CRITIQUE

(Part B: REFERENCES)

of

When Was Ancient Jerusalem Destroyed? Part 2: What the clay documents really show

(*The Watchtower*, November 1, 2011)

Doug Mason

CRITIQUE (PART B)
REFERENCES
of
When *Was Ancient Jerusalem Destroyed?*
Part 2, What the Clay Documents Really Show

(*Watchtower*, November 1, 2011, pages 23 -28)

Version 1

This *Critique* of the article appearing in *The Watchtower* of November 1, 2011 is in two parts:

- **Part A** discusses points raised by the article. Available at

  http://www.jwstudies.com/Critique_Part_A_of_Jerusalem_Destroyed_part_2.pdf

- **Part B** (this document) provides supporting evidences and additional material.

Each major subject canvassed in this Critique commences with a new page. This allows the reader to quickly identify the subject matter, and if need be, provide those pages to a Watchtower apologist.

The October 1, 2011 and November 1, 2011 issues of *The Watchtower* magazine presented two parts of the Article: "***When*** *was Ancient Jerusalem Destroyed?*"

My Critique of "*Part One: Why It Matters?; What the Evidence Shows*" is available at:

http://www.jwstudies.com/Critique_of_When_Was_Ancient_Jerusalem_Destroyed.pdf

I am enormously grateful to two very special people without whom this Critique could never have been written, let alone in the short time that was available. They are Ann O'Maly and Marjorie Alley. I simply cannot thank them enough.

I also wish to acknowledge my debt to Carl Olof Jonsson and my enormous respect for his knowledge and his many years of genuine friendship. Carl, I thank you.

This Critique is of course my responsibility, so please address any concerns to me.

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PLEASE NOTE!

This *Critique* is provided in two Parts:

- **Part A and**
- **Part B (this document).**

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THE STORY OF GEDALIAH[1]

(A chapter from our ancient past)

1.

NEBUCHADNEZZAR, king of Babylon had accomplished his purpose. He had completely subdued the Kingdom of Judah, destroyed its capital Jerusalem, and its most sacred shrine, the Beth Hamikdosh. He had slain or captured most of the royal family and the nobility of the land. The upper classes of the Jewish people, including the leaders of the priesthood and the chief civil and military officers, were led captives *en masse* to Babylon. Many of them were mercilessly put to death at Riblah. Judah was crushed and bereaved of its best sons.

However, Nebuchadnezzar did not wish to turn the land of Judah into a complete desert. He permitted the poorer classes to remain in Judah to till the soil and to tend their vineyards. Over them Nebuchadnezzar had appointed Gedaliah, the son of Ahikam, as governor.

The prophet Jeremiah had been allowed to choose between remaining in Judah and going to Babylon as an honored guest of the Babylonian royal house. He chose to remain with his brethren on the holy soil. Jeremiah went to Mizpah, a short way north of Jerusalem, where Gedaliah had established the seat of his governorship, and offered him his fullest support. Gedaliah gratefully accepted, and Mizpah now became also the spiritual center of the people.

Gedaliah was a wise man, gentle and modest. He zealously began to encourage the people to cultivate the fields and vineyards, and thus lay the foundation of secur-

[1] *The Complete Story of Tishrei*, pages 73-77, by Nissan Mindel, (Merkos L'inyonei Chinuch, 1994)

ity. Under the wise administration of Gedaliah, the Jewish community began to prosper. Its fame began to spread abroad. Many Jews who had fled to places of safety in neighboring lands during the war of destruction, were attracted by the news of the revival of the Jewish community in Judah. They came to Gedaliah in Mizpah and were warmly welcomed by him. The Jewish Governor exhorted his brethren to remain loyal to the king of Babylon and promised them peace and security. His advice was well taken. The Babylonian garrison stationed in the land did not molest them; on the contrary, offered them protection against unfriendly neighbors. The young Jewish commonwealth was well on its way to recovery when it was suddenly struck by a cowardly deed of treachery and bloodshed.

2.

Among the refugees who had joined Gedaliah in Mizpah was Ishmael, the son of Nathaniah, a descendant of the royal house of Zedekiah, the last king of Judah. Ishmael was an ambitious man who would stop at nothing to attain his goal. The honor and success which Gedaliah had won filled him with cruel jealousy. Ishmael began to plot against Gedaliah. He found an ally in the king of Ammon, who had been following with apprehension the growth of the new Jewish colony.

The conspiracy became known to Johanan, the son of Koreah, a devoted officer of Gedaliah. Johanan warned the governor of the danger threatening his person. Gedaliah, however, being of a true and generous nature, shrank from believing such treachery. When Johanan offered to slay Ishmael secretly before the latter could carry out his evil plans, Gedaliah indignantly rejected the proposal.

In the meantime, Ishmael bided his time. Before long the opportunity he was waiting for presented itself. He was invited by the governor to a feast at Mizpah on New Year's day. Ishmael arrived at the banquet in the company of ten followers. During the feast, the ruthless band attacked and slew the governor. Having assassinated their host, they commenced a terrible massacre. Ishmael murdered many prominent followers of Gedaliah, and put to the sword the small Chaldean garrison stationed at Mizpah. His murderous deed accomplished, Ishmael left Mizpah with many captives, heading for Ammon.

Johanan and a few of his brave men had escaped the massacre, for they were not in Mizpah at that time. When Johanan learned of the terrible tragedy, he rallied additional help and pursued the assassin. Overtaking Ishmael near Gibeon in Benjamin, Johanan succeeded in freeing the captives, but Ishmael with a few followers managed to escape to the land of Ammon.

3.

The plight of the Jews was now sad indeed. The assassination of Gedaliah and of the Babylonian garrison would draw the wrath of Nebuchadnezzar upon the remnants of the people in Judah. They were sorely afraid of his punishment. Yet whither could they turn? The only haven of refuge seemed to be Egypt, where the hand of Nebuchadnezzar had not reached yet. But that country was hateful to them. Although some nine hundred years had passed since their ancestors had been liberated from Egypt after centuries of slavery, Egypt was still regarded with aversion. Their despair and fright was so great, however, that the poor people did decide to seek escape in Egypt, and set out on their way southward.

The hard-pressed Jews halted in Beth-Lehem and turned to Jeremiah for advice. The faithful prophet who had shared in all their trials and misfortunes and had clung to them with unwavering affection, was still among them. To him they now turned their anxious eyes, promising to abide by whatever counsel he might give them.

For ten days Jeremiah prayed to G-d, and finally he received a Divine message which he immediately told to the assembled people:

> "Thus says the G-d of Israel . . . if you will still dwell in this land, I will build you, and not destroy you, and I will plant you, and not pluck you up . . . Fear not the king of Babylon, of whom you are afraid . . . for I am with you to save you . . . But if you say, 'We will not dwell in this land,' disobeying the voice of your G-d, saying, 'No, but we will go into the land of Egypt,' . . . then it shall come to pass that the sword which you feared shall overtake you there in the land of Egypt, and the famine whereof you were afraid shall follow close after you in Egypt; and there you shall die . . . G-d hath spoken to you, O remnant of Judah, go not to Egypt; know you with certainty, for I have warned you this day!"

But Jeremiah's words fell on deaf ears. The people had already formed their resolution, and had only hoped that the prophet would confirm it. In spite of their solemn pledge to Jeremiah that they would follow his advice, they accused the prophet of plotting together with his disciple Baruch, the son of Neriah, to deliver them into the hands of the Chaldeans. Then they all proceeded on their way to Egypt, forcing Jeremiah and Baruch to accompany them.

When the refugees reached the border of Egypt, they halted. Here Jeremiah once again warned his brethren that the safety they sought in Egypt would be short-lived. He predicted that before long Egypt would be conquered by Nebuchadnezzar and destroyed. The prophet further warned them of the dangers besetting them in mixing with the idolatrous Egyptians. If they should return to idolatry, which had been the cause of all their misfortunes in the past, they would seal their fate beyond hope.

Unfortunately, the prophet's warnings and entreaties were in vain. The Jewish refugees settled in Egypt and before long abandoned their faith in G-d. They sank to the level of the heathen practices of the Egyptians.

A few years later there was a political upheaval in Egypt when Pharaoh Hophra was assassinated. Nebuchadnezzar took advantage of the situation. He invaded and destroyed the land, and most of the Jewish refugees perished in this invasion and war. Thus Jeremiah's dreadful prophecy came true again.

Where and when the aged prophet died is not known with certainty. It is believed that he and his faithful disciple Baruch spent their last years with their exiled brethren in Babylon.

In memory of the assassination of Gedaliah and the tragedy that it brought upon our brethren in those days, so soon after the Destruction of the Beth Hamikdosh, we fast on the 3rd day of Tishrei, the *Fast of Gedaliah.*

VAT 4956

Nebukadnezar II year 37

Transcription, translation, and commentary: P.V. Neugebauer and E. F. Weidner, *Ein astronomischer Beobachtungstext aus dem 37. Jahre Nebukadnezar II.* (*-567/66*)[2]

ASTRONOMICAL DIARIES AND RELATED TEXTS FROM BABYLONIA

BY THE LATE ABRAHAM J. SACHS, COMPLETED AND EDITED BY HERMANN HUNGER

Volume I

Diaries from 652 B.C. to 262 B.C.

VERLAG DER ÖSTERREICHISCHEN AKADEMIE DER WISSENSCHAFTEN

WIEN 1988

VAT 4956 (No. -567)

Nebukadnezar II year 37. I II III [ ] X XI XII

Copy E. F. Weidner, AfO 16 Tf. XVII

Transcription, translation, and commentary: P.V. Neugebauer and E. F. Weidner, *Ein astronomischer Beobachtungstext aus dem 37. Jahre Nebukadnezar II. (-567/66)*

Obv'

1: Year 37 of Nebukadnezar, king of Babylon. Month I (the 1st of which was identical with) the 30th (of the preceding month), the moon became visible behind the Bull of Heaven; [sunset to moonset:] .... [....]

2: Saturn was in front of the Swallow. The 2nd, in the morning, a rainbow stretched in the west. Night of the 3rd, the moon was 2 cubits in front of [....]

3: it rained? Night of the 9th (error for 8th), beginning of the night, the moon stood 1 cubit in front of β Virginis. The 9th, the sun in the west [was surrounded] by a halo

3: [.... The 11th]

4: or 12th, Jupiter's acronychal rising. On the 14th, one god was seen with the other; sunrise to moonset: 4^{o}. The 15th, overcast. The 16th, Venus [....]

5: The 20th, in the morning, the sun was surrounded by a halo. Around noon, ... rain PISAN. A rainbow stretched in the east. [....]

6: From the 8th of month XII2 to the 28th, the river level rose 3 cubits and 8 fingers, b cubits [were missing] to the high flood [....]

7: were killed on order of the king. That month, a fox entered the city. Coughing and a little *risitu*-disease [....]

8: Month II (the 1st of which was identical with) the 30th (of the preceding month), the moon became visible while the sun stood there, 4 cubits below β Geminorum; it was thick; there was earth shine [....]

9: Saturn was in front of the Swallow; Mercury, which had set, was not visible. Night of the 1st, gusty storm from east and south. The 1st, all day [....]

10: stood [... in front] of Venus to the west. The 2nd, the north wind blew. The 3rd, Mars entered Praesepe.

[2] *Astronomical Diaries and Related Texts from Babylonia, Volume 1, Diaries from 652 B.C. to 262 B.C.*, by the late Abraham J. Sachs, completed and edited by Hermann Hunger, Verlag der Österreichischen Akademie der Wissenschaften, Wien 1988

The 5th, it went out of it. The 10th, Mercury [rose] in the west behind the [Little Twins ....] 11: The 15th, ZI IR. The 18th, Venus was balanced 1 cubit 4 fingers below α Leonis. The 26th, (moonrise to sunrise) 23°; I did not observe the moon. The 27th, 20+x [....]

12: <u>Month III</u> (the 1st of which was identical with) the 30th (of the preceding month), the moon became visible behind Cancer; it was thick; sunset to moonset: 20°; the north wind blew. At that time, Mars and Mercury were 4 cubits in front of α [Leonis ...]

13: Mercury passed below Mars to the East? ; Jupiter was above α Scorpii; Venus was in the west opposite ϑ Leonis [....]

14: 1? cubit. Night of the 5th, beginning of the night, the moon passed towards the east 1 cubit <above/below> the bright star of the end of the Lion's foot. Night of the 6th, beginning of the night, [....]

15: it was low. Night of the 8th, first part of the night, the moon stood 2½ cubits below β Librae. Night of the 9th, first part of the night, the moon [stood] 1 cubit in front of [....]

16: passed towards the east. The 9th, solstice. Night of the 10th, first part of the night, the moon was balanced 3½ cubits above α Scorpii. The 12th, Mars was b cubits above [α Leonis ...]

17: [....] The 15th, one god was seen with the other; sunrise to moonset: 7°30'. A lunar eclipse which was omitted [....]

18: [.... the moon was be]low the bright star at the end of the [Lion's] foot [....]

19: [....] .... [....]

'Rev.

1': [....] .... first part of the night .... the moon was]

2': 1 cubit [above/below] the middle star of the elbow of Sagittarius .... [....]

3': When 5° of daytime had passed, the sun was surrounded by a halo. The 19th, Venus was 2½ cubits below? Capricorni. Night of the [....]

4': That month, the equivalent (of 1 shekel of silver was): barley, 1 kur 2 sut; dates, 1 kur 1 pan 4 sut; mustard, 1 kur .... [....]

5': <u>Month XI</u> (the 1st of which was identical with) the 30th (of the preceding month), the moon became visible in the Swallow; sunset to moonset: 14°30'; the north wind blew. At that time Jupiter was 1 cubit behind the elbow of Sagittarius [...]

6': The 4th, the river level rose. The 4th, Venus was balanced ½ cubit below (*sic*) Capricorn. Night of the 6th, first part of the night, the moon was surrounded by a halo; Pleiades, the Bull of Heaven, and the Chariot [stood in it ....]

7': the moon was surrounded by a halo; Leo and Cancer were inside the halo; α Leonis was balanced 1 cubit below the moon. Last part of the night, 3° of night remaining, [....]

8': sunrise to moonset: 17°; I did not watch. The sun was surrounded by a halo. From the 4th to the 15th, the river level rose 1½ cubits. On the 16th, it receded. Night of the 18th (and) the 18th, rain PISAN DIB [....]

9': when the [....] of Bel was cut off from its place, two boats .... went away?. The 2nd, overcast. Night of the 23rd, [.... Mars?]

10': was balanced above (*sic*) the small star which stands 3½ cubits behind Capricorn. Night of the 29th, red glow flared up in the west, 2 double-[hours ....]

11': barley, 1 kur?; dates: 1 kur 1 pan 4 sut; mustard, 1 kur 1 pan; sesame, 4 sut; cress, [....]

12': Month XII (the 1st of which followed the 30th of the preceding month), the moon became visible behind Aries while the sun stood there; sunset to moonset: 25°, measured; earth shine; the north wind blew. At that time, Jupiter [.... Mercury and Saturn, which had set]

13': were not visible. The 1st, the river level rose. Night of the 2nd, the moon was balanced 4 cubits below η Tauri. Night of the 3rd, beginning of the night, 2½ cubits [....]

14': From the 1st to the 5th, the river level rose 8 fingers; on the 6th it receded. Night of the 7th, the moon was surrounded by a halo. Praesepe and α Leonis [stood] in [it ....]

15': the halo surrounded Cancer and Leo, it was split towards the south. Inside the halo, the moon stood 1 cubit in front of < α Leonis >, the noon being 1 cubit high. Night of the 10th, first [part of the night ....]

16': Night of the 11th, overcast. The 11th, rain DUL. Night of the 12th, a little rain, ... The 12th, one god was seen with the other, sunrise to moonset: 1°30'; .... [....] Mercury]

17': was in front of the "band" of the Swallow, ½ cubit below Venus, Mercury having passed 8 fingers to the east; when it became visible it was bright and (already) high. 1 ? [.... Saturn]

18': was balanced 6 fingers above Mercury and 3 fingers below Venus, and Mars was balanced b cubits below the bright star of < .... > towards [...]

19': ...., ..., The 21st, overcast; the river level rose. Around the 20th, Venus and Mercury entered the "band" of the Swallow. From [.... Jupiter,]

20': which had passed to the east. became stationary. At the end of the month it went back to the west. Around the 26th, Mercury and Venus [came out] from the "band" of Anunitu [....]

21': the river level receded 8 fingers. That month, on the 26th, a wolf entered Borsippa and killed two dogs; it did not go out, it was killed [....]

Lower edge

1: Year 38 of Nebukadnezar, month I, the 1st (of which followed the 30th of the preceding month): dense clouds so that [I did not see the moon ....]

2: Year 37 [....]

Left edge

1: [Year 37 of Nebukad]nezar

DOES RAYMOND DOUGHERTY PROVIDE SUPPORT FOR AN EXTRA KING OF BABYLON?

10. Consider the example of Neriglissar. A royal inscription regarding him states that he was "the son of Bêl-shum-ishkun," the "*king of Babylon*." (Italics ours.) Another inscription calls Bêl-shum-ishkun the "wise prince." The original word rendered "prince," *rubû*, is a title also meaning "king, ruler." Since there is an obvious discrepancy between the reign of Neriglissar and his predecessor, Amel-Marduk, could this "king of Babylon," Bêl-shum-ishkun, have ruled for a time between the two? Professor R. P. Dougherty acknowledged that "the evidence of Neriglissar's noble ancestry cannot be disregarded."—*Nabonidus and Belshazzar—A Study of the Closing Events of the Neo-Babylonian Empire*, by Raymond P. Dougherty, published 1929, page 61.

***WT*, Nov 1, 2011**

Its own military excesses and Scythian invasion of the land caused Nineveh to suffer serious decline, and hence the imperial city yielded to the united onslaught of Medes, Scythians, and Babylonians in 612 B. C.[1] This event signalized the beginning of a renaissance of Babylonian political power which produced the Neo-Babylonian empire, known formerly as the Chaldaean empire, whose sovereigns were Nabopolassar, Nebuchadrezzar II, Amêl-Marduk, Neriglissar, Lâbâshi-Marduk, and Nabonidus in conjunction with his son Belshazzar.

Dougherty, page 1

1. *Neo-Babylonian Kings according to Cuneiform Texts*[27]

Nabû-apal-uṣur	21 years	626/625–605 B. C.
Nabû-kudurri-uṣur[28]	43 years	605–562 B. C.
Amêl-Marduk	2 years	562–560 B. C.
Nergal-šar-uṣur	4 years	560–556 B. C.
Lâbâši-Marduk	A few months	556 B. C.
Nabû-nâ'id	17 years	556–539 B. C.

[27] This list is based upon cuneiform historical texts and upon dated contract tablets of the Neo-Babylonian period. See references in notes 2 and 8. These Babylonian documents furnish evidence that *Nabû-apal-uṣur* (Nabopolassar) was the father of *Nabû-kudurri-uṣur* (Nebuchadrezzar), and that *Amêl-Marduk* (Evil-Merodach) was the son of Nebuchadrezzar. According to Berossus (Josephus, *Contra Apionem* I, 20; *CLP* cols. 49, 50), *Nergal-šar-uṣur* (Neriglissar) was the son-in-law of Nebuchadrezzar. *Lâbâši-Marduk* (Laborosoarchod) is referred to in cuneiform texts as the son of Neriglissar. *Nabû-nâ'id* (Nabonidus) is not mentioned as being related to any Neo-Babylonian king. This is no final criterion, however, as the available cuneiform records are silent also as to Neriglissar's relationship by marriage to Nebuchadrezzar.

Dougherty, page 7

Of the above Neo-Babylonian king-lists the first is based upon more than two thousand dated cuneiform documents. It must therefore be accepted as the ultimate criterion in the determination of Neo-Babylonian chronological questions, the majority of which are connected with events which took place in the sixth century B. C. Judged by this unimpeachable standard, the writings of Herodotus of the fifth century B. C. and those of Xenophon of the first part of the fourth century B. C. are lacking in true historical perspective so far as an orderly enumeration of Neo-Babylonian kings is concerned. The record of Megasthenes, next in point of time, is defective inasmuch as he makes no mention of Nabopolassar, the founder of the dynasty, and gives no information as to how long each king reigned. It is not until the third century B. C. that the Berossus list, with a real Babylonian background and therefore of appreciable accuracy, appears.

Dougherty, page 10

Neo-Babylonian Empire was contemporaneous with the Twenty-sixth Dynasty. The following table indicates this synchronism:

Twenty-sixth Dynasty[154]			*Neo-Babylonian Kings*[155]		
Psametik I..........	663–609	B. C.	Nabopolassar....	626/625–605	B. C.
Necho....	609–593	"	Nebuchadrezzar.....	605–562	"
Psametik II.........	593–588	"	Amêl-Marduk.......	562–560	"
Apries (Hophra).....	588–569	"	Neriglissar..........	560–556	"
Ahmose II (Amasis)..	569–525	"	Lâbâshi-Marduk.....	556	"
Psametik III........	525	"	Nabonidus...........	556–539	"

The above eras of rule parallel one another in remarkable fashion. In the first place, there is essential concurrence chronologically.

Dougherty, page 45

Nabonidus made no claim that he was establishing a new dynasty; he regarded himself as in entire accord with the great kings of the Neo-Babylonian empire. The passage describing his election as king is followed by these words:

[14]*Ša ^{md}Nabû-ku-dur-ri-uṣur* [15]*ù ^{md}Nergal-šar-uṣur* [16]*šarrâni$^{me\check{s}}$ a-lik maḫ-ri-ia* [17]*na-aš-pa-ar-šú-nu* [18]*dan-nu a-na-ku* [19]*um-ma-na-ti-šú-nu* [20]*ga-tu-ú-a paq-da* [21]*a-na qi-bit-šú-nu* [22]*lâ e-ga-ku-ma* [23]*ka-bat-ta-šú-nu* [24]*šú-ṭu-ub-ba-ak.*[261]

[14]As for Nebuchadrezzar [15]and Neriglissar, [16]the kings who preceded me, [17,18]I am their mighty delegate. [19,20]Their troops have been entrusted into my hand. [21,22]Towards their command I am not dilatory; [23,24]I rejoice their heart.

The next ten lines contain a partially-preserved record concerning Amêl-Marduk and Lâbâshi-Marduk.[262] There is no evidence in any of the lines that Nabonidus considered himself guilty of usurpation. He felt himself at one with Nebuchadrezzar and Neriglissar. Apparently there is sufficient ground for the view that the last reign of the Neo-Babylonian empire was an integral part of the Neo-Babylonian dynasty.

Dougherty, page 73

When writing of any confusion in a transition from one king to the next, Dougherty clearly states that it resulted from an overlap.

Chronological data secured from contract tablets belonging to the period of transition from Lâbâshi-Marduk's reign to that of Nabonidus appear to suggest a state of uncertainty in the kingdom. Dated documents indicate an overlapping of reigns and hence a condition of political confusion. The known texts connected with Lâbâshi-Marduk's occupancy of the throne range from the twelfth day of the second month to the twelfth day of the third month of his reign. The earliest tablet of Nabonidus' reign is dated on the fifteenth day of the second month of his accession year, only three days after the earliest tablet of the reign of Lâbâshi-Marduk.[263] The accession year of Lâbâshi-Marduk was the latter part of the preceding calendar year. It is difficult to determine the exact length of the reign of Lâbâshi-Marduk because so few texts belonging to his time have been published.[264] If the records are to be taken as they stand, the official chronology of the period indicates a regnal overlapping of nearly a month. The real reason for such a situation can be conjectured with difficulty. Other tablets dated at the end of Lâbâshi-Marduk's reign and at the beginning of Nabonidus' reign will probably furnish information as to the true course of events.[265]

Dougherty, pages 73-74

The record of Berossus remains to be considered. It is so significant in its implications that the sections having a bearing upon the question under discussion will be quoted in full. The text is as follows:

[*Greek text from Berossus here*]

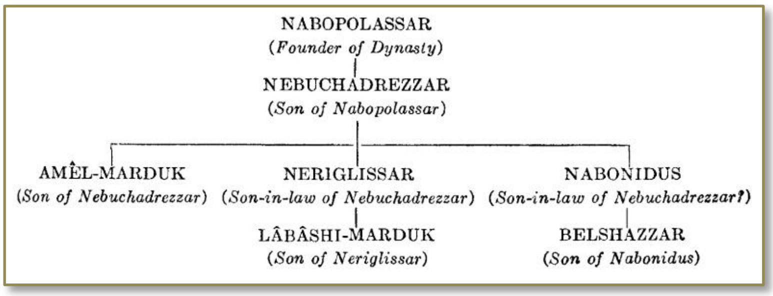
The salient points of this account may be summarized in a few brief paragraphs.

(1) Amêl-Marduk was slain as the result of a conspiracy and was followed by Neriglissar[280] who had plotted against him. Neriglissar reigned four years.

(2) The next king was Lâbâshi-Marduk, the youthful son of Neriglissar. Nothing is stated as to the way in which Neriglissar's reign came to a close. Because Lâbâshi-Marduk exhibited evil tendencies he was conspired against and tortured to death by his friends after he had reigned only nine months.

(3) Upon the death of Lâbâshi-Marduk those who had planned his downfall assembled and by common consent bestowed the sovereignty upon Nabonidus, one of those from Babylon who was in the same insurrection.

Dougherty, page 78



Dougherty, page 79

There is documentary evidence that Neriglissar gained the throne by means of a conspiracy which resulted in the death of Amêl-Marduk.

Dougherty, page 146

Though the cuneiform sign for the *moon* is clear and unambiguous, some of the signs for the names of the planets and their positions are unclear. (*Mesopotamian Planetary Astronomy—Astrology,* by David Brown, published 2000, pages 53-57)

The *Watchtower*, November 1, 2011, page 28

2.1 The Planet-names in Cuneiform, c.750–612 BC

I have found that all the names attested for the seven planets in the period c. 750–612 BC can be placed into five categories. For example, the names Sagmegar, Delebat, Ṣalbatānu, Šiḫṭu, Kaiamānu, Šamšu and Sîn are unique to Jupiter, Venus, Mars, Mercury, Saturn, the Sun and the Moon respectively. They are never used for any other celestial bodies. They are what I am terming the "A-names" for these planets. The Marduk planet however, is a B-name for Mercury, which means that this name is shared only by other planets. In this case it is also used of Jupiter. Nēbiru is a C-name for Jupiter, Venus and Mercury, for it can be used only for these planets and only when one of them is located near the horizon. D-names, such as Nīru, are used for constellations or particular stars as well as for more than one planet. Finally some names refer only to *one* planet and to a constellation or individual star. These are the E-names, for example Šēlebu, used for the fox constellation and Mars,

[160] E.g. Hunger writes in SAA8 xvif "Saturn is considered *equivalent* with the Sun…scholars can *replace* one by another, *interchanged*…any planet can be *intended*…by constellations. Boll found the explanation for these *substitutions*…a planet could *take the place* (of a star)."

[161] As early as 1961 (English 1967) Foucault argued that the methods by which the "rational populace" asserted control over the insane were dependent on the society in question, that they did not manifest cultural universals, nor could they be understood in terms of an *a priori* human essence. He argued in 1969 (English 1972) against the tendency of historians to analyse the past in terms of categories like "the general will of the people", and more significantly for the topics herein covered, he criticised the modern tendency to classify into categories of "rational" and "non-rational". There is, indeed, a strong temptation to "rationalise" the omen corpus, the assumption being that the compilers of the omen series ought to have formed part of the same "culture of the sane" as do we – that their mentalities are "commensurable" – see Rochberg (1992) 549. When an omen seems inexplicable to us, some scholars (see below) have resorted to the notion that the omen must once have been "rational", and that it has subsequently become "corrupted". Much that is merely speculative can lead from this. E.g. completing the quote from above, Hunger SAA8 xvi writes: "There are many omens which speak of movements of fixed stars relative to each other… It is unclear what these protases may have originally meant.., The scholars considered the names of constellations in such cases to be substitute names for the planets (on the basis that) if a planet had the same color as a fixed star, it could take the place of the other in the interpretation of the omen." This last "rationalisation" was the work of Bezold (1916, after Boll), but is both untestable scientifically and cannot be corroborated on the basis of the Scholars' own comments. (See also the remarks by Koch-Westenholz, 1995 131–2.) The effort here will be to discuss the "rationalisations" actually attested in the 7th and 8th centuries BC, and not those which seem familiar to us and which we (perhaps understandably) feel to be universal.

but for no other planets.

Many of the names used for heavenly bodies are those also applied to gods and their attributes. This is not the place to discuss the extent to which the gods and the planets were equated, and yet it is quite clear that the relationship was often close.[162] For my purposes it is sufficient that the phenomena manifested by the stars, constellations and planets were understood by the astrologer-astronomers to be messages, binding or otherwise, from the gods, and that they and the king whom they guarded against supernatural misfortune acted on these signs accordingly. The celestial bodies were "bearers of signs to the inhabited world" – see §2.1.1 below.

The following is a comprehensive list of all the names known to have been *used* in the period studied. The following section, wherein many of the names are analysed, refers back to this list. The results are displayed in Chart 2.1.

A *Names unique to the planet (amongst celestial bodies) and which can be used under any circumstances*[163]

JUPITER — **$^{d/mul}$sag.me.gar** = Sagmegar (reading uncertain, meaning unknown). Used in all text-groups. *Planetarium* No.334. SAG.ME.GAR is written in the -567 Diary and sàg.me.gar in the -651 and the -418 Diaries. It is used less frequently in the late periods, where it is replaced by the A-name $^{mul/múl}$babbar (which is quicker to write).

^{mul}en.gišgal.an.na = Engišgalanna (reading uncertain). In 8254 it is equated with Sagmegar, and in Assurbanipal's acrostic hymn SAA3 2: 43 it is said to be *mamlu šūpû* "noble, illustrious, the lord [who…] the (celestial) positions (*manzāzu*) of the Anunnakkī, [who…] lustration rites […] rituals, and offerings […]"

VENUS — ***$^{d/mul}$dele-bat*** = *Delebat* (meaning unknown). Used in all text groups in all periods. It appears as ***dele-bat*** in the -651, and all subsequent Diaries. *Planetarium* No.109.

^{d}u.dar/^{d}iš.tar = Ištār (NA Issār, the goddess of war and love). E.g. 8051: 4/8461: 3. The deity can also be written ^{d}15 and $^{d(+)}$Innin, but I have been unable to find either spelling used to refer to the planet in the texts herein considered. This is presumably only by chance.[164]

MARS — ***$^{d/mul}$ṣal-bat-a(an)-nu*** = *Ṣalbatānu* (meaning unsure, though Lambert (1996) has suggested seeing *ṣalbatānu* as a variant of *ṣarbatānu*, a rare adjectival form derived from *ṣarbû* "pertaining to the poplar", an epithet of Nergal). It is used in all text groups. *Planetarium* No.360. *Ṣalbatānu* does not appear in the Diaries where Mars is always referred to by the single sign

[162] Rochberg (1996).

[163] References, when *not* given, are very frequent. The planets, for which the names are attested in the texts of interest here, are italicised *and* bolded.

[164] For references to the use of 30 and 15 for Sîn and Ištar from the OB period on, see Lieberman (1987) n202. See also Parpola (1993a) nn87–9.

an (-651 Diary: 10). *Planetarium* No.21. It is found in the SB *ACh.* 2Supp.80: r.9. An is not usually written as the "star An" (though in the Hellenistic period new year ritual, *RAcc.* p138 l.308, ^{múl}an is attested), nor as the "god Anu". Simply the cuneiform sign AN is written.

^{d}**u.gur** = Nergal (lord of the Underworld, linked to Erra, the war and plague god, sometimes called Meslamta-ea and identified with Lugal-irra). In 8114: 8, 8284: 2, 8502: 11, 8541: 12 Nergal is used as a name for Mars. The few references in the SB texts listed in *Planetarium* No.302 do not change Nergal's status as an A-name for Mars in the period of concern here. See von Weiher (1971) 76f.

^{mul}***sa-ar-ri*** = *Sarru* (false planet). In 8288: 3 Mars is referred to in a protasis "If Jupiter and the false planet meet." Also written ^{mul}lul.la in the SB texts, there is no textual evidence that *sarru* is the name of any heavenly body except Mars, as *Planetarium* Nos. 249 & 342 also show.

mul *šá* ^{kur}**su.bir$_4$.ki** = Planet of Subartu (a region at this time often synonymous with Assyria[165]). In 8491: r.7 Mars is said to be the Planet of Subartu.

MERCURY $^{d/mul}$**udu.idim.gu$_4$.ud** and

$^{d/mul}$**gu$_4$.ud** (x051: s1) = *Šiḫṭu* (jumping planet). Used in all text groups, including the -651 Diary, and all subsequent Diaries where the form **gu$_4$.ud** is used without determinative.

^{mul}***Na-bu-ú***/$^{d(+)}$**ag**/^{d}**pa** = Nabû (Biblical Nebo, god of wisdom/scribes, son of Marduk and god of Borsippa). Attested (probably) as a name for Mercury in *Sargon's 8th Campaign* l.317 (§I.3 n41), and perhaps as a planet in x064: 5. It is found as a name for Mercury in the SB text *ACh.*1Supp.8: 7 (*Planetarium* No.290).

dumu-lugal = *Mār šarri* (Crown prince). In x052: r.9, x073: r.7–8 & x074: r.6 ^{mul}udu.idim.gu$_4$.ud is equated with the crown prince.

SATURN $^{d/mul}$**udu.idim.sag.uš** and

^{d}**sag.uš** = *Kaiamānu* = (steady/normal/constant planet). (*Planetarium* No. 333.) Used in all texts including the -651 Diary: 8 where sag.uš is written, and in the -567 Diary: 2 where ^{d}sag.uš is used. In this and in all subsequent Diaries the name genna is used for Saturn, with the -567 Diary using a divine determinative.

SUN ^{d}**utu**/^{d}**20/20/*šamšu*/*šá-maš*** = Sun god. The distinction between *šamšu* "the Sun" and the vocative Šamaš is made in the inscriptions,[166] but the need repeatedly to mention the Sun, made the use of the signs ^{d}utu, ^{d}20, and 20 more common in the majority of texts under consideration. Since utu and babbar share a sign, the use in the Diaries of ^{múl}babbar and ^{d}utu (with their respective determinatives) is understandable.

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165 Subartu was the land of the Subareans, nomads based somewhere north of Sumer and Akkad in the late 3M and early 2M BC and traditionally part of Sargon of Agade's empire. By the NA period Assyria itself was sometimes referred to as Subartu, though in *The Sargon Geography* the region appears to have been considered to belong to the empire of another king. For details see Horowitz (1998) 79.

166 E.g. see the glossary at the end of Borger (1956).

THE COMPILERS WERE ASTROLOGERS (VAN DER SPEK)

Scholar R. J. van der Spek explains: "The compilers were astrologers, not historians." He describes sections of the tablets that contain historical records as "more or less casual," and he warns that such historical information must "be used with caution."[15]

15. *Bibliotheca Orientalis,* L N° 1/2, Januari-Maart, 1993, "The Astronomical Diaries as a Source for Achaemenid and Seleucid History," by R. J. van der Spek, pages 94, 102.

The following citations from van der Spek put the quotation into context.

BIBLIOTHECA ORIENTALIS L N° 1/2, Januari-Maart 1993

THE ASTRONOMICAL DIARIES AS A SOURCE FOR ACHAEMENID AND SELEUCID HISTORY

the long-awaited publication of the Astronomical Diaries by the late Abraham Sachs and Hermann Hunger is a wellcome contribution to the documentary evidence on Babylonian civilization in the Late Babylonian and Hellenistic Periods. As we shall see below, the diaries not only contain reports on stars and planets, but also present interesting historical information. Due to the fragmentary state of preservation and the high degree of complexity of the astronomical terminology, in which only few specialists in the field of assyriology are at home, the publication must be regarded as a masterpiece of scholarship.

***Bibliotheca Orientalis*, R. J. van der Spek**

The Babylonian Astronomical Diaries are of course important for the study of astronomy. Careful day-by-day observations of the sky are available for a very long period, now published in accessible English for the time span 652 B.C. to 165 B.C. (though the number of pre-Achaemenid diaries is limited to two) and more will come. The observations concern information on the moon, the planets, solstices and equinoxes, Sirius phenomena, meteors, comets, etc. This publication has to find its way in (the history of) astronomy. Meteorologists also may benefit from this publication, since it contains a report of the daily weather situation and the river level as well. Interesting conclusions may be drawn concerning the development of the climate in Iraq.

***Bibliotheca Orientalis*, R. J. van der Spek**

The Diaries also contain important information which has nothing to do with astronomy, viz. reports on the prices of commodities and on historical events. Both are of course very useful for the study of history.

***Bibliotheca Orientalis*, R. J. van der Spek**

Most often at the end of a year-rapport historical information is inserted. Mention is made of battles of kings, visits of kings or royal officials to the temple, offerings brought by them, but also seemingly quite unimportant events as the news that "five dogs approached one bitch" (no. -207, Obv' 17).

At first sight the purpose of collecting these very different data seems hard to understand. Recent studies, however, have shown that the Astronomical Diaries constituted a kind of source-book and a scientific foundation of divination, e.g. as a source-book for horoscopes and omina.

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The following provides the immediate context of the citation in *The Watchtower*.

Astrology was also used for weather forecasts[7]), which might explain the wheather reports in the diaries. Even the commodity prices were subject of astrological predictions, as may be deduced from a Late Babylonian text from Uruk[8]). Thus, also the historical events, mentioned in the diaries, are therefore not recorded out of historical interest, but for astrological and 'divinational' purposes. The compilers were astrologers, not historians. This explains the fact that the historical sections, as Hunger indicates in his Introduction (p. 36), "are of a remarkable unevenness: sometimes they record events of ephemeral importance from the city of Babylon, in other cases events of political significance". The reason for the recording of historical events probably was to present a relationship between events in the sky and on earth. Events on earth could be a victory of the king in a certain battle, but also the fact that "five dogs approached one bitch". Both kinds of 'historical events' played a role in the omina, which explains why both are mentioned in the diaries.

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The sections recording historical events are of course a matter of major importance for the assessment of historical developments. They must, however, be used with caution in view of their above mentioned purpose as material for astrological research. But also in another respect the position of the compilers of the diaries determined the substance of the information. The compilers lived in Babylon, were connected with the temple and were best informed on the situation in Babylon and her temple. The information of political importance had often to come from farther away.

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In the Seleucid period the core of the empire gradually shifted to Antioch on the Orontes and the king was often on campaign in far away regions. So the information was more or less casual and this is sometimes expressed in the introduction formula: ITU BI *al-te-e um-ma*, "that month, I heard as follows": (e.g. No. -168 A14). However, the unevenness in the way of reporting, as mentioned by Hunger, is also apparent in another aspect. In some diaries reports of historical events occur frequently, but in others we have no information for many consecutive years. It seems that not all compilers were in the same way interested in historical events. Sometimes a stray remark is made, sometimes we have a complete report,

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LUNAR THREES ON VAT 4956 (F. RICHARD STEPHENSON AND DAVID M. WILLIS)[3]

[*The following is from the Reference article cited at Endnote 18a on page 28 of the November 1, 2011 article. The author of the "Watchtower" article was fully aware of the contents of the Study by Stephenson and Willis and the conclusions, yet decided to keep them from the reader.*]

Tablet [VAT 4956] twice gives the date as the 37th year of Nebuchadrezzar – both at the beginning of the obverse and at the end of the reverse. ... The equivalent **Julian date of 568-567 BC**, as identified by Neugebauer and Weidner, and Sachs and Hunger, seems **well established**. ...

Observations involving the moon are especially valuable for dating the Babylonian astronomical diaries since the moon moves so rapidly through the sky – on average 13 deg daily. The lunar observations on the tablet are of two main types:

- "lunar threes" (three time-intervals recorded near the beginning, middle and end of each month); and
- conjunctions of the moon with "Normal Stars". ...

Lunar Threes

During each lunar month the following three time-intervals were systematically recorded:

(i) sunset to moonset on the first of the month ...

(ii) sunrise to moonset around the middle of the month ...

(iii) moonrise to sunrise near the end of the month. ...

Seven "lunar threes" are preserved intact on the tablet. Here we shall give two examples.

(i) "Month III, (the 1st of which was identical with) the 30th (of the preceding month)... sunset to moonset: 20° ..."

From the tables of Parker and Dubberstein, lunar month III began on June 21 in 568 BC. ... We compute that the interval between sunset and moonset at Babylon was actually 22.7°. However, on the previous and following evenings the respective intervals were 6.4° and 37.0°.

Hence **the date according to Parker and Dubberstein is quite acceptable**.

(ii) "Month XII, (the first of which was identical with) the 30th (of the preceding month).., sunset ... to moonset: 25°, measured". ...

On this evening, the computed interval between sunset and moonset was actually 25.7° – almost identical to the measured value. On the previous and following evenings the appropriate intervals were 10.0 and 41.8°.

Hence **once again the tabular date is confirmed**.

[3] From pages 421 – 428 of *Under One Sky: Astronomy and Mathematics in the Ancient Near East*, F. Richard Stephenson and David M. Willis, editors: John M. Steele, Annette Imhausen, Ugarit-Verlag, Münster, 2002. (*The Watchtower* November 1, 2011, page 28: Reference 18a) (Emphases supplied)

Our comparisons between the various recorded time intervals and their computed equivalents are summarised in Table 1. ...

Month	Day	Julian Date	Interval	Measured [VAT 4956]	Computed	Difference
I	14	568 May 5	SR-MS	4	3.5	0.5
II	26	568 Jun 17	MR-SR	23	23.2	0.2
III	1	568 Jun 20	SS-MS	20	22.7	2.7
XI	1	567 Feb 12	SS-MS	14.5	17.0	2.5
XII	1	567 Mar 14	SS-MS	25	25.7	0.7
XII	12	567 Mar 26	SR-MS	1.5	0.7	0.8

Table 1. Analysis of "lunar threes"; comparison between measured and computed values.

We conclude that the various lunar threes on the text are quite in keeping with a date for the tablet of 568-567 B.C. In addition, reference to Table 1 reveals that even at this early date, timing errors were typically of the order of 1° - no mean achievement.

Review of Lunar Threes on VAT 4956 by Professor Hermann Hunger, Vienna, Austria[4]

In *Under One Sky: Astronomy and Mathematics in the Ancient Near East* (J. M. Steele and A. Imhausen [eds.], Münster 2002), pp. 423-428, F. R. Stephenson and D. M. Willis have evaluated the lunar data in VAT 4956 and come to the conclusion that the date 568/7 BC can be "confidently affirmed".

Stephenson and Willis used the "Lunar Three" to check the date. These are the following time intervals: sunset to moonset (SS-MS) on the first evening of the month; sunrise to moonset (SR-MS) on the first morning on which the almost full moon set after sunrise; and moonrise to sunrise (MR-SR) on the last morning on which the moon was visible before conjunction. I repeat the table from p. 424 of their article:

Table Year 568/7 BC, beginning April 22/23

Month	Day	Julian Date	Interval	Text	Computed	Difference
I	14	568 May 5	SR-MS	4	3.5	0.5
II	26	568 Jun 17	MR-SR	23	23.2	0.2
III	1	568 Jun 20	SS-MS	20	22.7	2.7
XI	1	567 Feb 12	SS-MS	14.5	17.0	2.5
XII	1	567 Mar 14	SS-MS	25	25.7	0.7
XII	12	567 Mar 26	SR-MS	1.5	0.7	0.8

As Stephenson and Willis say, each interval increases by about 12° per day, so the correct day can usually be identified by comparing text with computation. **I have repeated their computations for 568/7 BC, and I agree with their results.** In the following, I conduct the same computations for the year 588/7 BC, first for the dates given by Parker & Dubberstein, followed by those dates claimed by F., which are shifted by about one month.

Table: Year 588/7 BC, beginning April 3/4[5]

Month	Day	Julian Date	Interval	Text	Computed	Difference
I	14	588 Apr 17/18!	SR-MS	4	6	2
II	26	588 May 28/29	MR-SR	23	17.3	5.7
III	1	588 Jun 1/2	SS-MS	20	13.8	6.2
III	15	588 Jun 15/16	SR-MS	7.5	5.8	1.7
XI	1	587 Jan 24/25	SS-MS	14.5	16.5	2
XII	1	587 Feb 23/24	SS-MS	25	27.8	2.8
XII	12	587 Mar 7/8!	SR-MS	1.5	1.8	0.3

[4] *Review of Assyrian, Babylonian, and Egyptian Chronology, Volume II of Assyrian, Babylonian, Egyptian, and Persian Chronology Compared with the Chronology of the Bible*. Furuli, Rolf J., Oslo, Awatu Publishers, 2nd ed., 2008. 376 pp., (From http://goto.glocalnet.net/kf4/reviewHunger.htm) (Emphases supplied)
[5] Dates as per Parker and Dubberstein.

Table: Year 588/7 BC, beginning May 2/3[6]

Month	Day	Julian Date	Interval	Text	Computed	Difference
I	14	588 May 16/17!	SR-MS	4	1	3
II	26	588 Jun 27/28!	MR-SR	23	18.3	4.7
III	1	588 Jul 1/2!	SS-MS	20	17.8	2.2
III	15	588 Jul 15/16!	SR-MS	7.5	15.3	7.8
XI	1	587 Feb 22/23	SS-MS	14.5	9.8	4.7
XII	1	587 Mar 24/25	SS-MS	25	21.5	3.5
XII	12	587 Apr 6/7!	SR-MS	1.5	4.8	3.3

The dates with an exclamation mark disagree with the calendar, in the sense that the measurements of the intervals could not have been taken on the date given on the tablet if the tablet were referring to year 588/7. The differences between text and computation are in both cases much larger than in 568/7 BC. Using the words of Stephenson and Willis, **588/7 BC can be confidently excluded.**

[6] These dates are in accordance with the shift of dates expressed in the *Watchtower* article of November 1, 2011, p. 28, Reference 17. This shift was also suggested by a Rolf Furuli, and is the subject of this review by Professor Hunger.

MARJORIE ALLEY'S LUNAR THREE TIME INTERVAL RESULTS FROM ASTRONOMY COMPUTER PROGRAMS[7]

[*The calculations by **Stephenson and Willis**[8]**,** and also by **Hermann Hunger**[9] show that the Lunar Three measurements on VAT 4956 could have only been taken during 568/567 BCE. Using readily available astronomy software, it is possible to conduct the same computations. When Marjorie Alley used several of these programs, she found that each program confirmed that the readings on VAT 4956 are from the year 568/567 BCE and not from 588/587 BCE.*]

The following Tables compare the time intervals recorded on VAT 4956 against

- time intervals calculated with the Computer program ***Sky View Café***
- time intervals calculated with the Computer program ***JPL Horizons***.

Settings for Jet Propulsion Laboratories (JPL) *Horizons* astronomy program

The results from the astronomy programs for all three years are entirely consistent with one another.

This is the address for the JPL HORIZONS site, with the settings used:

http://ssd.jpl.nasa.gov/horizons.cgi#results

Ephemeris Type:	**OBSERVER**
Target Body:	**Sun [Sol]** [10]
Observer Location :	user defined (**44°24'00.0''E, 32°33'00.0''N**)
Time Span :	Start=**588 BC-04-15 UT+3**, Stop=**587 BC-05-01**, Step=**1m**
Table Settings :	QUANTITIES=**1**; RTS flag=**TVH**
Display/Output :	*default* (formatted HTML)

Ephemeris Type:	**OBSERVER**
Target Body:	**Moon [Luna]** [301]
Observer Location:	user defined (**44°24'00.0''E, 32°33'00.0''N**)
Time Span:	Start=**568 BC-01-01 UT+3**, Stop=**567 BC-07-30**, Step=**1m**
Table Settings:	QUANTITIES=**1**; RTS flag=**TVH**
Display/Output:	*default* (formatted HTML)

Note: RTS is rise, transit, set.

RTS MARKERS (TVH). Rise and set are with respect to the reference ellipsoid true visual horizon defined by the elevation cut-off angle. Horizon dip and yellow-light refraction (Earth only) are considered. Accuracy is < or = to twice the requested search step-size..

Since I set the step-size to 1 minute, the accuracy is less than or equal to 2 minutes

[7] Courtesy Marjorie Alley. Reproduced by permission.
[8] F. R. Stephenson and D.M. Willis, "*The Earliest Datable Observation of the Aurora Borealis"* in *Under one Sky: Astronomy and Mathematics in the Ancient Near East*, ed. John M. Steele, Annette Imhausen, 2002, Ugarit-Verlag, Vienna, page 424.
[9] Their findings are provided in this *Companion Reference*.

Table: Year 568/567 BC, beginning April 22/23

Location of Lunar three measurement on VAT 4956 *("Obverse" means front of the tablet)*	**Babylonian date** *(Day begins at sunset)*	**Lunar three interval**	**Measurement recorded on VAT 4956** *(1º is 4 minutes in time)*		**Julian date for 568/567 BCE**	**JPL Horizons results**	**Sky View Café results**
Obverse, line 4	Month **I**, day 14	Sunrise to moonset SR - MS	4 º (16 min.)		May 5/6 568/567 BCE	3.75 º	3.75 º
Obverse, line 11	Month **II**, day 26	Moonrise to sunrise MR - SR	23 º (92 min.)		June 16/17 568/567 BCE	23.25 º	23 º
Obverse, line 12	Month **III**, day 1	Sunset to moonset SS-MS	20 º (80 min.)		June 20/21 568/567 BCE	22.75 º	22.75 º
Obverse, line 17	Month **III**, day 15	Sunrise to moonset SR - MS	7.5 º (30 min.)		July 4/5 568/567 BCE	8.25 º	8.25 º
Reverse, line 5'	Month **XI**, day 1	Sunset to moonset SS - MS	14.5 º (58 min.)		Feb 12/13 568/567 BCE	17.25 º	17.25 º
Reverse, line 12'	Month **XII**, day 1	Sunset to moonset SS - MS	25 º (100 min.)		Mar 14/15 568/567 BCE	26 º	26 º
Reverse, line 16'	Month **XII**, day 12	Sunrise to moonset SR - MS	1.5 º (6 min.)		Mar 25/26 568/567 BCE	0.5 º	0.5 º

VAT 4956 Lunar Three measurements compared with calculated values for 568/567 BCE commencing on April 22/23

Table: Year 588/587 BC, beginning April 3/4

Dates are according to the accepted table by Parker and Dubberstein for 588/587 BC, with the year commencing on April 3/4.

Location of Lunar three measurement on VAT 4956 *("Obverse" means front of the tablet)*	**Babylonian date** *(Day begins at sunset)*	**Lunar three interval**	**Measurement recorded on VAT 4956** *(1° is 4 minutes in time)*		**Julian date for 588/587 BCE** Using the accepted calendar for 588/587 BCE with New Year (I, 1) on Apr ¾	**JPL Horizons results**	**Sky View Café results**
Obverse, line 4	Month I, day 14	Sunrise to moonset SR - MS	4 ° (16 min.)		Apr. 16/17 588 BCE	IMPOSSIBLE Moon set 11 min. BEFORE sunrise	Impossible
Obverse, line 11	Month II, day 26	Moonrise to sunrise MR - SR	23 ° (92 min.)		May 28/29 588 BCE	17.5 °	17.5 °
Obverse, line 12	Month III, day 1	Sunset to moonset SS-MS	20 ° (80 min.)		June 1/2 588 BCE	13.5 °	13.5 °
Obverse, line 17	Month III, day 15	Sunrise to moonset SR - MS	7.5 ° (30 min.)		June 15/16 588 BCE	5.5 °	5.75 °
Reverse, line 5'	Month XI, day 1	Sunset to moonset SS - MS	14.5 ° (58 min.)		Jan 24/25 587 BCE	16 °	16.25 °
Reverse, line 12'	Month XII, day 1	Sunset to moonset SS - MS	25 ° (100 min.)		Feb 23/24 587 BCE	27.25 °	27.25 °
Reverse, line 16'	Month XII, day 12	Sunrise to moonset SR - MS	1.5 ° (6 min.)		Mar 6/7 587 BCE	IMPOSSIBLE Moon set 29 min. BEFORE sunrise	Impossible

VAT 4956 Lunar Three measurements compared with calculated values for 588/587 BCE commencing on April 3/4 (Parker & Dubberstein dates)

Table: Year 588/7 BC, beginning May 2/3

According to Furuli's requirements, and followed by *The Watchtower* of November 1, 2011, in which 588 BCE is assumed to have commenced May 2/3.

Location of Lunar three measurement on VAT 4956 *("Obverse" means front of the tablet)*	**Babylonian date** *(Day begins at sunset)*	**Lunar three interval**	**Measurement recorded on VAT 4956** *(1° is 4 minutes in time)*		**Julian date for 588/587 BCE** Using Furuli's revised calendar for 588/587 BCE with New Year (I,1) on May 2/3	**JPL Horizons results**	**Sky View Café results**
Obverse, line 4	Month I, day 14	Sunrise to moonset SR - MS	4 ° (16 min.)		May 15/16 588 BCE	IMPOSSIBLE. Moon set 34 min. BEFORE sunrise	IMPOSSIBLE
Obverse, line 11	Month II, day 26	Moonrise to sunrise MR - SR	23 ° (92 min.)		June 26/27 588 BCE	28 °	27.75 °
Obverse, line 12	Month III, day 1	Sunset to moonset SS-MS	20 ° (80 min.)		June 30/Jul 1 588 BCE	5.5 °	5.5 °
Obverse, line 17	Month III, day 15	Sunrise to moonset SR - MS	7.5 ° (30 min.)		July 14/15 588 BCE	IMPOSSIBLE. Moon set 6 min. BEFORE sunrise	IMPOSSIBLE
Reverse, line 5'	Month XI, day 1	Sunset to moonset SS - MS	14.5 ° (58 min.)		Feb 22/23 587 BCE	9.75 °	9.75 °
Reverse, line 12'	Month XII, day 1	Sunset to moonset SS - MS	25 ° (100 min.)		Mar 24/25 587 BCE	21 °	21.5 °
Reverse, line 16'	Month XII, day 12	Sunrise to moonset SR - MS	1.5 ° (6 min.)		Apr 4/5 587 BCE	IMPOSSIBLE. Moon set 42 min. BEFORE sunrise	IMPOSSIBLE

VAT 4956 Lunar Three measurements compared with calculated values for 588/587 BCE commencing on May 2/3, as postulated by Furuli and by The *Watchtower*, November 1, 2011

VAT 4956 records a time-interval of 16 minutes between sunrise and moonset (SR - MS) on Month I, day 14 of Nebuchadnezzar' 37th year.

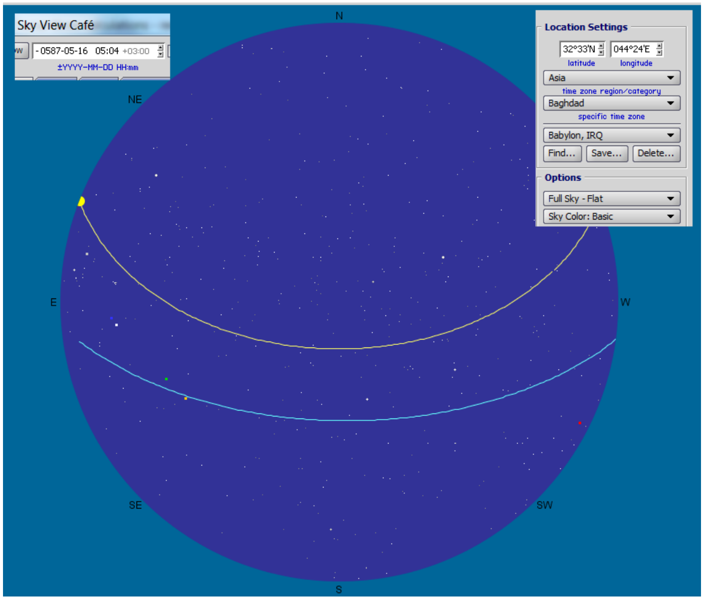
We have seen that a modern astronomy program, Sky View Cafe (SVC), shows the interval SR - MS was 15 minutes on that date in 568 BCE, which is the year accepted by all scholars.

The WT proposes the alternate year 588 BCE, but that date is IMPOSSIBLE because on Month I, day 14 of 588 BCE (where New Year was on May 2/3), we cannot measure the time that elapsed between sunrise and moonset because the full moon was NOT VISIBLE IN THE SKY AT SUNRISE! It had already set.

The WT tries to confuse matters in their discussion of the Lunar Threes in footnote 18a on page 28 of "When Was Ancient Jerusalem Destroyed? Part Two," WT 11/1/2011 by saying the measurements taken by the "ancient observers" using "some sort of clock" were "not reliable."

It does not matter what kind of clock you have if you cannot measure SR - MS because the moon is NOT EVEN IN THE SKY. It does not matter if you have a Timex, or a Rolex, or an atomic clock, or an ancient water clock, or if you just count ONE-Mississippi, TWO-Mississippi --- you cannot measure moonset for a moon that is not there!

Here is the picture:



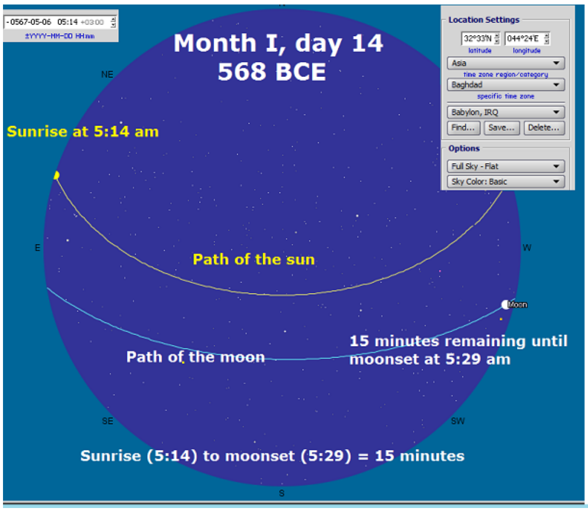
Sunrise at 5:04 am on Month I, day 14
May 16, 588 BCE, with a New Year of 588 BCE at on May 2/3

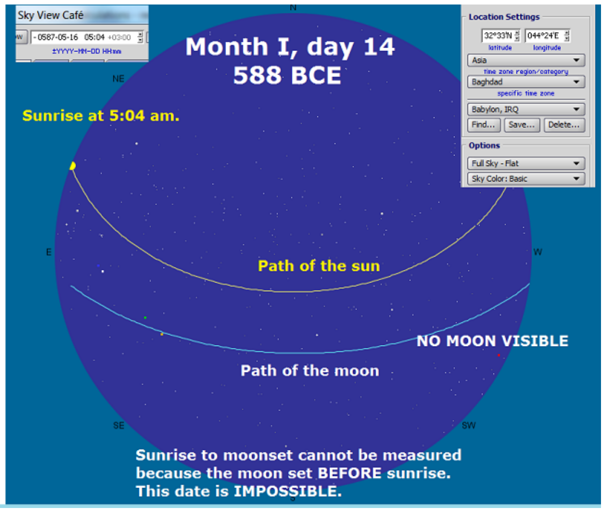
Note that there is no full moon visible in the western sky.

We cannot measure the interval between sunrise and moonset because the MOON IS NOT THERE! It set at 4:31 am, 33 minutes before sunrise.

This is an IMPOSSIBLE date.[10]

The following shows the side by side comparison of Lunar Three interval SR -MS for Month I, day 14, year 568 BCE and year 588 BCE. (Where New Year, Nisanu 1 = May 2/3, 588 BCE.)





[10] Post by Marjorie Alley at http://www.jehovahs-witness.net/watchtower/bible/216056/1/VAT-4956-Comparison-Of-The-Lunar-Three-Time-Intervals-For-Years-568-7-BCE-and-588-7-BCE

ANN O'MALY'S LUNAR THREE TIME INTERVAL RESULTS FROM "SKY VIEW CAFÉ" AND "CARTES DU CIEL" ASTRONOMY PROGRAMS[11]

[*The calculations by* ***Stephenson and Willis***[12]***,*** *and also by* ***Hermann Hunger***[13] *show that the Lunar Three measurements on VAT 4956 could have only been taken during 568/567 BCE. Using readily available astronomy software, it is possible to conduct the same computations. When Ann O'Maly used several of these programs, she found that each program confirmed that the readings on VAT 4956 are from the year 568/567 BCE and not from 588/587 BCE.*]

Researcher Ann O'Maly applied the settings of Babylon to obtain Lunar Three data at VAT 4956 from the following online astronomy programs:

- Sky View Café (SVC)
- Cartes du Ciel (CdC).

Observer's location: Babylon, 32° 33' N / 44° 24' E.

SR = sunrise; SS = sunset; MR = moonrise; MS = moonset.

Table: Year 568/7 B.C.E., Nisanu 1 = April 22/23

Month/Day	Julian Date	Interval	Text	SVC	Difference	CdC	Difference
I.14	May 6 a.m., 568	SR-MS	4°	3.75°	0.25°	3.5°	0.5°
II.26	June 17 a.m., 568	MR-SR	23°	23°	0°	29.25°	6.25°
III.1	June 20 p.m., 568	SS-MS	20°	22.75°	2.75°	19°	1°
III.15	July 5 a.m., 568	SR-MS	7.5°	8.25°	0.75°	10.75°	3.25°
XI.1	Feb 12 p.m., 567	SS-MS	14.5°	17.25°	2.75°	19.25°	4.75°
XII.1	Mar 14 p.m., 567	SS-MS	25°	26°	1°	27.75°	2.75°
XII.12	Mar 26 a.m., 567	SR-MS	1.5°	0.5°	1°	0.25°	1.25°

Comments:

SVC's range of difference between its results and those of the text is 0° to 2.75°. Average difference 1.2°.

CdC's range of difference between its results and those of the text is 0.5° to 6.25°. Average difference 2.8°.

Conclusion:

Even though the CdC program seems to be a little more erratic with the accuracy of its time interval results compared to SVC, every 568/7 B.C.E. Lunar Three time interval is accounted for and mostly agrees with the text's figures. This set of lunar data confirms the year as correct.

[11] Courtesy Ann O'Maly. Reproduced by permission.
[12] F. R. Stephenson and D.M. Willis, "*The Earliest Datable Observation of the Aurora Borealis"* in *Under one Sky: Astronomy and Mathematics in the Ancient Near East*, ed. John M. Steele, Annette Imhausen, 2002, Ugarit-Verlag, Vienna, page 424.
[13] Their findings are provided in this *Companion Reference*.

Table: 588/7 B.C.E., Nisanu 1 = May 2/3 (Furuli's calendar)

Month/Day	Julian Date	Interval	Text	SVC	Difference	CdC	Difference
I.14	May 16 a.m., 588	SR-MS	4°	!	!	!	!
II.26	June 27 a.m., 588	MR-SR	23°	27.75°	4.75°	35°	12°
III.1	June 30[1] p.m., 588	SS-MS	20°	5.5°	14.5°	4.75°	15.25°
III.15	July 15 a.m., 588	SR-MS	7.5°	!	!	!	!
XI.1	Feb 22 p.m., 587	SS-MS	14.5°	9.75°	4.75°	12.25°	2.25°
XII.1	Mar 24 p.m., 587	SS-MS	25°	21.5°	3.5°	23.25°	1.75°
XII.12	Apr 5[2] a.m., 587	SR-MS	1.5°	!	!	!	!

Notes:

! No measurement of the type specified on the tablet could be taken that day according to these programs' simulations.

[1] This measurement could not have been taken on this date as it was before first lunar crescent visibility. Still, the computed values are included.

[2] Furuli has April 3/4, but this would be a counting error on his part if Addaru 1 = March 24. There is some confusion with his dates for 587 B.C.E.

Comments:

SVC's range of difference between its results and those of the text, when a time interval could be taken, is 3.5° to 14.5°. Average difference 6.9°.

CdC's range of difference between its results and those of the text, when a time interval could be taken, is 1.75° to 15.25°. Average difference 7.8°.

Conclusion:

These Lunar Three time intervals, omitted from Furuli's (and thus the *Watchtower*'s) study of the tablet's lunar data, clearly confirm that the May-based year 588/7 B.C.E. can be confidently excluded as a match for VAT 4956.

Table: 588/7 B.C.E., Nisanu 1 = April 3/4 (Parker and Dubberstein’s tables)

Month/Day	Julian Date	Interval	Text	SVC	Difference	CdC	Difference
I.14	Apr 17 a.m., 588	SR-MS	4°	!	!	!	!
II.26	May 29 a.m., 588	MR-SR	23°	17.5°	5.5°	24°	1°
III.1	June 1 p.m., 588	SS-MS	20°	13.5°	6.5°	11.5°	8.5°
III.15	June 16 a.m., 588	SR-MS	7.5°	5.75°	1.75°	6.75°	0.75°
XI.1	Jan 24 p.m., 587	SS-MS	14.5°	16.25°	1.75°	20°	5.5°
XII.1	Feb 23 p.m., 587	SS-MS	25°	27.25°	2.25°	29.5°	4.5°
XII.12	Mar 7 a.m., 587	SR-MS	1.5°	!	!	!	!

Notes:

! No measurement of the type specified on the tablet could be taken that day according to these programs’ simulations.

Comments

SVC’s range of difference between its results and those of the text, when a time interval could be taken, is 1.75° to 6.5°. Average difference 3.5°.
CdC’s range of difference between its results and those of the text, when a time interval could be taken, is 0.75° to 8.5°. Average difference 4°.

Conclusion

These 588/7 B.C.E. Lunar Three results fare better than those in the previous table. However, it’s clear that 568/7 B.C.E. remains the far better match out of the three scenarios.

ANN O'MALY'S LUNAR THREE TIME INTERVAL RESULTS FROM "ALCYONE EPHEMERIS 2.8" (AE) ASTRONOMY PROGRAM[14]

[*The calculations by* ***Stephenson and Willis***[15]***,*** *and also by* ***Hermann Hunger***[16] *show that the Lunar Three measurements on VAT 4956 could have only been taken during 568/567 BCE. Using readily available astronomy software, it is possible to conduct the same computations. When Ann O'Maly used several of these programs, she found that each program confirmed that the readings on VAT 4956 are from the year 568/567 BCE and not from 588/587 BCE.*]

Table: 568/7 B.C.E., Nisanu 1 = April 22/23

Month/Day	Julian Date	Interval	Text	AE	Difference
I.14	May 6 a.m., 568	SR-MS	4°	2.75°	1.25°
II.26	June 17 a.m., 568	MR-SR	23°	23.25°	0.25°
III.1	June 20 p.m., 568	SS-MS	20°	22.75°	2.75°
III.15	July 5 a.m., 568	SR-MS	7.5°	7°	0.5°
XI.1	Feb 12 p.m., 567	SS-MS	14.5°	17°	2.5°
XII.1	Mar 14 p.m., 567	SS-MS	25°	25.75°	0.75°
XII.12	Mar 26 a.m., 567	SR-MS	1.5°	-0.5° !	2°

Notes

! No measurement of the type specified on the tablet could be taken that day according to this program's simulation. The moon set before the sun rose instead of the other way around. This time, a calculation has been included for all exclamation marked boxes.

Method

1.5° (above horizon) to 0° (horizon) = 1.5° of time

0° (horizon) to -0.5° (below horizon) = 0.5° of time

Therefore, the difference between the tablet's figure and AE's computation is, here,

1.5 + 0.5 = 2°

Comments

AE's range of difference between its results and those of the text is 0.25° to 2.75°.

Average difference 1.4°.

[14] Courtesy Ann O'Maly. Reproduced by permission.
[15] F. R. Stephenson and D.M. Willis, "*The Earliest Datable Observation of the Aurora Borealis"* in *Under one Sky: Astronomy and Mathematics in the Ancient Near East*, ed. John M. Steele, Annette Imhausen, 2002, Ugarit-Verlag, Vienna, page 424.
[16] Their findings are provided in this *Companion Reference*.

Table: 588/7 B.C.E., Nisanu 1 = May 2/3 (Furuli's calendar)

Month/Day	Julian Date	Interval	Text	AE	Difference
I.14	May 16 a.m., 588	SR-MS	4°	-9.5° !	13.5°
II.26	June 27 a.m., 588	MR-SR	23°	28°	5°
III.1	June 30[1] p.m., 588	SS-MS	20°	5.5°	14.5°
III.15	July 15 a.m., 588	SR-MS	7.5°	-2.5° !	10°
XI.1	Feb 22 p.m., 587	SS-MS	14.5°	9.5°	5°
XII.1	Mar 24 p.m., 587	SS-MS	25°	21.25°	3.75°
XII.12	Apr 5[2] a.m., 587	SR-MS	1.5°	-11.5° !	13°

Notes

! No measurement of the type specified on the tablet could be taken that day according to this program's simulations. See note on this above.

[1] This measurement could not have been taken on this date as it was before first lunar crescent visibility. Still, the computed values are included.

[2] Furuli has April 3/4, but this would be a counting error on his part if Addaru 1 = March 24. There is some confusion with his dates for 587 B.C.E.

Comments

AE's range of difference between its results and those of the text is 3.75° to 14.5°.

Average difference 9.25°.

Table: 588/7 B.C.E., Nisanu 1 = April 3/4 (Parker and Dubberstein's tables)

Month/Day	Julian Date	Interval	Text	AE	Difference
I.14	Apr 17 a.m., 588	SR-MS	4°	-3.75° !	7.75°
II.26	May 29 a.m., 588	MR-SR	23°	15°	8°
III.1	June 1 p.m., 588	SS-MS	20°	13.75°	6.25°
III.15	June 16 a.m., 588	SR-MS	7.5°	4.5°	3°
XI.1	Jan 24 p.m., 587	SS-MS	14.5°	16.25°	1.75°
XII.1	Feb 23 p.m., 587	SS-MS	25°	27.25°	2.25°
XII.12	Mar 7 a.m., 587	SR-MS	1.5°	-8.25° !	9.75°

Notes

! No measurement of the type specified on the tablet could be taken that day according to this program's simulations. See note on this above.

Comments

AE's range of difference between its results and those of the text is 1.75° to 9.75°.

Average difference 5.5°.

LUNAR THREES COMPARISON USING "SKY MAP PRO 11.04"[17]

Table: 568/7 B.C.E., Nisanu 1 = April 22/23

Month/Day	Julian Date	Interval	Text	Sky Map Pro	Difference
I.14	May 6 a.m., 568	SR-MS	4°	3.82°	0.18°
II.26	June 17 a.m., 568	MR-SR	23°	23°	0°
III.1	June 20 p.m., 568	SS-MS	20°	22.90°	2.9°
III.15	July 5 a.m., 568	SR-MS	7.5°	8.31°	0.81°
XI.1	Feb 12 p.m., 567	SS-MS	14.5°	17.26°	2.76°
XII.1	Mar 14 p.m., 567	SS-MS	25°	25.98°	0.98°
XII.12	Mar 26 a.m., 567	SR-MS	1.5°	0.63°	0.87°

Comments

Sky Map Pro's range of difference between its results and those of the text is 0° to 2.9°.

Average difference 1.2°.

Table: 588/7 B.C.E., Nisanu 1 = May 2/3 (Furuli's calendar)

Month/Day	Julian Date	Interval	Text	Sky Map Pro	Difference
I.14	May 16 a.m., 588	SR-MS	4°	-8.22° !	12.22°
II.26	June 27 a.m., 588	MR-SR	23°	27.74°	4.74°
III.1	June 30[1] p.m., 588	SS-MS	20°	5.65°	14.35°
III.15	July 15 a.m., 588	SR-MS	7.5°	-1.18° !	8.68°
XI.1	Feb 22 p.m., 587	SS-MS	14.5°	9.81°	4.69°
XII.1	Mar 24 p.m., 587	SS-MS	25°	21.43°	3.57°
XII.12	Apr 5[2] a.m., 587	SR-MS	1.5°	-10.44° !	11.94°

Comments

Sky Map Pro's range of difference between its results and those of the text is 3.57° and 14.35°.

Average difference 8.6°

[17] Name of the contributor is unknown and unavailable. Provided courtesy Ann O'Maly

"CONJUNCTIONS OF THE MOON WITH NORMAL STARS" ON VAT 4956 (F. RICHARD STEPHENSON AND DAVID M. WILLIS)[18]

[*The following is from the Reference article cited at Endnote 18a on page 28 of the November 1, 2011 article. The author of the "Watchtower" article was fully aware of the contents of the Study by Stephenson and Willis and the conclusions, yet decided to keep them from the reader.*]

From an early period, the Babylonians recognised 31 "normal stars" spread along the zodiac. When the moon or a planet was in conjunction with one of these stars, the separation in "cubits" was estimated – usually to the nearest ½ cubit or about 1°. ...

In all, seven observations are preserved on our text for which the star is identified. ...

(i) "Month III ... night of the 8th, first part of the night, the moon stood 2½ cubits below β librae". ... We compute that at local time of 20h, ... the moon would be 4.3° to the south of β Lib. **The tabular date is thus confirmed**. ...

(ii) "Month III ... night of the 10th, first part of the night, the moon was balanced 3½ cubits above α Scorpii".

This conjunction occurred only two days after the previous one involving β Lib. At 20 h on **Jun 29**, the computed longitude and latitude of the moon were 218. 1° and +3.4°, The star α Sco (= Antares) would be in longitude 214.1° and latitude -4.2°. Hence the moon would be 7.6° to the north and 4.0° to the east of α Sco (see Figure 2). **Once again the date is confirmed**. ...

Our investigations of the seven recorded conjunctions of the Moon with stars are summarised in Table 2. ...

For the first and third observations we have amended the recorded day of the month by 1, on the basis of calculation; presumably scribal errors have occurred here. In the case of the sixth observation, the date is missing and we have inserted the calculated day of the month. These emendations are indicated by parentheses.

Month	Day	Julian Date	Star	Cubits	Degrees	Ratio
I	[8]	568 Apr 29	β Vir	1	1.9	1.9
II	1	568 May 22	β Gem	4	7.3	1.8
III	[4]	568 Jun 24	β Vir	1	3.1	3.1
III	8	568 Jun 27	β Lib	2.5	4.3	1.7
III	10	568 Jun 29	α Sco	3.5	8.6	2.5
XI	[11]	567 Feb 22	α Leo	1	2.5	2.5
XII	2	567 Mar 15	η Tau	4	7.6	1.9

Table 2. Analysis of conjunctions of the moon with Normal Stars: comparison between measured and computed values

... All seven observations are, in fact, well supported by calculation and are in good accord with a date for the tablet of 568-567 B.C. ...

[18] From pages 421 – 428 of *Under One Sky: Astronomy and Mathematics in the Ancient Near East*, F. Richard Stephenson and David M. Willis, editors: John M. Steele, Annette Imhausen, Ugarit-Verlag, Münster, 2002. (*The Watchtower* November 1, 2011, page 28: Reference 18a) (Emphases supplied)

Conclusion

The observations analysed here are sufficiently diverse and accurate to enable the accepted date of the tablet – i.e., 568-567 BC – to be confidently affirmed. It should be emphasised that although the circumstances of conjunctions of the moon with stars tend to repeat at 19-year intervals (the Metonic cycle), this is not the case for lunar threes.

INVESTIGATION BY ANN O'MALY OF THE 13 SETS OF LUNAR POSITIONS ON VAT 4956[19]

Do all 13 sets of lunar positions on VAT 4956 fit the year 588/587 BCE?

According to the *Watchtower* article titled, '***When** Was Ancient Jerusalem Destroyed?-What the Clay Documents Really Show?*' (November 1, 2011 pp. 22-28), the following claim is made:

> Because of the superior reliability of the lunar positions, researchers have carefully analyzed these 13 sets of lunar positions on VAT 4956. They analyzed the data with the aid of a computer program capable of showing the location of celestial bodies on a certain date in the past. What did their analysis reveal? While not all of these sets of lunar positions match the year 568/567 B.C.E., **all 13 sets match calculated positions for 20 years earlier, for the year 588/587 B.C.E. -** p. 25, 27 (emphasis added)

The only researcher, that I am aware of, who has previously made this claim is Dr. Rolf Furuli. In the book *Assyrian, Babylonian, Egyptian, and Persian Chronology- Vol. II*, (2nd edition, 2008), he says:

> In the year 588/87, the positions of the stars and the constellations before, after, above, and below the moon fit perfectly, and the same is true with the distances between these and the moon, to the very degree. This strongly suggests that the lunar data on VAT 4956 were copied from a tablet having genuine observations from 588/87. - p. 332-3
>
> Because of the excellent fit of all 13 lunar positions in 588/87, there are good reasons to believe that the lunar positions represent observations from that year ... . - p. 333

Putting the claim to the test:

The introduction to Table C.5 on p. 332 of Furuli's book outlines the criteria for determining an excellent, inaccurate or bad fit with the tablet's data:

> Below in Table C.5 is a comparison of good and bad fits of the lunar positions for the three different years that have been analyzed. An 'Excellent' fit can include a deviation of 1°, an 'Inaccurate' fit can include a deviation of 2°, and a 'Bad' fit has a deviation of more than 2°.

The following "*Table C.5: The fit of the 13 sets of lunar positions related to years*" is adapted to include my comments on those results.[20]

The astronomy program used for comparison is the online version of Sky View Café.

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[19] Post by Ann O'Maly at: http://www.jehovahs-witness.net/watchtower/bible/216051/1/Do-All-13-Sets-Of-Lunar-Positions-On-VAT-4956-Fit-The-Year-588-587-B-C-E. Used by permission.

[20] The column for 586/5 B.C.E. has been left out of the reproduced Table C.5 as it is irrelevant.

	Claim by Furuli for 588/587	**Comments by Ann O'Maly**	**Claim by Furuli for 568/567**	**Comments by Ann O'Maly**
Nisanu 1	Excellent	*Sunset **May 2**: The moon was **positioned as was stated** on the tablet. However, contrary to the tablet's statement about the moon being **visible, this moon would not have been** (and thus the month is starting a day too early).* *As Furuli agrees that the lunar data on the tablet seem to be "genuine observations" (p. 333), it is puzzling that this moon could not be 'genuinely observed' and yet be seen as fitting the tablet's description 'excellently.'*	Excellent	*Sunset **April 22**: The moon was **visible and its position consistent** with the tablet's statement.*
Nisanu 9	Excellent	***May 10**: The moon couldn't be described as 'in front of' the star, but **the distance** from it **matches** that on the text.*	Bad	***April 30**: The moon's position is, for the text's date, **indeed bad**.*
Ayyaru 1	Excellent	*Sunset **June 1**: A **good positional fit**, however the rest of the observation details for the moon that day are ignored.*	Bad	*Sunset **May 22**: This should have been labeled an **EXCELLENT** fit. The moon's stated characteristics and position match very well (only 1° deviation) with the astro-program's results.*
Simanu 1	Excellent	*Sunset **June 30**: Again, contrary to the text, **this moon was not visible**.* *Also, the modern computed time interval (sunset to moonset) does not fit the text's figure by a long shot. However, **the moon's position was consistent** with the tablet's statement.*	Excellent	*Sunset **June 20**: All the boxes are ticked - visibility, position, time interval and other characteristics. Yes, **excellent**.*
Simanu 5	Excellent	***July 4**: This should have been labeled **BAD** under F's criteria in the introduction.* *The moon is approx. 5½-6° behind the star rather than F's 2°36' above it or the 2° <above/below> it, as indicated in the text (a deviation of 3½° or more).*	Bad	***June 24**: Assuming the star has been correctly identified, the moon's position for the text's date is **bad**.*
Simanu 8	Excellent	***July 7**: Should be marked **BAD**. The moon could not be described as 5° 'below' the star (or, as F. claims, 4°24' below it), but it was about 12° in front of it.*	Excellent	***June 27**: The moon was about 4° below the star (only 1° deviation) - **excellent** fit with the tablet.*
Simanu 10	Excellent	***July 9**: Contrary to F's calculated distance of 7° 16', the moon was, in fact, about 10½° above the star and thus deviates 3½° from the 7° indicated on the tablet.* *Therefore, this position should also be entered as **BAD**.*	Excellent	***June 29**: The moon was about 5½° above the star. The tablet indicates a distance of 7° which is a 1½° deviation from my chosen program's calculation.* *So, using F's criteria, this could mean an **INACCURATE** tag.*
Sabatu 1	Excellent	*Sunset **February 22*** [see note 1 below]*: The position of the moon is consistent with the tablet's statement, however, contrary to what the tablet said, it is **unlikely that it was visible**.* *In addition, the stated time interval **poorly fits the computed time**.*	Excellent	*Sunset **February 12**: The moon's position and its visibility are **consistent** with the tablet's testimony.* *The time interval is a better match than the one for 587 B.C.E.*

	Claim by Furuli for 588/587	*Comments by Ann O'Maly*	Claim by Furuli for 568/567	*Comments by Ann O'Maly*
Sabatu 6	Excellent	***February 27****: This should be labeled* ***BAD****.* [See note 2 below.]	Excellent	***February 17****: This date yields a* ***compatible result*** *with the specified celestial objects falling within the halo's parameter.*
Sabatu 11?	Excellent	*No day number can be seen on the tablet, so 'Sabatu 11' is speculation. Curiously, F's comments and the table's 587 section (p. 328-329) are based on calculations for Sabatu 12, and he says that the moon's position is "exactly as the tablet says."* *Logically, then, there cannot be an 'Excellent' fit for the moon's position on Sabatu 11 as well! This isn't the only problem, but for the sake of simplicity, the above criticism will suffice.* *This one should be marked* ***INVALID****.*	Excellent	***February 22****: There is a good fit with this corresponding date to Sabatu 11, but seeing as no date is given on the tablet at all, and because of the confusion of dates on the 587 side, it is* ***better to omit the result*** *from this table.*
Addaru 1	Excellent	*Sunset* ***March 24****: The* ***moon's position is a good match*** *with the tablet. Other details could conceivably match too - with the exception of the* ***time interval*** *which would be classed as* ***a poor fit.***	Excellent	*Sunset* ***March 14****: Ticks all the boxes - the moon was visible, its position consistent with the tablet's statement, the time interval is a good match, good probability of other stated details fitting. Yes,* ***excellent****.*
Addaru 2	Excellent	***March 25****: The moon was about 9° behind and over 5½° below the Pleiades. In fact, the moon was right in the middle of Taurus' head. The tablet indicates the moon "was balanced" 8° below the Pleiades. This is a poor fit - even according to F's criteria - and should be marked* ***BAD****.*	Bad	***March 15****: The moon was 7° straight below the Pleiades (1° deviation) and is, therefore, an* ***EXCELLENT*** *match with the tablet!* [The reason why F. classed it as 'Bad' is explained below in note 3.]
Addaru 7	Excellent	***March 30****: The moon's position is* ***consistent*** *with the tablet's details.*	Excellent	***March 20****: The moon's position is likewise* ***consistent*** *with the tablet's details.*

Note 1:

The discussion of the lunar data on the tablet's Reverse is a little confusing in Furuli's 2nd edition. In his table, he had dated Sabatu 1 to February 22, 587 BCE in his 1st edition (p. 318), but to February 21/22 in his 2nd edition (p. 327).

Yet the Julian day number he provides corresponds to February 22 at 6 p.m. local time (similar inconsistencies between the table's Julian date and the Julian day number occur for Sabatu 6 and Addaru 1).

Regarding the moon's position, he says,

> The position is calculated at the end of Sabatu 1, because the moon could not be seen at the beginning of the day. (p. 326)

If sunset February 21 was supposed to begin Sabatu 1, it would be correct to say the new moon could not be seen, since this date was just before conjunction. It's unclear what is meant by 'the end of Sabatu 1' - the Julian day number gives a time *after* sunset which starts a new day (i.e. day 2).

If sunset February 22 was supposed to begin Sabatu 1, visibility would also be unlikely because of its azimuthal proximity to the sun, low altitude and having less than 1% illuminated fraction. According to both the Parker & Dubberstein and Anderlič/Firneis tables[21], and the criteria of both Schoch and Neugebauer[22], the likelihood of visibility would have been the *next* evening, February 23.

As February 22 seems to be the more reasonable date out of the two Furuli opts for, I'll run with that and the dates that follow on from it.

Note 2:

Reverse, line 6': *Night of the 6th, first part of the night, the moon was surrounded by a halo; Pleiades, the Bull of Heaven, and the Chariot [stood in it ....]*

Halos come in specific sizes due to uniformly shaped ice crystals in the atmosphere and the angle at which light passes through them. The most commonly seen halo is 22° in radius. Rarely, there are larger 46° ones. (See http://ww2010.atmos.uiuc.edu/(Gh)/guides/mtr/opt/ice/halo/22.rxml and http://ww2010.atmos.uiuc.edu/(Gh)/guides/mtr/opt/ice/halo/46.rxml for a quick overview on halos.)

On February 27, 587 BCE, during the first part of the night, the moon was more than 30° away from the Pleiades. Assuming the scribe wanted to say the constellations 'stood in' the halo (the line is broken, but it's likely), the question is: which halo was seen that night? Can we know?

Yes we can. According to both R.C. Thompson (*The Reports of the Magicians and Astrologers of Nineveh and Babylon*, p. xxiv, xxv - http://www.etana.org/sites/default/files/coretexts/20312.pdf*) and Sachs/Hunger (quoted below), the ancients had two words for halo: the smaller 22° one was called *tarbasu* (TÙR or TUR_3), and the larger one of 46° was called *supuru* (AMAŠ).

> TÙR 'halo'
>
> Akk. *tarbasu* 'pen, fold'. ... The larger type of halo called *supuru* is not so far attested in diaries. - *Astronomical Diaries and Related Texts From Babylonia*, Vol. I, p. 33.

(See also the *Chicago Assyrian Dictionary*, Vol. 15, p. 398 and Vol. 18, p. 221-2 - http://oi.uchicago.edu/research/pubs/catalog/cad/ .)

Consequently, it is the word *tarbasu*, describing the common 22° halo, which is used in VAT 4956.

Therefore, Neugebauer & Weidner comment:

> The halo with a 22° radius around the sun and moon is meant by *tarbasu* ... . Halo observations are mentioned quite often in our text. Obv. 3, 5; Rev. 3, 8 report on halos around the sun; Rev. 6, 7, 14, 15 on halos around the moon. The latter are particularly important; indeed, as it is regularly stated which stars and constellations are seen in the halo, an important clue is given for identifying them by approximately fixing the limits. - *Ein astronomischer Beobachtungstext aus dem 37. Jahre Nebukadnezars II (-567/6)*, 1915, p.41 - translated from the German.

Sabatu 6 appears to be the only occasion under Furuli's scheme, and where lunar halos are mentioned, that the celestial objects on the tablet would fall outside the 22° parameter.

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* Report no. 117 is also known as SAA 8, 494 and can be read here:

http://oracc.museum.upenn.edu/cgi-bin/oracc?prod=srch&project=saa&seq=volume,ch_no,designation&perpage=25&k0=sGRtCDR&zoom=4&zoomforce=1&page=2&item=21&trans=en

[21] http://www.univie.ac.at/EPH/Geschichte/First_Lunar_Crescents/Babylon-0599-0550.htm

[22] http://articles.adsabs.harvard.edu//full/1999JHA....30...51F/0000065.000.html

Note 3:

This is among the most embarrassing gaffes made in Furuli's 2nd edition. Bizarrely, despite the tablet clearly saying '**night** of the 2nd' and considering that the moon would only be visible for 2½ hours or so after sunset, the given 587 B.C.E. Julian day number translates into March 25 **at 9 a.m.** local time (i.e. still Addaru 1), and the given 567 B.C.E. Julian day number corresponds to March 16 **at 9 a.m.** local time - **broad daylight!** It is on this ludicrous foundation that these rapidly-changing lunar positions are calculated and Furuli concludes, this time, that the Addaru 2, 587 B.C.E. position is excellent, while the Addaru 2, 567 B.C.E. position is bad!

SUMMARY OF THE 13 SETS OF LUNAR DATA RESULTS:

	588/87	**568/67**
Nisanu 1	Partially good	Excellent
Nisanu 9	Excellent	Bad
Ayyaru 1	Partially good	Excellent
Simanu 1	Partially good	Excellent
Simanu 5	Bad	Bad
Simanu 8	Bad	Excellent
Simanu 10	Bad	Inaccurate?
Sabatu 1	Partially good	Excellent
Sabatu 6	Bad	Excellent
Sabatu 11?	Inconclusive	Inconclusive
Addaru 1	Mostly good	Excellent
Addaru 2	Bad	Excellent
Addaru 7	Excellent	Excellent

CONSEQUENTLY:

	588/87	568/67
Excellent	2	9
Mostly good	1	-
Partially good	4	-
Inaccurate?	-	1
Bad	5	2
Inconclusive	1	1

Conclusion

It should have become clear by now that, *even when the premises and criteria of the "researchers" are used* in examining VAT 4956 (e.g. a late May start to the Babylonian new year, sometimes having a new month begin *before* first lunar crescent visibility, omitting key data and including speculative data in the analysis), the claim "all 13 sets [of lunar positions] match calculated positions ... for the year 588/587 B.C.E." *still* remains totally false!

THE INFORMATION PROVIDED BY THE PLANETARY OBSERVATIONS

From: *1914, Touchstone of the Watchtower*, pages 105-107, by Max Hatton, 1965.[23]

Commencing on page 72, Neugebauer and Weidner provide details of the position of the planets on various dates as recorded on the Tablet. The location of Saturn, Jupiter, Venus, Mars and Mercury are provided.

"Babylon the Great Has Fallen!" [BF] page 331 informs us,

> Much information has been systematically collected by the Babylonians and from it we have here the beginning of astronomy. The groups of stars which now bear the name 'Twelve Signs of the Zodiac' were mapped out for the first time, and the planets Mercury, Venus, Mars, Jupiter, and Saturn were known.

We can see then that the Tablet provides observed positions of all the known planets. The observations were not haphazardly recorded either.

> Chaldean observations may be illustrated by an ephemeris prepared in 568. ... Already the course of the planets is definitely fixed in degrees and minutes with reference to the constellations and stars. (A T Olmstead, page 200 History of the Persian Empire, and page 120 The American Journal of Semitic Languages and Literatures Vol. LV, April 1938.

The groups of stars mentioned by BF are the "constellations" referred to by Olmstead. And There Was Light by Rudolph Thiel confirms on page 15, "There are twelve constellations in the Zodiac."

On the following page of each reference given, Olmstead observes

> Not only were the cycles of all the planets but Mercury known with astonishing precision, but the astronomers were not satisfied with their results and were seeking to make them more precise.

The cycles of the planets (i.e., the period each planet takes on one revolution about the Sun) are disclosed on page 128 of the Encyclopaedia Britannica Atlas (1961) "Modern Space Map."

Mercury	88 days
Venus	224.7 days
Earth	365.25 days
Mars	1.88 years
Jupiter	11.86 years
Saturn	29.46 years
Uranus	84.02 years
Neptune	164.79 years
Pluto	248.43 years

Seeing that the position and date of the position of each of the Planets known in those days is definitely recorded on the tablet, and Astronomers say that the Tablet relates to the year 568 BC. We have the 37th Year of Nebuchadnezzar definitely located by the several lines of evidence on the Tablet.

The Planets did stand in the relation to each other recorded on the Tablet in 568 BC. Remember that the Society is satisfied that Astronomers can calculate the date of tablets from the Astronomical data that they contain. (see my page 48 and Awake, April 22nd, 1963 page 17.)

Now picture what the situation would have to be for this Tablet to fit another year with which the observation details on the tablet coincided.

[23] His complete study is available at:
http://www.jwstudies.com/1914_Touchstone_Of_TheWatchtower_Hatton.pdf

To do this, it is necessary first of all to consider the peculiarities related to each planet. For convenience sake, we will start with the Earth and we will station ourselves at Babylon where the original observations were made. As the positions of the Planets are located with reference to the Constellations, the Earth would have to be back in its same relation to them as it was on the date of the record on the Tablet. This only happens at the end of each complete revolution around the Sun and therefore once a year, so if an alternative year is to be found for the planets to stand in the same relation to each other, it would have to be very nearly in exact multiples of 365.25 days away from the dates in 568 BC. This point may be better understood too when the positions of the planets are being considered.

A paragraph from the book A Key to the Heavens by Leo Mattersdorf might also help, page 83:

> Hence, the constellations for ages have presented the same formations, and those we see on a spring evening, let us say, we shall see at the same time the next spring. The stars become old looked-for friends, and the rising of the springtime star groups presages the advent of another season of warmth, flowers, and blossoms. The evening stars of other times of the year are similarly identified with their respective seasons, and actually present for us an infallible celestial calendar.

Of all the planets known to the Babylonians, Saturn has the cycle taking the longest period of time, ie., 29.46 years. Therefore it would be back in its required position almost 29½ years before or after 568 BC.

Obviously though, the Earth would have completed 29½ cycles in this time and though Saturn would be in position, the Earth would be half-way on its journey around the Sun again. And what about the other planets? Let us take the planet with the next largest orbit, Jupiter (11.86 years). At the end of 29½ years it would be nowhere near its required position on the specified date, for it would have circled the Sun twice (23.72 years) and have been nearly half-way around the Sun again. There is no need to consider the other planets, for clearly a date approx. 29½ years away from 568 BC would be absolutely impossible.

On page 200 of History of the Persian Empire, Olmstead cites an Astronomical Textbook of the Babylonians dated to 577 BC. On it the scribe stated, "Saturn comes back in 59 years." This is not absolutely correct for as we can see 29.46 x 2 = 58.92. Nevertheless, in approx. cycles of 59 years, Saturn was again observable in the same location. Let us then consider the position that would exist each 59 years.

The Earth, as the Babylonian Textbook testifies, would be in its required position, (because the cycle is of complete years.) Saturn of course is in a favourable position. Now, what about Jupiter? Is it going to fit in on its due-date? Unfortunately, No! It would have completed a total of 4 revolutions about the Sun in this time and would almost have completed its 5th, almost. Almost but not quite, for on its prescribed date it would be roughly 4½ months away from its required position.

When we consider that the Society's Chronology is approx. 20 years at variance with the Absolute Chronology for the period it becomes apparent that it requires Nebuchadnezzar's 37th year to be about 588 BC.

When we again refer to the cycles of the planets, we can see that it is absolutely impossible for the planets to have stood in the correct relationship to each other in that year.

To determine another year when all the planets did stand in the required relationship to each other at the prescribed intervals, we have to calculate the Lowest Common Multiple of all the cycle periods. For example, if Jupiter's Cycle took 12 years instead of 11.86, and Saturn's was 30 years instead of 29.46, it would take 60 years for the Planets to again stand in the same relation to each other as required by the Tablet. The Earth would again too be in its required location with reference to the Constellations. (Anyone with a basic knowledge of Mathematics knows that 60 is the Least Common Multiple of 12 and 30. There is not one number less than 60 that they will both divide into evenly.)

During this time, Saturn would have made 2 revolutions around the Sun and Jupiter 5. But the problem is not so simple, for the observations of Mercury, Venus and Mars are also recorded and these too would have to be back in their recorded positions on given dates. Besides this, we do not want the Lowest Common Multiple of 12 and 30, we want it of 29.46 years, 11.86, years, 1.88 years, 1 year, 224.7 days and 88 days.

If you calculate the Lowest Common Multiple of just 1 year, 11.86 years and 29.46 years you will arrive at the figure 1,746,978 years. It makes one’s head swim to even think what the Lowest Common Multiple of all the Cycle periods would be.

I am not suggesting that the observations of the planets by the Babylonians were absolutely accurate, but slight errors would not alter the situation. The eclipse and the planetary positions fix this year quite positively.

Is it any wonder that Otto Neugebauer wrote to me and said that the year was absolutely certain?

It is no wonder either that the Seventh-day Adventist Bible Commentary states, concerning this tablet,

> Modern Astronomers who have checked this information by astronomical computation say that the combination of data for the sun, moon, and planets which all move in differing cycles, cannot be duplicated in any other year.

Incidentally, in a year 59 years away from 568 BC, Mars would have been at least 7 months or approx. one-third of its Cycle out of position on its due date. I just mention this in case someone was thinking that 59 years was near enough. It is nowhere near a sufficient period.

There is no reason to doubt the veracity of the statements of the experts who correspond the Tablet with the year 568 BC, and the conclusion that this year was Nebuchadnezzar's 37th is inescapable.