BABYLONIAN PLANETARY OMENS

PART ONE

ENŪMA ANU ENLIL
TABLET 63:
THE VENUS TABLET OF AMMIṢADUQA

by

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in   collaboration   with

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PHILOLOGICAL INTRODUCTION

The sources for Tablet 63 of the Series *Enūma Anu Enlil*,[1] the so-called Venus Tablets of Ammiṣaduqa, 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 5 322 and pl. xix (=p. 344), and identified by me as a "Venus Tablet," all new sources are from the collections of the British Museum. Three fragments (E, K, N; see Table Ia) 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 Cuneiform Tablets in the Kouyunjik Collection of the British Museum* and from the list of *Enūma Anu Enlil* type material in the British Museum, compiled and generously put at my disposal by A. Sachs. Therefore, it is eminently possible that further fragments may come to light among unpublished texts in other museums, and even in the British Museum itself. 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 visibilities 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 *Iqqur īpuš* 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 H; L, P, and Q; 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 exemplars (see Table Ib).

1. All four sections I-IV were contained in exemplar A (+) M and probably in J. If L (+) P (+) 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-III 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 T (+) 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).

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[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] See Bibliography.

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 approximately 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 (Σ), it will then be approaching superior conjunction with the Sun and its furthest distance from the Earth. Between last visibility in the East (Σ) and first visibility in the West (Ξ) 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 (Ω) 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 two weeks and a few days in the summer, before its first visibility in the East (Γ) occurs. Then it is again visible for eight months and some days before its last visibility in the East (Σ). Of course, observations of "last visibilities" can occur 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	*50 = 17	*56 = 37
*39 = 36	*45 = 19	*51 = 7	*57 = 1
*40 = 5	*46 = 8	*52 = 2	*58 = 20
*41 = 15	*47 = 18	*53 = 12	*59 = 21
*42 = 35	*48 = 3	*54 = 6	*60 = 17
43 = 4	*49 = 13	55 = 16	

Figure 1. The Orbits of Venus and the Earth
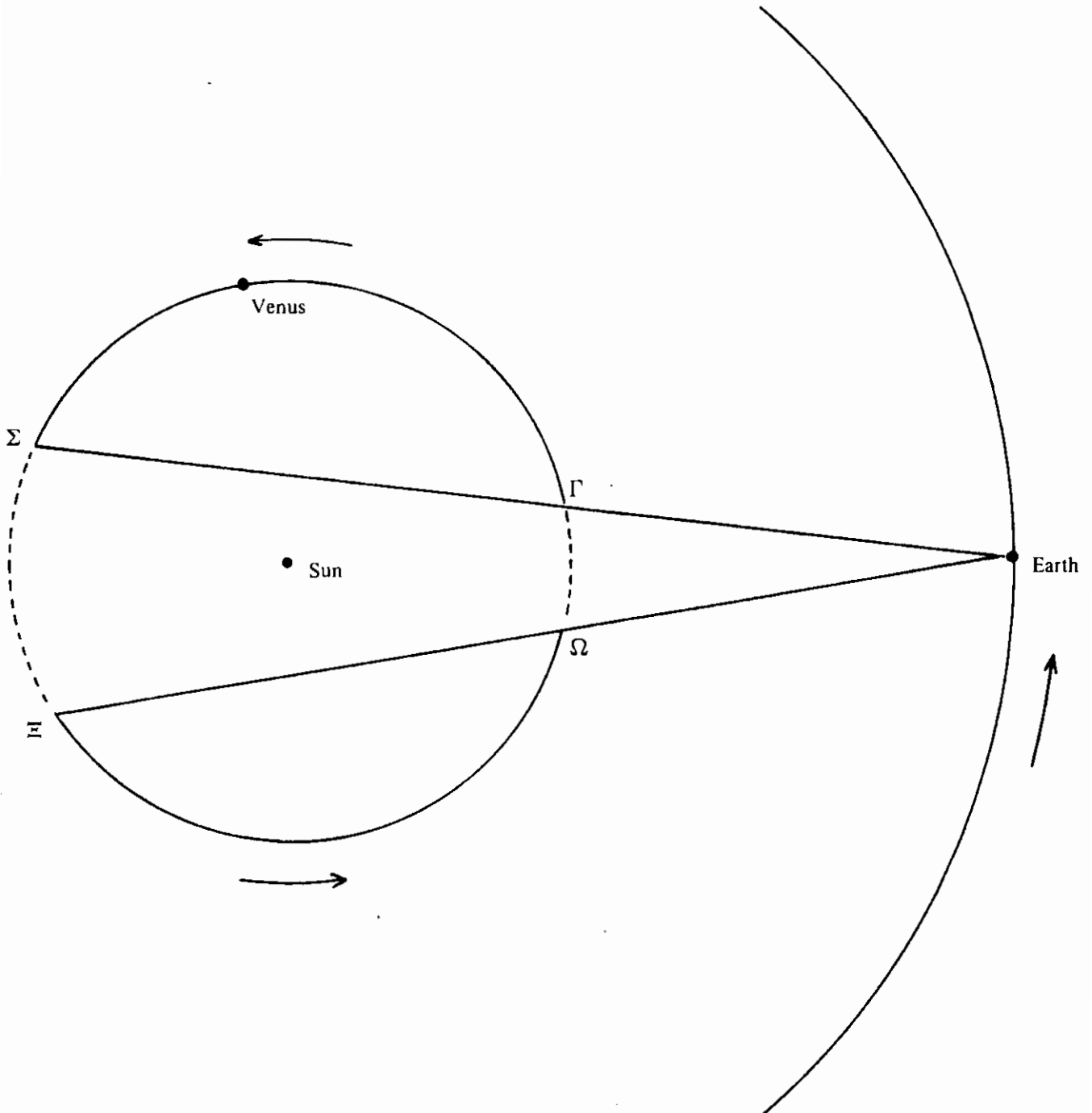
Note. This diagram is not drawn to scale. The actual dates and longitudes of the phenomena of Venus depend on variables not represented in this simplified scheme.

In table IV are given the dates and periods of invisibility from each omen in sections I and III 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 scribe 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 Ammiṣaduqa 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 1-21.

Year	Omens	Last visibility	Interval of invisibility	First visibility	Interval of visibility
[1]	1	Ω XI 15 (B)	3d (AB)	Γ XI 18 (B)	8m 23d (B)
		Ω (A)		Γ (A)	
	57	Ω (AU)	3d (AJ)	Γ XI 18 (J)	
				XI 18 (U)	
				XI 28 (A)	
[2]	2	Σ VIII 11 (B)	2m 7d (B)	Ξ X 19 (B)	8m 4d (B)
		Σ (A)	2m 8d (A)	Ξ (A)	
	52	Σ (A)	2m 8d (A)	Ξ X 19 (A)	
[3]	3	Ω VI 23 (B)	20d (AB)	Γ VII 13 (B)	8m 19d (B)
		Ω (A)		Γ (A)	
	48	Ω VI 23 (A)	20d (A)	Γ VII 13 (A)	
		Ω (Q)			
[4]	4	Σ VII[1] 2 (B)	2m 1d (AB)	Ξ VI 3 (B)	8^2m 29d (B)
		Σ (A)		VI 3 (J)	
				Ξ (A)	
	43				
[5]	5	Ω II 2 (B)	18d (B)	Γ II 18 (B)	8^3m 7d (B)
		Ω (A)	15d (A)	II (AJ)	
	40	Ω II 2 (KP)	x d (P)	Γ II 28 or 18 (K)	
		II 2 (T)		Γ (T)	

[1] A scribal error for IV.

[2] Including the attested XII$_2$ in Ammiṣaduqa 4.

[3] Including the alleged VI$_2$ in Ammiṣaduqa 5.

(Table IV continued)

Year	Omens	Last visibility	Interval of invisibility	First visibility	Interval of visibility
[5]	6	Σ IX 25 (B) Σ IX 12 (A)	2m 4d (AB) 4d (J)	Ξ XI 29 (B) Ξ XI 16 (A) XI 28 (J)	8m 29d (B)
	54	Σ x + 1 (A) Σ 12 (O)	2m xd (AO)	Ξ (AO)	
[6]	7	Ω VIII 18[4] (B) VIII 20 + x (A)	3d (AB)	Γ IX 1 (B) IX 1 (A) IX (J)	8m 20d (B + A)
	51	Ω VIII 28 (A)	5d (A)	Γ IX (A)	
[7]	8	Σ V 21 (A) Σ (BC)	2m 11d (B) xm x + 1d (A)	Ξ VIII 2 (A) VIII 2 (C) VIII (J)	8m 23d (AC)
	46	Σ (Q)		Ξ (Q)	
[8]	9	Ω IV 25 (AC)	7d (BCD)	Γ V 2 (ACJ) Γ (D)	7! m 23d (AC)
	44	IV (V)		Ξ! (Q) IV (V)	
[8]	10	Σ XII 25 (AC)			
[9]	11	Ω III 11 (AC)	9m 4d (CD) 9m xd (A) xm 5d (J)	Γ XII 15 (AC) Γ (D) XII 16 (J)	8[5]m 25d (C)
[10]	12	Σ VIII 10 (AC)	2m 6d (C) xm 6d (D) 2m 16? d (F)	Ξ X 16 (ACJ)	8m 10d (C)
	53	Σ (O)	2m 8d (A) 2m xd (O)	Ξ X 16 (A) Ξ (O)	

[4]A scribal error for 28.

[5]Including the attested VI$_2$ in Ammiṣaduqa 10.

(Table IV continued)

Year	Omens	Last visibility	Interval of invisibility	First visibility	Interval of visibility
[11]	13	Ω VI 26 (C)	11d (CF)	Γ VI$_2$ [6] 7 (CJ)	7^1 m 2d (C)
	49	Ω VI 26 (A)	12d (A)	Γ VI$_2$ 8 (A)	
[12]	14	Σ I 9 (C)	5m 16d (CF)	Ξ VI 25 (CJ)	7^1 m 10d (C)
	38	Σ I 8 (K)	5m 18d (K)	VI x (K)	
		I 8 (T)	5m 17d (T)	VI 25 (T)	
		I (P)		VI 24 (P)	
[13]	15	Ω II 5 (C)	7d (CFG)	Γ $x + 1$ (F)	8m 9d (FG + G)
				Γ (CJ)	
				12 (G)	
	41	Ω II 5 (K)	7d (T)	Γ (KT)	
		5 (T)	$6d^1$ (V)	III (V)	
[13]	16	Σ X 20 (C)	15d (C)	Ξ XI 11 (CG)	8^7m 29d (CG)
		X 21 (G)		Ξ (J)	
	55	Ω^1 24 (O)	1m xd (O)	Γ^1 XI 28 (A)	
		Ω^1 (A)	xm 4d (A)	Γ^1 (O)	
[14]	17	Σ^1 VII 10 (C)	1m 16d (C)	Ξ^1 VIII 26 (CG)	8m 20d (C)
		VII 10 (G)			8m 21d (G)
	50	Ω VII 11 (A)	1m 17d (A)	Γ VIII 28 (A)	
	60	Ω 11 (N)			
		Ω 3 (R)	1m 7d (R)	VIII 28 (R)	
		VII (B)		VIII 27 (B)	
[15]	18	Σ V 20 (C)	2m 15d (C)	Ξ VIII 5 (C)	9^1 m 0d (C)
		Σ V 21 (G)		Ξ IX 5 (G)	11^1 m 0d (G)
	47	Σ (Q)	1 + xd (O)	Ξ (A)	

[6]This is assumed to be the attested VI$_2$ in Ammiṣaduqa 11.

[7]Including the attested XII$_2$ in Ammiṣaduqa 13; if the alleged VI$_2$ in Ammiṣaduqa 14 is correct, the interval is 9^1 m 29d.

(Table IV continued)

Year	Omens	Last visibility	Interval of invisibility	First visibility	Interval of visibility
[16]	19	· Ω V 5 (C)	15d (C)	Γ IV 20 (G)	7$^!$ m 25d (G)
		Ω VIII 5 (G)		$\Xi^!$ V 20 (C)	6$^!$ m 25d (C)
	45	Ω (Q)			
[16]	20	Σ XII 15 (CG)	3m 9d (C)	Ξ III 25 (C)	8m 15d (C)
		Σ (H)	2m 7d (H)	Ξ (G)	
	58	Σ (AUV)	2m 7d (AJ)	Ξ (Λ)	
				III 4 (J)	
[17]	21	XII 10 (C)	4d (CH)	Γ XII 14 (C)	
	59	Ω (A)	4d (ΛJ)	Γ XII 14 (J)	
		$\Sigma^!$ (V)		Γ (A)	
[19]	34	Ω VI$_2$ 1 (C)	15d (C)	Γ VI$_2$^{8} 17 (C)	9$^!$ m 8d (C)
		Ω (N)	16d (M)	VI$_2$ (M)	
				· VI$_2$ 14 (N)	9$^!$ m 11d (N)
[20]	35	Σ III 25 (C)	2m 6d (C)	Ξ VI 24 (C)	8^{9}m 3d (C)
		25 (N)	2m 16d (M)	VI 14 or x (N)	
				Ξ (M)	
	42	III (V)	1$^?$ m 9d (V)	Ξ (V)	
				x + 5 (K)	
[21]	36	Ω I 27 (C) ·	7d (C)	II 3 (C)	8m 25d (C + O)
		27 or 28 (N)			
	39	I 26 (PT)	6d (T)	Γ II 3 (P)	
		$\Sigma^!$ I 27 (K)		Γ (T)	
				$\Xi^!$ II 3 (K)	
[21]	37	Σ (C)		XII 28 (C)	
	56	Σ 28 (O)	2m 0d (A)	Ξ (OU)	
		Σ (A)	xm 0d (J)		

[8] This is assumed to be the attested VI$_2$ in Ammiṣaduqa 17 + d.

[9] Including a VI$_2$ or a XII$_2$; this is assumed to be the attested XII$_2$ in Ammiṣaduqa 17 + a.

Suggestions for a History of the Tradition of the Text.

From the preceding table two things are clear: the source of section IV, which we will henceforth call the γ text, was a rearrangement of the omens that appear in sections I and III, which sections we will call the β text; and γ 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 Ammiṣaduqa; 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 γ text as omen 59. One may hypothesize therefrom that the common source of β and γ, which source we will call a, had omen 21 in place of omen 11, but that β 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 Ammiṣaduqa'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 paleographically and one that was peculiar to β since γ, 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 β makes perfect sense astronomically as a sequence of observed events if month XII_2 was intercalated in year 4 and month 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 γ 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 Ammiṣaduqa 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-year period of Venus (or such an 8-year period followed by the first pair of phenomena in a third). However, the text of β 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 nineteen of omens 1-10 because they do not fit in with the entries for eight years later in omens 11-21. Therefore, more than half of the entries in this section of β 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 γ 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 Σ and Ξ in omen 14–5 months and 16 days--also appears in omen 39 of the γ text as 5 months and 17 or 18 days. However, in the case of omen 16 (β), which is not correct 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 (γ), the phenomena, the dates, and the interval are all different, the interval being 1 month and 4 days. The succeeding omen 17 (β) has the wrong phenomena, while omen 50 (γ) has the correct phenomena. All three texts–a, β, and γ–are corrupt in this section. Omen 20 (β) and omen 58 (γ) 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 VI_2, which is not attested for the 16th year of Ammiṣaduqa) were also copied differently from a by different scribes.

These considerations make it difficult to place much reliance on the data in this set of omens, and even raise the possibility that they are not a continuation of omens 1-10 intended to cover the 9th through the 16th (17th if omen 21 is regarded as the beginning of a third 8-year cycle) years of Ammiṣaduqa's reign. It is true that the periods of visibility indicate the presence of an intercalated 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 Ammiṣaduqa, 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 authenticity of the text rather than the other way around.

Table VI. Attested Intercalations in the Reign of Ammiṣaduqa.

(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 XII_2)	L-F
5** (with VI_2)	L-F[2]
10**	L-F; YOS 13 532
11**	L-F
13*	YOS 13 404
14**	L-F[3]
17+a*	L-F; YOS 13 53; VAS 18 99
17+d**	YOS 13 146

Further, L-F cite an unpublished text dated 17+a that indicates that the preceding year contained an intercalated VI_2.

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[1]Intercalations attested in YOS 13 have been collected and kindly communicated to us by Dr. Hermann Hunger, University of Vienna.

[2]This 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.

Bibliography

The following annotated bibliography includes the more significant studies of the Venus Tablets since the edition of Langdon, Fotheringham, and Schoch in 1928; they discuss the literature before 1928 in chapter V (pp. 28-44).

1. 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 Ammiṣaduqa'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 étude sur la chronologie de la dynastie Ḥammurapienne," *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 Ammiṣaduqa'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 Ammiṣaduqa 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 Ammiṣaduqa," *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 Cornelius' dates, and finds the last to be the best. Therefore, he identifies -1581 with the first year of Ammiṣaduqa, 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 Astronomie*, 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 -1645. 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.