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# A Mysterious Circular Tablet with Numbers and Stars

## Summary

In this paper we publish a unique circular cuneiform tablet which is divided into twelve sectors each of which contains numbers and star names. Our analysis of the text suggests that it contains astrological material related to the so-called *Kalendertext* scheme.

Keywords: Circular tablets; astrology; star names; Mesopotamia; Sumerian.

In diesem Beitrag publizieren wir eine einzigartige kreisförmige Keilschrifttafel, die in zwölf Sektoren eingeteilt ist, von denen jeder Zahlen und Sternnamen enthält. Die Textanalyse legt nahe, dass es sich um astrologisches Material handelt, das mit dem sogenannten Kalendertext-Schema in Verbindung steht.

Keywords: Kreisförmige Tontafeln; Astrologie; Sternnamen; Mesopotamien; sumerisch.



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## 1 Introduction

BM 47762 preserves approximately one fourth of a round tablet with numerous numerals and a small number of star-names. The tablet attracted the attention of Wayne Horowitz during his search for exemplars of Astrolabes, including those in planisphere form of the type CT 33 11–12.[1] Horowitz quickly realized that the tablet had nothing to do with Astrolabes and passed the text on to John Steele for further investigation. In the following, we present a preliminary study of the text in the hope that others will be able to offer a fuller explanation of the mathematical and astronomical/astrological schemes at play on this unique member of the cuneiform corpus.

Fig. 1 BM 47762 obverse.


Fig. 2 BM 47762 reverse.

1 For other circular astronomical texts, see Horowitz and Al-Rawi 2001.

## 2 The tablet

The circular tablet fragment BM 47762 = 81-11-03, 467 (Figs. 1 and 2), most likely from Babylon, presents a set of numbers and star-names which place this text in the realm of astronomy or astrology, and so the area of expertise of our friend and colleague Lis Brack-Bernsen. What is almost certainly the obverse is divided into sectors, each containing several lines of cuneiform text (the reverse is uninscribed except for unreadable traces of a few wedges towards the center of the tablet). The surviving piece gives at least part of four out of an original 12 sectors. A small piece of the outer edge of the tablet survives in the third section from the left, with part of a circular incision that apparently served as an outer border of the text when complete. Given the format of the tablet, sectors in the shape of 'pie-slices', the available space in each line diminishes as one moves towards the center of the circle. This enables us to determine how many lines are missing from each of the other less well preserved sectors. The actual center of the circle is missing, but it is likely that the very center of the circle was left vacant. In fact, if the tablet was more complete we would probably find the impression of a compass point at the center given that the arc of the surviving piece of the border at the edge of the tablet is so well drawn. This is also the case for the dividing lines between the sectors, suggesting work with an ancient 'compass and ruler'. In contrast, the scribe struggles somewhat with the problem of rendering cuneiform in his circular format leaving some signs squeezed, or misshapen. As on all previously known circular astronomical/astrological tablets the text is meant to be read from outside to inside. The obverse reads as follows:

| | Sector IX | Sector X | Sector XI | Sector XII |
|---|---|---|---|---|
| (1) | [x x x x] | [x x x x] | GU.LA 1 ⌜28⌝ | [x x x x] |
| (2) | [x x x x] | [x x x x] | 2 28 11 7 | 3 [x x x] |
| (3) | [x x x x] | [x] ⌜7 10 14⌝ | 2 7 11 14 | 3 7 1[2 x] |
| (4) | [x x x] ⌜21⌝ | 1 14 10 21 | 2 14 11 21 | 3 14 1[2 x] |
| (5) | [x x x 2] ⌜8⌝ | 1 21 10 28 | 2 21 11 28 | 3 21 12 [x] |
| (6) | [x x x x] | 10 21 SAG.DU RÍN | 11 21 ⟨ŠÚ⟩ SAG.DU | 12 21 SA[G.DU] |
| (6a)[2] | | | GÍR.TAB | ŠUL.[PA.È[?3]] |

2 (Transliteration, L. 6a) This line exists in Sector XI–XII (see the commentary).

3 (Translit., L. 6a, Sector XII) We expect a reference to Sagittarius here. Most likely the scribe intended

| | | | | |
|---|---|---|---|---|
| (7) | [x x x] | ˹2˺ 8 ÙZ | 28 Á BIR | 28 ŠUL.[PA.È] |
| (8) | [x x x] | [7 IG]I GIŠ.DA | 7 IGI BIR | 7 IGI [x (x)] |
| (9) | [x x] | [14 S]AG | ˹1˺4 [SAG] | 14 SAG |
| (10) | [x x] | [x x] | x BI[?4] | [x x] |

## 3 Commentary

The text has a rigid format with each sector containing ten entries. Each entry is written on a separate line except in the case of line 6 where in sectors XI and XII the scribe ran out of room and so continued onto an indented line 6a. In the following, we treat lines 6 and 6a together. The structure of the text allows most of the four partially preserved sectors to be restored with certainty. Below we give a translation of the text including restored text.

| | Sector IX | Sector X | Sector XI | Sector XII |
|---|---|---|---|---|
| (1) | [Sagittarius 11 28] | [Capricorn 12 28] | Aquarius 1 28 | [Pisces 2 28] |
| (2) | [12 28 9 7] | [1 28 10 7] | 2 28 11 7 | 3 [28 12 7] |
| (3) | [12 7 9 14] | [1] 7 10 14 | 2 7 11 14 | 3 7 1[2 14] |
| (4) | [12 14 9] 21 | 1 14 10 21 | 2 14 11 21 | 3 14 1[2 21] |
| (5) | [12 21 9 2]8 | 1 21 10 28 | 2 21 11 28 | 3 21 12 [28] |
| (6), (6a) | [9 21 beginning of Virgo] | 10 21 beginning of Libra | 11 21 beginning of Scorpio | 12 21 begin[ning] of Sagitt[arius[!]] |
| (7) | [28 […]] | 28 The She Goat | 28 […] The Kidney | 28 Šulpae |
| (8) | [7 in front of […]] | [7 in front of] Jaw of the Bull | 7 in front of The Kidney | 7 [in front of […]] |

to write PA.BIL.SAG but instead wrote ŠUL.PA.È, which also contains the PA sign and which appears in the following line. An error of this kind suggests that the scribe was copying another tablet.

4 (Translit., L. 10, Sector XI) BI or a more complex sign which ends with a BI-type element.

| | | | | |
|---|---|---|---|---|
| (9) | [14 beginning] | [14 be]ginning | 14 beginning | 14 [beginning] |
| (10) | [...] | [...] | [...] [...] | [...] |

The preserved entry in line 1 of Sector XI indicates that each of the twelve sectors concerned one sign of the zodiac and demonstrates that the preserved portion of the tablet contains the final four sectors. Each entry in lines 2–5 contains a series of four numbers in the following sequence, with variables *a* and *b* as the first and third numeral in each line:

*a* 28 *b* 7
*a* 7 *b* 14
*a* 14 *b* 21
*a* 21 *b* 28

In each case, the variables *a* and *b* are each less than or equal to 12, and both *a* and *b* increase by 1 (moduli 12) from one sector to the next. Furthermore, *b* is always equal to the number of the zodiacal sign (where Aries = 1, Taurus = 2, etc., up to Pisces = 12). The use of numbers to refer to signs of the zodiac (and months in the ideals 360-day calendar) is found in astrological texts which use the so-called *Dodecatemoria* and *Kalendertext* schemes.[5] Entries from these schemes are usually written out in the form of four numbers (for example, 1 13 1 1) where the first and second numbers, and the third and fourth numbers, are to be understood as either a position given with a sign of the zodiac, and degree or a date in the schematic 360-day calendar given with the month and day. This parallel suggests that in our text, the four numbers in each of lines 2–5 are also to be understood as two pairs of either month and day, or zodiacal sign and degree. The agreement between the number *b* and the sign of the zodiac found in line 1 seems to confirm this interpretation of these numbers. The relation between the two pairs of numbers in each entry does not follow either the *Dodecatemoria* or *Kalendertext* schemes, however. In those schemes, the first pair of numbers should increase by 13 degrees or 277 degrees respectively for each increase of 1 degree in the second pair of numbers, which results in a mapping of every position in the second pair onto a distinct position in the first pair. The position generated by either scheme does not agree with what we find here. Nevertheless, there does appear to be a connection between the numbers in lines 3–5 and the *Kalendertext* scheme: if we take both *a* and *b* to be zodiacal signs, then the number of degrees between the first pair of numbers and the second pair of numbers is equal to 277, which is the characteristic number of the *Kalendertext* scheme. However, the entry in line 2 does not follow this same rule. It seems likely, therefore, that the text

5 For an overview of these schemes, see Brack-Bernsen and Steele 2004.

contains some type of astrological material which is related to the *Kalendertext* scheme in some way, but which also exploits the pattern of numbers 7-14-21-28, which perhaps corresponds to the phases of the moon.

Line 6 begins with the number of the zodiacal sign for the sector followed by the number 21 and the statement 'beginning of' (literally 'head of') another zodiacal sign which is nine signs further on from the sign of the sector. An interval of nine signs may again relate to the *Kalendertext* scheme as 277 = 9 signs + 7 degrees.

Lines 7–9 (and probably line 10) each begin with a number from the 7-14-21-28 sequence followed by a star name preceded in line 8 by the term IGI, meaning either 'in front of' or 'visible', and in line 9 by the term SAG, meaning 'at the beginning of'. The stars given in line 7 are all known to be used as substitute names for planets in certain omen texts: The She Goat for Venus, The Kidney for Mercury, and Šulpae for Jupiter.[6] We think it likely, therefore, that line 7 should be interpreted as referring to the planets. Beyond that, however, we do not understand the relationships between the numbers, the star names, and the terms IGI and SAG in these lines.

This is as far as we can go in understanding our text.[7] We present this text to Lis in the hope that she will enjoy our exposition of this 'mathemagical' text and be able to build upon our analysis to provide a fuller explanation of the text and its place in the cuneiform astronomical-astrological corpus.

6 Reiner 2004.

7 At the Regensburg IV conference in Berlin, Jeanette Fincke presented a second fragment of this text and proposed an alternative interpretation of its contents. We refer the reader to her forthcoming study for further details.

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## Illustration credits

**1–2** Courtesy of the Trustees of the British Museum.

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