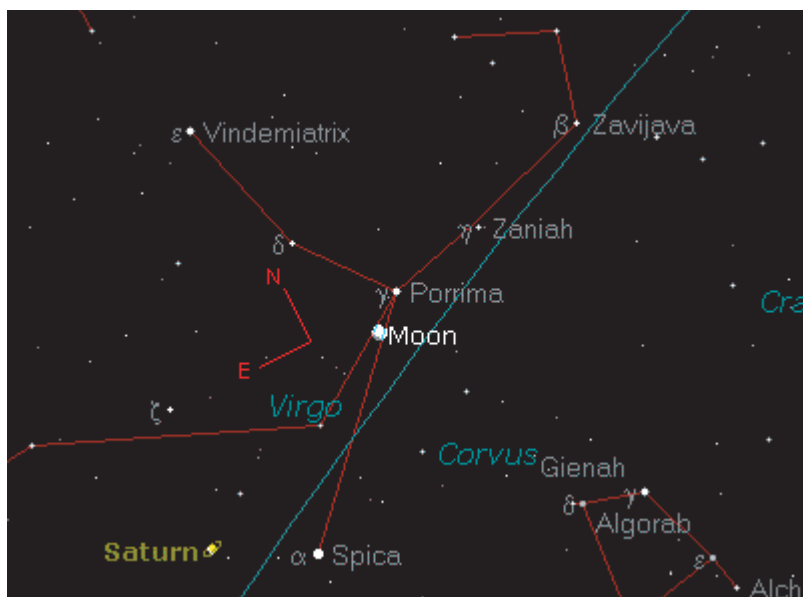


REPORT 50_(1/2) DIARY NO. -197

Seleucid Era Year 114 Month | Day 11
Julian Year -197 (198 BCE) Apr 22

Time: Sunset 6:31 pm
View: East, High in Sky

Diary Line 5: *Night of the 11th, beginning of the night, the moon was 1 cubit behind alpha Virginis, the moon being 1 cubit low to the south;*



Sunset Apr 22, -197: the moon in Virgo, 2° behind (east) Porrima and 2° to the south.

Comments: Sunset on the night of Apr 22nd, the moon was near the normal star Porrima (alpha Virginis) of the constellation Virgo. TheSky computes the moon was 1° 51' behind (east) the star and 1° 22' low to the south. The Diary entries of 2° behind and 2° south are consistent with the computed distances.

REPORT 50 (2/2) DIARY NO. -197

Seleucid Era Year 114 Month | Day 11
Julian Year -197 (198 BCE) Apr 22

Time: Sunset 6:31 pm
View: High in Sky

Diary Line 5: *Night of the 11th, beginning of the night, the moon was 1 cubit behind alpha Virginis, the moon being 1 cubit low to the south;*

[Field of View 200° Zenith of Babylon at center of planisphere]



Sunset Apr 22, -197: Planisphere for Babylon. The sun is on the horizon and the moon is high in the sky.

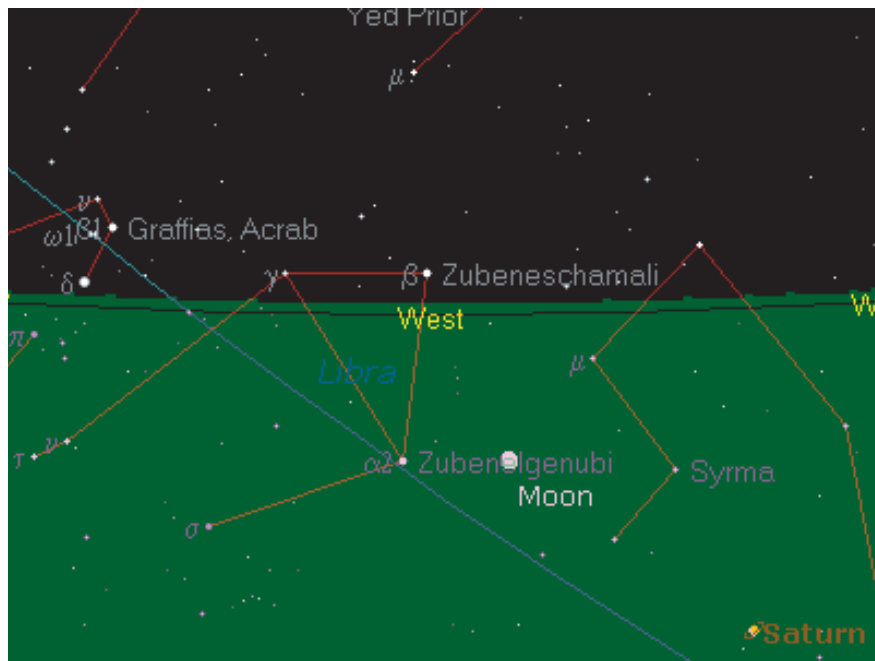
Comments: A sky watcher at sunset in Babylon looking up would see the constellation Leo directly above. To the west, the sun would be setting; Mars and Mercury having set would not be seen. Looking over to the east, the observer would see the moon in Virgo and Saturn behind to the east.

REPORT 51 DIARY NO. -197

Seleucid Era Year 114 Month 1 Day 13
Julian Year -197 (198 BCE) Apr 24/25

Time: Sunrise 5:24 am
View: West, moonset

Diary Line Ar04: *the 13th, moonset to sunrise: 7° 40'; clouds, I did not watch;*



Sunrise Apr 25, -197: *At sunrise in the east, the moon had set in the west.*

Comments: The moon is well below the horizon at sunrise on Apr 25th. TheSky computes sunrise occurred at 5:24 am and moonset at 4:50 am, an interval of 34 minutes. The Diary records a time period of 31 minutes (7° 40'), a mismatch of 3 minutes.

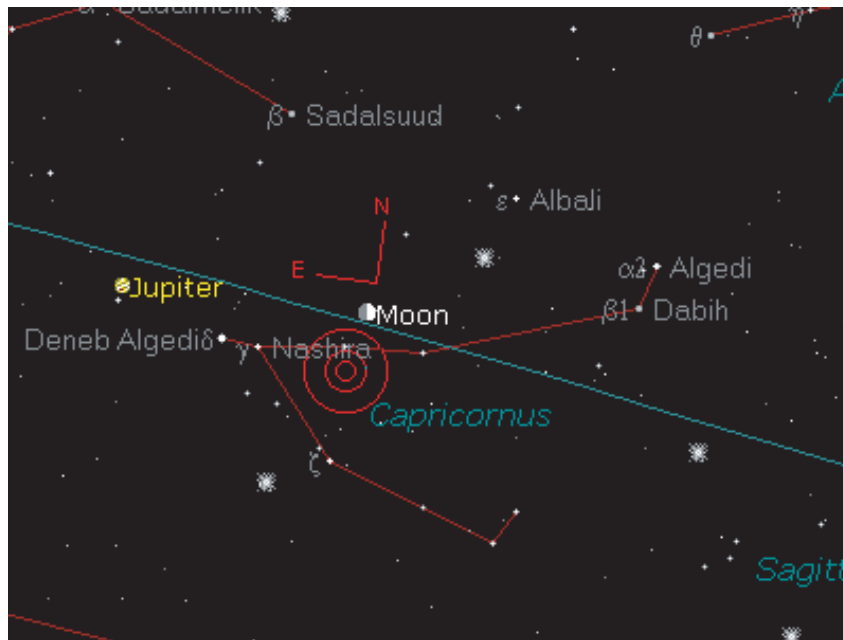
The observer "did not watch." The time interval inscribed in the Diary is based on a calculation - apparently an accurate one.

REPORT 52 DIARY NO. -197

Seleucid Era Year 114 Month VII Day 7
Julian Year -197 (198 BCE) Oct 13

Time: Sunset 5:38 pm
View: South, High in Sky

Diary Line B2: *Night of the 7th, beginning of the night, the moon was 1 cubit in front of gamma Capricorni*



Sunset Oct 13, -197: *The moon was 2° (1 cubit) in front of Nashira (gamma Capricorni)*

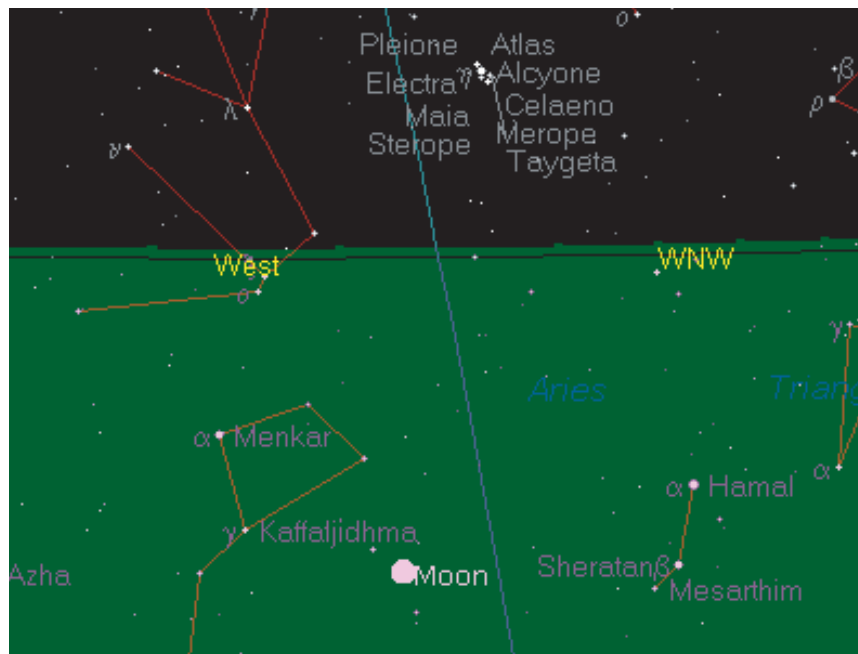
Comments: The moon is in front (west) of Nashira. TheSky computes the distance of 4°19' from Nashira west to the moon (to the bull's eye). The Diary records a distance of 2° (1 cubit), a difference of a little more than 2°. The moon moves east roughly ½° per hour, and consequently 4 hours later - still in the *beginning of the night* - the computed distance would match the Diary.

REPORT 53 DIARY NO. -197

Seleucid Era Year 114 Month VII Day 12
Julian Year -197 (198 BCE) Oct 18/19

Time: Sunrise 6:08 am
View: West

Diary Line B3: *The 12th moonset to sunrise: 13°30', measured.*



Sunrise Oct 19, -197:
Moonset to sunrise, 54
minutes (13°30')

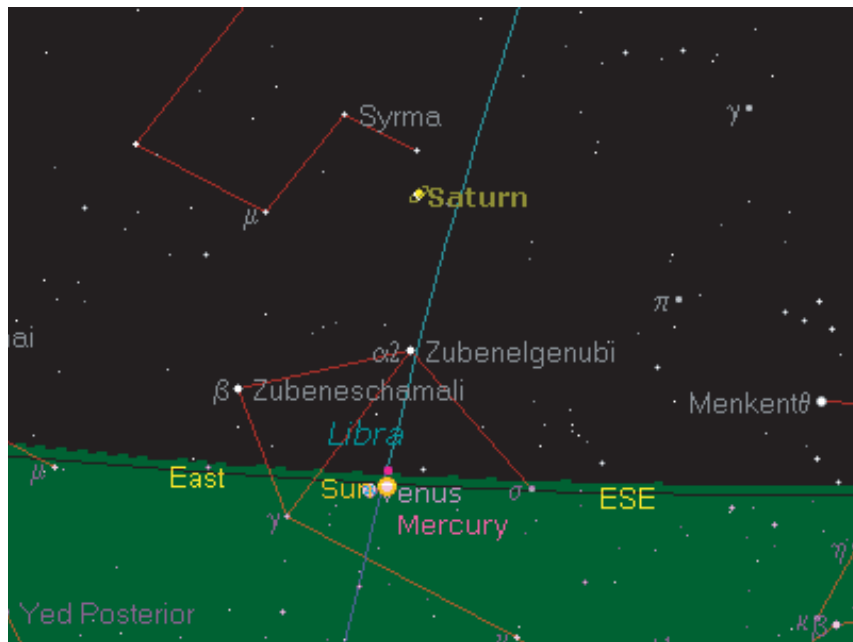
Comments: The moon was far below the horizon at sunset. TheSky computes the moon set at 4:51 am, 77 minutes before sunrise at 6:08 am. The Diary records a "measured" time interval of 54 minutes (13° 30'). The difference of 23 minutes is out of line with the close match that usually pertains.

REPORT 54^(1/2) DIARY NO. -197

Seleucid Era Year 114 Month VII Day 12
Julian Year -197 (198 BCE) Oct 18/19

Time: Sunrise 6:08 am
View: East

Diary Line B3: *The 12th Saturn's first appearance in Libra; rising of Saturn to sunrise: 15°; (ideal) fist appearance on the 10th.*



Sunrise Oct 19, -197:
Saturn was high in the sky
in Libra

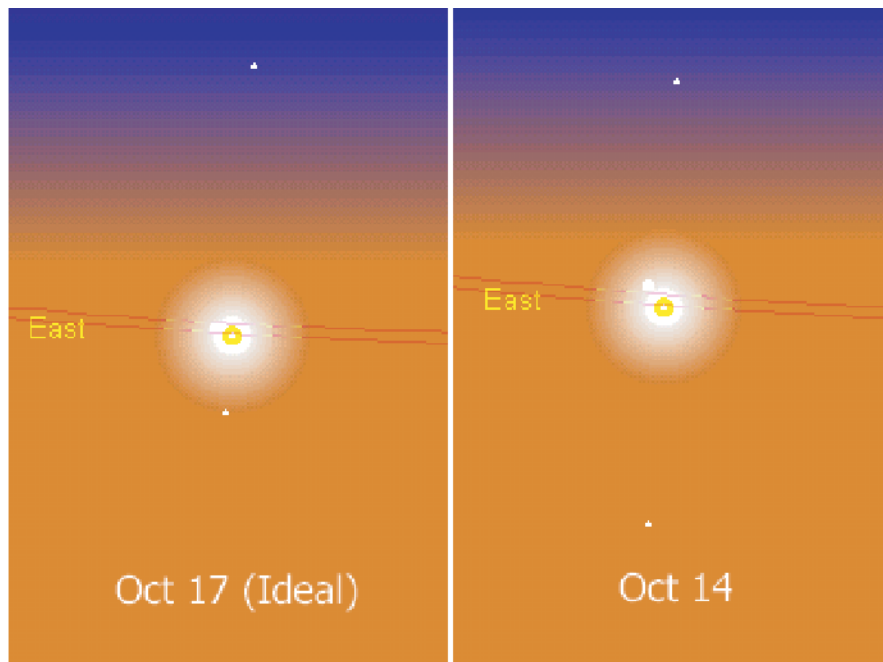
Comments: Saturn appeared well before sunrise. TheSky computes the rising of Saturn at 4:55 am and sunrise at 6:08 am, an interval of 73 minutes. The Diary records a time span of 60 minutes (15°). The mismatch is 13 minutes.

REPORT 54 (2/2) DIARY NO. -197

Seleucid Era Year 114 Month VII Day 12
Julian Year -197 (198 BCE) Oct 18/19

Time: Sunrise 6:08 am
View: East

Diary Line B3: *The 12th Saturn's first appearance in Libra; rising of Saturn to sunrise: 15°; (ideal) fist appearance on the 10th.*



Sunrise Oct 19, -197:
The first appearance of Saturn in the east

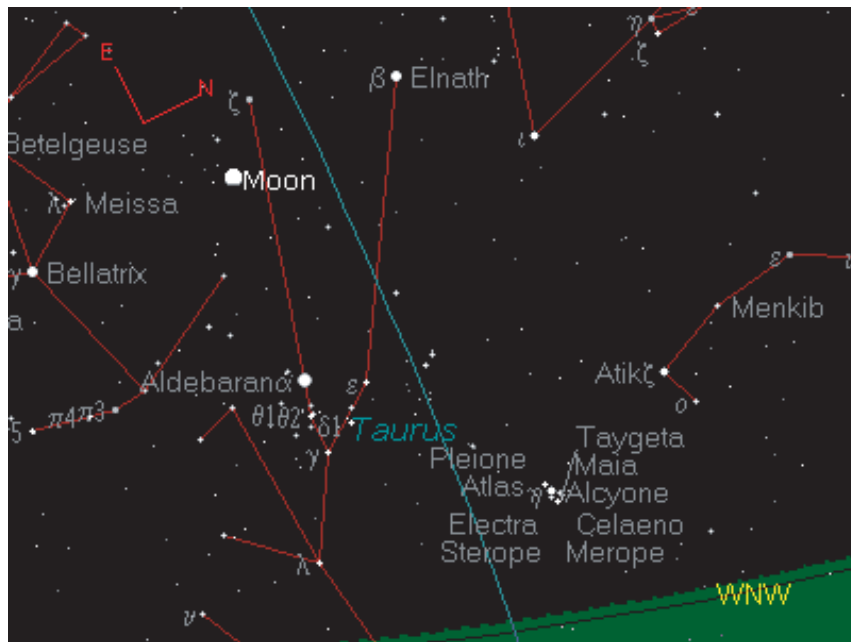
Comments: Hidden behind the sun during superior conjunction, Saturn had not been visible prior to "the first appearance." On Oct 19th, it appeared high in the eastern sky at sunrise. Babylonian astronomers calculated Saturn would "ideally" have been visible 2 days earlier on Oct 17th. The Skyshot of sunrise on Oct 17th (Saturn is the white speck above the sun) suggests the ideal date was tardy. TheSky indicates Oct 14th would be a more likely date of first appearance.

REPORT 55 DIARY NO. -197

Seleucid Era Year 114 Month VII Day 15
Julian Year -197 (198 BCE) Oct 21/22

Time: Sunrise 6:11 am
View: West

Diary Line B4: *Night of the 15th, last part of the night, the moon was $\frac{1}{2}$ cubit below zeta Tauri,*



Sunrise Oct 22, -197: *At sunrise, the moon was in the west below zeta Tauri*

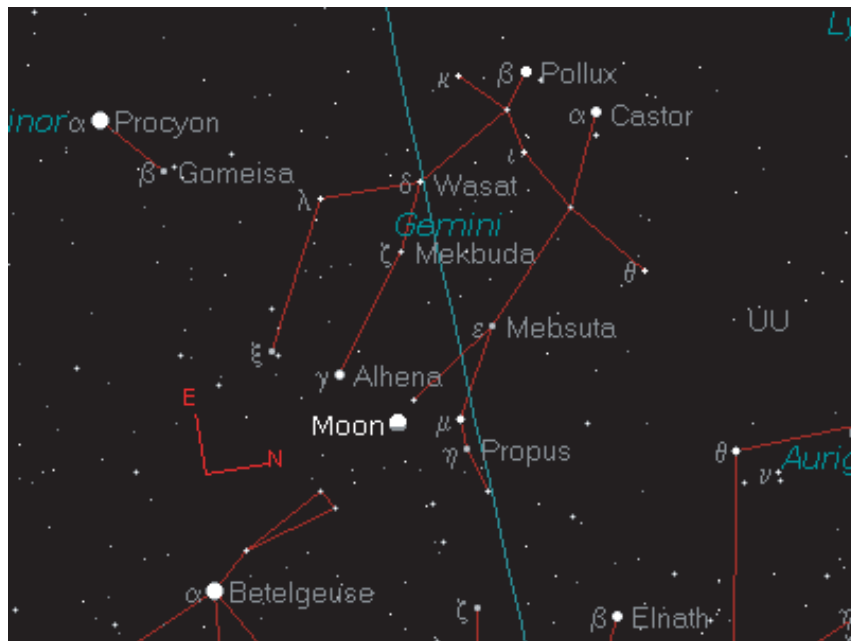
Comments: The "last part of the night" could be any time during the final third of the night. The distance of the moon below (south) the normal star zeta Tauri will not vary much during the late night hours. TheSky places the moon $2^{\circ} 17'$ south of the star. The Diary records the distance as 1° ($\frac{1}{2}$ cubit). The mismatch of $1^{\circ} 17'$ is equivalent to about 5 minutes.

REPORT 56 DIARY NO. -197

Seleucid Era Year 114 Month VII Day 16
Julian Year -197 (198 BCE) Oct 22/23

Time: Sunrise 6:11 am
View: West

Diary Line B5: *Night of the 16th, very overcast; last part of the night, the moon was 1 cubit 8 fingers above gamma Geminorum.*



Sunrise Oct 23, -197: The moon 2° 40' above (north) Alhena

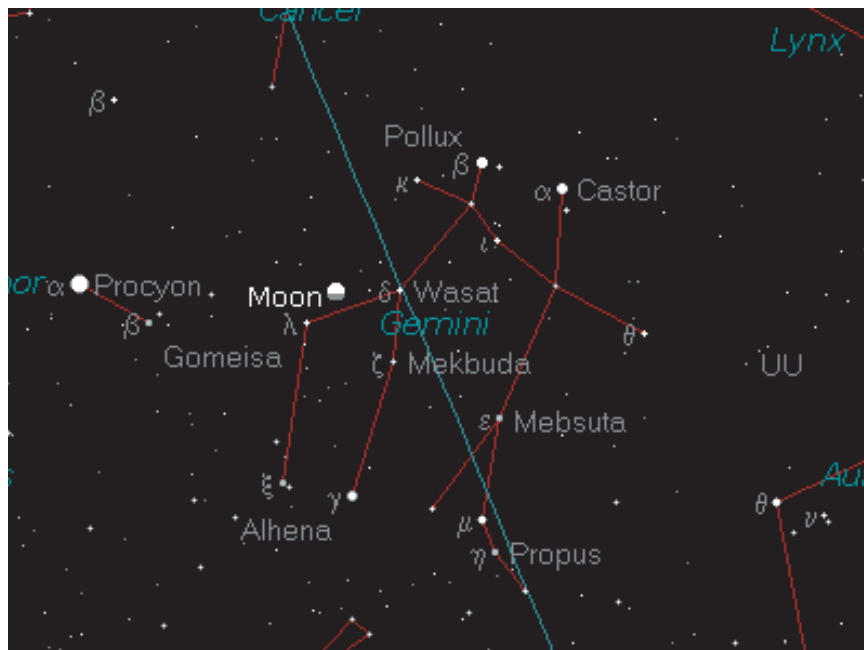
Comments: The moon is in Gemini, near the normal star Alhena (gamma Geminorum). TheSky computes the moon is 2° 39' above (north) the star. The Diary records a separation of 2° 40' (1 cubit 8 fingers) - a close match to the modern computed distance.

REPORT 57^(1/2) DIARY NO. -197

Seleucid Era Year 114 Month VII Day 17
Julian Year -197 (198 BCE) Oct 23/24

Time: Sunrise 6:13 am
View: West

Diary Line B5: *Night of the 17th, very overcast; last part of the night, the moon was 5 cubits below alpha Geminorum, the moon being ½ cubit back to the west.*



Sunrise Oct 24, -197: : The moon in Gemini, 10° below and 1° behind Castor (alpha Geminorum)

Comments: TheSky computes the moon at 9° 55' below (south) and 1° 43' back (west) of the normal star Castor (alpha Geminorum). The Diary records a distance of 10° (5 cubits) below and 1° (½ cubit) back to the west. The mismatches are slight - 45' north/south and 43' east/west - a difference of a few minutes in each case.

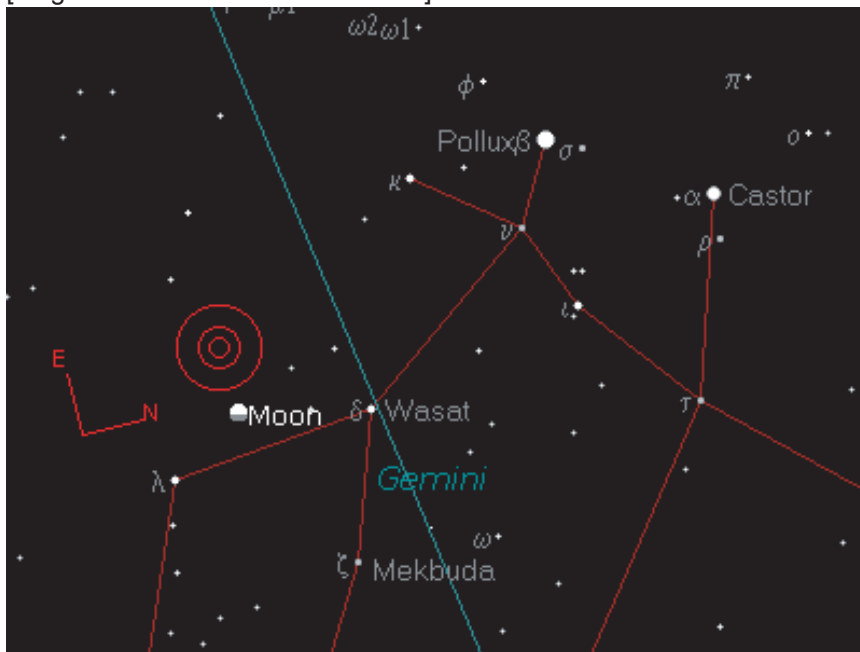
REPORT 57 (2/2) DIARY NO. -197

Seleucid Era Year 114 Month VII Day 17
Julian Year -197 (198 BCE) Oct 23/24

Time: Sunrise 6:13 am
View: West

Diary Line B5: *Night of the 17th, very overcast; last part of the night, the moon was 5 cubits below alpha Geminorum, the moon being ½ cubit back to the west.*

[Magnification 2X Field of View 50°]



Sunrise Oct 24, -197: *The moon (bull's eye) was 10° below Castor, and the moon was 1° "back to the west" of Castor (bull's eye)*

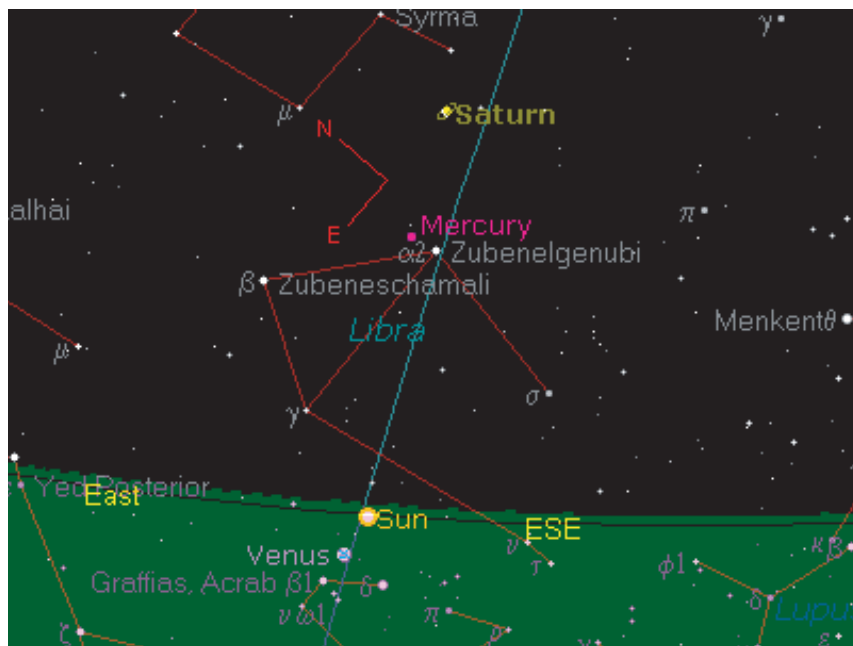
Comments: The precise meaning of the Babylonian astronomical terms *above*, *below*, *ahead*, *behind* and so on, is open to question. It is not clear which reference base the sky-watchers used - the horizon, the cardinal directions, or the ecliptic. Neither is the Babylonian method of measuring distances known. Consequently, the Reports employ the "eyeball method" of estimating distance. Typically, as above, the pertinent region of the sky is magnified and distances estimated in the cardinal directions. In some cases, *ahead* and *behind* are understood to refer to the rising and the setting times of celestial bodies.

REPORT 58^(1/2) DIARY NO. -197

Seleucid Era Year 114 Month VII Day 19
Julian Year -197 (198 BCE) Oct 25/26

Time: Sunrise 6:14 am
View: East

Diary Line B6: *The 19th, Mercury's first appearance in the east in Libra, 3½ cubits behind Saturn to the east; it was bright, rising of Mercury to sunrise: 16°; (ideal) first appearance on the 17th.*



Sunrise Oct 26, -197:
Mercury in Libra, 7° behind Saturn to the east; Mercury rose 64 minutes before sunrise

Comments: Mercury is in Libra. TheSky computes Mercury is 7° 02' to the east of Saturn. The Diary records a distance of 7° (3½ cubits), a mismatch of less than a minute.

TheSky puts sunrise at 6:14 am and the rising of Mercury at 5:05 am, 69 minutes before sunrise. The Diary records the interval from the rising of Mercury to sunrise is 64 minutes (16°). The mismatch amounts to 5 minutes.

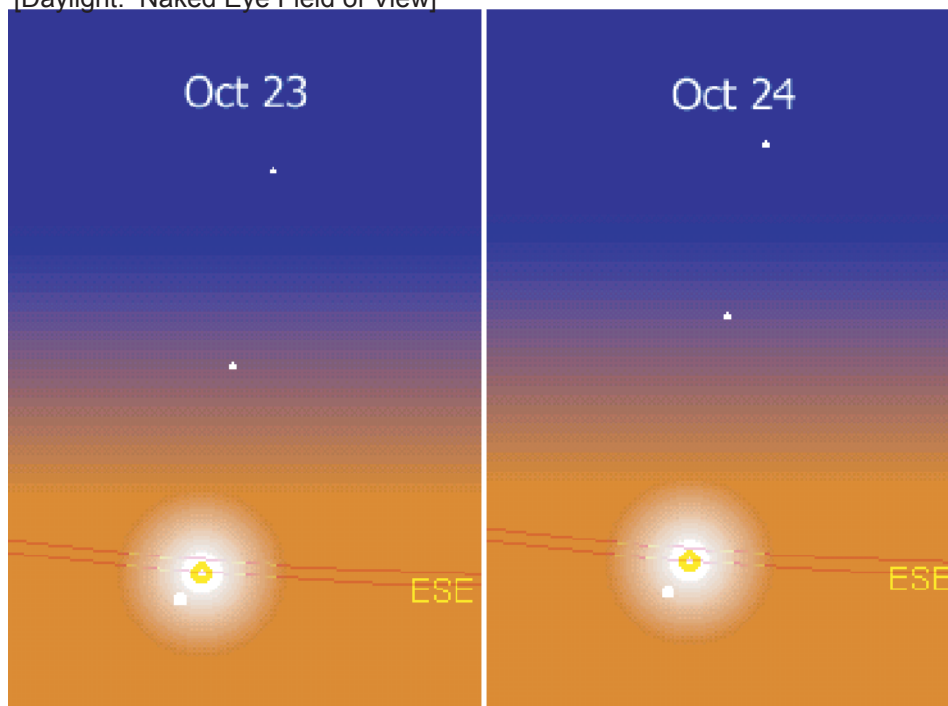
REPORT 58 (2/2) DIARY NO. -197

Seleucid Era Year 114 Month VII Day 19
Julian Year -197 (198 BCE) Oct 25/26

Time: Sunrise 6:14 am
View: East

Diary Line B6: *The 19th, Mercury's first appearance in the east in Libra, 3½ cubits behind Saturn to the east; it was bright, rising of Mercury to sunrise: 16°; (ideal) first appearance on the 17th.*

[Daylight: Naked Eye Field of View]



**Sunrise Oct 23 & 24,
-197: (ideal) first
appearance of
Mercury on Oct 24th**

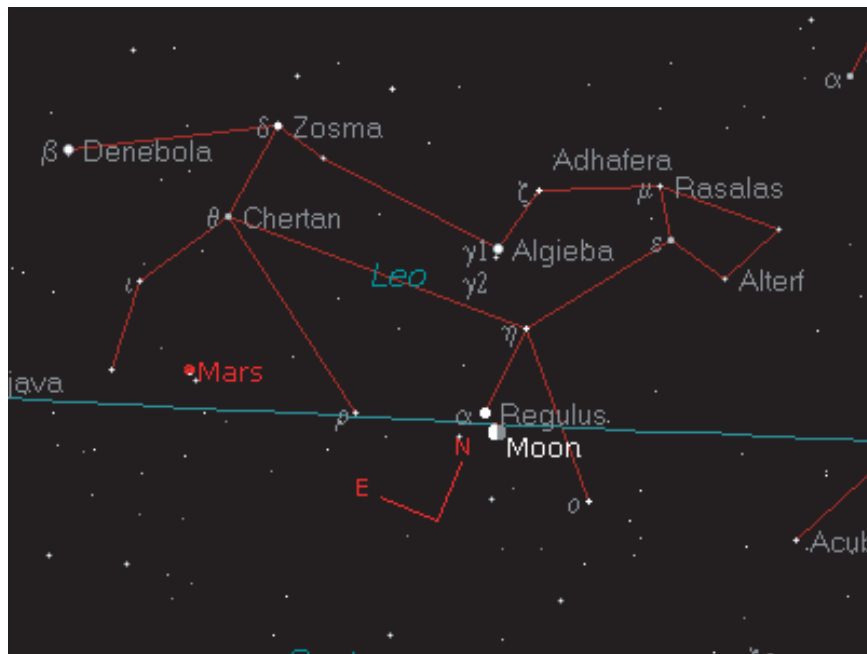
Comments: The Diary records that the first appearance of Mercury in the east occurred on Oct 26th. Babylonian astronomers calculated that Mercury should have first been visible two days earlier on Oct 24th (the morning of Day 17). The above Skyspot bears out their calculations. The white dot representing Mercury on Oct 23 is close to the sun, while on Oct 24 it lies in the purple band that indicates the planet is likely visible.

REPORT 59 ^(1/2) DIARY NO. -197

Seleucid Era Year 114 Month VII Day 20
Julian Year -197 (198 BCE) Oct 26/27

Time: Sunrise 6:15 am
View: High in sky

Diary Line B6: *Night of the 20th, last part of the night, the moon was 6 fingers below alpha Leonis, the moon having passed a little to the east.*



Sunrise Oct 27, -197: The moon was $0^{\circ} 30'$ (6 fingers) below Regulus

Comments: The moon is in Leo, near the normal star Regulus (alpha Leonis). TheSky computes the moon is $0^{\circ} 34'$ south of Regulus. The Diary records the distance of the moon below Regulus as $0^{\circ} 30'$ (6 fingers). The mismatch amounts to less than a minute.

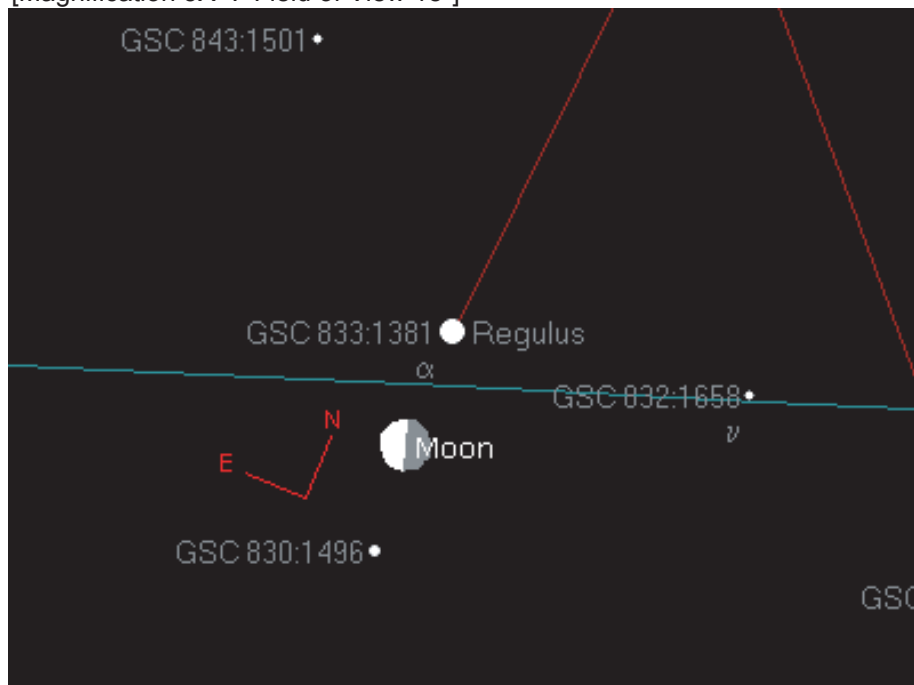
REPORT 59 (2/2) DIARY NO. -197

Seleucid Era Year 114 Month VII Day 20
Julian Year -197 (198 BCE) Oct 26/27

Time: Sunrise 6:15 am
View: High in sky

Diary Line B6: *Night of the 20th, last part of the night, the moon was 6 fingers below alpha Leonis, the moon having passed a little to the east.*

[Magnification 5X+: Field of View 18°]



Oct 27, -197 at 9:15 am
(3 hours after sunrise):
The moon having
passed a little to the
east of Regulus

Comments: The Diary records the moon "passed a little to the east" of the normal star Regulus during the last part of the night of Oct 27, i.e., before sunrise at 6:15 am. The Skyshot above indicates the moon did not pass east of the star until 3 hours later, at 9:15 am. In the 3 hours from 6:15 am to 9:15 am, the moon moved 1° 02', which is measure of the mismatch between the Diary text and TheSky computations. The discrepancy amounts to about 4 minutes.