# ÖSTERREICHISCHE AKADEMIE DER WISSENSCHAFTEN PHILOSOPHISCH-HISTORISCHE KLASSE DENKSCHRIFTEN. 210. BAND

# ASTRONOMICAL DIARIES AND RELATED TEXTS FROM BABYLONIA

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Volume II

Diaries from 261 B.C. to 165 B.C.



A:

# Obv.

- 1 Year 114, month 1, [....]
- Night of the 10th, beginning of the night, the moon was  $2^{-1}/2$  cubits behind [ $\beta$  Virginis.]
- 3 it was set towards its inside.
- The 10th, the south wind blew; in the afternoon, clouds were in the sky.
- Night of the 11th, beginning of the night, the moon was 1 cubit behind γ Virginis,
- 6 the moon being I cubit low to the south;
- 7 last part of the night, overeast. The 11th, clouds [....] the sky.
- s slow rain so that the sandal [was (not) removed.]
- 9 Night of the 12th, clouds crossed the sky [....]

# Lower edge

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! [....] .... [....]
2 [....] ....
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#### Rev.

- 1 [....] all day [....]
- 2 .... Night of the 10+[xth,....]
- 3 clouds crossed the sky, rain shower [....]
- the 13th, moonset to sunrise: 7° 40': clouds. I did not watch:
- 5 in the morning, clouds crossed the sky, rain shower.
- Night of the 14th, clouds were in the sky: the moon was 1 cubit behind!
- $7 = [\alpha/\beta]$  Librae, the moon being 2 cubits'
- 8 high? to the north; all night very overcast. The 15th, sunrise to moonset: 2°.
- 9 The river level from the 9th to the 11th
- 10 rosé [nn] cubits ....

# Left edge

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1 [....] around noon, rain DUL [....]
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#### Date

The year number is preserved; the lunar position for the 11th shows the month to be I. This would lead to a restoration of obv. 2 as given. β Virginis was, according to computation, not obscured by the moon on that occasion: note, however, that the text does not claim that the occultation itself was observed.

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B and C: The translation combines the two exemplars; not every line of transliteration will therefore be mentioned in the translation.

#### B Obv.

- [Year 114, kings Antiochus and his son Antiochus, month VII, the 1st (of which followed the 30th of the preceding month),] sunset to moonset: [nn°]; it was bright, earthshine, measured; very overcast. Night of the 2nd, very overcast. The 2nd, very overcast. Ni[ght] of the 3rd, the moon was [....] behind 9 Ophiuchi.
- B2 [.... Night of the 6th, beginn]ing of the night, the moon was  $\frac{2}{3}$  cubit behind β Capricorni. Night of the 7th, beginning of the night, the moon was 1 cubit in front of γ Capricorni. Night of the 8th, [....]
- B3 [.... Night of the 12th, beginning of the night, the moon was] 6 cubits [below]  $\beta$  Arietis, the moon being  $\frac{1}{2}$  cubit back to the west. The 12th, moonset to sunrise: 13° 30′, measured. The 12th, Saturn's first appearance in Libra; rising of Saturn to sunrise: 15°; (ideal) first appearance on the 10th [....]
- [...] moonrise to sunset: [...] clouds. I did not watch .... sunrise to moonset: 2° 20+[x]'; clouds. I did not watch. Night of the 14th, sunset to moonrise: .... clouds. I did not watch; gusty wind; last part of the night, the moon was ½ cubit in front of α Tauri. Night of the 15th, last part of the night, the moon was ½ cubit below ζ Tauri, the moon being ½ cubit to [....]
- 17th, very overcast; last part of the night, the moon was 1 cubit 8 fingers above γ Geminorum. The 16th, very overcast. Night of the 17th, very overcast; last part of the night, the moon was 5 cubits below α Geminorum, the moon being ½ cubit back to the west. The 17th, very overcast. Night of the 18th, very overcast, rain DUL. Night of the 19th, last part of the night, the moon was
- l cubit [in front of] ε Leonis. The 19th, Mercury's first appearance in the east in Libra, 3 ½ cubits behind Saturn to the east; it was bright, rising of Mercury to sunrise: 16°; (ideal) first appearance on the 17th. Night of the 20th, last part of the night, the moon was 6 fingers below α Leonis, the moon having passed a little to the east. Night of the 21st, last part of the night, the moon [stood] 1 cubit in front of Mars
- [to the west,] I cubit in front of 9 Leonis. Night of the 22nd, last part of the night, the moon was 1 cubit in front of  $\beta$  Virginis: last part of the night, Mars was 4  $\frac{1}{2}$  cubits below 9 Leonis. Night of the 23rd, last part of the night, the moon was 2  $\frac{1}{2}$  cubits in front of  $\gamma$  Virginis. Night of the 24th, last part of the night, the moon was 2  $\frac{1}{2}$  cubits in front of  $\alpha$

- Virginis. Night of the 25th, last part of the night, Mercury was ½ cubit above α Librae. Night of the 26th, last part of the night, the moon was 2 cubits in front of α Librae. 2 cubits in front of Mercury. 1½ cubits below Saturn, the moon having passed ½ cubit to the east. The 27th, moonrise to sunrise: 12°, measured.
- Night of the 29th, last part of the night. Mercury was 3 cubits below β Librae. That month, the equivalent for 1 shekel of wrought silver was: barley, 4 pān; dates, 1 kur 2 pān 3 sūt; mustard, 1 kur 2 pān 3 sūt; cress, 2 pān 5 sūt; sesame, 1 pān; wool, 4 minas,
- which was given in the land. At that time, Jupiter was in Aquarius; around the 17th, [Mercury's] first appearance in the east in Libra; around the 10th, Saturn's first appearance in Libra; Mars was in Leo; Venus, which had set, was not visible. That month, the river level from the 10th to the 15th rose 1 cubit, total; 26 was the nu (gauge);
- from the 15th to the 23rd, [it receded]  $\frac{1}{2}$  cubit, [total:] 29 was the na (gauge); [from the 24th to the end of the month, it rose  $\frac{1}{2}$  cubit, total: 23 was the na (gauge).
- Month VIII. (the 1st of which was identical with) the 30th (of the preceding month), sunset to moonset:  $16^{\circ}$ , measured. Night of the 4th, [the moon was..., below  $\beta$  Capricorni, the moon being nn] cubits back to the west. Night of the 5th, beginning of the night, the moon was 3 cubits in front of  $\gamma$  Capricorni. Night of the 10th, beginning of the night, the moon was [....] below  $\eta$  Piscium.
- Night of the 11th, beginning of the night, the moon was [...] behind  $\alpha$  [Arietis: last part of the night, Mercury] was 4 fingers [...]  $\beta$  Scorpii. Night of the 12th, beginning of the night, the moon was 4 cubits below  $\eta$  Tauri, the moon being a little back to the west: last part of the night, Mars was  $\frac{2}{3}$  cubit above  $\beta$  [Virginis.]
- Night of the 13th, moonrise to sunset: 6° 40′, measured [....] moonset to sunrise: \( \bar{5}0'\)7 \\ 50′, measured (despite) clouds; very overeast. Night of the 14th, sunset to moonrise: 3°, measured (despite) clouds: clouds were in the sky; the moon was surrounded by a halo; last part of the night, the moon was 1 \( \bar{1}\sigma\_2 \) cubits below
- B15 η Geminorum. The 14th, sunrise to moonset: 11°. [measured': clouds] were in the sky. Night of the 15th, last [part of the night, the m]oon was 2 cubits in front of α Geminorum. Night of the 16th, last part of the night. Mercury was 3 cubits above α Scorpii: last part of the night, the moon was [....] behind β Geminorum.
- Night of the 17th, last part of the night, the moon was  $[x] + \frac{1}{2}$  cubits behind  $\delta$  Cancri. Night of the 18th, last part of the night, the moon was 2 cubits in front of  $\alpha$  Leonis. Night of the 19th, last part of the night, the moon was  $\frac{1}{2}$  cubit above  $\rho$  Leonis. Night of the 20th, [last part of the night, the moon was]
- B17  $2^{-1}/_2$  cubits in front of  $\beta$  Virginis. Night of the 21st, [last part of the night, the moon was]  $3^{-1}/_2$  cubits in front of  $\gamma$  Virginis, it stood  $1^{-1}/_2$  cubits behind Mars to the east. The 21st, very overcast. Night of the 22nd, very overcast, rain DUL. The 22nd, [..., Night of the 23rd,]

#### C'Obv.

B18=Cl' rain DUL; last part of the night, the moon was [....] behind α Virginis. [Night of the 2]4th', very overcast. Night of the 25th, last part of the night, the moon was 2 cubits below β Librae. The 25th, Venus' first appearance in the east in Sagittarius; it was small, rising of Venus to sunrise: 9°: [(ideal) first appearance] on [the 22nd ....]

- B19=C2' dense fog. Night of the 26th, last part of the night, the moon was  $\lfloor x \rfloor + 1/2$  cubits above  $\beta$  [Scorpii], the moon being 1/2 cubit back to the west. Night of the 27th, last part of the night, the moon was 2 cubits behind  $\alpha$  Scorpii. The 27th, Mercury's [last appearance] in the east in [Sagittarius . . . .]
- B20=C3′ the sun was surrounded by a halo. The 27th', moonrise to sunrise: 12° 50′; clouds, I did not watch; overcast, [....] lightning flashed, thunder, thick rain, PISAN DIB. Night of the 29th (and) the 29th, very overcast. That month, the equivalent (for I shekel of silver was): barley, [....]
- B21=C4′ mustard!. 1 kur' 2 pān 4 sūt; cress, 2 pān; sesame, 1 pān; wool. 4 minas. At that time, Jupiter was in Aquarius; around the 22nd. Venus' first appearance in the west in the beginning of Sagittarius; ar[ound ....]
- (four lines missing in B)
- Month IX, the 1st (of which followed the 30th of the preceding month). sunset to moonset: 16° 10′; clouds, I did not watch; very overcast. Night of the 2nd. the moon [....]
- stood to the east. Night of the 5th, very overcast. Night of the 6th (and) the 6th, very overcast [.... Night of the 8th, beginning of the night, the moon was] 5 cubits [below]
- C7' α Arietis, the moon being ½ cubit back to the west. Night of the 9th. [.... Night of the 11th, beginning of the night, the moon was]
- Cs' 2 cubits in front of ζ Tauri. Night of the 12th, beginning of the night. [....]
- C9' = B26 Night of the 13th, moonrise to sunset: 3° 20'; clouds. I did not watch; very overcast; beginning of the ni[ght, ....] moonset to sunrise: [x] + 50'; .... [.... Night of the 14th, last part of the night, the moon was]
- C10' = B27  $\frac{1}{2}$  cubit in front of  $\delta$  Cancri. The 14th, very overcast [...]
- C11'=B28 [....] the 16th, very overcast, rain DUL. The 17th, very overcast, rain DUL. Night of the 18th, last [part of the night, ....]
- Night of the 20th, last part of the night, the moon was 1  $^2$ /<sub>3</sub> cubits above  $\alpha$  Virginis [.... Night of the 23rd, last part of the night, the moon was]
- C13'  $2^{-1}/2$  cubits in front of  $\beta$  Scorpii. Night of the 24th, last part of the [night, .... Night of the 25th, last part of the night, the moon was] 2 cubits [above  $\vartheta$  Ophiuchi.]
- the moon having passed  $\frac{1}{2}$  cubit to the east. Night of the 26th, last part of the night, Mars [was . . . .  $\gamma$  Virginis . . . . That month.]
- ci5' the equivalent (for 1 shekel of silver was): barley, 4 pān 1 sūt; dates, 1 kur 2 pān 3 sūt; mu[stard, ....]
- Venus was in Capricorn, at the end of the month, in Aquarius; Saturn was in Libra:

  Mars [....]
- C17' Month X, (the 1st of which was identical with) the 30th (of the preceding month), sunset to moonset: 11° 30′; clouds, I did not watch; very overcast. The 1st, very [overcast.... when Mars became stationary to the east,]
- c18' it became stationary [....] behind  $\gamma$  Virginis. Night of the 6th, beginning of the night, the moo[n was ....  $\beta$  Arietis .... Night of the 8th, beginning of the night, the moon was]
- C19' · 1 cubit 8 fingers behind η Tauri; clouds were in the sky; the moon [was surrounded by a ha]lo [.... Night of the 9th, beginning of the night, the moon was]

- C20′  $2^{-1}/_2$  cubits behind  $\alpha$  Tauri. The 9th, very overeast. Night of the 10th, very over[cast . . . . ]
- c21' clouds, I did not watch: very overcast. Night of the 14th, moonrise to sunset: 2° 40'; clouds, I did not [watch....]
- (22' [a]ll day clouds crossed the sky, rain PISAN DIB. Night of the 15th. [....]
- (Night] of the 17th, first part of the night, Mercury was I cubit above Jupiter [.... Night of the 20th, last part of the night, the moon was .....]

# C Rev.'

- c1 it stood 1 cubit in front of Saturn to the west. Night of the 20+[xth, ....]
- The 25th, Mercury's last appearance in the west in Aquarius. Night of the 27th, last part of the night, [....]
- The 28th', Jupiter's last appearance in Leosic. That month, the equivalent (for 1 shekel of silver was): bar[ley.....]
- Jupiter's last appearance in Aquarius; Venus was in Aquarius, in the middle of the month, in Pisces; ar[ound ....]
- C5 That month, on the 13th, a "fall of fire" in the district of Tintir [....]

#### B'Rev.

- BI'=C6 Month XI, the 1st (of which followed the 30th of the preceding month), sunset to moonset: 19°; it was bright, earthshine, measured; it could be seen while (the sun) stood there; it was low to the sun; the moon [stood] 3 [....] in front of Venus [to the west ....]
- B2'=C7  $-1^{-1}/2$  cubits behind  $\alpha$  Arietis. Night of the 5th, beginning of the night, the moon was 4 [cubits] below  $\eta$  Tauri [....]
- B3'=C8 having passed to the east. Night of the 8th, beginning of the night, the moon was 1 cubit above γ Geminorum; last part of the night, Mars was [...] above γ Vir[ginis...]
- B4'=C9 Night of the 10th, very overcast, rain DUL. Around the 10th, when Saturn became stationary to the east, it became stationary ½ cubit in front of α Librae. Night of the 11th, beg[inning of the night, . . . .]
- B5'=C10 The 12th, moonset to sunrise: 12°; clouds, I did not watch: very overcast, rain shower. Night of the 13th, moonrise to sunset: 13° 30′, measured (despite) clouds; beginning of the night, the moon [..., Night of the 14th.]
- B6'=C11—last part of the night, the moon was  $2^{1/2}$  cubits behind  $\beta$  Virginis. The 14th, Mercury's first appearance in the east in Aquarius; it was bright, rising of Mercury to sunrise: 15°; [(ideal) first appearance] on [.... Night of the 15th, last part of the night, the moon]
- B7'=C12 stood 2  $\frac{1}{2}$  cubits behind Mars to the east. Night of the 16th, last part of the night, the moon was 1 cubit behind  $\alpha$  Virginis [....]
- B8'=C13 Night of the 18th, beginning of the night, very overcast; last part of the night, the moon was  $1^{-2}/_{3}$  cubits below  $\beta$  Librae, [it stood ....] behind [Saturn to the east ....] .... [....]

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B9'=C14  $2^{-1}/2$  cubits; very overcast, rain shower. The 19th, very overcast. Night of the 20th, last part of the night, the moon was [....] behind  $\alpha$  [Scorpii .... Night of the 21st, last part of the night, the moon was]  $2^{-1}/2$  cubits [behind  $\theta$ ] Ophiuchi. Night of the 24th?, [last part of the night, the moon was .... below  $\beta$  Capricorni,]

- Blo'=C15 the moon having passed a little to the east. Night of the 25th, first part of the night, Venus was  $4^{2}$  cubits below  $\beta$  Arietis; last part of the night, the moon was  $1^{2}/3$  cubits [in front of]  $\gamma$  Capricorni. The 27th, moonrise to sunrise: 12°, mea[sured .... Venus was]
- B11'=C16 5 cubits below α Arietis, Venus having passed a little to the east; very overcast. The 29th, very overcast; at sunset, rain DUL. That month, the equivalent (for 1 shekel of silver was): barley, 4 pān 5 sūt; dates. [....]
- B12'=C17 in the middle of the month, 1 kur 3 pān 2 sūt: mustard, 1 kur 1 pān 5 sūt: cress, 3 pān; sesame. 5 sūt 3 qa: wool, 4 minas. At that time, Venus was in Pisces, in the middle of the month. [in Aries; around the 12th',]
- B13'=C18 Mercury's first appearance in the east in Aquarius: Saturn was in Libra: Mars was in Virgo; Jupiter, which had [set,] was not visible. That month, I did not watch the river level.
- Bl4'=Cl9 Month XII, (the 1st of which was identical with) the 30th (of the preceding month), sunset to moonset: 13° 30'; clouds, I did not watch: very overcast. Night of the 1st. very overcast. rain PISAN DIB. The 1st, very overcast. Ni[ght of the 2nd, the m]oon was 6 cubits below α Arietis, the moon being ½ cubit back to the west, .... 2 cubits in front of Venus.
- B15'=C20 The 2nd, very overcast. Night of the 3rd, very overcast; beginning of the night, the moon was 2 cubits in front of  $\eta$  Tauri. The 3rd, Jupiter's [first appearance] in Pisces; rising of Jupiter to sunrise: [nn°;] (ideal) first appearance on the 1st. Night of the 4th, beginning of the night, the moon was 1  $^2$ /<sub>3</sub> cubits in front of  $\alpha$  Tauri. Night of the 5th,
- B16'=C21 beginning of the night, the moon was  $1^{-1}/_2$  cubits in front of  $\zeta$  Tauri; very overcast. Night of the 6th, beginning of the night, the moon was  $1^{-1}/_2$  cubits [below]  $\mu$  Geminorum; very overcast. The 6th, very overcast; in the morning, rain DUL. Night of the 7th, beginning of the night, the moon was
- B17'=C22 6 cubits below a Geminorum. The 7th, very overcast; in the afternoon, rain shower. Night of the 8th, very overcast; beginning of the [night.] the moon was  $2^{-2}/_{3}$  cubits in front of  $\delta$  Cancri. Night of the 9th, beginning of the night, the moon was 2 cubits in front of  $\epsilon$  Leonis.
- B18'=C23 The 9th, very overcast; at sunset, rain shower. Night of the 10th, beginning of the night, the moon was 10 fingers [...] α Leonis. Night of the 11th, very overcast; beginning of the night, the moon was 2 cubits behind ρ Leonis. The 11th, rising of Mercury to sunrise: 14°. Night of the 12th, very overcast;

- B19'=C24 beginning of the night, the moon was I cubit in front of  $\beta$  Virginis, it stood [nn cub]its in front of [Mars] to the west. Night of the 13th, beginning of the night, the moon was 2 cubits in front of  $\gamma$  Virginis. The 13th, moonset to sunrise: 3° 20''; clouds, I did not watch: very overcast, rain shower. The 13th, Mercury's
- B20'=C25 last appearance in the east in Pisces; all day clouds crossed the sky. Night of the [14th, last part of the ni]ght, the moon was 1 cubit in front of α Virginis. The 14th, sunrise to moonset: 6° 50'; clouds, I did not watch; very overcast, rain shower. Night of the 15th, sunset to moonrise: 3°; clouds, I did not watch;
- B21'=C26 very overcast; last part of the night, the moon was 1 [....] above  $\alpha$  Librae, it stood [.... behind Saturn to] the east. Night of the 16th, first part of the night. Venus was 1  $\frac{1}{2}$  cubits below  $\eta$  Tauri; very overcast. The 16th, very overcast. Night of the 17th, last part of the night, the moon was 2  $\frac{1}{2}$  cubits in front of  $\beta$
- B22' Scorpii. Night of the 1[8th, last part of the night, the moon was .... behind  $\alpha$  Scorpii;] very overcast. Night of the 19th, very overcast, rain shower; last part of the night, the moon was  $2^{-1}/_2$  cubits above  $\vartheta$  Ophiuchi, the moon having passed a little to the east. The 19th, very overcast, lightning flashed, much thunder,
- [rain,] eloudburst, PISAN DIB. Night of the 20th, very overcast [....] clouds were in the sky. Night of the 22nd, last part of the night, the moon was 2 cubits in front of  $\beta$  Capricorni; clouds were in the sky, the moon was surrounded by a halo. Night of the 23rd, last part of the night, the moon was [....] in front of  $\gamma$  Capricorni.
- B24' [....] Night of the 24th, [....]  $\frac{5}{6}$ ' cubit. Night of the 25th, very overcast, lightning flashed, much thunder, rain PISAN DIB; first part of the night, Mars, while going back to the west, was  $1^{-1}/2$  cubits above  $\beta$  Virginis. The 25th, very overcast. Night of the 26th.
- B25' [...] cubits; very overcast. The 20+[xth.... The 2]8th, very overcast, lightning flashed, thunder, rain DUL. Around the 30th, when Mars became stationary to the west, [it became stationary]  $1^{-1}/2$  cubits above  $\beta$  Virginis, being 4 fingers back to the west.
- B26' [....] new' dates, [....] 2 pān 4 sūt; sesame, 5 sūt 3 qa; wool, 4 minas. At that time, around the 2nd, Jupiter's first appearance in the beginning of Pisces; Venus was in Aries, in the middle of the month
- [in Taurus ....] That month, the river level from the 22nd to the end of the month rose 8 fingers above the (normal) peak flood.
- B28' [Month I, the 1st (of which followed the 30th of the preceding month), ....]
- B29' [D]iary from month VII to the end of month XII, year 114, kings Antiochus and his son Antiochus.

# Left edge

B1=C1 Diary from month VII to the end of month XII, year 114, [kings] Antiochus and [his son] Antio[chus.]

B11: there is some error in the river level data; at the end of the line, either  $\frac{1}{2}$  KÜŠ is to be emended to 1 KÙŠ, or 23 to 26.

B18: the number 22 at the end of the line is restored from LBAT 1238:10'.

B rev.1': the signs ina GUB IGI are in smaller writing above the line.

#### Calendar

# No. -195

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A: BM 35199 (= Sp.II 754) + 35845 (= Sp.III 375) +
                                                                                                             SE 116
   + 35919 (= Sp.HII 455)
                                                                                                             11 - VI
Copies: LBAT 317 (35199), 819 (35845 + 35919)
Photo: Pl. 119
'Obv.
1'
       [\ldots] GU_4-UD [\ldots]
       [.... AN-KU<sub>10</sub> šamáš ....] ki [PAP] NU IGI [....]
2'
       [\ldots \text{SIG}]^{\text{há}} + ma - na [\ldots]
3'
       [....] TE E ina DA SAR [....]
4′
       [SIG .... GE<sub>6</sub> 3 sin x] MÚL TUR šá 4 [KÙŠ ár LUGAL nn mm ....]
ōʻ
       [.... dele-bat ina ŠÚ ina ALLA IGI nn na-su] in 4 IGI GE_6 6 [....]
6′
       [..., GE_6 8 SAG GE_6 sin ..., ina IGI GENN[A 2^{-1}/2 \text{ KÙŠ}] and \check{SU} G[UB \dots]
71
       [\ldots] \lceil x \ x \ x \rceil [\ldots]
       [\ldots] \lceil \mathbf{x} \rceil \operatorname{GE}_{6} [\ldots]
9'
       [\ldots] \lceil x \rceil \lceil x \rceil \lceil MUL^{!} \mid IGI \mid x \mid x \rceil \lceil \ldots \rceil
101
       [.... GE<sub>6</sub> 21 ina ZALÁG sin SIG! MÚL KUR sá] DUR nu-nu 5 KÙŠ GE<sub>6</sub> 22 ina
u
       Z[ALAG...]
       [.... GE<sub>6</sub> 2]4 ina ZALÁG sin e is le_{10} \frac{1}{2} [KÙŠ ....]
12'
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