for a
further twenty years before the first dated Arsacid
document emerges from Babylon. This is a rather
mutated rectangular limestone fragment dated 191
SEM (122/1 B.C.) with apparently seven lines of text.
The first of these is now practically unintelligible while
the traces in the last two cannot be resolved with any
certainty. What remains has been restored to read:

1 [traces]
2 [Βασιλεύοντος Μεσόλον Άρσάκου]
3 [Ἐφαρμοΰνας Φελέλληνος έτοιμον]
4 (vacat) ὦς ὥ δ' Βασιλεύοντος ἔγγεγρα
5 εἰ ὦς δὲ τό πρότερον Ἀσημι καὶ Π
6–7 [traces perhaps of a monthly name in line 7]

... (in the reign of) the Great King Arsaces,
(God) Manifest (and) Philhellene. In the year
(vacat), according to the king's reckoning, (but)
according to the former (reckoning), 191. ....

It is evident that the inscription was intended to bear
the double Arsacid-Seleucid date but sadly the
presumably untrained stone-cutter neglected the former
(the space has been left blank on the stone). It, nonethe-
less, confirms the currency of the new time reckoning
scheme in Babylon for dating records written in Greek.
There is a further fragmentary Babylonian text that
has retained its AE and SEM dates. It opens with:

1 [Βασιλεύοντος Μεσόλον Άρσάκου]
2 Εφαρμούνας Φελέλληνος έτοιμον]
3 ΊΑ καὶ Π ὦς ὥ Βασιλεύς [ἐγείρει ὥς δὲ τό
 πρότερον]
4 ΒΣ ....

... (in the reign of) [the Great] King [Arsaces],
(God) Manifest (and) Philhellene. In the year
137, according to the king's reckoning, (but)
according to the former (reckoning), 202. ....

Some scholars dismiss the 65 rather than 64 years
difference between the two epochal dates in this text as a
mere scribal error. Others put it down to a scheme that
utilised a Macedonian style Parthian calendar
beginning the year in autumn. But the arrangement of
dates in a letter of Artabanus II (c. A.D. 10–38) from
Susa and two Greek parchments from Dura-Europos
in the Parthian period explain this expected anomaly.
The first two and last lines of the Susa text read:

1 Ἐξελήφθη ὡδεύον Εὔσιοστοῦ
 διοικησιστοῦ ὦς ὥ βασιλεὺς ἔγει ὥς δὲ
 πρότερον τίτο Τριακόσιτον
 διοικησιστοῦ έτους]
2 Βασιλεὺς βασιλέων Ἄρσάκης Ἀντιόχω
 καὶ Φραντείς άντωνον ἐν Σούσοις τίτοις
 ἔμροσε καὶ τί τόη ὀλε ὑπερην ....]
3–14 [remainder of the text]
15 ΗΣ Αὐδονόπου (sic) ΙΖ

Received in the year 268, according to the
king’s reckoning, (but) according to the former
(reckoning). [in the year 335].
King of Kings Arsaces to Antiochus and
Phraates, the two archons in Susa and to the
city, greeting. ....
(Year) 268, (month) Audnnaios, the 17th.

The combined statements in lines 1 and 15 of the
letter place the date 17 Audnnaios 333 SEM (10/11
December A.D. 21) in the first half of the Macedonian
calendar with the corresponding AE date 268 being 65
years later. This strongly suggests that the first months
in the Seleuco-Macedonian and Parthian calendars
could not have been coincident.

The two Dura parchments too have preserved
double dates. They respectively give 13 Panemos 398
SEM = 334 AE and 26 Daisios 432 SEM = 368 AE,
both in the second half of the Macedonian year and with
a 64-year difference between their epochal dates.

The disparity between the date differences in the
letter of Artabanus II and the two Dura texts shows that,
as in cuneiform records, the epoch of the Arsacid Era in
Babylonian Greek documents too was 1 Nisanu 247
B.C. This naturally entailed a 65-year difference
between the SEM and AE dates when records were
dated in the first six months of the Macedonian year. It
also proves that there never was in operation in
Babylonia a Macedonian genre of the Arsacid time
reckoning with 1 Dios 247 or 248 B.C. as the epoch of
its era.

It is now possible to confidently date the second of
the above two Greek records from Babylon to the
period I Dios — 30 Xandikos 202 SEM (5/6 October
111–30/31 March 110 B.C.) in the reign of Mithradates
II (c. 121–91 B.C.).

Further to the north of Babylon, the mint at Seleucia
on the Tigris too appears to have operated the Seleuco-
Macedonian calendar for dating Parthian regal coins.
It has been suggested that the Arsacids emulated the Syrian or Phoenician practice of placing date on their coins although the technique for noting both the month and year of the issue — probably also an original Phoenician concept — was developed under them at Seleucia. Yet prior to the reign of Phraates IV (c. 38–2 B.C.), Parthian coins are seldom dated and even then only bear either the year or month of the emission. Beginning with the reign of the latter, both month and year of striking are invariably integrated in the inscription of Parthian tetradrachms. These were perhaps introduced for administrative convenience and to control the mint’s output. But the inherent flaws of hand striking and a progressive shrinkage of the coin flans, compared with the sizes of obverse and reverse designs, inevitably prevented the month-year combination from being always fully impressed on the coins.

Given the preponderance of dated Parthian emissions from Seleucia on the Tigris, I found it appropriate to separate them here into three distinct groups first and then briefly analyse their calendrical significance.

GROUP 1: includes the first indubitable dated Arsacid coins from that mint. These are the S13.2–5 tetradrachms and S13.8–10 drachms of Mithradates I struck after the Parthian victory of 141 B.C. (Fig. 1). Although historically important, they, and a handful of other year-dated types leading to the reign of Orodès II (c. 57–38 B.C.), contribute very little to the identification of the calendar of Seleucia.

GROUP 2: covers the dated tetradrachms of Orodès II. These inaugurate the month names in their abbreviated form that sadly supersedes the year of mintage. But at least one single year-date is also recorded giving ΓΟΞ = 273 SEM (40/39 B.C.).

Beyond the fact that Macedonian months were used at Seleucia during the reign of Orodès II, nothing can be gleaned from the coins in this group to reveal the framework of the calendar’s controlling cycle. However, a seemingly neglected tetradrachm of this king uncovers for us the identity of one of the two Macedonian embolismic months (cf. below).

GROUP 3: comprises the remaining dated Parthian tetradrachms beginning with the reign of Phraates IV and ending the series with an isolated issue for Vologases VI (c. A.D. 208–222) in A.D. 227/8. It is a small number of coins from this group that would finally unravel for us the order of intercalary years in the Seleuco-Macedonian calendar.

In a preliminary study aimed at establishing the initial month of the Parthian calendar at Seleucia I treated two overlapping tetradrachm series of Phraates IV and his rival Tiridates (c. 29–27 B.C.). Given the limitations of the extant material, little progress on the organisation of the calendar was made at the time although I noted a peculiar change in one of its two intercalary months.

As discussed earlier, the cuneiform and Greek records of the death of Alexander III lead to Aiaur = Daisios in 323 B.C. A slightly earlier record also gives XII in the Babylonian = embolismic Xandikos of the Macedonian calendar. Considering these equations and that the assimilation of the two schemes was complete renders coincident the Babylonian VI and the Macedonian Hyperberetaios-embolimos. But the date on a unique tetradrachm of Orodès II (Fig. 2) clearly upsets these alignments and signals a calendrical change. It gives, in the exergue of its reverse, the abbreviations ΓΟΞ ΕΜ ΤΙ. While the last two letters TI could well be the monogram of a mint magistrate, ΓΟΞ EM can only stand for Gorpiaios or Gorpiaios. This is the earliest evidence of the introduction of an intercalary month on a Parthian coin and indeed of all issues from Seleucia prior to and during the reign of Orodès II. It is also the first example to give Gorpiaios, not Hyperberetaios, as the end-of-year embolismic month of the calendar and thus confirm a shift in the arrangement of the Macedonian months. Accordingly, we can safely infer that with this move, the mid-year intercalary month of the cycle too changed from Xandikos to Dystros.

McDowell locates this calendrical reform in the period A.D. 15/16–46/47 while Bickerman speculates that it occurred during A.D. 17–31 due perhaps to a single excessive intercalation ordered by the Parthian king. However, although knowledge of precisely when, how and for what reason this happened is still lacking, insofar as the extant evidence is concerned, the terminus post quem for the shift is 48 B.C. (cf. below) and not the suggested A.D. 15–17. This proves that as early as autumn of that same year, the first month of the Parthian calendar at Seleucia had moved from Dios to Hyperberetaios. It also implies that there may even have been a link between the Arsacid time reckoning and the calendar of Antioch from 49 B.C. on with Hyperberetaios = October as its first month of the year.

In addition to the above example, there were already known, prior to 1991, three more Parthian
tetradrachms from different embolismic years\textsuperscript{51} in the period 26/5 B.C.–A.D. 78/9. Using these, several past students attempted to resolve the problem of intercalation in the Macedonian calendar. Yet insufficient evidence entailed unsatisfactory results and in one particular case\textsuperscript{52} the work in fact led to certain erroneous conclusions.

It is clear that lack and neglect of material have been instrumental in preventing determination of both the earliest date of the retardation and also cyclical intercalations of the Macedonian calendar. However, the situation changed following the discovery in 1991 of a large number of Parthian tetradrachms including a small group of examples from hitherto unattested embolismic years. Two of the coins in this hoard provided, in addition to their year of minting, the names of both intercalary months in the Macedonian cycle. Having secured some of these important pieces, I utilised the extra information to construct a complete and reliable picture of the calendar at Seleucia.

Below is chronologically set out the combined material from the hoard and the previously reported examples:

1. Tetradrachm of Phraates IV (S51.31), in exergue of reverse year \textit{ΣΙΣ} (287 SEM), month EMBO (Figs. 3).

2. Tetradrachm of Orodes III (S59.1), on reverse year \textit{ΣΙΣ} (317 SEM) behind king, in exergue month \textit{ΔΥΣΕΠΟΥY} (Fig. 4).

3. Tetradrachm of Orodes III (S59.2 var.), on reverse year \textit{ΣΙΣ} (317 SEM) behind king, EM (\textit{εινδυσεπου}) in front, in exergue month \textit{ΔΥΣΕΠΟΥY} (Fig. 5). The reconstructed month Dystros is secure. The traces of the three letters \textit{ΣΕΠ} of the month name are in the same position with respect to the word ΔΙΚΑΙΟΥ

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Fig. 1. Silver drachm of Mithradates I (S13.8), dated year ΓΟΡ = 173 SEM (140/139 B.C.), no month (reproduced from Wroth (1903), pl. III.11).

Fig. 2. Silver tetradrachm of Orodes II (S46.7), no year date, month ΓΟΡ = Gorpiatos-Embolormos (reproduced from Ars Classica-Nabille (1926), pl. 65.2246).

Fig. 3. Silver tetradrachm of Phraates IV (S51.31), dated year \textit{ΣΙΣ} = 287 SEM, month Embolormos = March/April 25 B.C. (Author’s Collection).
above them as those found on the previous example having an almost complete month name.

4 tetradrachm of Gotarzes II (S65.11 var.), on reverse year ΗΝΤ (358 SEM), in exergue month ΕΠΙΒΟΑΤ, a degenerated form of ἐμβολίῳς with letter M given as Μ (Fig. 6).

5 tetradrachm of Gotarzes II (S65.23 var.), on reverse year ΣΤ (360 SEM), in exergue ΕΠΙΒΟ (Fig. 7). The monogram Σ before the embolismic month represents Gorpiaios. It is also found on S63.5 tetradrachms of Artabanus II. This is the second known Parthian example confirming the retardation of the Macedonian calendar.

6 tetradrachm of Vologases I (S68.5 var.), on reverse year ΓΕΤ (363 SEM), in exergue ΕΠΙΒΟΑΛ (Fig. 8).

7 tetradrachm of Vardanes II (S69.10 var.), on reverse year ΘΕΤ (369 SEM), in exergue ΕΠΙΒΟΑ (Fig. 9).

8 tetradrachm of Vologases I (S70.6 var.), on reverse year ΖΟΤ (377 SEM), in exergue ΕΜΒΟΑΙΜ (Fig. 10).

9 tetradrachm of Vologases II (S72.7), on reverse year ΘΤ (390 SEM), in exergue ΕΜΒΟΑΤ (Fig. 11).

To formulate the Macedonian cycle of intercalations, it is imperative to ascertain which one of the above dates constitutes the first embolismic year of its respective cycle. Considering that in the Babylonian scheme the first is a mid-year intercalation in year one of the cycle, this automatically requires an end-of-year Macedonian intercalation (owing to the six-month difference between the beginning of year in the two calendars). In the above list, the only candidate for this
is the embolismic Gorpiaios in year 360 SEM (no. 5). Given that the first and last six months in the Babylonian and Macedonian calendars, respectively, have the same year number, the date 360 SEM can be taken as the first year of a simulated Babylonian nineteen-year cycle with intercalations in years 1, 3, 6, 9, 11, 14, and 17. The result would render years 360, 362, 365, 368, 370, 373, and 376 SEB intercalary. The final step would now be to rearrange the above list of Macedonian dates by adding to or subtracting from each appropriate multiples of 19 to align them with their Babylonian equivalents. However, it should be borne in mind that because of the half-year gap between the two calendars, the six mid-year Macedonian would remain one year ahead of the corresponding end-of-year Babylonian intercalations:

a. 1st intercalation of the Macedonian cycle = 360 SEM (no. 5),
b. 2nd intercalation = 363 SEM (no. 6) and \(287 + 4 \times 19\) (no. 1),
c. 3rd intercalation remains unattested but can either be 2 or 3 years ahead of the 2nd one in 363 SEM, that is, year 365 or 366 SEM. Since the 4th intercalation is from year 369 SEM, taking 365 would lead to an unprecedented four-year gap between the two whereas 366 SEM is harmonious with the Babylonian equivalent in 365 SEB.
d. 4th intercalation = 369 SEM (no. 7),
e. 5th intercalation = 390 - 19 = 371 SEM (no. 9),
f. 6th intercalation = 317 + 3 \times 19 = 374 SEM (no. 3),
g. 7th intercalation = 377 SEM (no. 8) and 358 + 19 (no. 4).
Comparing these with their parallel Babylonian dates, it becomes at once clear that the Macedonian cycle has intercalations in years 1, 4, 7, 10, 12, 15, and 18, with an end-of-year embolismic month in year 1 and six mid-year intercalations in the remaining ones.

It is now possible to determine the date of the above quoted tetradrachm of Orodes II with a Gorpiazos-embolimos. Taking the example of Gutarzes II struck during the same month in 360 SEM (no. 5), the only viable date for Orodes would be $360 - 5 \times 19 = 265$ SEM (48/7 B.C.) since 19 years either side of this would fall outside his reign (c. 57–38 B.C.).

The question, however, remains as to what the earliest date for the retardation of the Seleuco-Macedonian calendar was and whether or not this persisted down to the end of the Parthian rule in Iran. In a short article on the subject,51 I concluded that prior to 49 B.C., the first month of this calendar was indeed Dios.
TABLE 2. Dated Tetradrachms of Vologases II and Pacorus II with Officina Letters.

| Year $\Omega\Sigma\Pi\Pi\Pi = 389$ SEM (A.D. 77/8) | | |
|---|---|---|---|
| **Month** | **Officina Letter I** | **Ruler I** | **Officina Letter II** | **Ruler II** |
| Dios | A | Vologases II | A | Pacorus II |
| Apellaios | A | Vologases II | A | Pacorus II |
| Audnaios | A | Vologases II | A | Pacorus II |
| Peritiios | A | Vologases II | A | Pacorus II |
| Dystros | A | Vologases II | A | Pacorus II |
| Xandikos | B | Vologases II | B | Pacorus II |
| Artemisios | B | Vologases II | B | Pacorus II |
| Deiios | B | Vologases II | B | Pacorus II |
| Panemos | B | Vologases II | B | Pacorus II |
| Loios | B | Vologases II | B | Pacorus II |
| Goriaios | B | Vologases II | B | Pacorus II |
| Hyperberetaios | B | Vologases II | B | Pacorus II |

| Year $\Omega\Pi\Pi\Pi = 390$ SEM (A.D. 78/9) | | |
|---|---|---|---|
| **Month** | **Officina Letter I** | **Ruler I** | **Officina Letter II** | **Ruler II** |
| Dios | $\Gamma$ | Vologases II | $\Gamma$ | Pacorus II |
| Apellaios | $\Gamma$ | Vologases II | $\Gamma$ | Pacorus II |
| Audnaios | $\Gamma$ | Vologases II | $\Gamma$ | Pacorus II |
| Peritiios | $\Gamma$ | Vologases II | $\Gamma$ | Pacorus II |
| Dystros | $\Gamma$ | Vologases II | $\Gamma$ | Pacorus II |
| Xandikos | $\Gamma$ | Vologases II | $\Gamma$ | Pacorus II |
| Embolinos | $\Gamma$ | Vologases II | $\Gamma$ | Pacorus II |
| Artemisios | $\Gamma$ | Vologases II | $\Gamma$ | Pacorus II |
| Daisios | $\Gamma$ | Vologases II | $\Gamma$ | Pacorus II |
| Panemos | $\Gamma$ | Vologases II | $\Gamma$ | Pacorus II |
| Loios | $\Gamma$ | Vologases II | $\Gamma$ | Pacorus II |
| Goriaios | $\Delta$ | Vologases II | $\Delta$ | Pacorus II |
| Hyperberetaios | $\Delta$ | Vologases II | $\Delta$ | Pacorus II |

A tetradrachm of Pacorus II, lacking month name but dated $\Omega\Pi\Pi\Pi$ (391 SEM), with an officina letter $\Delta$ indicates that this letter continued from year 390 into 391 SEM; cf. Classical Numismatic Group, Inc., Mail Bid Sale 51, September 1999, Lot No. 637. A similar situation existed in 389 where letter $\Gamma$ continued into 390 SEM; cf. Petrowicz (1904), 144, no. 3; Ars Classica-Naville (1926), 150, no. 2424, and pi. 69, no. 2424; Sellwood (1980), 236, no. 73.6.

followed by Hyperberetaios in the period 49 B.C.–A.D. 50/1 and then again back to Dios during A.D. 77–79. It is now possible to maintain, on numismatic grounds, that the change in fact took place at the beginning of a new Macedonian cycle on 28/9 September 48 B.C. and remained so until 27/8 September A.D. 67 six cycles later. The seventh cycle began, once more, with Dios on 28/9 September A.D. 67 and lasted at least as late as A.D. 78/9, that is, the date 390 SEM of the tetradrachm of Vologases II in no. 9 above. Confirmation for this also comes from two tetradrachm series of Vologases II and Pacorus II (c. A.D. 78–105). Each of these displays, behind the king’s head on its obverse, what is considered to be an officina letter running from alpha to epsilon with roughly two letters per year (Fig. 12). I have listed in Table 2 the known examples of these two parallel types and the ones that have come to light after the publication of Sellwood’s catalogue. Not only do we find that these letters have some sort of sequential significance, but that this can only be fully exploited when the coins are arranged with Dios and not Hyperberetaios as the first calendar month.

There are, unfortunately, no known coins from the embolismic years after 390 SEM to verify the
organisation of the calendar at Seleucia prior to the fall of the Arsacids. However, it is highly unlikely that there was yet another rearrangement of the months during A.D. 79–228. In any case, whatever the last state of the calendar at Seleucia might have been, it was finally disbanded by the Sasanians soon after their victory over the Parthians. The new rulers denounced the use of an era in time reckoning and revived the method of dating by regnal years that had remained defunct for over five centuries.

Notes

1 Coins nos. 5–9 were apparently in a “board” containing among other types, several hundred Seleucid and Parthian tetradrachms. They appeared on the market during 1991–2000 and are believed to have had a Syrian origin. The remaining examples have no connections with the 1991 discovery; they have been in museum and private cabinets since the early 19th century.

2 For the discovery of the value 294;31;50,08,20 (= 29.50394136 days) by Aristarchos of Samos (c. 280 B.C.) cf. Rawlin (2002), 295–96.

3 King (1900), 12-13 (BM 12833).

4 Neugebauer (1957), 101; Toomer (1984), 166.

5 Parker & Dubberstein (1956), 1.


7 Sachs and Hunger (1988), 206–7, No. 322B.

8 Quoting Aristobulus, Plutarch (Alexander, 75) gives 30 Daisios as the date of Alexander’s death whereas in another passage (Alexander, 76) he gives 28 Daisios; cf. Perrin (1919), 431–35. Beloch (1927), 27–28, explains that Daisios 28 in Plutarch is based on a calendar with a morning epoch for the day while Daisios 30 corresponds to a calendar with evening epoch for the day. Cf. also Samuel (1972), 141, n. 2.

9 Hunger (2001), 274–75, No. 66. The colophon of the tablet has not survived but its last entry is undoubtedly from year 13 of Alexander III. This increases the likelihood that the text was compiled in or shortly after 324/3 B.C.

10 Epping and Strassmaier (1893), 149–78. Regnal years of Alexander III are counted from his first full year as king in Babylon, i.e. 2/3 April 330 B.C. (cf. n. 7 above); Strassmaier (1895), 64–69; Sachs (1955), 224, LBAT 1428 (BM 34597), dates (year and month) of consecutive lunar eclipses arranged in eighteen-year groups; Aaboe (1972), 114–15; Aaboe et al. (1991), 12–21.

11 Zenobius (Centuria VI,30) states: .... Παρά γάρ Μοσοκόσαν ὁ τελευταῖος μήν τοῦ ἐννοοτοῦ Ψερβερβετίας ἑνεργηθή. 

".... For among the Macedonians, the last month of the year was entitled Hyperberetias."

Cf. Leutsch and Schneidewin (1958), 171. From this it can be concluded that the mid- and end-of-year embolimic monts of the synchronised Macedonian calendar must have been Xandikos and Hyperberetias.
Kennedy (1968), pl. 6, No. 27 (BM 16927), possibly year 1 of King Alexander IV (collated by C.B.F. Walker and myself):

Rev. 4: .... [MU]-1-KÂM /'I-lek-su-an-dar LUGAL
also pl. 3, No. 13 (BM 16925), month III, year 2 of King Alexander IV (collated by C.B.F. Walker and myself):

Obv. 1: /'I-lek-su-an-dar LUGAL
Rev. 11: .... [MU]-2-KÂM.
Cf. also Jursa (1997), 132–33, discussing BM 78948 with the following date formula (collated by C.B.F. Walker and myself):

Obv. 2: [MU]-1-KÂM /'I-lek-su-an-dar LUGAL
Boyi (1998), 131–32, n. 134; Boyi (2000), 119, reviewing BM 78948 and BM 16925 (CT 49, 13); Hunger (2001), 6–7, No. 2 (BM 32238), Col. V, line 2 of the text records the death of Philip III on 27.IX in his seventh year (≈ 25/6 December 317 B.C.). It also provides the dates of the eclipses and eclipse possibilities in the period 731–317 B.C. (the latest is 13 December 317 B.C.). Yet the date of the tablet itself is given as year 2 of Antigonus (beginning on 27/8 March 316 B.C.). An explanation for this is that despite reporting Philip's demise, the tablet was entirely prepared during Antigonus' second year. It is equally possible that compilation of the text began in year 1 of Antigonus and was completed some time during his next year. Now, given that dating by "accession year" ended after Alexander III died (cf. n. 7 above), the period 28.IX.7–30.XII.7 Philip (26/7 December 317–26/7 March 316 B.C.) would have been year 1 of Antigonus. Yet, posthumous dating in the name of Philip continued in Babylonia and there are a number of documents from his "fictitious" eighth regnal year, the latest being BM 79012, dated 18.VIII Philip (8/9 October 316 B.C.); cf. Stolper (1993), 78–80. This same year, however, marked year 2 of Antigonus and also year 1 of Alexander IV as king (cf. n. 7 above). An incomplete colophon, giving:

Rev. 19: [MU]-11-KÂM MU-4-KÂM šu št-[i] [MU]-5-KÂM

Month XI, day 11, year 4 (of Alexander IV?), which is [year 5? of] [A]šu-ta-giššu as the General appears to confirm the above proposed chronology; cf. Stolper (1993), 86–89, discussing BM 109974 tablet.

Year 6 of Alexander IV began on 1 Nisan (2/3 April) 311 B.C. although the earliest attested record (BM 22022) dates to 19.II.6 (19/20 May 311 B.C.). The earliest contemporary text dated to King Alexander IV and Seleucus as "General" (uGAL ERÎNû) is from the end of month VIII in year 7 of Alexander IV (11/12 January 310 B.C.); cf. Sachs and Hunger (1988), 230–31, No. 309 (BM 40591). The latest contemporary records of the reign of Alexander IV are from his eleventh regnal year (306/5 B.C.); cf. Strassmeyer (1888), 135–36, No. 10 (Sp 94 = BM 33998), and 148–49 (copy), the record is mistakenly assigned to year 11 of Demetrius I (161–151 B.C.); Unger (1931), 320; Kennedy (1968), pl. 6, No. 25 (BM 16568); Del Monte (1997), 224.

Hunger (2001), 278–79, No. 67; lines 9 and 10 of the text appear to read:

... Seleucus .... the troops7 .... killed8 .... [....] ...
[....] .... for year 7 of Seleucus [....]

All cuneiform documents in the period 8–17 SEB (inclusive) are dated to “King Seleucus”. The earliest of these is dated 31.8 SEB; cf. Pinches (1898), 29f; McEwan (1895), 170. The dated colophon of an economic contract text from Unuk (BM 109941) places the beginning of the joint rule of Seleucus and Antiochus I in 18 SEB (294/3 B.C.):

Rev. 9: ....... UNUG4 [APIN U]-1-KÂM
10: MU-18-KÂM Se-la-ku-šu 4-ta-ša-šu LUGAL

.... Unuk. Month VIII, day 1, year 18, Kings Seleucus and Antiochus.

However, there are no known records from year 19 SEB (293/2 B.C.) in the name of joint kings and two texts only mention “King Seleucus” in this particular year: (i) BM 32286; cf. Kugler (1922), 309, No. (9)8; Kugler (1933), 105, Goal-Year Text for 90 SEB (222/1 B.C.), and 114 (copy); Schoenberger (1933), 7, (ii) BM 33563; cf. Rochberg (1998), 144, Text 30 (BM 33563). Dating to Seleucus and Antiochus I resumes in year 20 SEB (292/1 B.C.) and continues down to year 30 SEB (282/1 B.C.). Yet, there are two anachronistically dated colophons mentioning Seleucus and Antiochus I as joint rulers after the death of the former (cf. n. 17 below): (i) MLC 2105; cf. Clay (1913), No. 5, dated 10.IX.31 SEB; Oelsner (1986), 271. (ii) BM 33985; cf. Kennedy (1968), pl. 18–19, No. 103, dated 8.X.32 SEB.


Sachs and Wiseman (1954), 203, 205 and pl. III (BM 35603), the date of Seleucus' assassination is given as month VI of year 31 SEB = 25/6 August–23/4 September 281 B.C.

Hallo (1984/5), 146.

Neugebauer (1955), 33 and Neugebauer (1975), 1065, states that the Babylonian regulating cycle had a XII2 in years 1, 4, 7, 9, 12, and 15, and a XII3 in year 18. On the other hand, Samuel (1972), 142, gives a XII3 in years 3, 6,
8, 11, 14, 19, with a VI in year 17 of the cycle. But an important and seemingly neglected tablet (BM 354954+401024+46176) provides the correct disposition of the intercalary years in the period 170–189 SEB; cf. Neugebauer (1952), 33, n. 2; Neugebauer (1955a), 442–43; Neugebauer (1955b), pl. 244a. The cycle is identical with the stabilised scheme of the Achaemenids from 370/69 B.C. onward in which year 1 had a VI in years 3, 6, 9, 11, 14, and 17; cf. Britton (1993), 66–68.

23 Clay (1913), 84, No. 22 (MLC 2122), pl. 18; Sachs and Hunger (1989), 100–1, No. -234A; Weisberg (1991), 9, No. 1 (A 2527), pl. 2.
24 McEwan (1982), 38, No. 71 (1930.176n), and 114.

25 In volume 1 of my forthcoming book on the history and coinage of Parthia during 247–54 B.C., I will put forward the late date 132 B.C. as the end of the reign of Mithradates I. This is derived from the colophon of a text from Unak whose partially preserved date confirms the co-regency of Phrautes II (132–126 B.C.) and his mother, Riius, in 180 SEB (132/1 B.C.). Had this young Arsacid ruler succeeded his father in 174 SEB (138/7 B.C.), there would have been no reason for his mother’s association in kingship six years earlier. The extant records from the intervening period (138–132 B.C.) are exclusively dated to “King Arsaces”; cf. Clay (1913), 13, 87, and pl. 48 (MLC 2153), dates the tablet to c. 173 SEB; Oeselner (1975), 30–31, n. 14, year 180 SEB; Doty (1977), 377, year 180 SEB; Oeselner (1986), 275, n. (a), and 408, n. 570, year 180 SEB; Oeselner (1995), 147–48, year 180 SEB; Del Monte (1997), 245, year 180 SEB; Simonetta (2001), surprisingly ascribes to year 174 SEB.

26 Ofmsted (1937), 4; Sachs and Hunger (1996), 134–35, No. -140A.
27 Sachs and Hunger (1996), 178–81, No. -136A (read year 175 for 115 in line 1 of the lower edge text); Del Monte (1997), 119 (read ‘MU.175.KAM’ for ‘MU.115.KAM’).
28 Sachs (1976), 386–89, and pl. XVI.
30 For example: 125 AE (for 115) = 179 SEB; cf. Sachs (1952), 170, LBAT 1135. 120 AE (for 119) = 183 SEB; cf. Sachs (1955), 227, LBAT 1441; Hunger (2001), 64–65, gives the correct dates. 137 AE = 200 SEB (for 201); cf. Epping (1889), 166–67 and pl. 6. 163 AE (for 162) = 226 SEB; cf. Reiser (1896), 155, No. 55; collation by Professor S.M. Mau of Ruprecht-Karls-Universität Heidelberg (Germany) has confirmed 162 AE = 226 SEB.
31 Year 1 of the cycle is attested by the only contemporary VI in 189 SEB, i.e. 13 × 19 = 247 years later than the VI in year 35 of Artaxerxes II (370/69 B.C.); cf. Epping (1889), 156–57. This requires a XII in years 3 (= 191 SEB), 6 (= 194 SEB), 9 (= 197 SEB), 11 (= 199 SEB), 14 (= 202 SEB), and 17 (= 205 SEB) to form a Babylonian nineteen-year intercalary cycle. Although direct evidence is almost lacking, year 3 is confirmed by two cases of XII in 172 and 305 SEB; cf. Sachs (1955), 157, LBAT 1038; ibid., 179, LBAT 1193 and 1194. The first gives 172 + 19 = 191 and the second is 305 - 6 × 19 = 191 SEB. Likewise, for year 6, we have a XII in 175 SEB; cf. Sachs (1955), 162, LBAT 1057; (month partially preserved) and another in year 194 SEB; cf. Sachs and Hunger (1996), 182–85, No. -136B, month restored astronomically. The former is 175 + 19 = 194 while the latter is already from 194 SEB. Year 9 is confirmed by a XII in 178 SEB; cf. Sachs and Hunger (1996), 200–9, No. -133Br+Br2, and also in 254 SEB; cf. Sachs (1955), 177, LBAT 1184, year dated restored astronomically. These yield 178 + 19 = 197 and 254 - 3 × 19 = 197 SEB. Year 11 of the cycle is supported by a XII in 218 SEB; cf. Clay (1912), pl. 47, No. 99 (MLC 1737 = BRM II 99); McEwan (1981), 143–46; Van der Spek (1998), 229–31; McEwan (1981b), 132–36 (AB 244), lines 3–4, and 10–11 of the tablet; Van der Spek (1998), 234–35. This equates with 218 - 19 = 199 SEB. Year 14 is confirmed by a XII in 221 SEB which would give 221 - 19 = 202 SEB; cf. Reiser (1896), 93, No. 51; Oeselner (1975), 40; and also, Sachs and Hunger (1996), 432–43, No. 90, month restored astronomically. Finally, year 17 is attested by a XII in 186 SEB; cf. Kennedy (1968), pl. 33, No. 143; Van der Spek (1998), 210–11; in 224 SEB; cf. Sachs and Hunger (1996), 450–57, No. -87C; and in 262 SEB; cf. Neugebauer (1955b), pls. 32–33, No. 18,Cols. [I] and [X] with restored and preserved XII, respectively. These would give 186 + 19 = 205 SEB; 224 - 19 = 205 SEB; 262 - 3 × 19 = 205 SEB.
32 Sachs (1955), 179, LBAT 1193 and 1194; ibid., 180, LBAT 1195. These are fragments of three Almanacs from year 305 SEB; Sachs and Walicke (1984), 49 and 55.
33 Sachs (1976), 393–95 and 398 (copy).
Orodes II in association with YTI, the abbreviation of the month Hyperberetios (Sellwood collection).

40 McDowell (1935), 151–53. His arguments for a calendar at Seleucia beginning with month Artemisios and then Xandikos are based on incomplete evidence; Samuel (1972), 143.

41 Bickerman (1968), 25. The assumption that the shift was caused by an excessive intercalation remains untested. The Parthians might simply have changed the name of the first month of their calendar at Seleucia from Dios to Hyperberetios. Cf. also Samuel (1972), 143.

42 After the Battle of Pharsalus in which Julius Caesar defeated Pompey, the era of the calendar at Antioch on the Orontes was fixed on 1 Hyperberetios = 1 October 49 B.C.; cf. Ginzel (1914), 43–44; Seyrig (1950), 5–15; Samuel (1972), 174, and 274, n. 2.

43 (i) Tetradrachms of Pharnaces IV dated 287 SEM with the abbreviated month EMΩ or EMBO; cf. Wroth (1903), 104, No. 31; Petrovitz (1904), 84, No. 32; Fuji (1904), 174 and pl. VI4; Ars Classica-Naville (1926), 141–42, nos. 2292 and 2305; McDowell (1935), 186; Sellwood (1980), 162 and 164, nos. 50.13 and 51.31. (ii) tetradrachm of Orodes III dated 317 SEM with EM; cf. Prokesch-Osten (1874/5), 41–42 and pl. 3.30; Gardner (1877), 46; Wroth (1903), xliii, 174 and pl. XXIV5; Petrovitz (1904), 104; McDowell (1935), 187; Sellwood (1980), 192, No. 59.13; Shore (1993), 139, No. 327. (iii) tetradrachm of Vologases II dated 390 SEM and EMBOIA; cf. Lagoy (1855), 330–32, pl. VIII3; Gardner (1877), 56; De Morgan (1923–36), 138, Fig. 142.3 (wrongly attributes to Pacorus II); McDowell (1935), 192; Sellwood (1980), 233, No. 72.7.

44 Reimann (1889), 389, adds 19 to 287 SEM (embolismic) on the tetradrachm of Pharnaces IV (S50.13 or S51.31) to get 306, subtracts 76 from 390 SEM (embolismic) on Vologases II’s example (S72.7) to get 314 and then concludes that these and the date 317 SEM (embolismic) of Orodes III (S59.2) form years 6, 14, and 17 of the Macedonian cycle. In fact the dates on these examples correspond to years 4–12, and 15 of the cycle.

45 Wroth (1903), 149, No. 30; Petrovitz (1904), 110, No. 8; Ars Classica-Naville (1926), 147, No. 2379; Sellwood (1980), 202; Shore (1993), 141, No. 336.

46 According to the V 5 in BM 34033 (unpublished Normal Star Almanac for 189 SEOB), year 360 SEOB too would have had a mid-year intercalation since 189 + 9 × 19 = 360; cf. Epping (1889), 156–57.

47 Assar (2000), 12.

48 Certain tetradrachms of Orodes II with abbreviated month
names can be shown, on stylistic and iconographical grounds, to be earlier than the variety minted during Gorganos-embolinos of 47 B.C. These same coins strongly suggest that Hyperberetetus followed Gorganos prior to this date and not preceded it by eleven months. It is, therefore, highly likely that the calendrical shift was only authorised at the start and not during the nineteen-year intercalary cycle that began on 28/9 September 48 B.C.

Gourzis II's tetradrachm from year 360 SEM confirms that the corresponding cycle began with a Gorganos-embolinos in its year 1. It seems only logical to assume that the shift from Hyperberetetus to Dion was postponed until after the sixth cycle terminated on 27/8 September A.D. 67 (cf. also p. 56 above).

Sellwood (1980), 233 (nos. 72.1-4 and 72.7); 236 (nos. 73.1-5 and 73.7-8).

Abbreviations

A Prefix to registration number of tablets in The Oriental Institute (Chicago)

AB Prefix to registration number of tablets in the Bodleian Library (now in the Ashmolean Museum, Oxford)

ACT Astronomical Cuneiform Texts — Babylonian Ephemerides of the Seleucid Period for the Motion of the Sun, the Moon, and the Planets

ADRTB Astronomical Diaries and Related Texts from Babylonia

AE Arsacid Era [epoch = 1 Nisânû (14/15 April 247)]; 1 AE = 65 SEB

AO Prefix to registration number of tablets in the Louvre Museum, Paris (Antiquités Orientales)

AOAT Alter Orient und Altes Testament — Veröffentlichungen zur Kultur und Geschichte des Alten Orients und des Alten Testaments

Aof Altorientalische Forschungen

BaM Baghdader Mitteilungen — Deutsches Archäologisches Institut Abteilung Baghdad

BM British Museum

BRM Babylonian Records in the Library of J. Pierpont Morgan (Yale University)

CT Cuneiform Texts from Babylonian Tablets in the British Museum

HSM Harvard Semitic Museum (Harvard University)

LBAT Late Babylonian Astronomical and Related Texts; cf. Sachs (1955)

LCL The Loeb Classical Library

MLC Morgan Library Collection (Yale University)

NABU Nouvelles Assyriologiques Brèves et Utiles

RN Revue Numismatique

SSB Sternkunde und Sterndienst in Babel. — Assyriologische, Astronomische und Astralmythologische Untersuchungen

SEB Seleucid Era of the Babylonian Calendar [epoch = 1 Nisânû (2/3 April 311)]

SEM Seleucid Era of the Macedonian Calendar [epoch = 1 Dios (6/7 October 312)]

Sp Spartoli Collection (British Museum)

V1 Intercausal Uhiha (Babylonian calendar)

ZfA Zeitschrift für Assyriologie

W Find-number of tablets from Uruk-Warka in Iraq (Berlin)

XII Intercausal Adadnu (Babylonian calendar)

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