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Volume Two, Fascicle One

# Babylonian Planetary Omens: Part One <br> The Venus Tablet of Ammiṣaduqa 

by Erica Reiner
in collaboration with David Pingree

# BABYLONIAN PLANETARY OMENS 

## PART ONE

# ENŪMA ANU ENLIL <br> TABLET 63: <br> THE VENUS TABLET OF AMMIṢADUQA 

by
Erica Reiner
in collaboration with
David Pingree
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This edition of Enūma Anu Enlil is dedicated to the memory of A. Leo Oppenheim. He inspired both of us in many ways, and initiated and fostered our collaboration on Babylonian astral omens.

## FOREWORD

Enuma Anu Enlil (EAE) is the name by which the serics of celestial omens was known to the Babylonians. The name, as usual, is taken from the first words of the series' incipit. Scholars engaged in compiling, copying, and annotating the series were each called tupšar Enüma Anu Enlil, "scribe of Enūma Anu Enlil," and so, eventually, were the astronomers of Seleucid Babylonia.' The canonical corpus of celestial omens was divided by these scribes jnto about seventy tablets. The first fifty, dealing with the moon, the sun, and meteorological phenomena, were organized-but not edited-by E. Weidner, ${ }^{2}$ from the cuneiform texts in the British Museum published by Ch. Virolleaud in autograph copies, with transliterations but without translation, from 1908 to $1912,^{3}$ and from texts in other museums.

The last twenty-odd tablets contain omens derived from the movements of the planets and the stars, and for these not even a preliminary organization exists. It is, however, precisely these omens that are most significant for students of the history of science.

Therefore, at the suggestion of Professors Neugebaucr and Sachs, we are beginning the publication of the series EAE with the tablets that contain the planetary omens, that is, Tablets 50 and following, in a series of fascicles. Each fascicle will contain one or more tablets whose serial number is known, or, failing this, whose subject matter can be subsumed under some general heading. All fragments known to be part of the canonical series will be used to reconstruct the text; other fragments and scholia will appear as appendices to the canonical text. Each fascicle will also contain a glossary of technical terms (except for the present fascicle) and a list of apodoses.

First to be published is the present edition of Tablet 63, the "Venus Tablet." It is presented first because of its intrinsic interest for historians concerned with the chronology of the First Babylonian Dynasty, and also for the practical reason that it presents the fewest philological problems in its reconstruction (no overlap with any other tablet of EAE is possible) and its terminology (see Introduction p. 7). It will be followed by the edition of Tablets 50-52. Texts not previously published in autograph copy will be presented in the form of photographs on microfiche, as soon as enough photographs accumulate to fill such a microfiche.

The various fascicles containing one or more tablets of the series will be published as parts of individual volumes of the series Bibliotheca Mesopotamica. To facilitate the eventual use of the volumes as complete units, page numeration according to volume is given in square brackets at the bottom of each page-c.g. [ $B M$ 2,1] meaning volume 2 of $B M$, page 1. A separate title page and table of contents will be provided upon completion of each volume.

It is a pleasure to acknowledge a grant from the John Simon Guggenheim Memorial foundation for this project, which made possible collations of tablets in the British Museum.

[^0]The contributions of each author will be identified when these can be separated conveniently. In most cases, however, the textual interpretation relies on knowledge of both astronomy and of the texts pertaining to the histury of astronomy that David Pingree is providing. This collaboration should result eventually not only in the edition of the Babylonian corpus, but also in a critical evaluation of it for the history of astronomy.

## TABLE OF CONTENTS

FOREWORD ..... 3
TABLE OF CONTENTS ..... 5
PHILOLOGICAL INTRODUCTION ..... 7
Table Ia. Sources ..... 11
Table Ib. Arrangement of sources according to manuscript traditions ..... 12
Table II. Apodoses ..... 13
THE ASTRONOMICAL AND TEXTUAL PROBLEMS (By David Pingree) ..... 15
Astronomical Data in the Protases of Omens 1-21, 34-37, and 38-60 ..... 15
Table III. Correlations of omens $38-60$ with 1-21 and 34-37 ..... 15
Figure 1. The Orbits of Venus and the Earth ..... 16
Table IV. The astronomical data in the order of omens 1-21 ..... 17
Suggestions for a History of the Tradition of the Text ..... 21
Table V. The data as accepted by Van der Waerden ..... 22
Table VI. Attested intercalations in the reign of Ammiṣaduqa ..... 23
Bibliography ..... 26
THE TEXT ..... 28
Introductory Note ..... 28
Transliteration and Transcription ..... 29
Colophons ..... 61
Appendix A. Excerpts from EAE 63 in Iqqur ipuš ( $\S 104$ A) ..... 63
Appendix B. BM $41498=$ LBAT 1562 ..... 64
Appendix C. BM $34227+42033=$ LBAT $1560+1561$ ..... 65

## PHILOLOGICAL INTRODUCTION

The sources for Tablet 63 of the Series Enäma Amu Einlil, ${ }^{1}$ the si-cilled Venus Tablets of Ammisaduca, have been increased from the seven known to Langdon and Fotheringham ${ }^{2}$ to twenty. With the exception of one text (from Assur?) in the Staatliche Museen (Berlin), published by René Labat, MIO 5322 and pl. xix ( $=\mathrm{p} .344$ ), and identified by me as a "Venus Tablet," all new sources are from the collections of the British Muscum. Three fragments ( $\mathrm{E}, \mathrm{K}, \mathrm{N}$; see Table la) were previously published in LBAT, and identified by A. Sachs in the introductory catalogue to that volume. The others have been identified by me upon inspection of the omen fragments characterized as "astrological" in Bezold's Catalogue of the Cineiform Tablets in the Kouymiik Collection of the British Museum and from the list of Enüma Anu Einlil type material in the British Museum, compiled and gencrously put at my disposal by A. Sachis. Therefore, it is eminently possible that further fragments may come to light among unpublished texts in other museums, and cven in the British Museum itsclf. This fact is stressed here because, as will become clear from the presentation of the material, all but one of the twenty pieces present the material in such a uniform way that probably no more than two recensions-alike but for the fact that one includes omens $38-59$, and the other omits them and adds an extra omen (60) have to be reconstructed from these late manuscripts, even though the history of the canonical recension may be a complex one, as set forth by David Pingree on pp. 15 ff.

The fifty-nine omens of this tablet, as noted by previous editors and commentators, ${ }^{2}$ fall into four sections. Sections I (omens 1-21) and III (omens 34-37) deal with pairs of last and first visibilitics of Venus: they are separated by section II (omens 22-33). Most of the omens in I and III are repeated in IV (omens 38-59) wherein they are rearranged in the order of the months. Section II also was excerpted in the series Lequr ipus where it more properly belongs; see p. 10.

On the assumption that several fragments, though not direct joins, belong to the same tablet (A and M;F and $\mathrm{H}, \mathrm{L}, \mathrm{P}$, and $\mathrm{Q} ; \mathrm{T}$ and U ), the number of exemplars attested may be reduced from twenty to fifteen. Although none of the sources is completely preserved, certain conclusions can be drawn about the content and arrangement of the various exenplars (see Table 1b)

1. All four sections l-IV were contained in exemplar $\mathrm{A}(+) \mathrm{M}$ and probably in J. If $\mathrm{L}(+) \mathrm{P}(+) \mathrm{Q}$ are parts of one tablet, that exemplar contained sections II-IV, and hence probably I-IV; if G belongs to the same tablet, it certainly contained I-IV.
2. Sections I-IIl only were contained in C.
3. Sections I-III, plus omen 60 , were contained in B, and probably also in R and N . In N, only III and omen 60 are preserved; in $R$, the subscript preceding omen 60 and omen 60 .
4. Exemplar $\mathrm{T}(+) \mathrm{U}$ contained only section IV, and may represent the second tablet of a recension in which I-IV were written on two tablets, and therefore may be the continuation of an exemplar such as C (or of C itself).

[^1]5. The other sources are so fragmentary that it cannot be established whether they belong to one of the two basic type exemplars, namely manuscript tradition $x$-above (1) and possibly above (2) plus (4)and $y$-above (3). Sections I and II are attested in F (+) H and probably D; only section I in G: only IV in $\mathrm{K}, \mathrm{O}$, and V ; only 11 in L which, therefore, may belong to Iqqur ipuš (see below).
6. The placement of $K$ is not certain; $E$ cannot be placed, and is given in separate transliteration on p. 64 .

Note that $V$ (an Assur text?) is the only manuscript which uses mul Dil-bat for Venus instead of Ninsianna (all other manuscripts).

Each section is delimited not only by its content and, for section IV, also its form, but by a subscript. We have identified eight subscripts, $S_{1} S_{8}$, though some of these may have to be collapsed.

The first subscript, $\mathrm{S}_{1}$, occurs after section I ; unfortunately, it is illegible in C , and in H -which sets off this section from the next by a double ruling-only the middle portion of the subscript line is preserved, and this portion is blank, so that the nature of $\mathrm{S}_{1}$ is unknown. (However, in C at least, the subscript was not of the form $n k i s n \bar{u}$, because the traces do not allow such an interpretation.)
$S_{2}$, the subscript after omen 33, is attested in $B, C, D,(A+) M$, and $N$, and reads as follows: 12 kisruu tămurätu ${ }^{3}$ ša Ninsianna GABA.RI Bäbili 'twelve omens, visibilitics ${ }^{3}$ of Venus, copy of (a text from) Babylon'.

Section III is followed in C by a subscript $\mathrm{S}_{3}$ which may represent the subscript to Tablet 63; of it only the end, [. . ] kî pi labiriš̌u '[. . .] according to its original', is preserved. In N. a subscript of two lines, $S_{4}$, occurs; the first line is fragmentary and what is preserved is not intelligible; the second line in its preserved part has [. . ] Ta kisri ' [ . . ] from the omen(s)'. A subscript in both $\mathbf{P}$ and K , that we call $\mathrm{S}_{5}$, preceded the next section, IV: what preceded it is not preserved in $P$, and cannot be identified as omen 37 in K. Probably it is to be restored as [4 kiṣrū̆ ša] Ninsianna alıûtu 'four extraneous omens about Venus'; in P , only the word Ninsianna is preserved.
$S_{6}$, the subscript that concludes Tablet 63 in $A$ and $J$, is identical in its preserved portion to $S_{5}$, and is probably to be restored as [ 21 kiṣrī̀ $\check{s} a]$ Ninsianna ahùtu. In R, only the second half of the subscript is preserved: [. . kiṣ]ri tajärta ina libbi išū, this subscript, $\mathrm{S}_{7}$, may be restored from $\mathrm{S}_{8}$; see below, and the interpretation proposed on p.9. In B, this subscript takes up two lines, but the first line is broken with the exception of the first two sigus. The second sign may be $k i$, permitting a restoration $k i[s ̧ u l$ : the first sign is partly broken, and if it is a numeral it can be only the figure 4 . Therefore, we have concluded that this subscript is probably identical with $S_{4}$ and $S_{5}$, and that manuscripts $B$ and $R$, and probably $N$, did not contain section IV.

The additional omen 60 that follows $S_{7}$ in $B$ and $R$, and probably also in $N$, is a repetition of omen 17 (also appearing as omen 50 in section IV), but correcting the erroneous eastern setting of omen 17 to a western setting.

This omen is again followed by a subscript in $B$ and $R, S_{8} . S_{8}$ is better preserved than $S_{7}$, and may be used for the restoration of $\mathrm{S}_{7}$ : 2 kişrū ša Ninsianna ahưtu ultu libbi kiṣri tajārātu ina libbi išúu. Its beginning is preserved only in B , and the figure 2 is beyond doubt, in spite of the fact that the section preceding $\mathrm{S}_{8}$ (the section between $\mathrm{S}_{7}$ and $\mathrm{S}_{8}$ ) contains only one omen, not two.

[^2]Subscripts $\mathrm{S}_{7}$ and $\mathrm{S}_{8}$ employ a terminology not otherwise attested, and their interpretation is uncertain. They may be translated: ' $n$ extraneous omens about Venus, from an omen (or: the omens); they have returns therein'. The word translated as 'omen' is kişru; it was translated as 'section (of a text)' in CAD K 441 a sub 8 a, but the references cited there could also be interpreted as 'omens'; the translation 'omens' is chosen here because the subscript to the twelve omens of section II uses the same term.

The word translated as 'return' is tajartu (plural: tajārātu). It is normally used (in the singular) for the 'return (march)' from a campaign in Neo-Assyrian annals and, in transferred meaning, for 'pardon'; ${ }^{4}$ only a few atypical occurrences ${ }^{5}$ suggest the meaning 'repetition' that seems to be required in the subscripts.

Source $B$ also gives the total number of omens on the tablet in the colophon. The number, slightly broken, may be either 34 or 37 . The number 34 would account for the total of sections I and II $(21+12)$ and the added omen 60 ; the number 37 would account for all omens of sections I, II, and III $(21+12+4)$.

The basis for the attribution of the eight-year cycles of Venus of Tablet 63 to the reign of Ammisaduqa, and specifically of the first such cycle (omens $I-10$ ) to a Venus-cycle in the first eight years of his reign, is of course the name of year 8 of Ammisaduqa ${ }^{6}$ that follows the first ten omens. However, the tenth omen, the last of the cycle, is incomplete. In fact, it consists solely of the statement 'Venus disappeared in the east on the 25 th of month XII'. Thus, it is not an omen, because it lacks an apodosis; moreover, it also differs from omens 1-9 (and 11-20 of the "second cycle") because it lacks the period of invisibility and the date of the next first visibility. The date of the disappearance of Venus is stated as an event. We know that ominous occurrences that were observed in an extispicy, namely markings and features on the liver and lungs of the lamb, were reported in the Old Babylonian period. ${ }^{7}$ All those reports that are dated date to the reigns of the last two kings of the First Dynasty of Babylon, Ammisaduqa (fourteen reports) and Samsuditana (two). ${ }^{8}$ It is therefore our belief that omen 10 was not shortened from a complete omen in order to find space for the name of the year, but that it was originally a report of an observation of the last visibility of Venus, followed by the date, as in the case of the reports of haruspices.

It should be noted that the fragmentary line [. . ] KU.GI. ga. $\mathrm{Ke}_{4}$, that is, the end of the year name of Ammisaduqa 8, occurs on another fragment of celestial omens, Sm. 1057:8'.

With the exception of omen 10 , the omens of sections 1 , Ill, and IV, and omen 60 all follow the same pattern: In month MN, day $n$, Venus disappeared in the east/west; it remains invisible for $n$ days, and became visible in month $\mathrm{MN}_{2}$, day n , in the west/east: apodosis. While the verbs itbal 'disappeared' and innamir 'became visible' may be in the past tense because of the general style of omens, according to which the introductory summa ('if') governs a grammatical preterite, it is to be noted that the verb 'remains invisible' nonetheless is in the present tense-uhharam(-ma)-in all sources which use a syllabic spelling in

[^3]sections I and III and in omen 60, but in the preterite-uhhiram(-ma) in section IV. The logographic spelling ZAL may represent either the preterite uhhiram(-ma) or the present uhharam(-ma).

The omens of section II follow a different pattern: they begin not with the disappearance, but with the appearance of Venus. After the introductory 'In MN, day n, Venus appeared in the cast/west', there foliows A (podosis). Then contes an amplification or explanation: 'It remains present in the east/west until month $\mathrm{MN}_{2}$, day n ; it disappears in $\mathrm{MN}_{2}$, day $\mathrm{n}+\mathrm{I}$, and remains invisible for three monthis/seven days: in $\mathrm{MN}_{3}$, day $n\left(=\mathrm{MN}_{2}\right.$, day $\mathrm{n}+1$ plus three months or seven days), it rises in the west/cast: A(podosis) ${ }_{2}$. The second section may be called an amplification or explanation because the verb forms in this section are always in the present, and are all followed by the particle -ma. This verb form is characteristic of the explanations given in commented texts. Commented texts are of the pattern protisis - apodosis - commentary, and this is the pattern found in the omens of section II, with the difference only that in these omeris a second apodosis follows. Not only is it unique that two apodoses occur in two different parts of an omen; the two apodoses are dissimilar, and sometimes contradictory an occurrence found, to be sure, in other omen series, but with the specification that the second apodosis (which always immediately follows the first) is a variant from another source.

The structure of these omens of section II, and their relation to Tablet 63 , remains unicgue. As mentioned briefly on p. 3. this section was excerpted in at least some recensions of the series Iqqur ipurs. ${ }^{9}$ a series deriving omens from various activities undertaken by a person (in some recensions by the king) in the twelve months of the year, with the day of the month remaining unspecilied. ${ }^{10}$ Some tahlets of liquer ipurs which are organized by months (Labat's Séries Mensurfles) list as the last of the omens derived frem celestial phenomena moon, sum, Venus, metcorological and atmospherie phenomena an omen from the rising of Venus which is one of omens 22-33. (For months I, III, IX, and X see Labat, Calendrier p. 199; for month VI, ibid. p. 259.) A further, unpublished, fragment of such a monthly section of Iqqur ipuř for month II, K. 7939 , also contains the omen from Venus' rising (= LAE 63 omen 23); it is possible that sources for the other months also contained this omen. However, in the first part of Iqqur ipuš, in which a paragraph is devoted to cach activity, no separate paragraph for the risings of Venus through the twelve months has so far been attested, but such a paragraph was included by Labat as $\S 104 \mathrm{~A}$ of Iqqur ipmš because of the occurrence of such omens in the monthly series. One of the texts which at first was taken to belong to Tablet $63, \mathrm{~K} .3170+11719+1455 \mathrm{I}$, turned out to be part of Iqquir ipuš, because, while it has omens $22-27$ on the reverse, it has other Iqqur ipus paragraphs on the obverse. The pertinent onens from this text are edited in Appendix A. Source L. of Tablet 63, K. $12344+12758$, with omens $25-29$, may also be part of Iqqur ipus rather thatn of Tablet 63.

This fact raises anew the question pused by Labat, op. cit. pp. 9f., whether Iqqur ipuš borrowed from other omen series, or vice versa. As far as planetary omens are concerned, Labat included five paragraphs on Venus ( $8582-86$ ), and on pp. 170f. note 6 mentions the possibility that two paragraphs concerning Jupiter and one concerming ${ }^{\mathrm{d}}$ UDU.IDIM of EAE may have been incorporated in some editions of Iqqur ipuš. Without attempting to solve the general problem of the relationship of Iqqur ipuš to other omen texts, we would point out that section II of EAE 63 (omens $22-33$ ) fits into the monthly schema which forms the structure of Iqqur ipuš. Section IV, in which omens I-2I and 34-37 are rearranged in the order of the months, does not fit into the schema of Iqqur ipuš because most months occur more than once in the sequence.

[^4]
## Table Ia. Sources.

| A | K. $2321+3032$ | Neobabylonian. AAT 46: ACh Ištar 12, 15; Langdon-Fotheringham pl. 5-6. Omens 1-14; break; 45-59; $\mathrm{S}_{6}$ : end (colophon). |
| :---: | :---: | :---: |
| B | W 1924.802 | Neobabylonian. Langdon-Fotheringham pl. 3-4. Omens 1-11: break; $S_{2}$; 34-37: $\mathrm{S}_{7} ; 60 ; \mathrm{S}_{8}$ : cnd (colophon). Found at Kish in 1924. |
| C | K. 160 | 3R 63: AClı lstar 12-14: Langdon-Fotheringhan pl. 1-2. Photo: ACh frontispiece. Omens 8-21; $\mathrm{S}_{1} ; 22.33 ; \mathrm{S}_{2} ; 34-37: \mathrm{S}_{3}$; brcak. |
| D | K. 7225 | Photu. Column i: omens 7-12; break. Column ii: broken, possibly $\mathrm{S}_{2}$. |
| E | BM 41498 | Neobabylonian. LBAT 1562. See Appendix B. |
| F | BM 37010 | Neobabylonian. Omens 12-15; break. |
| G | Rm. 2,531 | Langdon-Fotheringlam pl. 3. Omens 15-20; break. |
| H | BM $36758+37496$ | Neobabylonian. Photo of BM 36758. Omens 19-21; $\mathrm{S}_{1} ; 22$-27: break. |
| J | BM 36395 | Neobabylonian. Photo. Omens 3-15; break; 54-59; $\mathrm{S}_{6}$; end (colophon). |
| K | BM $34227+42033$ | Neobabylonian. LBAT $1561+1560$. Two unidentified omens (see Appendix C); $S_{5}$; omens 38-42; break. |
| L | K. $12344+12758$ | Omens 25-29: break. |
| M | K. 3105 | Neobabylonian. Ploto. Onens 27-33; $\mathrm{S}_{2}: 34-36$ : break. |
| N | BM 41688 | Neobabylonian. LBAT 1563. $\mathrm{S}_{2}$ : omens 34-37: $\mathrm{S}_{4}: 60^{\circ}$ : break. |
| 0 | BM $37121+37432$ | Neobabylonian. Omens 53-56; break. |
| P | K. 7072 | ACh Supp. 42. $\mathrm{S}_{5}$; omens 38-40; break. |
| Q | Sm. 174 | Babyloniaca 3 285; Langdon-Fotheringham pl. 6. Omens 45-48; break. |
| R | K. 7090 | Photo. $\mathrm{S}_{7}: 60: \mathrm{S}_{8}$ : end (colophon). |
| T | K. 5963 + Rm. 134 | ACh Supp. 41 (Rm. 134 only). Omerns 38-41; break. |
| U | K. 12186 | Omens 56-58; break. |
| V | VAT 11253 | MIO 5 pl. 19 (= p. 344). Omens 41-45; break; 57.59; break. |

A and M may be parts of the same tablet.
F and H may be parts of the same tablet.
$\mathrm{L}, \mathrm{P}$, and Q may be parts of the same tablet.
T and U may be parts of the same tablet.

V has been collated by Dr. Liane Jakob-Rust. All other sources have been collated by E. Reiner; in addition, numbers on all British Museum tablets (i.e., all sources except B and V) have also been checked by Asgar Aabue.

Table Ib. Arrangement of Sources According to Manuscript Traditions.

| Manuscript Families | Sources | Sections |  |  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | 1 |  | II |  | III |  | IV |  |  |  |  |
| $\mathbf{x}$ | $\begin{aligned} & \mathbf{A}(+) \mathrm{M} \\ & \mathrm{~J} \\ & (G+) \mathrm{L}(+) \mathrm{P}(+) \mathrm{Q} \\ & \mathrm{~K} \end{aligned}$ | $1-(21)$ <br> (1) $-(21):$ $(1)-(21) ;$ | [ | $\text { (22) }-33:$ $(22)-(33):$ | $\mathrm{S}_{2}$ | $34-(37)$ $\begin{array}{r} 1 \\ ] ? \end{array}$ | [ ] <br> I $S_{5}:$ $\mathrm{S}_{5}:$ | $\begin{aligned} & (38)-59: \\ & (38)-59: \\ & 38-(59) \\ & 38-(59) \end{aligned}$ | $\begin{aligned} & S_{6} \\ & S_{6} \\ & {[ } \end{aligned}$ |  | - | --- |
| y | B <br> R <br> N | $1 \cdot(21):$ | [ | 1 1 | $S_{2}$ $S_{2}:$ | $\begin{aligned} & 34 \cdot 37 \\ & 34-37 \end{aligned}$ | $S_{4}$ | - - - | ] | $\left\lvert\, \begin{gathered} S_{7} \\ S_{7} \\ - \end{gathered}\right.$ | 60: <br> 60 : <br> 60: | $S_{8}$ $S_{8}$ $[$ |
| z | C $(+) T+U$ | (1) -21 ; | $\mathrm{S}_{1}$; | 22-33 | $\mathrm{S}_{2}$; | 34-37: | $S_{3}$ | $38 \cdot(59)$ | ${ }^{-}$ | - | - | - |

Note. Parentheses around the first or last number in the columns under sections I-IV indicate that the first or last omens of the section are not preserved, but the section is attested in the manuscript through some of the omens.

## Table II. Apodoses.

The following is a list of the apodoses attested in Tablet 63. They are arranged in alphabetical order, and followed by the serial number of the omen or onens to which they belong. The letters $a$ and $b$ after numbers $22-33$ refer to $A_{1}$ and $A_{2}$ of these omens respectively.

1. ebūr māti iossir 'the harvest of the land will prosper'
2. ebūr māti išsir libbi mäti iṭâh $(=1+6)$
3. cbür ruṭibti iš̌ir libbi mâti itâb 'the harvest of the irrigated land will prosper, the land will be happy'
4. Iušahhí še'i u tibni ina māti ibašši 'there will be scarcity of barley and straw in the land'
5. huušallini še'i u tibni ina māti ibašši ubbutu išsakkan 'there will be scarcity of barley and straw in the land, there will be . . , 11
6. Xibbi māti itâh 'the land will be happy'
7. müta dannatu isabbat 'hard times will befall the land’
8. mätu cuna dannati ipallhur 'the land will assemble in the fortresses'
9. mērešu išsir 'the arable land will prosper'
10. miqitti ummāni matti 'downfall of a large army'
11. miqitti ummān--nanda: miqitti $\mid \ldots$ ) 'downfall of the Manda-troops, variant: downfall of [a large army" |'
12. MU SAL ina māti rūqti ibă̌ši: ina É.GAL GULA there will be . . . in a distant land, variant: in the large? palace'
13. nagbū ippattaru Adad zunnēšu ta nagbēšı ubbala surrıu ana šarri salīma 1,57 (omitting nagbū isappar 'springs will open', Adad will bring his rains, Ea his floods, king ippattaru) will send messages of reconciliation to king'
14. nukurätu ina máti ibašsă 'there will be hostilities in the land'
15. nukurätu ina māti ibuššà cbūrru iššir 'there will be hostilities in the land, the harvest will prosper'
16. mukurãtu ina māti ibaššà ebür māti iššir $(=14+1)$
17. nuṭibtu išsir libbi māti iṭâb (cf. 3)
18. sarräni [...] 'kings [...]’
19. šarru ana šarri mukurta ǐ̌appar *king will send messages of hostility to king'
20. Šarru ana šarri salïma išappar 'king will send messages of reconciliation to king'

2, 6, 12, 15, 30b, 31a, 32ab, [4I], 52, 53, 54, 55
23b, 27a, 28b, 31b
21

30:
7. 51
$4,13,14,35,[38],|42|$.
49
29a, 33b
30b variant from lqqur ipuš
34 variant
24i, 58
20
34
1,57 (omitting nagbū

23a, 24b, 25a, 27b
3, 48

26b, 28a, 29b, 36, 39
59 second part
33a
22b, 25b

11, 2I variant, 59 first part

[^5]21. Šarrı ana シ̈arri salta išappar 'king will send messages of war to king'
22. urubātu ina māti ibašàa 'there will be mourning in the land'
23. zunnū ina māti ibǎ̌šúu ubbutu išsakkan 'there will be rains in the land, there will be ...
24. zummū ima šamé ibaššu ubbutu ibaš̌̌i 'there will be rains from the sky, there will be . . .
25. zumū̆ ina šamé mīlu ina nagbi ibaš̌̌â 'there will be rains from the sky, 19 floods from the springs'

27. zunnū $u$ māhū ibařšú cbūr māti išsir 'there will be rains and floods, the harvest of the land will prosper'

45
11 variant, 37,56

## $22 a$

$8,9,17,18,46,47,50$, 60 $26 a$

5, 40

# THE ASTRONOMICAL AND TEXTUAL PROBLEMS 

(By David Pingree)

## Astronomical Data in the Protases of Omens 1-21, 34-37, and 38-60.

In one synodic period of approxmately 584 days the planet Venus makes one rotation about the Sun. (See Figure 1 for a sketch of the orbits of Venus and of the Earth around the Sun). If we consider a rotation to begin with the planet's last visibility in the East $(\Sigma)$, it will then be approaching superior conjunction with the Sun and its furthest distance from the Earth. Between last visibility in the Lasi ( $\Sigma$ ) and first visibility in the West ( $\Xi$ ) it will be invisible for two months and some days. After its first visibility in the West it remains visible for eight months and some days before its last visibility in the West ( $\Omega$ ) occurs, and it approaches inferior conjunction with the Sun. It remains invisible for as little as three days in the winter, for as much as 1 wo weeks and a few days in the summer, before its first visibility in the East ( $\Gamma$ ) occurs. Then it is again visible for eight months and some days before its last visibility in the East ( $\Sigma$ ). Of course, observations of "last visibilities" can oceur before the expected dates and those of "first visibilities" after the expected dates; but if a watch were kept every night, such variations because of observational difficulties should not have expanded the periods of invisibility or contracted those of visibility by more than a few days.

As has been pointed out in the introduction, the text consists of four sections, of which section IV is a monthly rearrangement of sections I and III; omen 60 is a corrected form of omen 17. The identifications of these omens are given in Table III.

Table III. Correlations of Omens $38-60$ with 1-21 and $34-37$.

Note. The number on the left refers to the omens in section IV, the number on the right to the omens in sections I and III. Where the identification is confirmed by the preserved apodoses (see Table II), an asterisk is added.

| $* 38$ | $=14$ | 44 | $=9$ |
| ---: | :--- | ---: | :--- |
| $* 39$ | $=36$ | $* 45$ | $=19$ |
| $* 40$ | $=5$ | $* 46$ | $=8$ |
| $* 41$ | $=15$ | $* 51=17$ | $* 56=37$ |
| $* 42$ | $=35$ | $* 52=2$ | $* 57=1$ |
| 43 | $=4$ | $* 48$ | $=3$ |

Figure 1. The Orbits of Venus and the Earth


Note. This diagram is not drawn to scale. The actual dates and longitudes of the phenomena of Venus depend on variables not represented in this simplified scheme.

In table IV are given the dates and periods of invisibility from each omen in sections I and fll and from the corresponding omens in section IV and omen 60．The copies preserving the information are indicated in parentheses．A column is added indicating the intervals of visibility computed on the assumption also made by the seribe who computed the periods of invisibility recorded in the text－that is，that each month contains 30 days．In the margin is given in square brackets the number of the regnal year of Ammisaduqa in which the last visibility of each omen would have fallen on the assumption that sections $I$ and III contain observations of the 21 years of his reign．

Table IV．The Astronomical Data in the Order of Omens 1－2I．

| Year | Onlens | Last visibility | Interval of invisibility | First visibility | Interval of visibility |
| :---: | :---: | :---: | :---: | :---: | :---: |
| ［1］ | 1 | $\Omega \mathrm{XI} 15$（B） | $3 \mathrm{~d}(\mathrm{AB})$ | 「 XI 18 （B） | 8 m 23 d （B） |
|  |  | $\Omega(\mathrm{A})$ |  | $\Gamma(\mathrm{A})$ |  |
|  | 57 | $\Omega(\mathrm{AU})$ | 3d（ AJ ） | Г XI 18 （J） |  |
|  |  |  |  | XI 18 （U） |  |
|  |  |  |  | XI 28 （A） |  |
| ［2］ | 2 | $\Sigma$ VIII 11（B） | 2 m 7 d （B） | 三 $\times 19$（B） | 8 m 4 d （B） |
|  |  | $\Sigma(\mathrm{A})$ | 2 m 8 d （A） | $\Xi(\mathrm{A})$ |  |
|  | 52 | $\Sigma(\mathrm{A})$ | 2 mbd （A） | 三×19（A） |  |
| ［3］ | 3 | $\Omega \vee 123$（B） | 20 d （ AB ） | Г VII 13 （B） | $8 \mathrm{~m} \mathrm{19d}$（B） |
|  |  | $\Omega(\mathrm{A})$ |  | $\Gamma(\mathrm{A})$ |  |
|  | 48 | $\Omega$ VI 23 （A） | 20d（A） | ГV1l 13 （A） |  |
|  |  | $\Omega(\mathrm{Q})$ |  |  |  |
| ［4］ | 4 | $\Sigma V I^{1} 2(B)$ | 2 mld （AB） | 三 VI 3 （B） | $8^{2} \mathrm{~m} 29 \mathrm{~d}$（B） |
|  |  | $\Sigma(\mathrm{A})$ |  | VI 3 （J） |  |
|  |  |  |  | E（A） |  |
|  | 43 |  |  |  |  |
| ［5］ | 5 | $\Omega$ II 2 （B） | 18d（B） | Г II 18 （B） | $8^{3} \mathrm{~m} 7 \mathrm{~d}$（B） |
|  |  | $\Omega(\mathrm{A})$ | 15d（A） | II（ AJ ） |  |
|  | 40 | $\Omega$ II $2(\mathrm{KP})$ | $x \mathrm{~d}(\mathrm{P})$ | Г If 28 or $18(\mathrm{~K})$ |  |
|  |  | II $2(\mathrm{~T})$ |  | $\Gamma(\mathrm{T})$ |  |

[^6]（Table IV continued）

| Y＇ar | Omens | Iast visibility | Interval of invisibility | First visibility | Interval of visibility |
| :---: | :---: | :---: | :---: | :---: | :---: |
| ［5］ | 6 | こ IX 25 （B） | $2 \mathrm{~m} 4 \mathrm{~d}(\mathrm{AB})$ | ミ XI 29 （B） | 8 m 29d（B） |
|  |  | 工 IX $12(\mathrm{~A})$ |  | 玉 Xl 16 （A） |  |
|  |  |  | 4 d （J） | XI 28 （J） |  |
|  | 54 | $\sum \quad x+1(\mathrm{~A})$ | $217 \mathrm{xd}(\mathrm{AO})$ | $\pm(\mathrm{AO})$ |  |
|  |  | $\sum 12(0)$ |  |  |  |
| ［6］ | 7 | $\begin{aligned} & \Omega \text { VIII } 18^{4}(\mathrm{~B}) \\ & \text { VIII } 20+x(\mathrm{~A}) \end{aligned}$ | $3 \mathrm{~d}(\mathrm{AB})$ | I＇IX $\mid$（ B$)$ | $8 \mathrm{~m} 20 \mathrm{~d}(\mathrm{~B}+\mathrm{A})$ |
|  |  |  |  | IX I（A） |  |
|  |  |  |  | IX (J) |  |
|  | 51 | $\Omega$ VIII 28 （A） | 5 d （ A$)$ | I＇IX（A） |  |
| ［7］ | 8 | $\Sigma \mathrm{V} 21(\mathrm{~A})$ | $2 \mathrm{~m} \mid 1 \mathrm{~d}(\mathrm{~B})$ | EVIII $2(\mathrm{~A})$ | 8 m 23 d （ AC ） |
|  |  | $\Sigma(\mathrm{BC})$ | $x \mathrm{~m} x+1 d(A)$ | VIII 2 （C） |  |
|  |  |  |  | VIII（J） |  |
|  | 46 | $\Sigma(Q)$ |  | $\Xi(Q)$ |  |
| ［8］ | 9 | $\Omega \mathrm{IV} 25$（ AC$)$ | 7 d （BCD） | ГV2（ACJ） | $7^{\prime} \mathrm{m} 23 \mathrm{~d}(\mathrm{AC})$ |
|  |  |  |  | $\Gamma(\mathrm{D})$ |  |
|  | 44 | IV（V） |  | $\Xi!(\mathrm{Q})$ |  |
|  |  |  |  | IV（V） |  |
| ［8］ | 10 | $\Sigma$ XII $25(\mathrm{AC)}$ |  |  |  |
| ［9］ | 11 | $\Omega \mathrm{III} 11$（AC） | 9 m 4 d （CD） | Г XII 15 （AC） | 85 ml 25 d （C） |
|  |  |  | $9 \mathrm{mad}(\mathrm{A})$ | $\Gamma(\mathrm{D})$ |  |
|  |  |  | $x \mathrm{~m} 5 \mathrm{~d}$（J） | XII 16 （J） |  |
| ［10］ | 12 | $\sum$ VIII $10(\mathrm{AC)}$ | 2 mbod （C） | $\pm \times 16(\mathrm{ACJ})$ | $8 \mathrm{mmod}(\mathrm{C})$ |
|  |  |  | $x \mathrm{mod}$（D） |  |  |
|  |  |  | $2 \mathrm{~m} 16^{?} \mathrm{~d}(\mathrm{~F})$ |  |  |
|  | 53 | $\sum(0)$ | $2 \mathrm{~m} 8 \mathrm{~d}(\mathrm{~A})$ | $\pm \times 16(\mathrm{~A})$ |  |
|  |  |  | $2 \mathrm{mxd}(\mathrm{O})$ | $\pm(\mathrm{O})$ |  |

[^7]（Table IV continued）

| Year | Omens | Last visibility | Interval of invisibility | First visibility | Interval of visibility |
| :---: | :---: | :---: | :---: | :---: | :---: |
| ［11］ | 13 | $\Omega \mathrm{VI} 26$（C） | I1d（CF） | $\Gamma \mathrm{VI}_{2}{ }^{6} 7$（ CJ$)$ | 7！m 2d（C） |
|  | 49 | $\Omega \mathrm{VI} 26$（A） | 12d（A） | $\Gamma \mathrm{VI}_{2} 8(\mathrm{~A})$ |  |
| ［12］ | 14 | 519（C） | 5 m 16 d （CF） | ミVI 25 （CJ） | 7：miod（C） |
|  | 38 | 2I8（K） | 5m 18d（K） | VI $\times(\mathrm{K})$ |  |
|  |  | I 8 （T） | 5m17d（T） | $\text { VI } 25(\mathrm{~T})$ |  |
|  |  | 1 （P） |  | VI 24 （P） |  |
| ［13］ | 15 | $\Omega \mathrm{II} 5$（C） | 7 d （CFG） | $\Gamma \quad x+1(\mathrm{~F})$ | $8 \mathrm{~m} 9 \mathrm{~d}(\mathrm{FG}+\mathrm{G})$ |
|  |  |  |  | $\Gamma(\mathrm{CJ})$ |  |
|  |  |  |  | 12 （G） |  |
|  | 41 | $\Omega \mathrm{II} 5$（K） | 7d（T） | $\Gamma(\mathrm{KT})$ |  |
|  |  |  | $6 d^{\prime}(\mathrm{V})$ | HII (V) |  |
| ［13］ | 16 | ミ $\times 20$（C） | 15d（C） | $\Xi \text { XI } 11 \text { (CG) }$ | $8^{7} \mathrm{~m} 29 \mathrm{~d}$（CG） |
|  |  | $\text { X } 21 \text { (G) }$ |  | $\Xi(\mathrm{J})$ |  |
|  | 55 | $\Omega!\quad 24(\mathrm{O})$ | $\operatorname{lm} x d(O)$ | $\Gamma^{\prime} \mathrm{XI} 28 \text { (A) }$ |  |
|  |  | $\Omega^{!}(\mathrm{A})$ | $\operatorname{rm} 4 d(A)$ | $\Gamma^{!}(\mathrm{O})$ |  |
| ［14］ | 17 | $\Sigma{ }^{\prime}$ VII 10 （C） | 1 m 16 d （C） | $\Xi$ V VIII 26 （CG） | 8m 20d（C） |
|  |  | VII 10 （G） |  |  | 8 m 21d（G） |
|  | 50 | $\Omega$ VII 11 （ A$)$ | 1 m 17 d （ A ） | I＇VIII 28 （A） |  |
|  | 60 | $\Omega \quad 11(\mathrm{~N})$ |  |  |  |
|  |  | $\Omega \quad 3(\mathrm{R})$ | 1 m 7 d （R） | VIII 28 （R） |  |
|  |  | VII（B） |  | VIII 27 （B） |  |
| ［15］ | 18 | $\Sigma \mathrm{V} 20$（C） | 2m 15d（C） | $\Xi$ VIll 5 （C） | $9{ }^{\text {！m od（ }}$（ $)$ |
|  |  | こV21（G） |  |  | $11^{!} \mathrm{mmod}(\mathrm{C})$ |
|  | 47 | $\Sigma(\mathrm{Q})$ | $1+x \mathrm{~d}(\mathrm{O})$ | $\Xi(\mathrm{A})$ |  |

[^8](Table IV continued)

| Year | Omens | Last visibility | Interval of invisibility | First visibility | Interval of visibility |
| :---: | :---: | :---: | :---: | :---: | :---: |
| [16] | 19 | $\Omega \vee 5$ (C) | 15d (C) | ГIV 20 (G) | 7! m 25d (G) |
|  |  | $\Omega$ VIII 5 (G) |  | $\Xi!\vee 20$ (C) | $6!\mathrm{ll} 25 \mathrm{~d}$ (C) |
|  | 45 | $\Omega(\mathrm{Q})$ |  |  |  |
| [16] | 20 | E XII 15 (CG) | 3m 9d (C) | $\Xi$ III 25 (C) | 8 m 15 d (C) |
|  |  | $\Sigma(\mathrm{H})$ | 2m7d (H) | $\Xi(\mathrm{G})$ |  |
|  | 58 | $\Sigma$ (AUV) | 2 m 7 d (AJ) | \pm ( A$)$ |  |
|  |  |  |  | III 4 (J) |  |
| [17] | 21 | XII 10 (C) | 4d (CH) | Г XII 14 (C) |  |
|  | 59 | $\Omega$ ( A$)$ | 4 d ( AJ ) | Г XII 14 (J) |  |
|  |  | $\Sigma!$ (V) |  | $\Gamma(\mathrm{A})$ |  |
| [19] | 34 | $\begin{aligned} & \Omega \mathrm{VI}_{2} \mathrm{I}(\mathrm{C}) \\ & \Omega(\mathrm{N}) \end{aligned}$ | $\begin{aligned} & 15 \mathrm{~d}(\mathrm{C}) \\ & 16 \mathrm{~d}(\mathrm{M}) \end{aligned}$ | $\Gamma \mathrm{VI}_{2}{ }^{8} 17(\mathrm{C})$ | 9: m 8d (C) |
|  |  |  |  | $\mathrm{VI}_{2}$ (M) |  |
|  |  |  |  | $\mathrm{VI}_{2} \mathrm{I} 4(\mathrm{~N})$ | 9 ! m 11d (N) |
| [20] | 35 | $\begin{array}{r} \Sigma \mathrm{IIII} 25(\mathrm{C}) \\ 25(\mathrm{~N}) \end{array}$ | 2min (C) <br> 2m16d (M) | 三 VI 24 (C) | $8{ }^{9} \mathrm{~mm} 3 \mathrm{~d}$ (C) |
|  |  |  |  | VI 14 or $x(\mathrm{~N})$ |  |
|  |  |  |  | $\exists$ (M) |  |
|  | 42 | III (V) | $1^{\prime \prime} \mathrm{mmg}(\mathrm{V})$ | $\pm(\mathrm{V})$ |  |
|  |  |  |  | $x+5(\mathrm{~K})$ |  |
| [21] | 36 | $\begin{aligned} & \Omega 127(\mathrm{C}) \\ & 27 \text { or } 28(\mathrm{~N}) \end{aligned}$ | 7d (C) | II 3 (C) | $8 \mathrm{ml} 25 \mathrm{~d}(\mathrm{C}+\mathrm{O})$ |
|  |  |  |  |  |  |
|  | 39 | 126 (PT) | 6d (T) | $\Gamma \mathrm{II} 3$ ( P ) |  |
|  |  | $\Sigma$ ! 127 (K) |  | $\Gamma(\mathrm{T})$ |  |
|  |  |  |  | $\Xi^{\prime}$ II 3 (K) |  |
| [21] | 37 | $\Sigma(\mathrm{C})$ |  | XII 28 (C) |  |
|  | 56 | $\Sigma 28(\mathrm{O})$ | 2 m 0 d (A) | $\Xi(\mathrm{OU})$ |  |
|  |  | $\Sigma$ (A) | $x \mathrm{~m}$ Od (J) |  |  |

[^9]|BM 2, $20 \mid$

## Suggestions for a History of the Iradition of the Text.

From the preceding table two things are clear: the source of section IV, which we will henceforth call the $\gamma$ text, was a rearrangement of the omens that appear in sections I and III, which sections we will call the $\beta$ text; and $\gamma$ does not copy all of these omens but omits omens 10 and 11 of section I and omen 34 of section III. If we look more closely, we notice that omen 34 uniquely begins with an intercalary month: that omen 10 is not an omen but as presently preserved is in the form of a simple observation dated in the year of the Golden Throne, which is the eighth year of the reign of Ammisaduqa; and that omen 11 contains an egregious error. For in omen 11 the western last visibility (or first invisibility) should be dated XII 11 instead of III 11 and the interval of invisibility should be 4 days instead of 9 months and 4 days. The correct data are found in omen 21, which is quoted in the $\gamma$ text as omen 59. One may hypothesize therefrom that the common source of $\beta$ and $\gamma$, which source we will call $a$, had omen 21 in place of omen 11, but that $\beta$ substituted for it omen 11 with the apodosis of omen 37 . Omen 21 was then added at the end of the second 8 -year period and has a double apodosis, one unique to it, the other the apodosis of omens 11 and 37 . Of course it is also possible to regard omen 21 as containing the first pair of phenomena in the third 8 -year cycle of Venus in Ammisaduqa's reign.

But it seems to us that the $a$ text naturally falls into three sections. Omens $1-10$ constitute an 8 -year cycle of Venus (five synodic periods) in which omen 10 was already incomplete, but was dated. Except for the wrong month in omen 4 (month VII written by mistake for month IV, an easy error to make palcographicatly and one that was peculiar to $\beta$ since $\gamma$, in omen 43 , must have had month IV), for variant day-numbers in the different sources of omen 6 , and for a serious problem in omen 9 , this section in $\beta$ makes perfect sense astronomically as a sequence of observed events if month $\mathrm{XII}_{2}$ was intercalated in year 4 and month $\mathrm{VI}_{2}$ in year 5. In fact, we know that the first of these intercalations and probably the second occurred during the reign of Ammiṣaduqa. The $\gamma$ text provides us with variant day-numbers for omens 1 , 5 , and 7 which attest to some insecurity in the text of these ten omens, but not much. This part of the text allows one to eliminate most years in the approximate time of Ammisaduya from consideration as the first year of his reign, but they do not definitely decide which of the remaining years is the correct one.

Omens 11-20/21 appear to represent a second 8 -ycar period of Venus (or such an 8 -ycar period followed by the first pair of phenomena in a third). However, the text of $\beta$ is extremely corrupt: omens $11,14,16$, 17, 19, and 20, are impossible; van der Waerden's method of dealing with this is displayed in Table V. In fact, of the twenty-two entries in omens 11-21, which he takes to be a continuation of omens $1-10$, van der Waerden, applying the 8 -year rule, rejects or alters nine, reads unattested numbers in two, and rejects two entries among the nineteerr of omens $1-10$ because they do not fit in with the entries for cight years later in omens $11-21$. Therefore, more than half of the entries in this section of $\beta$ are, according to van der Waerden, astronomically impossible if omens 11-21 are to be regarded as a continuation of omens 1-10. Moreover, the versions of omens $12-21$ in the $\gamma$ text offer variants for eight of the day-numbers; and in nine cases no numbers happen to be preserved.

That some of these corruptions already existed in the $a$ text is clear from the fact that the impossible interval between $\Sigma$ and $\Xi$ in omen $14-5$ months and 16 days also appears in omen 39 of the $\gamma$ text as 5 months and 17 or 18 days. However, in the case of omen $16(\beta)$, which is not conrect according to van der Waerden, there is a given interval of 15 days which does not fit the dates of the phenomena; in the corresponding omen $55(\gamma)$, the phenomena, the dates, and the interval are all different, the interval being 1 month and 4 days. The succeeding omen $17(\beta)$ has the wrong phenomena, while omen $50(\gamma)$ has the correct phenomena. All three texts- $a, \beta$, and $\gamma$-are corrupt in this section. Omen $20(\beta)$ and omen 58 $(\gamma)$ allow one to restore the text of this omen in $a$; the date of the eastern last visibility was XII 25 , the interval was 2 months and 9 days, and the date of the western first visibility was III 4 . The dates in omen 19 (one must either read the second date as IV 20 as does G or assume an intercalated $\mathrm{VI}_{2}$, which is not attested for the 16 th year of Ammisaduqa) were also copied differently from $a$ by different scribes.

Table V. The Data as Accepted by van der Waerden.

| Omen | Last visibility | First visibility |
| :---: | :---: | :---: |
| 1 | $\Omega \times 115$ | $\Gamma \mathrm{XI} 18$ |
| 2 | $\Sigma$ VIII II | $\pm \times 19$ |
| 3 | $\Omega$ VI 23 | [ VII 13 |
| 4 | $\Sigma \mathrm{IV}^{1} 2$ | $\pm$ V1 3 |
| 5 | $\Omega \mathrm{II} 2$ | $\Gamma \cdots$ |
| 6 | $\Sigma \mathrm{IX} 25^{2}$ | $\Xi \mathrm{XI} 29^{2}$ |
| 7 | $\Omega$ VIII 28 | [1X1 |
| 8 | \V21 | $\Xi$ VIII 2 |
| 9 | $\Omega$. | $\Gamma \vee 2$ |
| 10 | $\Sigma \mathrm{XII} 25$ |  |
| 11 | $\Omega \times 11^{3} 11$ | [ XII 15 |
| 12 | $\Sigma$ VIII 10 | $\pm \times 16$ |
| 13 | $\Omega$ VI 26 | $\Gamma \mathrm{VI}_{2} 8$ |
| 14 | $\Sigma$ | $\Xi$ |
| 15 | $\Omega \cdots$ | Г II 12 |
| 16 | บ $\times 21$ | $\Xi$ XII $21{ }^{4}$ |
| 17 | $\Omega^{5}$ | $\Gamma^{5}$ VIII 28 |
| 18 | ミV20 | $\Xi \mathrm{VIII}{ }^{6} 5$ |
| 19 | $\Omega \mathrm{IV}^{7} 5$ | $\mathrm{I}^{\text {J }} \mathrm{IV}^{8} 20$ |
| 20 | 2 XII $25^{9}$ | $\pm \cdots$ |
| 21 | $\Omega$ XII 11 | $\Gamma \cdots$ |
| 34 | $\Omega$ | $\Gamma$ |
| 35 | 2 11125 | $\Xi$ |
| 36 | S127 | [ 113 |
| 37 | 2 $\times 28$ | EXII 28 |

[^10]${ }^{6}$ VIII in $C, I X$ in $C$
${ }^{7} \mathrm{~V}$ in C , VHII in C .
${ }^{8}$ IV in $G, V$ in $C$.
${ }^{9}$ XII 15 in CO .

These considerations make it difficut to place much reliance on the data in this set of omens, and even raise the possibility that they are not a continustion of omens $1-10$ intended to cover the 9 th through the 16th ( 17 th if omen 21 is regarded as the beginning of a third 8 -year cycle) years of Ammisaduga's reign. It is true that the periods of visibility indicate the presence of an intercalated $\mathrm{VI}_{2}$ in year 11 : in fact, our list of intercalations in Ammiṣaduqa's reign in Table VI shows $10^{* *}, 11^{* *}$, and $13^{*}$; and perhaps $14^{* *}$. However, the text of the dates of the phenomena in years 13 and 14 (omens 16 and 17 ) is corrupt, so that some doubt is thrown upon 13*. Therefore, the possibility exists that omens 18 - 20 and perhaps omens 14-20-have nothing to do with the reign of Ammisaduqa, or some of them may while others do not. However one looks at the matter, it is extremely risky to use any of this section as a criterion for dating: essentially one is forced to assume, if one does use it, that disagreements of the text with computations for one's chosen date are scribal errors, so that the chosen date becomes a means of verifying the anthenticity of the text rather than the other way around.

## Table VI. Attested Intercalations in the Reign of Ammisaduqa.

(L.-F: S. Langdon and J. K. Fotheringham, The Venus Tablets of Ammizaduga, Oxford-London 1928, p. 61.

YOS 13: J. J. Finkelstein, Late Old Babylonian Documents and Letters, Yale Oriental Series 13, New Haven-London 1972. ${ }^{1}$

VAS 18: H. Klengel, Altbabylonische Rechts- und Wirtschaftsurkunden, Vorderasiatische Schriftdenkmäler Neue Folge, Heft II (Heft XVIII), Berlin 1973.)

| 4* (with $\mathrm{XH}_{2}$ ) | L-F |
| :---: | :---: |
| 5** (with $\mathrm{VI}_{2}$ ) | L-F ${ }^{2}$ |
| 10** | L-F; YOS 13532 |
| $11^{* *}$ | L-F |
| 13* | YOS 13404 |
| 14** | L-F ${ }^{3}$ |
| $17+{ }^{*}$ | L-F: YOS 13 53; VAS 1899 |
| $17+d^{* *}$ | YOS 13146 |

Further, L-F cite an unpublished text dated $17+a$ that indicates that the preceding year contained an intercalated $\mathrm{VI}_{2}$.

[^11]Following omen 21 is an insert with a completely schematic arrangement of the first and last visibilities of Venus. The author of this insert assumed the following mean values for the periods of visibility and invisibility:

|  | Visibility | Invisibility |
| :--- | :--- | :--- |
| East | 8 months 5 days | 3 months |
| West | 8 months 5 days | 7 days |

The preserved copies of the text contain some errors, but they are casily corrected. The subseript in MSS. C. $\mathrm{M}(=\mathrm{A}$ ? ), and N indicates that they were copied from an original from Babyion. Note that Iqqur ipuš excerpts omens onl? from this section of Tablet 63. This schematic representation must be relatively late as it is based on a recognition of the periodicity of Venus' motion.

To us it seems likely that whoever put together $a$ used four sources: one contained omens 1.10 and some of omens 11-21, another the rest of omens 11-21, a third the insert (which we will call $\delta$ ), and a fourth omens $34-37$. This reconstraction would support our theory that omens $34-37$ have nothing to do with Ammiṣaduca's reign.

It is also possible that the compiler of a copied from one text containing onens $1-37$ till he had finished omen 21: then turned to another source, the $\delta$ text; and finally turned back to his original source to copy onens $34-37$, in the process omitting the entry for Ammisaduga's 18th year. This is the reconstruction of events that previous scholars have accepted; to us it appears very dubious indeed. For in fact omens 34-37 fit very poorly indeed with the previous omens. There are serious astronomical problems with three of the four $-34,35$, and 36 ; the $\gamma$ text does not contain an omen corresponding to omen 34 , but it has variants for two of the five attested day-numbers in 35,36 , and 37 . The text preserves a $\mathrm{VI}_{2}$ in omen 34 , which is supposed to fall in the 19 th year of Ammisaduca; and the interval of visibility between omens 35 and 36 indicates the presence of a $\mathrm{VI}_{2}$ or a $\mathrm{XII}_{2}$ if these two omens are sequential; this is supposed to correspond to the 20th year of Ammisaduqa. We do have in our list of intercalations two years-17+d** and $17+\mathrm{a}^{*}-$ which could well be identified with years 19 and 20 of Ammisaduqa, though it cannot be proved that the pair of years $\mathrm{X}^{* *}$ and $17+\mathrm{a}^{*}$ are not years 17 and 18 , or 18 and 19 , or 20 and 21 , or that there was not yet another intercalated $\mathrm{VI}_{2}$ in the period between the years 16 and 20 of Ammisaduqa which $17+$ a might follow. If we read month V in omen 19 , we expect a $\mathrm{VI}_{2}$ in year 16 . The principal objection to identifying $17+d^{* *}$ with the 19 th year of Ammisaduqa, however, is that the dates given in omen 34 are astronomically impossible because of the 8 -year rule.

Following omen 37 in the "canonical" copies of Tablet 63 (i.c., MSS. A. J, and K, and perhaps $\mathrm{L}(+) \mathrm{P}(+)$ Q) is the $\gamma$ text, of which we also find fragenents in a number of other copies (i.e., MSS O, T $(+) \mathrm{U}$, and $\mathrm{V}) ; \mathrm{T}(+) \mathrm{U}$ at least contained only $\gamma$.

Three copies (MSS. B, N, and R) evidently omitted the $\gamma$ text, but add an extra omen (60). This is a version of omen 17 with the erroneous castern last visibility of $\beta$ corrected to a western last visibility. This correction also appears in omen 50 of $\gamma$, but the source of $\mathrm{B}, \mathrm{N}$, and R seems not to have known $\gamma$. That source, according to the scribe of $\mathbf{B}$, dated from the reign of Sargon II (721-705 B.C.).

There is one other fragment, MS. E, which contains omens similar to those in the $\gamma$ text (not $\beta$ because of the sequence of two last visibilities in the East), but not identifiable with any of them. It attests to the existence of collections of similar Venus-omens different from those found in Tablet 63, and increases the probability that at least some of those from among omens $11-21$ and $34-37$ preserve records of observations not made during the reign of Ammisaduqa.

In conclusion we would remark that this text has undergone a considerable process of expansion and corruption prior to its being inscribed on the tablets available to us. The dates of original observations of first and last visibilities of the planet-including a whole series of such from the first half or more of Ammiṣaduqa's reign-were arranged in pairs, though not always correctly. At some time each pair was associated with an apodosis; and either then or at some other time the intervals of invisibility were computed. Several such collections-or perhaps just one that was already extremely corrupt-were combined to form $a$; and a rearrangement of the material in $a$ was made to form $\gamma$. We have independent witnesses to the existence of $a$ by itself (MSS. B, N, and R, which add the extra omen 60 which is a corrected version of 17); to $\gamma$ by itself (MS. $\mathrm{T}(+) \mathrm{U}$ and perhaps others); and to $\delta$ by itself (K. $3170+$ in Appendix A together with Iqqur ipuš). We can only conjecture about the relationship of these separate texts to each other, and about the relationship of the dates preserved in various of them to the occurrences of phenomena during the reign of Ammisaduqa. That the majority of the dates of the first 8 -year cycle and of the beginning of the second form a valid negative argument for establishing the date of the beginning of Ammişaduqa's reign seems to us to be admissible. We do not see the absolute necessity of accepting the hypothesis that the dates preserved in the rest of the text must also belong to Ammiṣaduqa's reign; at least half of them anyway are rejected or emended by those who claim they are relevant to the problem of Ammisaduqa's chronology. To leave out of consideration omens $11-37$ will not affect the usefulness of the test of proposed dates afforded by omens $1-10$ since the later dates are in any case ignored when they disagree astronomically with the earlier.

## Bibliography

The following annotated bibliography includes the more significant studies of the Venus Tablets since the edition of Langdon, Fotheringhan, and Schoch in 1928; they discuss the literature before 1928 in chapter V (pp. 28-44).
I. S. Langdon, J. K. Fotheringham, and C. Schoch, The Venus Tablets of Ammizaduga, Oxford-London 1928.

Analysing the material on the basis of Langdon's copies, transliterations, and translations of A, B, C, G, P, Q, and part of $T$ (Rm. 134) and using Schoch's tables, Fotheringham chose out of the possibilities $-1976,-1920,-1856,-1808$, and -1800 the second $(-1920)$ to be the first year of Ammisaduqa's reign. Langdon misread some numbers, but essentially the table on p. 58 correctly represents the data in the copies accessible to him; the main corrections one would have to make are in omens 16,19 , and 21.
2. D. Sidersky, "Nouvelle ćtude sur la chronologie de la dynastie Hammurapienne," Revue d'assyriologie 37 (1940) 45-54.

Using Langdon's data, Sidersky chose -1701 as the first year of Ammiṣaduqa.
3. A. Ungnad, Die Venustafeln und das neunte Jahr Samsuilunas (1741 v. Chr.), Leipzig 1940, reprinted Osnabrück 1972.

Using A, B, C, G, P, and part of $T$ (Rm. 134), correcting Langdon's readings at several points, and assuming that the first year of Ammisaduqa's reign falls between -1659 and -1639 , Ungnad chose -1645 as the most probable.
4. J. W. S. Sewell in S. Smith, Alalakh and Chronology, London 1940, pp. $26-27$ and 50.52.

Using Langdon's data and Schoch's tables, Sewell shows that the year - 1645 could be the first year of Ammisaduqua as well as -1920 .
5. F. Cornelius, "Berossos und die altorientalische Chronologie," Klio 35 (1942) 1-16.

Using Langdon's data and Schoch's and P. V. Neugebauer's tables, Cornelius claims in fn. 2 on p. 7 to have found that -1581 is a possible first year of Ammiṣaduqa.
6. B. L. van der Waerden, "On Babylonian Astronomy I. The Venus Tablets of Ammisaduqa," Ex oriente lux 10 (1945-1948) 414-424.
"Correcting" the data of Langdon and Ungnad (see Table V), and preparing new astronomical tables to replace Schoch's (B.L. van der Waerden, "Die Berechnung der Ersten und Letzten Sichtbarkeit von Mond und Planeten und die Venustafeln des Ammisaduqa," BSAW, Math.Phys. Kl. 94 [1943] 23-56), van der Waerden examines Sidersky's,Ungnad's, and Comelius' dates, and finds the last to be the best. Therefore, he identifies .1581 with the first year of Ammisaduqa, but calls attention to a difficulty that this dating raises involving climatic changes in antiquity. This dating is iterated by van der Waerden in his Die Anfange der Astronomic, Groningen 1965, pp. 34-47.
7. J. D. Weir, The Venus Tablets of Ammizaduga, Istanbul 1972.

Using Langdon's data, Weir concludes that the first year of Ammiṣaduqa was - 645 . Further, by making totally unjustifiable assumptions about the nature of the material preserved in the tablets, he tries to squeeze from these very questionable data arguments to support his theses that the original observations were made at Agade and that the orbit of Venus has altered since the seventeenth century B.C.

On the uncertainty of all such attempts at dating these tablets absolutely see O. Neugebauer, "Zur Frage der astronomischen Fixierung der babylonischen Chronologie," OLZ 32 (1929) 913-921.

## THE TEXT

## Introductory Note.

The format of the text edition is an experiment designed to present each text separately ${ }^{1}$ so that the preserved parts of each manuscript may be easily identified, and at the same time each omen may be given in its most complete form.

The top line is a composite transliteration from all available manuscripts: the bottom line gives a connected transcription of this composite text. Restorations appear in these two lines only. Under the top line, each source manuscript is given a separate line; each sign that is preserved in the source is indicated by a dash under the transliterated sign in the top line. A $\phi$ under the transliterated sign indicates that the sign is missing in the manuscript. Broken parts are left blank within the brackets. A small raised number before a sign indicates the line division within that manuscript. Whenever variant spellings appear in the different sources, the particular spelling of that word is given for each source, e.g., the spellings uh-ha-ram-ma or ZAL-ma in omen 34.

Whenever the dates-month or days-of the Venus phenomena differ from text to text, the reconstructed top and bottom lines express no choice among them. When the month name differs, these lines have MN, and the different months are given in each source line; when the day-number differs, these lines have UD.n.KAM, and the attested day-numbers are given in each source line.

Translations accompany the first two omens only, since the protases of omens $1-21$ and $34-60$ are of the same pattern (see p. 9 f ). The variables in the protases-the dates of first invisibility, duration of invisibility, and first visibility, and the Eastern or Western occurrence of these phenomena-are given for the sake of clarity and easy comparison in Table IV. Translation and comments on the protases of omens 22-33 are given on p. 10. The translation of the apodoses is found in Table II.

[^12]
## Transliteration and Transcription



 A ${ }^{6}$ I
nla - . . . . . . . . . . .
$\mathrm{B}^{6}$.

- Ina Uhāli UD.23.KAM Ninsianna ina ereb šamši itbal 20 ūmī ina śamê


 A ${ }^{8}{ }^{1}$ B ${ }^{8}$ $J^{7}{ }^{7}$

Ina Tašriti ud.2.KAM Ninsianna ina șit šamši ithal 2 arłlıi ud.1.kAM ina


> ŠA KUR DÙ̀G-ab
> B - - $\quad$ ]
> J - - [ ]
> libbi nāati iṭâb.

A

* J 1-5 broken.
[BM 2, 30]



 $A^{12}$ - - - - $12^{\prime}$ [
B ${ }^{12}$.

25. 

J ${ }^{11}$ 1 Ina Kislimi ud.n.KAM Ninsianna ina ṣit צ̌amši itbal 2 arḥī 4 ūmì ina


|  | EbUR | KUR | SI.SÁ |
| :---: | :---: | :---: | :---: |
| A | - | - | - |
| B | - | - | - |
| J | - | - | $-[1$ |
| ebūr | māti | iessir. |  |


A ${ }^{14}$

- 18.KAM

J 13 Ina Arallsamna UD.n.kAM Ninsianna ina ereb samsi tibar oumi ina




AN-e uhh-ha-ram-ma ina ITI.APIN UD.2.KAM ${ }^{\mathrm{d}} \mathrm{Nin}^{2}$-si ${ }_{4}$-an-na ina ${ }^{\mathrm{d}}$ UTU.ŠÚ.A
A .. uh-ha-ram-ma ${ }^{17}$ -
B . . ubl-ha-ram-ma ${ }^{17}$ [
${ }_{C} \underset{\text { |ram-ma }}{2} \quad . \quad . \quad . \quad . \quad . \quad . \quad$ n $[\mathrm{a}]^{3^{\prime}}$ [
D $\cdots$ uh-ha-ram [ $\left.\right|^{3^{\prime}}$ I


IGI.DU 8 Šég.MEŠ ina kUR GÁL.MEŠ ub-bu-tu GAR.meš
A - [ 8 G]ÁL - . . . MES





| ina | KUR | Gál meš | $u b-b u-t u$ | Garmis |
| :---: | :---: | :---: | :---: | :---: |
| A |  | - ME | - . | - . |
| B | . | - mis | - - | - - |
| C | - | - mles | - . | - - |
| D) |  |  |  |  |
| J |  | 1 |  | - - |
| illa | māti | ibašši | ubbutu | ïšsakkan. |



## kùgigakam

A [K]Ù. .
B G]A -
C . . . .
D . . .
J . . . $\mathrm{KE}_{4}$ KÜ.gi.gA.KAM



| ind | AN-C | whtha-ram-ma ina | ITISİ | UD.II.KAM | ${ }^{\mathrm{d}} \mathrm{Nin} \mathrm{Si}_{4}-\mathrm{an}-\mathrm{na}$ | ina | ${ }^{\text {dutuie }}$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| A | - | uhtha-ram-ma ${ }^{23}$ \| | 1\|T1. | - 15 | 4 | . |  |
| B | $\left.\right\|^{1-1}$ | ublha-ram-ma ${ }^{23}$ \| |  |  |  |  |  |
| C | - - | ub-la-ram-ma ${ }^{10^{\prime}}$ | - | 15 | $\phi \phi \phi \phi \phi$ | - |  |
| D |  |  |  |  |  | 1 |  |
| J. | - - | ZAL |  | 16 |  |  |  |
| ina | ̧amé | uhharamma ina | Aldari | U0.n. KıM | Ninsianna | ina | sit samsi |





F:-1「
šamêe uhharamma ina Tcbēti UD.16.KAM ina ereb šarnši innamir: ebūr

KUR SI.SÁ

| A | - | - | - |
| :--- | :--- | :--- | :--- |
| C | - | - | - |
| D | - | - | -1 |
| J | - | - | - |
| F |  |  |  |
| mäti |  | išsir. |  |



 $\begin{array}{ll}\mathrm{F}^{34}[\square \\ \mathrm{J}^{24} \\ & \text { | }\end{array}$ \| Ina Nisanni ud.9.KAM Ninsianna ina ṣit šamši itbal 5 arhī l6 ūmī ina


| 15 | ${ }_{171} 115$ | ina | 17.(ivi) | ('D).5.KAM | ${ }^{\mathrm{d}} \mathrm{Nin}^{\text {- } \mathrm{Si}_{4}-\mathrm{anl}-\mathrm{na}}$ | ina | ${ }^{\text {d U }}$ UTUŠU'A | it-bal | UD.7.KAM | i11:1 | AN-e |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| (' | , 17' - | . | - - | . . . | - 4 | . | - - - |  | 7 (:D)-me |  |  |
|  | $4^{4}$ \| |  |  |  |  |  |  | - - | [D.7.KAM | - |  |
|  | ; '1 |  |  |  |  |  |  |  | UD.7.KAM |  |  |
|  | 25 |  |  |  |  |  |  |  |  |  |  |
|  | d | Ina | Ajari | UI).S.KAM | Ninsianha | ina | creb šamši | ilbal | $7 \mathrm{k} / \mathrm{ml}$ | ina | same |




 © ${ }^{5}$ - - - . . . . . . . 1 9 Ina Tašrīti LD. 10 KAM Ninsianna ina sīt šamši itbal / ITI LD.16.KAM [ina



18 DIŠ ina ITI.NE UD.n.KAM ${ }^{d} \mathrm{Nin}^{2} \mathrm{si}_{4}$-an-na ina ${ }^{\mathrm{d}}{ }_{\text {UTU.E }}$ it-bal $n \quad$ ITI UD.15.KAM ina $\mathrm{C}^{22^{\prime}}$ - . . . - 20 . . . . . . . . . . . . 2 $\mathrm{G}^{7 \prime}$ - . . . - 21 .
$\mathrm{H}^{1}$
I Ina $A b i \quad$ UD.n.KAM Ninsianna ina ṣìt šamśi itbal $n$ arhī 15 ūmi ina


G $]^{8 \prime}$ uhh-ha-ram-ma - . GAN . . . . . . . . . . . . [ H (traces)
samê
uhharamma ina ITI.MN UD.15.KAM Ninsianna ina ereb šamši

H (traces)
innamir: zunnū ina māti ibaššû ubbutu [iššakkan].

[uhh-ha-ram-ma] ina ITI.MN UD.20.KAM ina dUTU.Ė IGI.DU 8 ŠÈG.ME ina AN-e $u$


$\mathrm{H} \ll$ ina $\mathrm{A}\left[\mathrm{N}-\mathrm{e} \gg 3^{\prime}\right.$ [
[uhharamma] ina ITIMN UD.20.KAM ina șit šamši innamir: zunnū ina šamê (u)





|  | ERín man-da | KI.MIN | šub-tim | [ |
| :---: | :---: | :---: | :---: | :---: |
| C | - - . | - . | - - | [ |
| G 1 |  |  |  |  |
| H |  |  |  |  |
|  | ummān-manda: |  | miqitti | [ |

21 DIŠ ina ITI.ŠE UD.10.KAM ${ }^{d^{d}}{ }^{\text {Nin-Si }}$-an-na [ina ${ }^{d_{U U U}}$ UTU.ŠU.A] it-bal UD.4.KAM ina aN-e




| ŠÀ | KUR | DU̇G-ab |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| C |  |  |  |  |  |  |  |  |
| H SILIm.ma salima | $\mathrm{KI} / \mathrm{N}$-ár isappar) | E[BUR <br> ebūr | rutibti | isšir | $l i b b i$ |  |  | $i t a ̂ a$. |

$S_{1}$
$\begin{array}{ll}\mathrm{C} & { }^{30} \\ \mathrm{H} & \mathbf{8}^{1}\end{array}$
(illegible traces)

1

22 DIŠ ina ITI.bÁR UD.2.KAM ${ }^{d}$ Nin-si $_{4}$-an-na ina ${ }^{d}{ }_{\text {UTU.E }}$ IGI.DU ${ }_{8}$ ú-ru-ba-a-tum ina KUR $\mathrm{H}^{9}$ [ I Ina Nisanni ud.2.KAM Ninsianna ina sīt šamši innamir: urubātu ina māti




 C - . - . . ${ }^{37}$
H - - - - - . . - . S[AR
Ninsianna ina șīt šamši inappahma: ebūr mäti iššir libbi māti iṭâb.





[^13][BM 2, 40]



man : ibašsûu ubbutu ibǎ̌ši; adi ud.10.KAM ša Nisanni ina ṣit šamši izzaz
 H $18^{\prime}$ L - . . - . . [

UD.11.KAM ša Nisanni itabbalma 3 arhī ina šame uhharamma UD.11.KAM ša Mneria ITI.ŠU ${ }^{\mathrm{d}} \mathrm{Nin}$-Si $_{4}$-an-na ina ${ }^{\mathrm{d}}$ UTU.ŠÚ.A SAR-ma ${ }_{4}$ SAL.KÚR.ME ina KUR GÁL.ME
C . . . . . . . . . . . . . . 4 .

H - - . . - . . - - - . [
L a]n . . . . . . . . SA [L
$\therefore \quad \cdots \quad M^{1}[$
Du'ūzi Ninsianna ina ereb šamši inappahma: nukurātu ina māti ibǎ̌šà



[^14]





SI.SÁ ŠÀ KUR DU̇G-ab
C
L J
M ] -
išsir libbi māti itàab.


 Ina Kislimi UD.10.KAM Ninsianna ina ṣit šamši innamir: hlušahhi še'i u $\bar{u}$ tibni


31 DIŠ ina ITI.AB UD.11.KAM ${ }^{\mathrm{d}} \mathrm{Nin}$-Si $_{4}$-an-na ina ${ }^{\mathrm{d}}$ UTU.ŠÚ.A IGI EBUR KUR SI.SÁ EN ${ }^{\mathrm{M}}{ }^{\text {r. } 1}$ I $\quad$ Ina Tebēti UD.11.KAM Ninsianna ina ereb šamši innamir: ebūr māti is̈šir; adi

 $M^{3}$ [

Ina Šabāṭi UD.12.KAM Ninsianna ina sịt šamši innamir: ebūr māti iššir; adi





| EN | UD.16.KAM | šá | ITI.APIN | ina | ${ }^{\text {d UTU.ŠU }}$. ${ }^{\text {a }}$ | DU-az | UD.n.KAM | šá | ITI.APIN |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| $\mathrm{C}^{30}$ | . . . | . | . . | - | . . . . | - - | - 16 | . |  |
| M | 1]6 |  |  | - |  | $\phi$ |  |  |  |
| adi | UD.16.KAM | ša | Arahs |  | ereb šam |  | UD.17.K |  | Arahsam |



| ${ }^{\text {d }} \mathrm{Nin}^{\text {-si }}$ - ${ }^{\text {an-na }}$ ina | ${ }^{\text {d UTU.E }}$ | SAR-ma | KUR | SAL.KAL |  | IB -ba |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| C . - $-\mathrm{a}[\mathrm{n}]^{32}$. | . . | . - |  | . . |  |  |
| M - . . - . ${ }^{7}[$ |  |  | KU]R |  |  |  |
| $\mathrm{N}^{1} \quad$ (illegible traces) |  |  |  |  |  |  |
| Ninsianna ina | șìt šamši | inappahr | màta | dannatu |  | ab |







 - ba $[1]^{38}$ - -6
$\mathrm{M}_{\mathrm{M}^{11}} \mathrm{C}^{1}[$

| - | - |
| :---: | :---: |
| Ina Simān |  |

b] al $_{7} . \quad \cdot \quad-16$ Ina Simāni UD.25.KAM Ninsianna ina șìt šamši itbal 2 arhín nūmi ina

| $\begin{aligned} & \text { AN-e } \\ & \text { B }-\quad . \end{aligned}$ | uhh-ha-ram-ma uh-ha-[ | $5^{\text {ina }}$ | ITI.KIN | UD.n.KAM |  | ${ }^{\mathrm{d}} \mathrm{Nin}-\mathrm{Si}_{4}$-an-na | ina |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| C | L. | - |  | . 24 [ |  | 39. |  |
| M | uh-ha-ram-ma | ${ }^{12}$ [ |  |  |  |  |  |
| N | ZA]L- ma |  |  | . 14 | UD. [x].KAM | M ${ }^{\text {d }}{ }^{1}$ [ |  |
| šamé | uhharamma | ina | Ulūli | UD.n.KAM |  | Ninsianna | in |


|  | $\mathrm{d}_{\text {UTU.ŠU }}$.A | IGI | ŠÀ | KUR | DU̇G-ab |
| :---: | :---: | :---: | :---: | :---: | :---: |
| B |  |  |  | 1 | - - |
| C | - | - | - | - | - |
| M | - | - | - |  |  |
| N |  |  |  |  |  |

ereb šamši innamir: libbi māti iṭàb.




LUGAL ana LUGAL LÚ.NE KIN-ár
B
C
N
sarru ana šarri salta išappar.


39 DIŠ ina ITI.BÁR ${ }^{\mathrm{d}} \mathrm{Nin}^{2} \mathrm{Si}_{4}$-an-na UD.n.KAM ina ${ }^{\mathrm{d}}$ UTU.[ŠÚ.A it-bal] ${ }^{\text {U }}$ UD.6.KAM ina AN-e







[ina AN-e] uhhhi-ram-[ma ina ITI.KIN UD]n.KAM ina duTU.ŠU.A [IGI


[^15]

 $Q^{1}$ [

I Ina Du'ūzi [Ninsianna UD.n.KAM ina șìt šamši] itbal [n ūmi ina šamê










 fl Ina Ulūli Ninsianna UD.26.KAM ina ereb samšíl itbal ud.12.KAM ina šamê




IGI-ir Š̀ ÈG.ME ina KUR GȦL.ME ub-bu-tu GAR -an
A
innamir: zunnū ina māti ibašŝû ubbutu išsakkan.

[^16]51 DIŠ ina ITI.APIN ${ }^{\mathrm{d}} \mathrm{Nin}^{2}$-si ${ }_{4}$-an-na UD.28.KAM ina ${ }^{\mathrm{d}}$ UTU.ŠÚ.A it-bal UD.5.KAM ina an-e A II Ina Araḩsamna Ninsianna UD.28.KAM ina ereb šamši itbal 5 ūmi ina šamè ZAL-ma ina ITI.GAN [UD.3.KAM] ina dutU.È IGI-ir SU.KÚ Š̌ u in.NU A - - ${ }^{13}-1$ - 1 [ $]$ - - . . . . . . . . . uhhiramma ina Kislimi [UD.3.KAM] ina ṣīt šamši innamir: huš̌ahhi še’ì u tibni ina KUR GÁL
A -
ina māti ibaš̌si.
 [Ina Arahsamna Ninsianna UD.11.KAM ina] șit [šamši] itbal 2 arhi 8 ūmi ina AN-e ZAL-ma ina ITI.AB UD.19.KAM ina dutU.ŠÚU A IGI EBUR KUR SI.SÁ A
šamê uhhiramma ina Tebēti UD.19.KAM ina ereb šamši innamir: ebūr māti iššir.


[Ina Arahsamna Ninsianna
UD.n].KAM ina ṣìt šamši itbal, 2 arhi 8 ūmi ina


SI.SÁ
A
0
išsir.
 n]a - 12 - . . . TÜM - . . 1

I [Ina Kislimi Ninsian]na UD.12.KAM ina ṣit šamši itbal 2 arhī $n$ ūmì ina

AN-e uh-hi-ram-ma [ina ITI.ÅŠ UD.16.KAM ina] dUTU.ŠÚ.A IGI-ir EBUR KUR A - uh-hi-ram-ma ${ }_{4}^{17}[$ ] $\quad . \quad$ [ $]$ $\left.0 \quad{ }^{4 \cdot} \quad\right]$. . . . . [


SI.SÁ
A..

0 1
J . -
issisir.



J ${ }^{5}$ [
















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SM,
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```
        4?
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$\qquad$


## Colophons

A ( = Hunger Kolophone 469)
Rev. ${ }^{28}$ [DIŠ̌ MUL.SAG.ME.GAR ina še-er-ti ik-tu]-un LUGAL.MEŠ KÚR.MEŠ SILIM.MEŠ DUB 1 UŠ 3 KAM DIŠ UD An ${ }^{\mathrm{d}}$ En-lil
$2^{\prime}$ [ ] x GIŠ ${ }^{\text {md }}$ U + GUR-DIN- it
End
28' "If Jupiter remains (in the sky) in the morning, enemy kings will become reconciled"
[ = catchline of Tablet 64].
Tablet 63 of Enūma Anu Enlil.
${ }^{29}$ [ . . .] written by Nergal-uballit.

B ( = Hunger Kolophone 150)
Rev. ${ }^{15 '}$ DIŠ MUL.SAG.ME.GAR ina še-er-ti i[k-tu-un LUGAL.MEŠ KÚR.MEŠ] SILIM.MEŠ ${ }^{16}$ DUB 1 UŠ 2.ÀM.KAM.MA [DIŠ] [UD An] ${ }^{\text {d }}$ En-líl 37.ÀM MU.b[IIM]
${ }^{17}$ [G]ABA.RI Ba-bi-i-li ${ }^{\text {kj }}$ [G]Im la-bi-ri-šúu ša-țir-ma [Ė]
${ }^{18}$ [š]U ${ }^{d_{U}}$ +GUR-DU-uš DUMU LÚ.DUMU.DÙ aN [x]
${ }^{19}{ }^{\prime}[(\mathrm{x})] \mathrm{E}^{\mathrm{ki}}$ MU.AN.NA $\quad$ [x].KAM LÚGAL.GI.NA $\operatorname{LUGAL} \quad[$ ]
End
15' "If Jupiter remains (in the sky) in the morning, enemy kings will become reconciled" [ = catchline of Tablet 64].
${ }^{16}$ Tablet 62 of Enüma Anu Enlil, it has 37 lines.
${ }^{17}$ Copy of (a text from) Babylon, written according to its original and collated.
${ }^{18}$ Written by Nergal-épuš, son of a "Free man" . . .
${ }^{19}$ At Babylon, $[\mathrm{x}]$ th year of Sargon, king [of Assyria].

J

${ }^{13}$ Tablet n of Enūma Anu Enlil, unfinished.
${ }^{14}$ [ . . .] evil years' will come out of Ekur (catchline of the "akitu-omens," see provisionally ACh Second Supplément 82 and Gadd, CT 40 p. 8 to pl. 38-40).
15' [ . . . ]-mušēzibu . . Uballissu-Bēl
16' (remainder fragmentary).

## R



7' Tablet n of Enūma Anu Enlil, [unfinished].
${ }^{8}$. . . broken.

## Appendix A. Excerpt from EAE 63 in Iqqur ipuš ( § 104A)

## K. $3170+11719+14551$

Omen 22 end: ${ }^{1 r}$ [3 ITI ina AN-e ZAL-ma UD.8.KAM šá IT]I.ŠE ina ${ }^{d}$ UTU.Šú.A KUR-ma [LUGAL ana LUGAL SAL.KÚR KIN-ár]

${ }^{3}$ [SAL.KÚR.MEŠ] ina KUR GÁL.MEŠ EN UD.7.KAM šá ITI.AB ina ${ }^{\text {d }}$ UTU.ŠÚ. [A DU]
4' [UD.7.KA]M šá ITI.AB TÙM-ma UD.7.KAM ina AN ZAL-[m]a UD.14.KAM šá ITI.[AB]
$5^{\prime}$ [ina ${ }^{\text {d }}$ U]TU.È KUR-ma EBUR KUR SI.SÁ ŠÀ KUR DU̇G-ab
Omen 24: $\quad 6^{\prime}$ [DIŠ ina ITI.SI] $G_{4}$ UD.4.KAM ${ }^{\mathrm{d}} \mathrm{Nin}^{2} \mathrm{si}_{4}$-an-na ina ${ }^{\mathrm{d}}{ }_{\text {IUTU }}$.E E IGI RI.RI.GA ERIN mat-ti ${ }^{7}$ [EN U]D.7.KAM šá ITI.ǍŠ ina ${ }^{\text {d }}$ UTU.È DU UD.8(or: 7).KAM Šá ITI.ÁŠ TÙM- ma
$8^{\prime}$ [3] ITI.MEŠ ina AN-e ZAL-ma UD.12.KAM šá ITI.GUD ina ${ }^{\text {dutu }}$ ǓÚU.A KUR -ma SAL.KÚR.ME ina KUR GÁL.ME
Omen 25: $\quad 9^{\prime}$ [DIŠ ina]ITI.ŠU UD.S.KAM ${ }^{d}{ }^{\text {Nin-si }} 4$-an-na ina ${ }^{[d]}$ UTU.ŠÚ.A IGI SAL.KÚR.MEŠ ina KUR G [ÁL.MEŠ]
${ }^{10}$ EBUR KUR SI.SÁ EN UD.9.KAM šá ITI.[Š]E ina ${ }^{\text {d }}$ UTU.ŠÚ.A DU UD.10.KAM šá ITI.ŠE TÙM-m[a]
 LUGAL SAL.KÚR KIN-[ár]
 ${ }^{13}$ ' [ub-bu-t]u GÁL EN U[D.10.KAM šá ITI].BÁR ina ${ }^{\text {d }}$ UTU.È DU 14 [UD.11.KAM šá ITI.BÅR TÙM -ma 3 ITI ina AN ZAL-m]a UD.11.KAM šá ITI.ŠU ${ }^{15}$ [ ina ${ }^{\mathrm{d}}{ }^{\text {UTU.ŠÚ.A KUR -ma SAL.KÚR.ME ina KUR GÁL.ME EBU]R KUR SI.SÁ }}$
Omen 27: ${ }^{16}$ [DIŠ ina ITI.KIN UD.2.KAM ${ }^{\mathrm{d}} \mathrm{Nin}^{2}$-si ${ }_{4}$-an-na ina ${ }^{\mathrm{d}}{ }^{\text {UTU.ŠÚ.A IGI] EBUR KUR SI.SÁ }}$ break

## Appendix B. E BM 41498 = LBAT 1562

${ }^{\prime}$ [ . . . . . . ina 1T]I.ŠU(or: DU ${ }_{6}$ ) UD.14.KAM
${ }^{2}$ [( ${ }^{\mathrm{d}} \mathrm{Nin}-\mathrm{si}_{4}$-an-na) ina ${ }^{\mathrm{d}}$ UTU.È IGI.DU $_{8}$ LUGAL ana LUGA]L LÚ.NE KIN-ár
3. [DIŠ ina ITI.APIN UD.10.KAM ${ }^{\mathrm{d}} \mathrm{Nin}^{2} \mathrm{si}_{4}$-an-na ina ${ }^{\mathrm{d}}{ }^{\text {UTU }}$ ].È it-bal 2 ITI UD.9.KAM ${ }^{4 \cdot}$ [ina AN-e ZAL-ma ina ITI.AB UD.19.KAM ina dUTU.ŠÚ].A IGI-ir EBUR KUR SI.SÁ

6' [ina AN-e ZAL-ma ina ITI.MN UD.n.KAM ina duTU.ŠÚ.A IGI-ir] EBUR KUR [SI.SÁ]
traces of one line


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Appendix C. K BM 34227 + 42033 = LBAT 1560 + 1561
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The apodosis of the first preserved omen is apodosis no. 23 , which occurs in omens $8,9,17$, and 18 . In the second omen, only the date of the first invisibility, XII? ${ }^{?} 24$, and that of the next first visibility, XI 28, are preserved. Since a period of invisibility that extends over 11 months 4 days is impossible, the month name read as XII may represent a mistake for X, in which case this omen would be identical to omen 55. Note that omen 55 corresponds to omen 16, but 55 refers to last visibility in the West and 16 to last visibility in the East. A last visibility in the East on XII 25 is recorded in 10 which is a report, not an omen. If the second fragmentary omen in K were to be identified with omen 10 , one would have to assume that K substituted the date of $\Omega$ in 11 for that of $\Xi$ in 10 ; one could then reconstruct omens 10 and 11 as follows:

| 10 | $\Sigma$ XII 25 | 3 m | 16 d | $\Xi$ III 11 |
| ---: | ---: | ---: | ---: | ---: |
|  | 8 m | 17 d |  |  |
| 11 | $\Omega$ XI 28 | 17 d | $\Gamma$ XII 15 |  |

None of these solutions seems convincing to us.

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AAD 1 - Berber: TAMAZIGHT OF THE AYT NDHIR by Thomas G. Penchoen. 1973, IV-124 r.., $\$ 8.50$.
The Ayt Ndhir dialect which is described belongs to one of the major Berber languages, Tamazight, spoken in the Middle Atlas Mountains of central Morocco. The description is based in the main on research undertaken with native speakers of the Ayt Ndhir territory surrounding El Hajeb. - While directed to the non-specialist, a number of points in the description proper will be of interest to the specialist as well: the presentation of noun and verb morphology points up a number of regularities which more often than not have been obscured in previous descriptions. Also, phonological rules are given which account for the major share of morphophonemic complexities. The reader will find in the appendices and 'optional' sections conjugation tables of typical verbs-including detailed observations on the placement of shwa in verbs-, a chart showing the main morphological patterns involved in verb derivation, a description of the phonological rules applying in complex sequences of morphemes of the verb group, the 'basic' vocabulary contained in several well-known lexicostatistic word lists, and a chart of the Tifina $\gamma$ alphabet used by the Tuareg.

## AAD 2 - Ancient Egyptian: MIDDLE EGYPTIAN by John Callender. 1975, 150 pp., $\$ 10$.

This grammar deals with the literary language used in Egypt from ca. 2000 to 1200 B.C. and considered in even later times to be the classical written form of Egyptian. The book is directed toward the general linguist as well as the Egyptologist; examples are glossed and written in transcription and there is an index of grammatical terms and Egyptian morphemes. A comprehensive set of paradigms of both verbal and non-verbal predicate types is included as an appendix, together with an appendix on negation and one on the historical origin of certain constructions. - The grammar contains three main parts: phonology, morphology, and syntax, of which the last receives most emphasis. The section on phonology sketches the laws of sound change to the extent they can be discovered. The section on morphology stresses the paradigmatic character of verb tenses and their derivations. A distinction is made between truly paradigmatic tenses and tenses borrowed from Old Egyptian for quotations or special effect. Following Polotsky, the "emphatic forms" are treated as nominalizations under the rubric "manner nominalizations." Unlike previous grammars of Egyptian, this grammar discusses syntax according to transformational categories. The process of "clefting" interrelates emphatic forms, the "participial statement" and constructions with $p w+$ relatives. The process character of negation is emphasized, and the implications of so considering it are developed in a special appendix. A sample text is also included, accompanied by a vocabulary and a translation.

AAD 3 - Semitic: DAMASCUS ARABIC by Arne Ambros. In preparation.

All prices are postpaid. Payment must accompany orders from individuals.
A handling fee of $70 \$$ will be charged to libraries if order is not prepaid.
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[^0]:    ${ }^{1}$ A. L. Oppenheim, "Divination and Celestial Observation in the Last Assyrian Empire," Centaurus 14 (1969), 99f.;
    O. Neugebauer, Astronomical Cuneiform Texts (London, 1955)13f.
    ${ }^{2}$ F. Weidner, "Die astrologische Serie Enüma Anu Enlil," Archiv für Orientforschung 14 (1941-1944), 172-195, 308-318; ibid. 17 (1954-1956), 71-89; ibid. 22 (1968-1969) 65-75.
    ${ }^{3} \mathrm{Ch}$. Virolleaud, L'Astrologie Chaldéenne, Le livre intitulé "enuma (Anu) 'iluBêl," fascicles 1-8 (Paris, 1908-1909); idem., Supplément (Paris, 1910); Second Supplément (Paris, 1912).

[^1]:    ${ }^{1}$ The number 63 is based on one system of numbering; in another system of serialization, the number 63 is given to the tablet we shall call 64.
    $2^{2}$ See Bibliography.

[^2]:    ${ }^{3}$ Collation shows a clear -mu-as the second sign in this word, thus excluding the reading TA gata-ra-tum retained by labat, Calendrier p. 199, in spite of the objections of Langdon, The Venus Tablets, p. 13 note 1. It is assumed here that tämurätu is a variant of tämarātu, although such a variant form is not attested elsewhere, because the twelve omens preceding refer to risings (lGI.DU $\mathrm{U}_{8}=$ tämartu) of Venus. Professor Borger (orally) suggested that the sign mU may stand for $a_{5}$ so that this subscript too would contain the term tajärätu, for which see note 5 .

[^3]:    ${ }^{4}$ Note that in CT 2829 r. 6 ta-a-a-ar-tum is not a gloss, as assumed in Kraus Texte 33 Index s.v., but is the apodosis, 'pardon', of the omen.
    ${ }^{5}$ These atypical occurrences are of three types:
    a) referring to a feature or deformation of the gall bladder obscrved in extispicy: summa martum ta-a-a-ra-tim isüu YOS 1031 iv $7-9$; šumma martu imitta u šumēla ta-a-a-ra-ti itaddât (ŠUB.MEŠ-át) CT $2848 \mathrm{~K} .182+$ г. 7.
    b) rubric at the end of a bilingual incantation: $[t] a-a-a-a r-t i$ s̆a EN AGA.MAH $[t] u-q a t-t e-e-m a$ ŠID- $n[u]$ 'you recite to the end the tajartu of the incantation "AGA.MAH"' K.5246:7f. (courtesy R. Borger).
    
     rise toward east') Rm. 932:4'-6', cf. (in broken context) [. . . ta-a-a-údr-tum i-šu-u ka-la-ma la ka-l[a-ma . .] ibid. 3'.
    ${ }^{6}$ See Ungnad, RIA 2190 no. 256.
    ${ }^{7}$ For a convenient survey, see Goetze, YOS 10 pp. 2 and 4, and JCS 1189 ff ., also Nougayrol, JCS 21219 ff .
    $8_{\text {Nougayrol, JCS } 21} 220$ n. 3.

[^4]:    ${ }^{9}$ Edited by René Labat, Un Calcndrier babylonien des travaux, des signes, et des mois (Séries Iqqur ipṻ) (Paris, 1965) $10 \xi \S 41^{\prime}$ and $66^{\prime}$ form an exception; they refer to any month of the year, with the day of the month from 1 to 30 being the variable.

[^5]:    ${ }^{11}$ The reading $u b b u t u$ has been chosen instead of arbūtu, partly because the apodoses differ from those in which arbütu occurs, and partly because the spelling ub-bu-fu occurs on an unpublished Old Babylonian tablet of EAE in a sinilar apodosis. The spelling $u b$-bu-tu may stand for ubbutu 'famine', while ubbutu is explained by šalputtu 'desecration' in lzbu Comm. 94.

[^6]:    ${ }^{1}$ A scribal error for IV．
    ${ }^{2}$ ncluding the attested $\mathrm{XII}_{2}$ in Ammiṣaduqa 4.
    ${ }^{3}$ Including the alleged $\mathrm{VI}_{2}$ in Ammisaduqa 5.

[^7]:    ${ }^{4}$ A scribal error for 28.
    ${ }^{5}$ Including the attested $\mathrm{VI}_{2}$ in Ammiṣaduqa 10.

[^8]:    ${ }^{6}$ This is assumed to be the attested $\mathrm{VI}_{2}$ in Ammiṣaduqa 11.
    ${ }^{7}$ Including the attested $\mathrm{XII}_{2}$ in Ammisaduqa 13；if the alleged $\mathrm{VI}_{2}$ in Ammisaduqa 14 is correct，the interval is 9 ！ m 29 d ．

[^9]:    ${ }^{8}$ This is assumed to be the attested $\mathrm{VI}_{2}$ in Ammisaduqa $17+\mathrm{d}$.
    ${ }^{9}$ Including a $\mathrm{VI}_{2}$ or a $\mathrm{XII}_{2}$; this is assumed to be the attested $\mathrm{XII}_{2}$ in Ammisaduqa $17+\mathrm{a}$.

[^10]:    ${ }^{1}$ Corrected from VII in B; presumably IV in V.
    ${ }^{2} \mathrm{IX} 12$ in AO; XI 16 in A.
    ${ }^{3}$ Corrected from 111 in AC .
    ${ }^{4}$ XI 11 in CG. XI 28 in $A$.
    ${ }^{5} \sum_{\text {in }} \mathrm{C}: \bar{Z}$ in Cl .

[^11]:    ${ }^{1}$ Intercalations attested in YOS 13 have been collected and kindly communicated to us by Dr. Hermann Hunger, University of Vienna.
    ${ }^{2}$ This $\mathrm{VI}_{2}$ is based on two unpublished contracts communicated to Fotheringham by Schnabel. It has not been confirmed.
    ${ }^{3}$ This is reported to be in an unpublished contract communicated to Fotheringham by Schnabel. If it is genuine, the interval of visibility between omens 16 and 17 is too long. Dr. Horst Klengel, Deutsche Akademie der Wissenschaften, Berlin, to whom we are grateful for his help, informs us that a quick check of the unpublished Old Babylonian contracts in the Berlin museum failed to turn up the contracts which supposedly contain the otherwise unattested intercalations.

[^12]:    $1_{\text {For this format, sometimes referred to as a "score", see D. O. Edzard, Or. NS } 43 \text { (1974) } 106 . ~}^{\text {(1) }}$

[^13]:    *Day 4 restored from Iqqur īpuš, see Appendix A.

[^14]:    *Day of last visibility I 10 in Iqqur īpuś, see Labat Calendrier p. 259.

[^15]:    *ITI.6.K[AM] (V) error for UD.6.KAM.
    ** $\mathrm{UD}(\mathrm{V})$ error for ITI.

[^16]:    *ŠÀab (A) error for DÙG-ab.

