ASTRONOMICAL DIARIES AND RELATED TEXTS FROM BABYLONIA

HERMANN HUNGER

Volume VII

Almanacs and Normal Star Almanacs

ÖSTERREICHISCHE AKADEMIE DER WISSENSCHAFTEN
PHILOSOPHISCH-HISTORISCHE KLASSE
DENKSCHRIFTEN, 466. BAND

ASTRONOMICAL DIARIES AND RELATED TEXTS FROM BABYLONIA

Volume VII

Almanacs and Normal Star Almanacs

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Verlag der
Österreichischen Akademie
der Wissenschaften

Wien 2014

Vorgelegt von w. M. Hermann Hunger in der Sitzung vom 21. März 2014

Gedruckt aus Mitteln der Sachs-Stiftung

Diese Publikation wurde einem anonymen, internationalen
Peer-Review-Verfahren unterzogen.
This publication has undergone the process of anonymous, international peer review.

Die verwendete Papiersorte ist aus chlorfrei gebleichtem Zellstoff hergestellt,
frei von säurebildenden Bestandteilen und alterungsbeständig.

ISBN: 978-3-7001-7627-5

Satz und Vorstufe: Andrea Sulzgruber
Druck: Prime Rate kft., Budapest

http://hw.oeaw.ac.at/7627-5
http://verlag.oeaw.ac.at
Printed and bound in the EU

Table of Contents

Preface

With an unfortunate delay, I herewith offer an edition of the astronomical texts called „Almanacs“ and „Normal Star Almanacs“ by A. J. Sachs. He had begun transliterations of a few of these texts, and published Almanacs for the year 305 of the Seleucid era together with C. B. F. Walker in Iraq 46 (1984). He also edited a group of very late Almanacs in the Kramer Anniversary Volume (AOAT 25). For many of the texts I could begin to work with the copies published by Sachs in LBAT; for others, only numbers or photos were initially available to me. From a catalogue of astronomical tablets in the British Museum by C. B. F. Walker I could add a number of tablets not known to Sachs. J. M. Steele identified tablets in the collection of the University Museum in Philadelphia and drew my attention to a tablet in the Museu de Montserrat of which a photo can be seen on the website of the Cuneiform Digital Library Initiative.

For permission to publish the tablets I am indebted in the first place to the Trustees of the British Museum where the majority of the material is kept. I thank M. van Ess of the German Archaeological Institute in Berlin for providing photos of tablets excavated by the Deutsche Orient-Gesellschaft in 1912 in Uruk, and for permission to publish them. U. Kasten of Yale University sent me new photos of three tablets in the Morgan Library Collection; I thank her also for the publication permission. B. André-Salvini kindly sent me photos of the tablet AO 8530 in the Louvre and granted permission for publication. St. Tinney gave permission to publish tablets in Philadelphia, by courtesy of the Penn Museum. For permission to publish the tablet A 1731 in the collection of the Oriental Institute in Chicago I thank W. Farber.

Several people helped me in preparing this edition. I am particularly grateful to Jeanette Fincke who very kindly made many photographs of British Museum tablets for me. I. Finkel collated difficult passages and checked the possibility of joins. T. de Jong, J. M. Steele and S. de Meis helped me with tablet dating in some difficult cases. During my visits to the Students' Room of the British Museum, the staff were always helpful, especially C. B. F. Walker and J. Taylor. To all of them I extend my thanks.

Hermann Hunger

Bibliographical Abbreviations

ADART	Astronomical Diaries and Related Texts from Babylonia (Vienna 1988ff.)
AfO	Archiv für Orientforschung (Vienna)
AHES	Archive for the History of the Exact Sciences (Heidelberg)
AOAT	Alter Orient und Altes Testament (Münster)
BagM	Baghdader Mitteilungen (Berlin)
CAD	The Assyrian Dictionary of the Oriental Institute of the University of Chicago (Glückstadt/Chicago 1956-2010)
CTMMA	Cuneiform Texts in the Metropolitan Museum of Art (New York)
HAMA	O. Neugebauer, A History of Ancient Mathematical Astronomy (New York 1975)
JCS	Journal of Cuneiform Studies (New Haven etc.)
JNES	Journal of Near Eastern Studies (Chicago)
Lambert AV	A. R. George and I. L. Finkel (eds.), Wisdom, Gods and Literature. Studies in Assyriology in Honour of W. G. Lambert (Winona Lake 2000)
LBAT	A. J. Sachs (ed.), Late Babylonian Astronomical and Related Texts (Providence 1955)
PD	R. A. Parker and W. H. Dubberstein, Babylonian Chronology 626 B.C. - A.D. 75 (Providence 1956)
SBTU I	H. Hunger, Spätbabylonische Texte aus Uruk I (Berlin 1976)
SSB	F. X. Kugler, Sternkunde und Sterndienst in Babel (Münster 1905-1924)
UOS	J. M. Steele and A. Imhausen (eds.), Under One Sky (Münster 2002)
ZA	Zeitschrift für Assyriologie (Berlin)

Introduction

In his pioneering article of 1948,[1] A. Sachs established the categories „Almanacs“ and „Normal Star Almanacs“ (abbreviated NS Almanacs) for two groups of non-mathematical astronomical texts. Later, hundreds of such tablets were discovered, mainly in the British Museum's collections from Babylon. Many of these had been copied by Th. G. Pinches and J. N. Strassmaier; Sachs published most of these copies in LBAT. Sachs's classification has stood the test of time, and the texts are edited in this book according to it.

I begin with NS Almanacs, first the datable ones in chronological sequence, then the undatable ones arranged by museum number; similarly, Almanacs are divided into datable and undatable. In combining sometimes more than one exemplar from the same year under one number, I follow the example of Sachs.[2] The rather rigid layout of Almanacs makes this space-saving procedure acceptable.

As a group the NS Almanacs are earlier than the Almanacs, although both groups overlap. Sachs in LBAT presented the copies of NS Almanacs first. There happen to be only a few Almanacs that I could not date; undated NS Almanacs are more numerous.

The dated texts can be arranged in 20-year sections as follows:

Seleucid Era	NS Almanacs	Almanacs
0-20	2	
21-40	5	
41-60	7	
61-80	7	
81-100	14	2
101-120	15	1
121-140	8	4
141-160	13	7
161-180	9	7
181-200	13	11
201-220	9	6
221-240	3	17
241-260		11
261-280		1
281-300		3
301-320		6
321-340		1
341-360		3
361-380		2
381-400		1

To judge from this distribution, it seems unlikely that any Almanacs existed before the Seleucid era, and even NS Almanacs are rare around 300 BC. They therefore were probably not the only source of data in the Babylonian horoscopes, which begin at the end of the 5th century.[3]

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[1] A. J. Sachs, A Classification of the Babylonian Astronomical Tablets of the Seleucid Period: JCS 2 (1948) 271-290.

[2] *Iraq* 46 (1984) 43-55.

[3] F. Rochberg, *The Heavenly Writing* (Cambridge 2004) 153-157.

1. Description of Almanacs and Normal Star Almanacs

A. Almanacs

Almanacs have 12 or 13 sections, one for each month of a Babylonian year, followed by a colophon. In each monthly section, after the month name, the duration of the preceding month is indicated by the numbers „1“ if that month has 30 days, and „30“ if it has 29 days. There follows a statement in which zodiacal sign each of the five planets will be in the beginning of the month; planets invisible at the time are not included. The expected phenomena are then listed in chronological order. They are:

1) First and last appearances of all planets, with day number and zodiacal sign

2) Acronychal risings of the outer planets, with day number only

3) Stations of the outer planets.

4) Solstices and equinoxes

5) First and last appearance, and acronychal rising, of Sirius. Items 4 and 5 are calculated according to the „Uruk Scheme“.[4]

6) Occasionally, first and last appearances, and acronychal risings, of fixed stars are mentioned.

7) A feature typical for the Almanacs is to give the days when a planet entered a zodiacal sign. However, this occasionally occurs in NS Almanacs as well (No. 103 of SE 234, at the end of each paragraph; also No. 96 of SE 210; No. 98 of SE 212; No. 100 of SE 215), and in Diaries (from the Seleucid era).

8) Around the middle of the month, the day is given when the moon sets for the first time after sunrise. Towards the end of the month, the day is indicated when the moon will be visible for the last time before conjunction. These two dates, together with the length of the preceding month given right after the month name, were called „Lunar Three“ by Sachs.[5]

Almost every Almanac has a colophon: *meš-ḫi šá* KUR-*ád*^{meš} *šá* ^{d}UDU-TIL^{meš} *šá*, followed by the year number and the name of the reigning king, in the Parthian period sometimes also the name of the queen.

Whereas KUR-*ád*^{meš} *šá* ^{d}UDU-TIL^{meš} can be easily translated as „reachings of the planets“, referring to their entries into zodiacal signs, *meš-ḫi* presents a problem. A word *mišḫu* is attested with the meaning „section“, a measured tract of work frequently connected to irrigation. On the other hand, a term *mišḫu* used in astronomical contexts is considered as „(a luminous phenomenon)“ and left untranslated by the CAD; it does not seem to fit in the colophons of Almanacs. Strictly speaking, nothing is measured in the Almanacs; on the contrary, all data are predicted.

In his editions of several very late Almanacs in the Kramer Anniversary Volume (AOAT 25, 1976), Sachs translated *meš-ḫi* in the colophons of Almanacs by „predictions“. I do not know his reasoning, but the translation makes sense, and I use it here.

B. Normal Star Almanacs

Like Almanacs, NS Almanacs list the events predicted for each month of a year. A prominent feature are the „Lunar Six“, time intervals between rising and setting of moon and sun. The term was coined by A. Sachs.[6] They are explained, apart from Sachs’s article, in volume I, p. 20, of this project,

[4] O. Neugebauer, JCS 2 (1948) 209ff.; HAMA 357-365; A. L. Slotsky, The Uruk Solstice Scheme Revisited, in: H. D. Galter (ed.), *Die Rolle der Astronomie in den Kulturen Mesopotamiens* (Graz 1993) 359-365. A convenient table by J. P. Britton is found in UOS p. 44.

[5] p. 278 (see footnote 1).

[6] p. 273 (see footnote 1).

and in several other places. It seems unnecessary to repeat the definitions. It may however be noted that the reading of *na* (uncertain to me at the time) is *manzāzu* „stand, position“, which does agree with the form *-su* of the pronominal suffix.[7]

NS Almanacs contain the following:

1) – 6) as in Almanacs.

7) The passings of the planets by Normal Stars, in the same style as in the Diaries and Goal-Year Texts.

8) There are two sub-groups of NS Almanacs (Sachs p. 281[8], see already Kugler SSB II 465). One has only the Lunar Three; the other has the Lunar Six in a separate column on the left side of the tablet. Unfortunately, they are not from different periods as it still seemed to Sachs; in the meantime, more tablets belonging to the Lunar Six sub-group have been found, and they are among the earliest examples of NS Almanacs.

The colophon of the NS Almanacs is just *meš-ḫi šá*, followed by the year number, and the king's (and sometimes the queen's) name.

The intervals called „Lunar Six“ by Sachs were recently investigated by P. J. Huber and J. M. Steele.[9] They arrived at the remarkable conclusion that these intervals were already calculated towards the end of the seventh century BC.

If only the Lunar Six section of a tablet is preserved, it is difficult to decide whether it originally was a NS Almanac or a list of Lunar Six data only.

There are three possible sequences of the intervals around full moon:

1.

Day number	Interval
x	ME
x	ŠÚ
x+1	GE_6
x+1	*na*

2.

Day number	Interval
x	ŠÚ
x+1	ME
x+1	*na*
x+2	GE_6

3.

Day number	Interval
x	ŠÚ
x+1	*na*
x+2	ME
x+3	GE_6

Based on these sequences, day numbers or interval names can sometimes be restored if only part of them is preserved.[10]

Both Almanacs and NS Almanacs are predictive. This emerges most clearly from comparison with the Diaries. One never finds remarks about weather (which are abundant in Diaries) or a note that an

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[7] So the transliteration would better have been NA, and this is found in recent publications. I retain *na* only for reasons of consistency.

[8] See footnote 1.

[9] SCIAMVS 8 (2007) 3-36. The procedures used to find these intervals in Babylonian mathematical astronomy are explained in detail by M. Ossendrijver, *Babylonian Mathematical Astronomy: Procedure Texts* (New York 2012) 113-115, 161-178, 195-202.

[10] These sequences are also listed by Huber and Steele, SCIAMVS 8 (2007) 3. I have never found the fourth theoretically possible sequence in an actual text.

observation was not possible. The Lunar Six are always complete which would not have been possible if all had to be observations.

Sachs noted in 1949 several possibilities for the sources of the predictions contained in Almanacs and NS Almanacs.[11] Jennifer Grey in her 2009 thesis[12], written after the publication of Diaries and Goal-Year Texts, came to the conclusion that the predictions were derived from Goal-Year Texts. This is an important result because theoretically most of the data could also have been calculated by means of the mathematical-astronomical tables.

2. Provenance

Most of the tablets published here come from Babylon. This can be inferred from the inventory numbers of the British Museum, although there may be among them tablets of different origin. If a tablet has an invocation at the beginning preserved, the divine names Bel and Beltiya show that it is from Babylon.

There are 8 tablets originating from Uruk. Some come from the German excavations in Uruk. Others were bought together with tablets demonstrably from Uruk. Their layout and terminology differ slightly from the Babylon tablets so that tablets with unknown provenance can be identified by means of these characteristics. The characteristic features of the Uruk tablets will be discussed below under „Style of Presentation“.

3. Dating

Although the accuracy of predictions in the Almanacs and NS Almanacs cannot a priori be determined, dated examples show that the data can be confidently used to calculate a date for a fragmentary tablet, in the same way as it is possible with Diaries. Particulary helpful are entries resulting from the „Uruk Scheme“. Because this scheme is based on the 19-year cycle, such an entry leaves only every 19th year to be considered. Frequently just one additional planetary event, preferably of Jupiter or Saturn, suffices to provide a unique date for the tablet within the historically possible time range.

4. Terminology

Most of the termini technici are known from the Diaries and Goal-Year Texts. The so-called Greek-Letter phenomena[13] are indicated by the same logograms. The names of the Normal Stars too are those used in the Diaries.

a) Special to the Almanacs and NS Almanacs are the dates of planets entering into zodiacal signs. These entries are expressed by KUR, logogram for *kašādu*. Sometimes it is complemented by *-ád*, confirming the expected form *ikaššad* „it will reach“. These dates are sometimes found in Diaries of the Seleucid period as well.

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[11] p. 287f. (see footnote 1).

[12] University of Durham, Department of Physics. See also J. M. K. Grey and J. M. Steele, Studies on Babylonian goal-year astronomy I: a comparison between planetary data in Goal-Year Texts, Almanacs and Normal Star Almanacs: AHES 62 (2008) 553-600.

[13] Neugebauer HAMA 386f.

b) In each monthly paragraph, the length of the preceding month is predicted as 29 or 30 days right after the month name, by means of the numbers 30 or 1, in the same way as in the Diaries. In the NS Almanacs, this is followed by the interval between sunset and moonset on the first evening of the month. There are cases, however, when the predicted month-length is not considered certain. Then, an alternative value for the interval from sunset to moonset is calculated. This is introduced by *ina* 1-*šú* (if the alternative possibility is a preceding 30-day month) or by *ina* 30-*šú* (if the alternative is a preceding 29-day month). A literal translation would be „in its 1" or „in its 30", meaning „in case the 1st day will follow the 30th of the preceding month" or „in case the 1st day will be identical with the 30th of the preceding month". I use the somewhat loose translations „if its 1st (day will follow the 30th of the preceding month)" and „if its (1st day will be identical with the) 30th (of the preceding month)", respectively.

c) The interval between sunset and moonset at the beginning of the month sometimes has the added remark TAB or *ina* KAL. The meaning of these remarks was discussed by Kugler, SSB II 536f.

They are not to be expected in Goal-Year Texts and Diaries because these texts consist of observations. There is one entry in a Diary: No. -77 month IV: ŠU 30 10,30 *ina* KAL *a-kám* KALAG *ki* PAP NU IGI. „Month IV, (the 1st day of which was identical with) the 30th (of the preceding month; sunset to moonset:) 10° 30′, *ina* KAL; dense mist, when I watched I did not see (the moon)." So this is explicitly non-observed.

ina KAL occurs in a few Almanacs. Almanacs do not give the interval from sunset to moonset. So *ina* KAL here cannot refer to the length of this interval. Kugler (SSB II 478 *ad* 11) interpreted it as *ina danāni* „in (case of) strength", i. e. of the lunar crescent. The greater the elongation of the moon, the brighter the crescent. This could result in the possibility to observe the moon, even if its negative latitude was unfavorable for early visibility.

For TAB, Kugler did not propose an Akkadian reading.

Sachs translated *ina* KAL „just barely" in AOAT 25, 385, explaining that it „is used when the visibility of the first lunar crescent is marginal after a hollow month" and stated that the „philological interpretation is unknown".

A few other remarks occur after the indication of month length:

In an undated Almanac (No. 229), *ana* PAP occurs after an illegible sign. In a NS Almanac from SE 23 (No. 3), *ina* LUL seems to follow the month length. Both passages are unclear to me.

d) UD-DA in Mercury risings and settings: As in the Diaries, sometimes a heliacal rising of Mercury and its corresponding setting is marked as DIB, literally „passed by", „omitted". These statements contain further, in most cases, the term UD-DA right after the direction (east or west) where the phenomenon was predicted to occur:

GU_4-UD *ina* NIM/ŠÚ UD-DA IGI DIB

GU_4-UD *ina* NIM/ŠÚ UD-DA ŠÚ-*šú* DIB

J. Gray has discussed these omitted phases of Mercury in her dissertation.

There is no diachronic distribution: the earliest reference has UD-DA, while several later ones do not.

IGI/ŠÚ-*šú* DIB is probably „the first appearance/its last appearance will be omitted". Then UD-DA could be a verb referring to some property of Mercury at the particular date which leads to omitting its appearance. However, the statements must make sense with or without UD-DA. The most frequent reading of UD-DA is *ṣētu* „light", „heat". T. de Jong (personal communication) notes that „light" could refer to the sky being too light for Mercury to become visible. It is difficult to fit *ṣētu* into the syntax of these statements. A translation would have to be „Mercury in the east (or: west) - light - first appearance (or: its last appearance) will be omitted."

References (examples only):

1) in Diaries:

-375A:3′ GU_4-UD *ina* ŠÚ UD-DA ŠÚ-*šú* D[IB
-291A:3′ GU_4-UD *ina* NIM IGI DIB
-284:13′ *in* 25 GU_4-UD *ina* ŠÚ UD-DA ŠÚ-*šú* DIB
-283:4 27 GU_4-UD *ina* ŠÚ ŠÚ-*šú* DIB
-277A:2 [GU_4-UD *ina* NIM] IGI DIB
-277A:27f. 20 GU_4-UD *ina* ŠÚ IGI DIB
-264 rev. 5 [*ina* ŠÚ U]D-DA ŠÚ-*šú* DIB
-251:3 11 GU_4-UD *ina* ŠÚ IGI DIB
-251:6 *in* 26 GU_4-UD *ina* ŠÚ ŠÚ-*šú* DIB
-246:13 5 GU_4-UD *ina* NIM IGI DIB
-230A rev. 10′ *in* 12 GU_4-UD *ina* ŠÚ IGI D[IB]
-218:5′ *in* 17 GU_4-UD *ina* [ŠÚ UD-D]A IGI DIB *in* 25 GU_4-UD *ina* ŠÚ UD-[DA ŠÚ-*šú* DIB]
-211:8 [GU_4-UD] *ina* ŠÚ IGI DIB
-207A:31 *in* 19 GU_4-UD *ina* NIM UD-DA IGI DIB
-207A:34 5 GU_4-UD *ina* NIM UD-DA ŠÚ-*šú* DIB
-194A:7′ [G]U_4-UD *ina* NIM UD-DA ŠÚ-*šú* DIB
-193A l.e. 1 14 GU_4-UD *ina* NIM IGI [DIB]
-193A r.5′ [GU_4-U]D *ina* NIM ŠÚ-*šú* DIB
-178B u.e. 1 *in* 2 GU_4-UD *ina* ŠÚ UD-DA IGI DIB
-141A:16′ *in* 28 GU_4-UD *ina* NIM UD-DA IGI DIB
-141C:26′ [....] ŠÚ-*šú* DIB
-132B:31 2 GU_4-UD *ina* ŠÚ UD-DA IGI DIB
-132C:9 14? GU_4-UD *ina* ŠÚ UD-DA ŠÚ-*šú* DIB (dupl. -132B r. 17)
-112:3 [GU_4-UD ....] ŠÚ UD-DA IGI DIB
-108A:18′ *in* 5 GU_4-UD *ina* NIM UD-DA IGI DIB
-105A r. 37′ *in* 3 GU_4-UD *ina* ŠÚ UD-DA IGI DIB *in* 26 GU_4-UD *ina* ŠÚ UD-DA ŠÚ-*šú* DIB
-94:9′ *in* 9 GU_4-UD *ina* NIM UD-DA ŠÚ-*šú* DIB
-85B:8′ *in* 7 GU_4-UD *ina* ŠÚ UD-DA ŠÚ-*šú* DIB
-78:2′ [....] ŠÚ-*šú* DIB

2) in Almanacs:

SE 39 II 13 GU_4-UD *ina* NIM IGI DIB
SE 39 II 25 GU_4-UD *ina* NIM UD-DA ŠÚ-*šú* DIB
SE 244 I [x GU_4]-UD *ina* NIM UD-DA IGI DIB
SE 246 VI 29 [GU_4-UD] *ina* ŠÚ UD-DA IGI DIB
SE 248 III 13 GU_4-UD *ina* NIM ⌜UD-DA I[GI DIB]
SE 305 VI 21 GU_4-UD *ina* NIM UD-DA *šá* DIB

3) in NS Almanacs:

SE 58 II 19 GU_4-UD *ina* NIM UD-DA IGI DIB
SE 100 VI 25 GU_4-UD *ina* ŠÚ UD-DA I[GI DIB]
SE 100 VII GU_4-UD *ina* ŠÚ UD-DA ŠÚ-*šú* D[IB
SE 183 III 3 GU_4-UD *ina* NIM IGI DIB
SE 183 III 23 GU_4-[U]D *ina* NIM ŠÚ-*šú* DIB

e) BAR occurs in some eclipse statements in combination with DIB, i. e. when the eclipse is omitted. The term BAR DIB was dealt with by J. M. Steele, AfO 48/49 (2002) 107-112. BAR = *aḫû* means „extraneous“, from outside a standard collection of omens. In the case of eclipses, it could refer to „additional“ eclipses predicted by a scheme but not corresponding to actually visible ones. F. Rochberg[14] translates BAR = *aḫû* by „invisible“ because „this is the effective meaning“, quoting Steele approvingly. I agree with this argument but nevertheless use the literal translation „extraneous“ in this edition.

5. Fixed stars

The calendar dates of the phenomena of Sirius in the Almanacs and NS Almanacs follow the so-called Uruk scheme which is connected to the 19-year intercalation cycle. Therefore the Sirius dates always have the same time difference in days from, e.g., the preceding Vernal equinox, or any other season of the current year.

O. Neugebauer and A. Sachs published a fragment[15] of a list of consecutive dates of the heliacal risings of the Pleiades which are in an analogous fashion derived from the Uruk scheme so that they are always 45 days distant from the preceding Vernal equinox. As pointed out in JCS 21 191f., this time distance can also be found in Almanacs.

As I shall show elsewhere, it is very likely that all predictions of stellar phases were calculated by means of the Uruk Scheme.

The following stars (or constellations) occur:
MÚL-MÚL
ŠU-PA
NUN^{ki}
SIPA
BIR

There is general agreement that MÚL-MÚL are the Pleiades, ŠU-PA is Arcturus, and SIPA is Orion. NUN^{ki} is differently identified[16]; its main star seems to be Canopus[17]. There is less evidence for BIR. D. Pingree equates it with ζ Puppis and neighboring stars.[18] I do not translate BIR here.

6. Style of presentation

There is little variation in layout and presentation. For the two different arrangements of Lunar Six or Lunar Three in NS Almanacs, see above sub 1.

Some of the very late tablets (later than SE 300) show peculiarities. They were discussed by A. Sachs in his article on these tablets in the Kramer Anniversary Volume (AOAT 25). They include special abbreviations. On the whole, these late tablets are written in a very cursive script and are in part hard to read.

Only 8 tablets of the corpus are certainly coming from Uruk. Their layout and style are slightly different from the Babylon tablets.

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[14] *The Heavenly Writing* (Cambridge 2004) 206 n. 150.

[15] BM 36838, in JCS 21 (1967) 190-192.

[16] F. Gössmann, *Planetarium Babylonicum* (Rome 1950) No. 306.

[17] J. Schaumberger, 3. Ergänzungsheft to SSB, 335.

[18] E. Reiner, *Babylonian Planetary Omens, Part Two* (Malibu 1981) 11.

Features of all Uruk texts versus Babylon texts are: „Solstice“ is written GUB-*za*, rather than GUB. „Equinox“ is LÁL-*tú* instead of LÁL-*tì*. In eclipse descriptions, time to sunset or sunrise is explicitly said to „remain“ (TAG_4).

The Uruk NS Almanacs are Nos. 24, 57, 64, 65, and 69. They contain only the Lunar Three, arranged in a separate column to the left of the remaining monthly data, where other NS Almanacs have the Lunar Six. “First part of the night“ is indicated by *ina* EN. This is an abbreviation of EN-NUN „watch“ (*viz*. evening watch), as can be seen from No 24 rev. 15´and 20´. „In the east“ is written *ina* KUR. „In the east/west“ is explicitly mentioned for first/last visibilities of outer planets and fixed stars although in these cases such direction information is redundant. Similarly, the part (first/last) of the night is given for last and first visibilities of the planets; this too is redundant because it can be inferred from the direction (west/east). Of course, the invocation on the upper edge is addressed to Anu and Antu.

No. 24 omits „night“ before the day numbers but gives the part of the night. This text also uses DIB for the passing of a planet above or below a Normal Star which is not expressed in any other text. This tablet is also unusual in having its scribe’s name at the end.

There are three Almanacs from Uruk, Nos. 159, 160, and 219. Like the Uruk NS Almanacs, they use TAG_4 to designate time remaining to sunset or sunrise. They also use KUR instead of NIM for „east“.

A special style is found in the almanac No. 153 from Babylon. The listings of the planets’ positions in zodiacal signs at the beginning of each paragraph are only partially given. During the invisibility period of Mars, the text twice notes that the planet was not visible, being „with the sun“ (*itti šamaš šū*).

Names of scribes or owners of the tablets are only rarely indicated: No. 24 (of SE 82), No. 160 (of SE 147) (both from Uruk); No. 17 (of SE 68).

7. Sources for the Almanacs and NS Almanacs

The so-called Greek-letter phenomena are recorded in the Diaries and Goal-Year Texts. The data for the same phenomena in the Almanacs and NS Almanacs were analysed by J. M. K. Grey and J. M. Steele.[19] Their conclusion was that it is very likely that the Goal-Year Texts were used for predicting the data found in Almanacs and NS Almanacs. Corrections of a few days had to be regularly applied to reach reliable results.

Their conclusion was corroborated by investigating the effects of intercalary months on the length of a goal-year period.[20] Since intercalation takes place every third or sometimes second year, it can happen that a goal-year period, given in years, contains one month more or less than intended. These extra months were taken into account in the construction of the Almanacs and NS Almanacs.

Entries into zodiacal signs are characteristic of Almanacs but can also be found in the Diaries. The Diaries list at the end of each monthly paragraph in which zodiacal sign the planets were during the month. When a planet moved from one sign into another, the date of this entry is sometimes given; this is first attested in a Diary from SE 99. But in general, only the zodiacal sign is indicated. The movement of a planet can be traced with the help of the Normal Stars which it passes. However, some Normal Stars are far apart, and the dates of a planet passing them would not provide sufficient information when the planet reaches another sign.

[19] Studies on Babylonian goal-year astronomy I: a comparison between planetary data in Goal-Year Texts, Almanacs and Normal Star Almanacs: AHES 62 (2008) 553-600.

[20] Grey, J. M. K. and J. M. Steele, Studies on Babylonian goal-year astronomy II: the Babylonian calendar and goal-year methods of prediction: AHES 63 (2009) 611-633.

An investigation of the dates of entries into zodiacal signs in the Almanacs should lead to interesting results but cannot be undertaken within this text edition.

8. Layout of Transliteration and Translation

An apostrophe (´) before the heading „Obv.“ or „Rev.“ indicates that the beginning of the tablet is broken, an apostrophe after the heading indicates that the end is not preserved.

In NS Almanacs, one type of layout (see above p. XI) has the Lunar Six data separately on the left side of each paragraph. I try to imitate this in the transliteration. In translations, the Lunar Six will be translated first in each paragraph, followed by the remaining (mostly planetary) data.

Lines between paragraphs are given if they are visible on the tablet. Of course, depending on the state of preservation ot the tablet, lines are not always clearly discernible.

Concordance of Museum Numbers

Museum Number	Edition Number
A 1731	154
AO 8530	69
BCM A.1846-1982	37
BM 31592	199
BM 31635	199
BM 32088	72
BM 32230	95
BM 32242	199
BM 32247	103
BM 32263	104
BM 32321	7
BM 32368	7
BM 32471	72
BM 32509	105
BM 32522	38
BM 32612	199
BM 32618	6
BM 32675	106
BM 32709	107
BM 32749	103
BM 32769	77
BM 32847	12
BM 32888	156
BM 32994	220
BM 33448	82
BM 33450	52
BM 33462	52
BM 33466	82
BM 33468	99
BM 33471	108
BM 33482	79
BM 33485	202
BM 33486	79
BM 33487	79
BM 33489	27
BM 33497	62
BM 33498	108
BM 33501	49
BM 33504	62
BM 33510	62
BM 33515	192
BM 33578	68
BM 33611	109
BM 33615	68
BM 33632	99
BM 33633	190
BM 33641	185
BM 33651	205
BM 33727	110
BM 33736	193
BM 33743	82
BM 33746	191
BM 33752	205
BM 33754	99
BM 33777	20
BM 33784	210
BM 33790	210
BM 33797	209
BM 33798	201
BM 33822	202
BM 33867	171
BM 33873	158
BM 33987	45
BM 33989	14
BM 34032	93
BM 34033	87
BM 34042	185
BM 34051	170
BM 34054	83
BM 34056	80
BM 34076	75
BM 34078	86
BM 34080	39
BM 34116	63
BM 34121	163
BM 34151	80
BM 34159	206
BM 34199	76
BM 34228	58

Museum Number	Edition Number
BM 34229	91
BM 34232	157
BM 34257	111
BM 34259	112
BM 34263	77
BM 34278	221
BM 34298	178
BM 34323	77
BM 34324	203
BM 34325	113
BM 34328	114
BM 34345	165
BM 34356	115
BM 34377	116
BM 34395	86
BM 34413	117
BM 34469	118
BM 34470	161
BM 34588	86
BM 34607	96
BM 34614	211
BM 34620	84
BM 34659	211
BM 34667	190
BM 34668	190
BM 34722	191
BM 34758	90
BM 34802	63
BM 34819	167
BM 34834	119
BM 34854	16
BM 34866	120
BM 34868	85
BM 34888	71
BM 34949	174
BM 34953	85
BM 34991	185
BM 35039	186
BM 35059	98
BM 35090	78
BM 35092	121
BM 35093	168
BM 35098	191
BM 35142	122
BM 35149	187
BM 35159	21
BM 35167	21
BM 35187	182
BM 35314	191
BM 35335	185
BM 35340	94
BM 35366	169
BM 35372	86
BM 35376	222
BM 35429	211
BM 35457	71
BM 35464	92
BM 35465	123
BM 35468	124
BM 35476	125
BM 35481	126
BM 35484	191
BM 35542	50
BM 35550	127
BM 35551	173
BM 35562	184
BM 35570	208
BM 35577	50
BM 35581	59
BM 35584	8
BM 35602	208
BM 35608	50
BM 35620	179
BM 35623	86
BM 35636	98
BM 35637	89
BM 35638	98
BM 35640	89
BM 35650	59
BM 35687	191
BM 35691	100
BM 35707	190
BM 35714	59
BM 35720	189
BM 35725	59
BM 35729	166
BM 35737	182
BM 35755	191
BM 35788	71
BM 35793	128

Museum Number	Edition Number
BM 35795	11
BM 35811	71
BM 35817	53
BM 35820	98
BM 35860	223
BM 35894	162
BM 35900	9
BM 35904	86
BM 35972A	10
BM 35984	59
BM 35988	185
BM 35993	129
BM 35994	130
BM 36016	188
BM 36020	169
BM 36021	9
BM 36026	224
BM 36035	59
BM 36077	190
BM 36877	5
BM 36962	131
BM 36987	60
BM 37400	132
BM 38212	183
BM 40083	216
BM 40084	217
BM 40101	153
BM 40496	195
BM 40596	25
BM 40604	81
BM 40613	133
BM 40625	41
BM 40626	17
BM 40658	225
BM 40677	73
BM 41010	164
BM 41022	43
BM 41073	134
BM 41079	43
BM 41106	61
BM 41117	46
BM 41127	135
BM 41137	136
BM 41150	137
BM 41468	207
BM 41516	207
BM 41520	44
BM 41532	44
BM 41545	40
BM 41588	30
BM 41599	51
BM 41634	29
BM 41640	101
BM 41838	37
BM 41842	12
BM 41846	42
BM 41863	44
BM 41880	28
BM 41895	54
BM 41900	196
BM 41965	67
BM 41988	138
BM 42005	139
BM 42016	140
BM 42022	35
BM 42045	141
BM 42076	18
BM 42077	102
BM 42135	22
BM 42191	142
BM 42211	143
BM 42226	56
BM 42232	144
BM 42247	145
BM 42252	226
BM 42757	198
BM 42981	227
BM 43046	228
BM 43067	74
BM 45696	47
BM 45698	191
BM 45716	181
BM 45729	200
BM 45827	176
BM 45839	177
BM 45919	194
BM 45929	190
BM 45953	190
BM 45972	180
BM 45982	215

Museum Number	Edition Number
BM 46013	180
BM 46021	190
BM 46041	97
BM 46043	197
BM 46046	191
BM 46050	204
BM 46094	176
BM 46105	197
BM 46106	172
BM 46206	146
BM 46210	70
BM 46255	175
BM 47724	4
BM 47727	82
BM 47738	55
BM 47816	13
BM 47869	31
BM 47909	48
BM 48072	88
BM 48104	2
BM 48864	52
BM 48923	52
BM 53627	229
BM 55536	153
BM 55542	16
BM 55582	86
BM 55595	190
BM 55643	230
BM 65156	1
BM 65667	26
BM 76990	212
BM 77225	190
BM 77240	168
BM 77257	190
BM 77269	71
BM 77997	3
BM 99679	71
BM 99695	147
BM 132281	36
BM 132283	40
BM 132284	30
BM 132285	196
BM 132287	66
CBS 217	148
CBS 499	34
CBS 737	33
CULC 371	32
Dropsie Coll.	218
DT 143	214
MLC 1860	24
MLC 1885	57
MLC 2195	160
MM 86.11.354	213
MM 86.11.369	19
MM0871	15
Rm 731	23
Rm 755	38
Rm 786	155
Rm 812	149
Rm 813	150
Rm 814	151
Rm 838	152
Rm 917	23
U 180(3)	64
U 193a	64
U 193b	64
U 194	65
VAT 1836	211
VAT 290	211
W 20030,109	159
W 22340a	219

Concordance of Publications

Publication	Edition number
AOAT 25, 382ff.	213
AOAT 25, 384ff.	214
AOAT 25, 386ff.	215
AOAT 25, 389ff.	216
AOAT 25, 392f.	217
AOAT 25, 393ff.	218
BagM Beih. 2, 83	159
CTMMA 2, 82	19
CTMMA 2, 83	213
JCS 1 349	32
Lambert AV 310f.	37
LBAT *995	4
LBAT 996	9
LBAT *997	12
LBAT 998	12
LBAT *999	13
LBAT 1000	14
LBAT 1001	18
LBAT *1001a	19
LBAT 1002	22
LBAT *1003	23
LBAT *1004	24
LBAT 1005	28
LBAT 1006	29
LBAT **1007	32
LBAT 1008	30
LBAT *1009	38
LBAT *1009a	38
LBAT 1010	39
LBAT *1011	41
LBAT 1012	40
LBAT *1013	43
LBAT *1014	43
LBAT 1015	42
LBAT 1016	44
LBAT 1017	44
LBAT 1018	44
LBAT 1019	45
LBAT 1020	47
LBAT 1021	50
LBAT 1022	51

Publication	Edition number
LBAT *1023	52
LBAT 1024	53
LBAT *1024a	55
LBAT *1025	57
LBAT 1026	58
LBAT 1027	59
LBAT 1028	59
LBAT *1028a	61
LBAT 1029	63
LBAT 1030	63
LBAT *1030a	64
LBAT *1030a	64
LBAT *1030a	64
LBAT *1031	65
LBAT *1032	69
LBAT *1033	70
LBAT 1034	71
LBAT 1035	71
LBAT *1036	71
LBAT 1037	71
LBAT 1038	75
LBAT 1039	76
LBAT *1040	77
LBAT 1041	77
LBAT 1042	77
LBAT *1042a	79
LBAT *1042b	79
LBAT *1042c	79
LBAT 1043	80
LBAT 1044	80
LBAT *1045	82
LBAT *1046	82
LBAT 1047	83
LBAT 1048	84
LBAT 1049	85
LBAT 1050	85
LBAT 1051	86
LBAT 1052	86
LBAT 1053	86
LBAT *1054	86
LBAT **1055	87

Publication	Edition number
LBAT 1056	89
LBAT 1057	90
LBAT 1058	91
LBAT **1059	93
LBAT 1060	94
LBAT 1061	96
LBAT 1062	98
LBAT 1063	98
LBAT 1064	98
LBAT 1065	98
LBAT 1066	111
LBAT 1067	112
LBAT 1068	114
LBAT 1069	115
LBAT 1070	116
LBAT 1071	117
LBAT 1072	118
LBAT 1073	119
LBAT 1074	120
LBAT 1075	16
LBAT 1076	78
LBAT 1077	113
LBAT 1078	121
LBAT 1079	122
LBAT 1080	125
LBAT 1081	21
LBAT 1082	86
LBAT 1083	123
LBAT 1084	124
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LBAT 1093	71
LBAT 1094	59
LBAT 1095	11
LBAT 1096	128
LBAT 1097	86
LBAT 1098	10
LBAT 1099	129
LBAT 1100	130
LBAT 1101	59
LBAT 1102	101
LBAT 1103	54
LBAT 1104	37
LBAT 1105	67
LBAT 1106	138
LBAT 1107	139
LBAT 1108	140
LBAT 1109	35
LBAT 1110	141
LBAT 1111	102
LBAT 1112	142
LBAT 1113	143
LBAT 1114	56
LBAT 1115	144
LBAT 1116	145
LBAT 1117	191
LBAT *1118	153
LBAT *1119	153
LBAT *1120	156
LBAT 1121	155
LBAT 1122	157
LBAT **1123	158
LBAT *1124	159
LBAT 1125	162
LBAT 1126	161
LBAT 1127	163
LBAT *1128	164
LBAT 1129	165
LBAT 1130	166
LBAT 1131	168
LBAT 1132	169
LBAT 1133	169
LBAT 1134	170
LBAT 1135	171
LBAT 1136	172
LBAT 1137	173
LBAT 1138	82
LBAT 1139	174
LBAT *1140	175
LBAT 1141	176
LBAT 1142	176
LBAT 1143	178
LBAT 1144	177
LBAT *1145	179
LBAT *1146	180
LBAT *1147	181

Publication	Edition number
LBAT 1148	182
LBAT 1149	182
LBAT *1150	183
LBAT 1151	184
LBAT 1152	185
LBAT 1153	185
LBAT 1154	185
LBAT 1155	185
LBAT *1156	185
LBAT 1157	187
LBAT 1158	186
LBAT 1159	188
LBAT 1160	189
LBAT **1161	190
LBAT 1162	190
LBAT 1163	190
LBAT 1164	190
LBAT 1165	190
LBAT *1166	190
LBAT **1167	190
LBAT **1168	190
LBAT 1169	191
LBAT 1170	191
LBAT 1171	191
LBAT **1172	191
LBAT 1173	191
LBAT 1174	191
LBAT 1175	193
LBAT 1176	194
LBAT 1177	196
LBAT 1178	197
LBAT *1179	199
LBAT *1180	199
LBAT *1181	200
LBAT 1182	201
LBAT 1183	202
LBAT 1184	204
LBAT 1185	206
LBAT 1186	197
LBAT 1187	207
LBAT 1187	207
LBAT 1188	208
LBAT 1189	208
LBAT **1190	209
LBAT **1191	210
LBAT **1192	210

Publication	Edition number
LBAT 1193	211
LBAT 1194	211
LBAT 1195	211
LBAT **1196	211
LBAT *1197	214
LBAT *1198	215
LBAT *1199	216
LBAT *1200	217
LBAT 1202	221
LBAT 1203	203
LBAT 1204	167
LBAT 1205	191
LBAT 1206	222
LBAT 1207	92
LBAT 1208	100
LBAT 1209	191
LBAT 1210	223
LBAT 1211	224
LBAT 1212	226
SBTU I 99	219
UOS 367ff.	103
ZA 36, 66ff.	211

Dated Normal Star Almanacs

No. 1

BM 65156 (= 82-9-18, 5137)
Photo: Pl. 1
Year: SE 12?

´Obv.
(illegible traces of 6 or 7 lines)

Rev.´

1 ⌜SIG⌝ MUL_x(ÁB)-MUL_x(ÁB)? 1 KÙŠ AB GE_6 24 *e is* [le_{10} nn mm]
2 ZÍZ GE_6 [x] SIG *šur* SI 1 KÙŠ 8 U GE_6 22 [*e šur*]
3 ULÙ 1½ KÙŠ ŠE GE_6 11 *e* MÚL *ár šá še-pí*[*t* MAŠ-MAŠ nn mm]

(from here on two columns)

4	MU 12 BAR 20+[x]	MAŠ	GE_6 3 USAN GU_4-UD ⌜*e*⌝ [....]
5	GU_4-UD *ina* ŠÚ *ina* MAŠ ŠÚ		*ina*? GE_6 16 SIG *šur* ULÙ [....]
6	GU_4 29 *ina* NIM *ina* MAŠ IGI		KIN GE_6 20 *ina* ZÁ[LAG ....]
7	SIG 16 *ina* NIM ŠÚ	*ina* MAŠ	DU_6 GE_6 10+[x ....]
8	ŠU 11 *ina* ŠÚ IGI	*ina* A	AB GE_6 [....]
9	IZI 19 *ina* ŠÚ ŠÚ	*ina* KI	ŠU GE_6 29? U[SAN ....]
10	KIN 12 *ina* NIM IGI	*ina* KI	APIN GE_6 [....]
11	DU_6 13 *ina* NIM ŠÚ	*ina* RÍN	IZI [....]
12	[APIN] 28 *ina* ŠÚ IGI	*ina* ⌜x⌝	
13	[x x]+1 *ina* [ŠÚ ŠÚ]		

Comments
While the heliacal risings and settings of Mercury for „year 12“ fit to some degree with SE 12, the remaining data cannot be related to this year. Mercury is visible on I 3 (line 4); but the remainder of the right column is unclear to me. Maybe lines 9 and 10 refer to Saturn because there are so few data mentioned.
The speed of the planet in lines 1-3 suggests Mars; the data would fit, e. g. SE 170, 234, or 249 (but not SE 11 or 12). There is no obvious relation to the rest of the text.
The signs at the ends of lines in the left column are smaller and may have been added later.
Rev. 1: the signs for Pleiades are written as in JCS 21 (1969) 217:4, see ibid. p. 200f. In both cases, there seem to be more wedges present than are required for the sign ÁB.

No. 1

´Obv.
(illegible traces of 6 or 7 lines)

Rev.´

1 1 cubit below η Tauri. Month X, night of the 24th, [....] above α [Tauri.]
2 Month XI, night of [the xth,] 1 cubit 8 fingers below β Tauri. Night of the 22nd,
3 1½ cubits [above ζ] Tauri. Month XII, night of the 11th, [....] above μ Gemin[orum.]

(from here on two columns)

I

4 Year 12, month I, the 20+[xth,] Gemini
5 Mercury's last appearance in the west in Gemini.
6 Month II, the 29th, first appearance in the east in Gemini.
7 Month III, the 16th, last appearance in the east in Gemini.
8 Month IV, the 11th, first appearance in the west in Leo.
9 Month V, the 19th, last appearance in the west in Virgo.
10 Month VI, the 12th, first appearance in the east in Virgo.
11 Month VII, the 13th, last appearance in the east in Libra.
12 [Month VIII,] the 28th, first appearance in the west in ....
13 [...., the x]+1st, [last appearance] in [the west ....]

II

4 Night of the 3rd, first part of the night, Mercury above [....]
5 .... Night of the 16th, below ζ Tauri [....]
6 Month VI, night of the 20th, last [part of the night ....]
7 Month VII, night of the 10+[xth, ...]
8 Month X, night [....]

---

9 Month IV, night of the 29th?, fir[st part of the night, ...]
10 Month VIII, night [....]

---

11 Month V, [....]

No. 2

BM 48104 (= 81-11-3, 813)
Photo: Pl. 1
Year: SE 19

´Obv.

1´	⌜x⌝ [....]		
2´	13	[....]	
3´	14	9,20	[ME ....]
4´	14	8,30	*n*[*a* ....]
5´	15	5	GE_6 [....]
6´	26	23,40+[x	KUR ....]

Rev.´

1	GAN 1	19,20	[....]	
2	13	14	ME	⌜x⌝ [....]
3	13	5,30	ŠÚ	⌜x⌝ [....]
4	14	1,30	GE_6	⌜x⌝ [....]
5	14	9,10	*na*	[....]
6	27	20,40	[KUR	]

———————————

7	ZÍZ 30	10,20+[x		
8	13	9,10+[x	ŠÚ	]
9	14	1+[x	ME	]
10	14	[x	*na*	]

Left edge

1	*meš-ḫi šá* MU-19-KAM	ᶦ*S*[*e*ʾ*-lu-ku*	LUGAL]
2		GABA-RI [....	]

No. 3

BM 77997 (= 85-4-30, 190)
Photo: Pl. 1
Year: SE 23

´Obv.

1´	[....] ⌜x x *šá*⌝ [....]
2´	[x x] 19ʾ ⌜x⌝ [....]
3´	[x] ⌜x⌝ [x x] ⌜x⌝ [....]
4´	[IZ]I 30 GE_6 3 *ina* ZÁ[LAG ....] *ina* ZÁLAG MÚL-BABBAR SIG MAŠ-M[AŠ IGI .... AN]
5´	SIG MÚL KUR *šá* KA *šil-taḫ* PA ⅔ʾ KÙŠ 17 GENNA *ina* ABSIN [ŠÚ ....]

———————————

No. 2

´Obv.´

1´ .... [....]
2´ The 13th, [....]
3´ The 14th, [moonrise to sunset:] 9° 20´.
4´ The 14th, sunrise [to moonset:] 8°30´.
5´ The 15th, sunset to moonrise: 5°.
6´ The 26th, [moonrise to sunrise:] 23° 40+[x´.]

´Rev.´

1´-6´ Month IX, the 1st (of which will follow the 30th of the preceding month); (sunset to moonset:) 19° 20´. The 13th, moonrise to sunset: 14°. The 13th, moonset to sunrise: 5° 30´. The 14th, sunset to moonrise: 1° 30´. The 14th, sunrise to moonset: 9° 10´. The 27th, [moonrise to sunrise:] 20° 40´.
.... [....] .... [....] .... [....]

7´-10´ Month XI, (the 1st of which will be identical with) the 30th (of the preceding month); (sunset to moonset:) 10° 20+[x´.] The 13th, [moonset to sunrise:] 9° 10+[x´.] The 14th, [moonrise to sunset:] 1+[x°.] The 14th, [sunrise to moonset: ....]

Left edge

1 Predictions of year 19, [king] S[eleucus.]
2 Copy of [....]

No. 3

´Obv.

1´ [....] .... [....]
2´ [....] 19? .... [....]
3´ [....] .... [....] .... [....]
4´ Month V, (the 1st of which will be identical with) the 30th (of the preceding month). Night of the 3rd, last part of the [night, ...] last part of the night, Jupiter [....] below [α] Geminorum. [.... Mars]
5´ ⅔? cubit below ϑ Ophiuchi. The 17th, Saturn‘s [last appearance] in Virgo. [....]

6′ KIN 30 *ina* LUL GE_6 2 *ina* ZÁLAG ⌜MÚL-BABBAR SIG MAŠ-MAŠ⌝ [*ár* ....]

7′ DU_6 1 5 LÁL-*tì* 12 *dele-bat ina* ŠÚ *ina* [x IGI ....] ⌜x x⌝ [....]

8′ GE_6 26 USAN AN S[IG ....]

Rev.′

1 [APIN x] 13 *na* GE_6 20 USAN AN *e* MÚL ⌜IGI *šá* SUḪUR MÁŠ 6?⌝ [SI ....]

2 ⌜GE_6⌝ [2]2 USAN AN *e* MÚL *ár šá* SUḪUR MÁŠ 4+[x SI ....]

---

3 GAN 30 GE_6 14 *ina* ZÁLAG MÚL-BABBAR SIG MAŠ-MAŠ IGI 2⅔ KÙ[Š ....]

4 22 MÚL-BABBAR *ana* ME E-*a* 27 KUR ⌜GE_6 29?⌝ [....]

---

5 [AB x G]E_6 1 USAN *dele-bat e* MÚL ⌜*ár šá* SUḪUR⌝ [MÁŠ ....]

Date

The equinox on VII 5 sets the year at SE 4 + 19n. Saturn in Virgo (line 6′) and a first appearance of Venus in the west (line 8′) identify the year as SE 23, which is confirmed by the positions of Mars.

No. 4

BM 47724 (= 81-11-3, 429)

Listed as LBAT *995

Photo: Pl. 2

Year: SE 31

Upper edge

2 [*ina a-mat*] ^{d}EN *u* ^{d}GAŠAN-*iá liš-lim*

Obv.′

I

1	[BAR ....] 10?			GE_6 5 USAN GU_4-UD SIG ⌜MÚL⌝-MÚL ½ KÙŠ
2	[x	x	M]E	
3	[x	x	Š]Ú	
4	[x	x]	GE_6	
5	[x	x	*n*]*a*	GE_6 27 *ina* ZÁLAG *dele-bat* SIG MÚL KUR
6	[		]	*šá* DUR *nu-nu* 3 KÙŠ

---

7 [GU_4 ....] ⌜x x x x⌝ [....]

II

1 Š[U ....]

2 12 [....]

3 13 [....]

4 14 [....]

′Rev.

III broken;