A Late Babylonian Tablet with Concentric Circles from the University Museum (CBS 1766)*

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A century ago H. V. Hilprecht published his book *Explorations in Bible Lands During the 19th Century*, which included on page 530 a photograph of one side of CBS 1766,[1] an intriguing tablet of uncertain provenance that is now to be found in The University Museum in Philadelphia. In Hilprecht's book, the photograph was accompanied by the label, "Astronomical Tablet from the Temple Library," a designation that has gone untested. In fact, the tablet has been for the most part forgotten. No edition or even copy of the tablet was ever published, and the only printed study of the text was that of A. Jeremias, in *Handbuch der alterorientalischen Geisteskultur*, 2nd ed., (Berlin and Leipzig, 1929), 197–99, where a reprint of the photograph is accompanied by a proposal that the text provides an astrological scheme to relate the seven ancient planets to the seven days of the week. Other than this, *HKL* I, p. 193 offers only one more entry, *Hilprecht Temple of Bêl* 52 f46, which turns out to be a photograph of a different tablet,[2] and *HKL* II, p. 110 offers no entries at all. More recently, P. Gerardi's 1984 bibliographical work, *OPBF* 4 (= *A Bibliography of the Tablet Collections of the University Museum*) p. 17, was unable to offer any bibliography for the tablet at all.[3]

In *HKL* I, the editors identified the tablet as "*Astronomisch*," an identification which led the tablet to be listed in *HKL* III, pp. 114–15 § 102 under the category "*Astronomie, Sternlisten, Kalenderwissenschaft*." Likewise, C. B. F. Walker included our text by way of its photograph in Hilprecht's *Explorations in Bible Lands During the 19th Century* in his "Bibliography of Babylonian Astronomy and Astrology."[4]

* The author wishes to thank Philip Jones, Erle Leichty, and Steve Tinney for their hospitality at The University Museum, Francesca Rochberg for reading a draft version of this article and offering important contributions to the understanding of the text, John Britton for his help at the beginning of this project, and the Trustees of the University Museum for permission to study and publish the tablet. This article is dedicated to Professor Leichty, in gratitude for his friendship and encouragement over the years, and in tribute to his many seen and unseen contributions to the advancement of the study of cuneiform civilization. Assyriological abbreviations are as in *CAD*, *The Chicago Assyrian Dictionary.*

1. (Philadelphia, 1903) with the cooperation of J. Benzinger, F. Hommel, P. Jensen, and G. Steindorff.

2. = *Die Ausgrabungen der Universität von Pennsylvania im Bêl Temple zu Nippur* (Leipzig, 1903). The photograph on p. 56 is of the mathematical tablet on Hilprecht, *Explorations*, 531.

3. Here there are no entries for any tablet between CBS 1757 and 1781.

4. See C. B. F. Walker in H. D. Galter, ed., *The Rolle der Astronomie in den Kulturen Mesopotamiens* (= *Grazer Morgenländische Studien* 3; Grazer, 1993), 418. The author wishes to thank Christopher Walker for providing updated versions of this list.

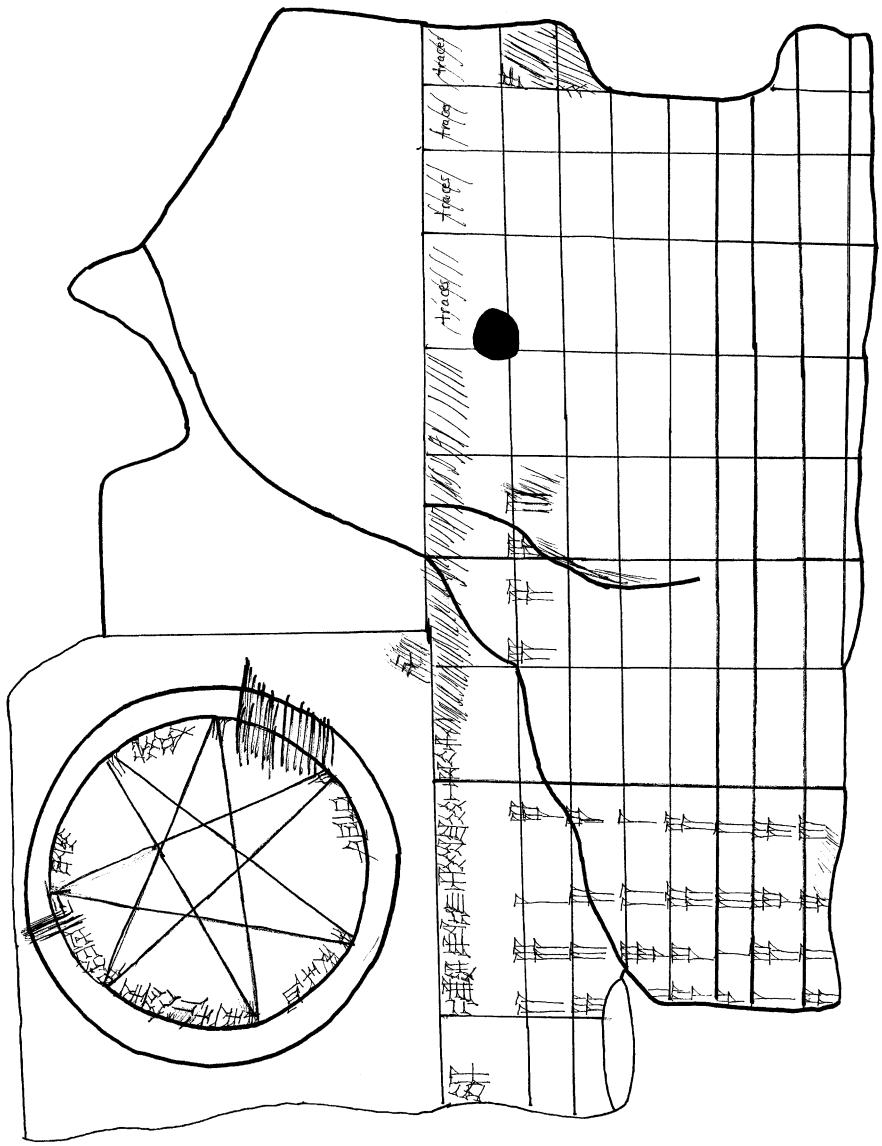

Plate 1. Hand-copy of CBS 1766.

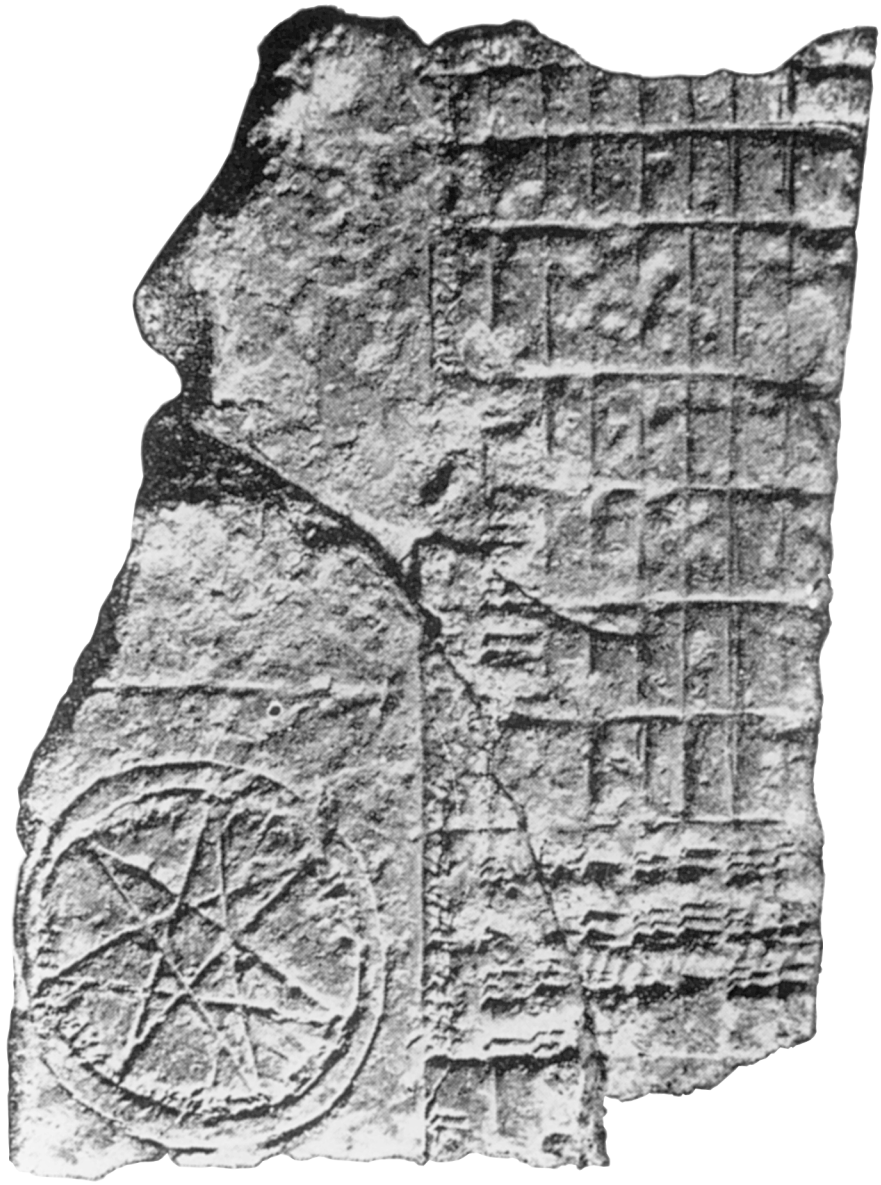

Plate 2. Photograph of CBS 1766 (courtesy of the Trustees of the University Museum, Philadelphia).

Thus, the tablet attracted my attention as I began to search for sources for my upcoming book on astrolabes,[5] particularly since the photograph shows that CBS 1766 includes in the top left corner of its published side a diagram meant to represent a seven pointed star figure inscribed inside two concentric circles. Thus, I hoped that CBS 1766 could be related in some way to the Astrolabe diagrams published on CT 33 11–12. Over the past few years, during intermittent visits to the University Museum, I took the opportunity to study the tablet a number of times. Below, I present what I have come to learn about the CBS 1766 by means of a preliminary edition of the text.

CBS 1766 (see Plates 1 and 2)

CBS 1766, at present, is badly damaged. An inscription is found on one side of the tablet but is in part effaced. This side is flat, and appears to be the obverse of the tablet. The other side, probably the reverse, is entirely lacking. The inscription on what will be called the obverse has two components: the diagram and a numerical table.

The diagram is to be found in the upper left corner of the obverse within a square space defined by the upper and left edges of the tablet, a vertical ruling at its right, and a horizontal ruling at its bottom that continues to the right edge of the tablet. It is crudely drawn with the circles formed apparently without the aid of a compass.[6] Likewise many of the lines intersecting the circles that form the star figure are not straight, and so appear to have been drawn free hand without the use of some type of ruler.

The seven points of the star touch the inner circle and are numbered 1–7 in a clockwise direction beginning at the top of the diagram. In each case a short label which stretches into the open spaces between the points follows the numbers. The numbers and labels are inscribed just inside the inner of the two concentric circles with the tops of the signs resting along the inner circle, and their bases oriented towards the center of the circle.[7] The space between the inner and outer circles is empty. Below the diagram itself, but in the lower right corner of the square area belonging to the diagram, one finds the traces of a single sign, most likely ⌜IM⌝. Beyond the ruling marking the right border of the area of the diagram is vacant space, which, when the tablet was complete, comprised the upper right portion of the obverse.

The second component of the inscription—the numerical table on the lower half of CBS 1766—begins at the horizontal ruling that divides the tablet roughly in half. Below this ruling are eight additional horizontal rulings that are parallel to the first,

5. My now nearly complete *The Three Stars Each: Astrolabes and Related Texts*. For the Mesopotamian astrolabes, a group of cuneiform astronomical texts that purport to name the 36 stars which define the months of the astronomical year (one star for each month in each of the three stellar paths), see W. Horowitz, *Mesopotamian Cosmic Geography* [hereafter *MCG*] (Winona Lake, 1998), 154–66.

6. No compass point is visible as for example on "The Babylonian Map of The World" on BM 92687 = CT 22 48 obv., with a more recent handcopy in *MCG* 402 pl. 2. For a list of other photographs and prints see most recently *MCG* 20.

7. Compare the orientation of the signs on BagM. Beih. 2 no. 98 (see *MCG* 193–95).

which are in turn intersected by nine parallel vertical rulings. These rulings too are not straight, but are clearly meant to form a grid of horizontal lines and vertical columns.

Line 1 is inscribed across the length of the tablet without regard to the vertical rulings and appears to offer an opening introductory line of prose. Beneath this apparent introduction, line 2 col. ii, and col. iv–v, present pairs of numerals. Column ii, and only column ii, continues the sequence of numerals from line 3 to the bottom of the present tablet. In each case, the sum of the pairs of numbers are equivalent in modulo 7; for example in col. ii line 2, 2+6 = 1+7 (both being modulo 7: 1), and in col. ii line 4, 3+7 = 2+1 (both being modulo 7: 3).[8] The traces that survive in the last columns of lines 2–3 do not seem to be numbers but cannot be read with any degree of certainty.

Given that the numerical table gives pairs of numbers in modulo 7, it seems fair to assume that the table corresponds in some way to the diagram with its seven pointed star above. Likewise, one might hypothesize that the line of prose between the diagram and the numerical table was meant to explain how to correlate the diagram above and the table below. Unfortunately, this hypothesis cannot be confirmed on the basis of the current state of preservation of CBS 1766. Most of the signs in line 1 are so badly effaced that their readings cannot be ascertained. Thus, any explanation as to the relationship between the numerical table and the diagram that might have been offered in line 1 is now unavailable. Further, the meanings of the labels attached to the points of the star in the diagram are obscure, and, as noted above, the reverse of CBS 1766 is completely broken. In fact, on the basis of the present tablet, one cannot even prove without a shadow of a doubt that the diagram and numerical table are even related to one another. Given these uncertainties, the edition of CBS 1766 below should be seen as a first attempt to understand this unique work and its place in the cuneiform scribal tradition.

The Diagram

1.	1	da-mu	Blood/Damu
2.	2	u_4-mu-šum	Daily/The Stormy one
3.	3	traces	—
4.	4	kal/lab-ba-nu	The Dog-like one/Lion-like one
5.	5	ha-an-šu	Fifth
6.	6	RI-x HAR-ri	. . . .
7.	7	nin-x-x	Nin- . .

Bottom right corner of diagram: ⌜IM⌝ (Wind, Compass-point) Direction

The Chart

Introductory Line: IM ṣi-im-da-tum zi-qí-pu iq-r[i-bu$^{?}$/ik-ta[l-du$^{?}$ . . .

Provisional translation: Direction: *Pairs of altitudes* which *appro*[*ached*$^{?}$/*rea*[*ched*$^{?}$ . . .[9]

8. In modulo #, the number # begins the series of numbers anew. Hence in modulo 5, one counts 1, 2, 3, 4, 5, 1 . . . . , in modulo 7: . . . 6, 7, 1. Thus, both 2 + 1 (= 3) and 6 + 4 (10 = 7 + 3) are both modulo 7: 3.

9. Italics indicate uncertainty in translation.

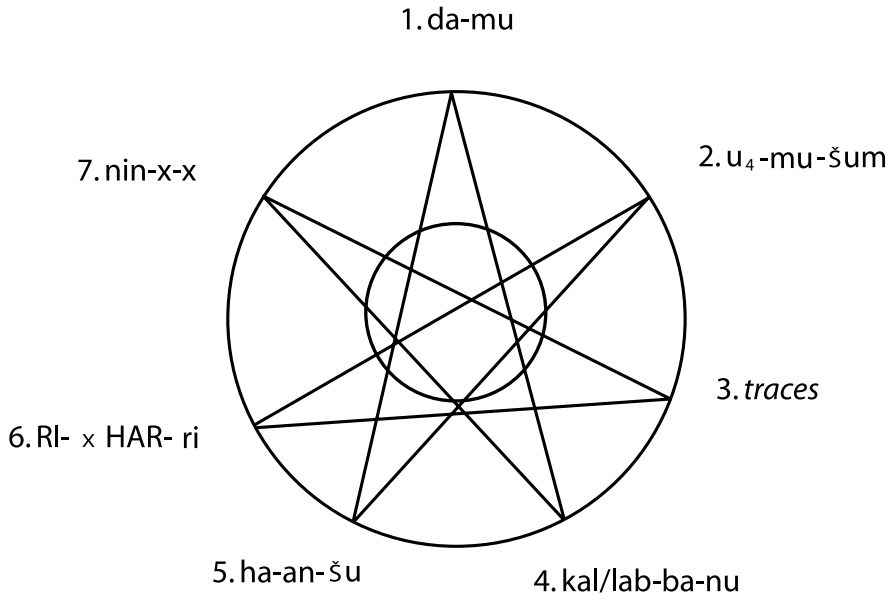

Fig. 1. The diagram.

Table of Numbers:

	col. ii				col. iv		col. v	
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)[10]
1.	2	6	1	7	5	4	⌜7⌝	2
2.	6	3	5	4				
3.	⌜3⌝	7	2	1				
4.	⌜7⌝	4	6	5				
5.	⌜4⌝	1	3	2				
6.	1	5	7	6				
7.	⌜6⌝	2	5	3				

Mathematical Commentary

The numbers in the table are arranged in sets of pairs where the sum of A+B is equivalent to the sum of C+D in modulo 7,[11] and the sum of E+F is equivalent to the sum of G+H in modulo 7.[12] The sums in Columns A–B C–D begin with modulo 7: 1, and increase by 1 from lines 1–6. Thus, in line 1, 2+6 and 1+7 both equal 8 (modulo 7: 1); in line 2, 6+3 and 5+4 both equal 9 (modulo 7: 2). However, at line 7, the

10. Letters are assigned here to the sub-columns in order to facilitate the discussion in the mathematical commentary below.

11. All in col. ii.

12. E–F in col. iv, G–H in col. v.

scribe returns to the sum of modulo 7: 1, thereby skipping modulo 7: 7, which would be equivalent to our 0.[13] The sequence then continues with the single set of sums in Columns E–F G–H (5+4 and 7+2), both modulo 7: 2. There are no further traces of numerals in Columns E–F G–H, nor elsewhere on the obverse, but it seems possible that the writer of the text would have assumed that his reader would have known the appropriate sequence of sums, and so have been able to complete the table by heart.[14] Of course, further pairs of numbers could have been preserved in tables on the reverse.

			Sum A+B				Sum C+D	
Line:	A	B	Base 10	Modulo 7	C	D	Base 10	Modulo 7
1.	2	6	8	1	1	7	8	1
2.	6	3	9	2	5	4	9	2
3.	3	7	10	3	2	1	3	3
4.	7	4	11	4	6	5	11	4
5.	4	1	5	5	3	2	5	5
6.	1	5	6	6	7	6	13	6
7.	6	2	8	1	5	3	8	1

			Sum E + F				Sum G + H	
Line:	E	F	Base 10	Modulo 7	G	H	Base 10	Modulo 7
1.	5	4	9	2	7	2	9	2

Provisional Interpretation[15]

I assume that the diagram and numerical table on CBS 1766 are related, and given the "circle inside a circle" shape of the diagram,[16] that the sets of numbers A–B, C–D, and E–F, G–H relate to the situation of concentric circles. Further, I assume that the first set of numbers in each pair (A, C, E, G) are related to the outer circle, and that the second set (B, D, F, H) to the inner circle,[17] thereby giving a set of seven coordinates

13. A–B lines 1–6 also show a sort of symmetry with the number in B being the same as that in the next line of A. For example the numbers in A line 2 = B line 1 (both give 6), and the numbers in A line 3 = B line 2 (both give 3) etc.

14. One may extrapolate that the sequence would have continued with sums equaling modulo 7: 3, and modulo 7: 4. See further below.

15. The following is based on observations made by F. Rochberg and family who had the insight to suppose that the diagram and pairs of numbers related to the situation of two concentric, but moveable circles on a wheel. For a similar idea concerning elements in the diagram *BagM.* Beih. 2, no. 98; see *MCG* 206–7.

16. Akkadian *kippatu ina kippati*. For "a circle inside a circle" as a standard shape in Mesopotamian geometry and cartography see *MCG*, 42.

17. Similar results are achieved if A, C, E, G are inside and B, D, F, H are outside (compare Figure I with that below in n. 19). Yet, I presume that the first sets of numbers are for the outer circle because the cuneiform signs on the diagram are written with their tops pointing away from the center of the circle and bottoms oriented downwards. Thus, it would seem that the diagram was meant to be read from the outside inwards; i.e. the outside number before the inside number.

for points along the circles' circumferences. If so, one can best generate the shape of the diagram at the top of CBS 1766 by means of assuming that A–B and C–D lines 1–6, respectively, give a series of coordinates on concentric circles that are to be connected in sequence by a series of lines drawn though the circles; with the outer circle rotated one "tick" of the wheel counterclockwise after line 6 to generate the coordinates in A–B, C–D line 7, and then drawing a line connecting this coordinate with the pair in A–B, C–D line 1 (original position) to complete the star figure:[18]

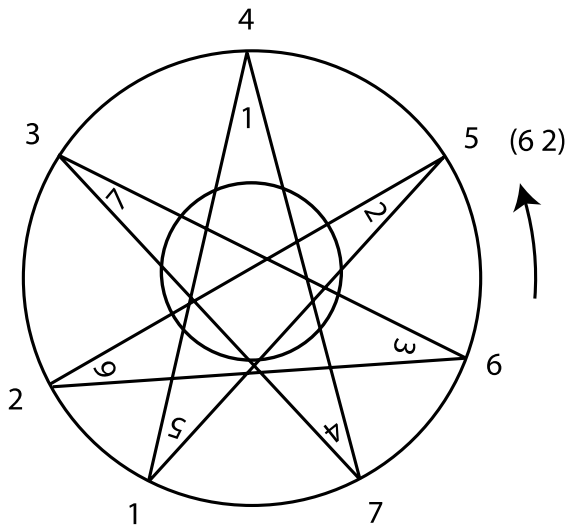

Fig. 2. (A for the outer circle, B for the inner circle).

18. A–B (6–2) to 2–6 (fig. 2); C–D (5–3) to 1–7 (fig. 3). One can, of course, obtain the same results at line 7 by moving the inner circle six points clockwise since movement along a circle with seven points on its circumference is governed by the formula *7 minus X "ticks" counterclockwise = X "ticks" clockwise*:

Counterclockwise "ticks"	Clockwise "ticks"
1	6
2	5
3	4
4	3
5	2
6	1

One cannot, however, generate the diagram by moving the inner circle between A–B, C–D lines 1–6 and line 7 counterclockwise for which see immediately below.

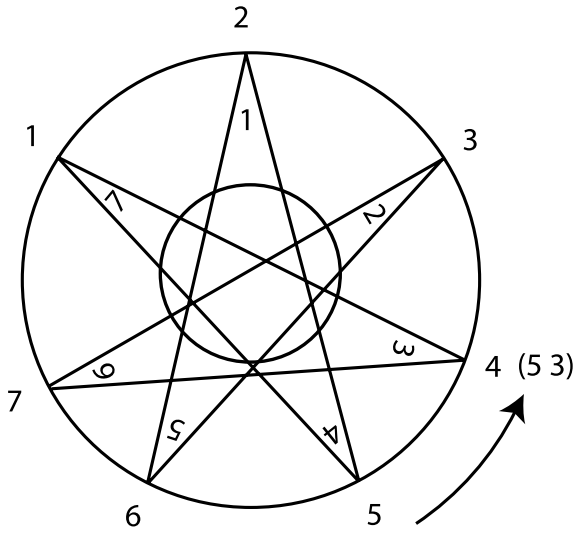

Fig. 3. (C for the outer circle, D for the inner circle).[19]

19. For the same drawing generated by taking the numbers as "A inner circle, B outer circle," see the diagram below:

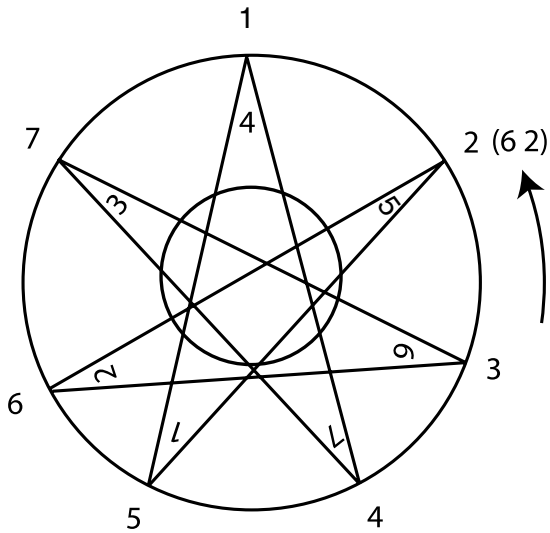

Fig. 5. A–B (A = inner circle, B = outer circle).

A move of one "tick" of the inner circle clockwise to get from A–B, C–D lines 1–6 to A–B, C–D line 7, although mechanically possible, is precluded in the case of CBS 1766 since this move does not produce the seven pointed figure in the diagram. Rather, this move yields a figure with only six points leaving one set of numbers on the diagram unattached:

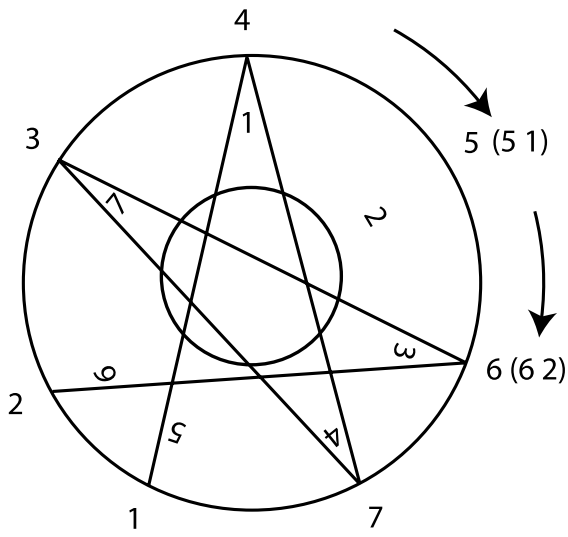

Fig. 4. (A = outer circle, B = inner circle, inner circle moves one tick clockwise).

Thus, there is reason to presume that movement from one position to the next in the system represented by CBS 1766 was always facilitated by moving the outer circle counterclockwise. This presumption finds support in the fact that a transition from A–B line 7 to C–D lines 1–6 requires that the outer circle be moved counterclockwise only one additional "tick," for a total of two "ticks" from A–B lines 1–6 to C–D lines 1–6. Thus, it is possible that the pairs in A–B line 7 were meant to begin an intermediate sets of pairs between A–B and C–D that was not given in full in the tables.[20]

As for E–F and G–H, here too I presume that these pairs of numbers, when complete, would have yielded seven pointed stars as with A–B and C–D.

Yet, the rule for the transition A–B → C–D does not hold for C–D → E–F, particularly since E–F line 1 seems to present the same situation as C–D lines 1–6; nor for the transition E–F → G–H—which can be best realized by moving an outer circle E counterclockwise three "ticks." Nonetheless, the apparent increase of one "tick" with each subsequent transition: A–B 1–6 → C–D 1–6 (2 ticks), and E–F → G–H (3 ticks), suggests CBS 1766 provides just part of system of coordinates belonging to more comprehensive mathematical scheme than that now derivable from the surviving table. For example, the observation that the tables begin with modulo 7: 1

20. It is possible, but not likely, that the numerical series A–B and C–D would have continued onto the reverse.

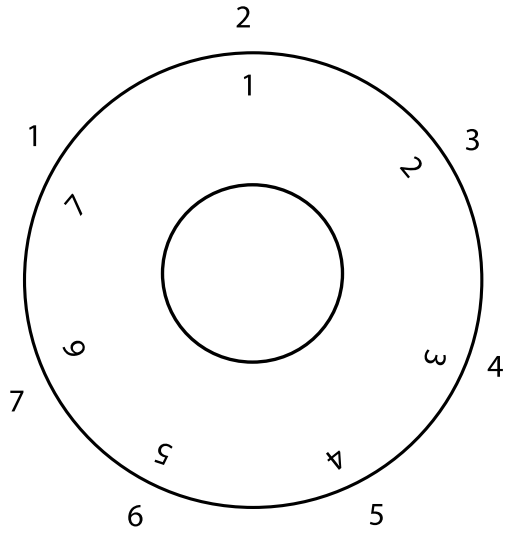

Fig. 6. Presumed E–F (E = inner circle, F = outer circle).

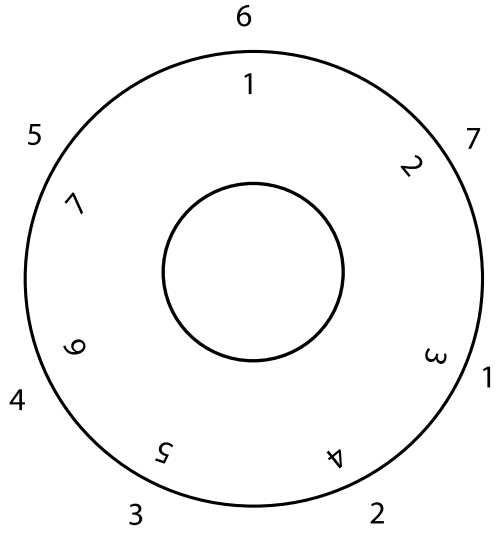

Fig. 7. Presumed G–H (G = inner circle, H = outer circle).

(A+B and C+D), and increase by one to modulo 7: 2 for E+F and G+H, suggest that further tables would have given sets of pairs for modulo 7: 3, 7: 4, 7: 5, 7: 6 in sequence.[21] Unfortunately, the absence of complete sets of pairs for E–F and G–H,

21. Likewise, I would suggest that a transition G–H → a presumed I–J would require moving the outer circle four "ticks" counterclockwise, presumed I–J → presumed K–L five "ticks," and so on.

as well as the absence of a proved theory governing the transition C–D → E–F, and E–F → G–H, and beyond, prevents us from offering any overall unified explanation for the sequence of numbers given in the numerical tables.

It also not possible, on the basis of CBS 1766 alone, to determine why the tables themselves appear to be so incomplete. Perhaps, the scribe of the present tablet meant to provide only a selection of possible coordinates that could be generated by the device/system represented by the diagram.

Finally, although the above provides at least a partial explanation for the mathematics, and possible mechanics of the diagram and tables of numbers in CBS 1766, I have yet to investigate the text's purpose, or the S*itz im Leben* of the tablet; a subject I will return to in the discussion below on pp. 52–53 after the philological commentary.

Philological Commentary

The Diagram

The labels on the diagram could be names for some set of seven, for example seven gods, demons, winds, stars, or supernatural animals, such as the groups of seven listed in *KAR* 142 or the later part of The Great Star List.[22] However, it must be stressed that the repertoire here does not match any previously known group of seven.

1. *da-mu*: As written most likely the common noun *dāmu*, 'blood,' but possibly instead the name of the god Damu written without the divine determinative as may be the case with a DN starting NIN in the label for Point 7.

2. *u_4-mu-šum*: The word which best fits the signs is *ūmussu*, 'daily' from *AHw.* 1418–20 *ūmu* A,[23] but an understanding from *AHw.* 420, *ūmu* B, 'storm (-demon),' with a meaning 'the one who is like a storm-demon' might be preferred. Cf. the discussion of the name in Point 4.

3. traces

4. *kal/lab-ba-nu*, 'The Dog-like one/The Lion-like one': From *kalbu*, 'dog', or *labbu*, 'lion'. If *kalbānu*, a parallel adverbial form is *CAD* K 67 *kalbāniš*, 'like a dog'. A plant-name *kalbānu* is already attested. *AHw.* 424 translates '*Hundsstrauch*' but the editors of *CAD* doubt any connection between the plant-name and *kalbu*, 'dog'.

5. *ha-an-šu*, 'Fifth', is an appropriate label for the fifth point on the diagram.

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22. *KAR* 142 was most recently published in B. Pongratz-Leisten, *Ina šulmi īrub* (Mainz, 1994) [= *Baghdader Forschungen* 16], 221–32. For the later part of The Great Star List see U. Koch-Westenholz, *Mesopotamian Astrology* (Copenhagen, 1995), 198–205. For groups of seven see also Šurpu VIII 6–9, Ee IV 41–48, *MCG* 219–20, *CAD* S 230–31, *sibittu*. For supernatural animals see, e.g., The Great Star List 299–304 (The two calves of Adad and two horses of the flood) and Ee IV 51–52 (the team of four of Marduk's chariot).

23. Readings u_4-mu-sum$_6$, or perhaps better -šu$_{14}$ without mimmation, are also possible.

6. RI-x HAR-ri. I remain completely puzzled by this group of signs. The sign following RI seems to be composed of two elements: a small MAŠ/BAR followed by an element with long horizontal components. I know of no sign form that offers an exact match but was most tempted by KIŠ in which case I would suggest *rikis* (construct form of *riksu*). Yet, no second word starting with HAR (e.g., *harru*, 'water channel', *hurru*, 'hole', and *murru*, 'myrrh', i.e., *rikis harri/hurri/murri*) yields a reasonable solution to the reading of the label.[24]

7. *nin-x-x*. Perhaps the beginning of a divine name starting with NIN without the determinative as may also be the case in no. 1 if one reads *da-mu* for name of the god Damu.

Bottom right corner of diagram: ⌜IM⌝: Perhaps for IM = *šāru*, 'direction', see the commentary below. This sign cannot be part of the diagram (the circles with the inscribed seven pointed star and labels) *per se* since the sign is written horizontally along the line below it, and not with its base oriented towards the center of the circles.

The Introductory Line of The Numerical Table

IM

The basic meaning of IM = *šāru* is 'wind'. The meaning 'direction', derives from the sense 'the direction from which a wind blows'.[25] One might guess that IM here somehow relates to the direction one moved around the diagram, but how this might be so is unclear. There is almost no possibility that a sign preceded IM along the left edge of the tablet. Cf. the traces of IM in the lower right corner of the square of the diagram.

ṣi-im-da-tum zi-qí-pu, 'Pairs of altitudes'

A rendering *ṣimdātu*, 'pairs' (see *CAD* Ṣ, 199, 4., pl. of *ṣimittu*) is suggested by the fact that numerals in the chart below are arranged in sets of pairs: e.g., the sums A+B = C+D in modulo 7. However, an objection may be that the word is hitherto attested with this meaning only in the Middle Babylonian and Middle Assyrian periods. Hence, the word could also be understood to be a plural of *CAD* Ṣ 196–97 *ṣimdu* A 4 , 'arrangement, regulation', and to refer in some way to the rules which governed the mathematical theory of the table and/or movement on the diagram.[26]

The next word can be best understood as a noun *ziqīpu* from *zaqāpu*, 'to erect, to point upward', and if so to be at least a homonym of *zaqīpu/ziqīpu/zaqību/ziqību*,

24. A reading *re-*⌜u_5⌝ HAR-*ri* where the first element is *re'û*, 'shepherd', seems unlikely both because it too yields nonsense and I could find no writings of *re'û* with U_5. Readings along the lines of DAL.x HAR-*ri* , RI.MAŠ SA.HAR-*ri*, RI.MAŠ BAN.HAR-*ri* seem even less promising.

25. See *CAD* $Š_2$, 136–37, *šāru* 2. In Mesopotamia, as in our world, winds are named for the direction of their origin rather than the direction in which they are blowing, i.e., a northwind blows from north to south. See *MCG*, 196–98.

26. A singular homonym *ṣimdatu*, 'royal decree, royal/temple regulation' is also attested (*CAD* Ṣ 194–96).

which has a meaning 'stake', i.e., the stakes that were used in the first millennium for impaling prisoners to death.[27] Although our context precludes this exact meaning of *zipīpu*, a noun from *zaqāpu* with a technical sense relating to vertical distance may be appropriate to CBS 1766, especially if one assumes that the diagram represents circles in a vertical position, like ferris wheels, rather than a circles in a horizontal position, like carousels. In this case, the term *zi-qí-pu* could refer to the lines drawn on the diagram connecting the various points. If so, our *ziqīpu* brings to mind the noun *ziqpu* from the same root which has the meaning 'height, altitude' as a mathematical term,[28] and refers to consecutive culminations of stars moving in a 'ferris-wheel' type motion in astronomy in respect to an observer on earth.[29] If this is what is meant by *ziqīpu* in CBS 1766, the circles on the diagram can be compared with the circle on a recently published *ziqpu*-star planisphere from Neo-Babylonian period Sippar, which has a rosette at its center. Here, consecutive risings of *ziqpu*-stars over the course of the year diagrammed on the planisphere must represent the 'ferris-wheel' type motion of the *ziqpu*-stars as they ascend, reach their zenith in the center of the sky, and then descend.[30] Further, albeit indirect evidence can be used to connect CBS 1766 with the *ziqpu*-stars and circular cosmographical drawings.

CBS 1766, The Map of The World, and the ziqpu-*stars*

The closest parallel to the geometric shape of the diagram on CBS 1766 is found in the Neo-Babylonian birds-eye-view drawing of the Earth's Surface commonly known as "The Babylonian Map of The World" (BM 92687):[31]

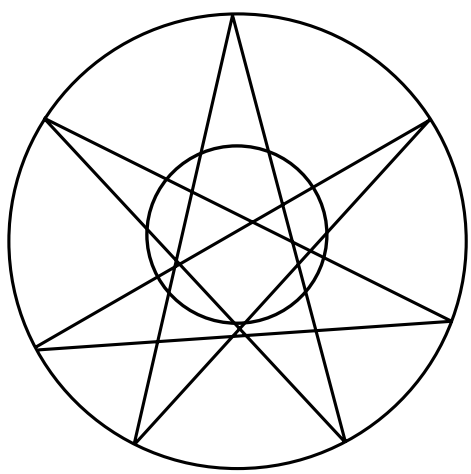

Fig. 8. CBS 1766.

27. *CAD* Z, 58.

28. *CAD* Z, 128, *ziqpu* A 3.

29. *CAD* Z, 128, *ziqpu* A 4. For the astronomical term, the '*ziqpu*-star texts', and bibliography see most recently W. Horowitz and F. N. H Al-Rawi, "Tablets from The Sippar Library IX: A *Ziqpu*-Star Planisphere," *Iraq* 63 (2001), 171.

30. Ibid., 171–79.

31. Last published by myself in *MCG*, 20–40.

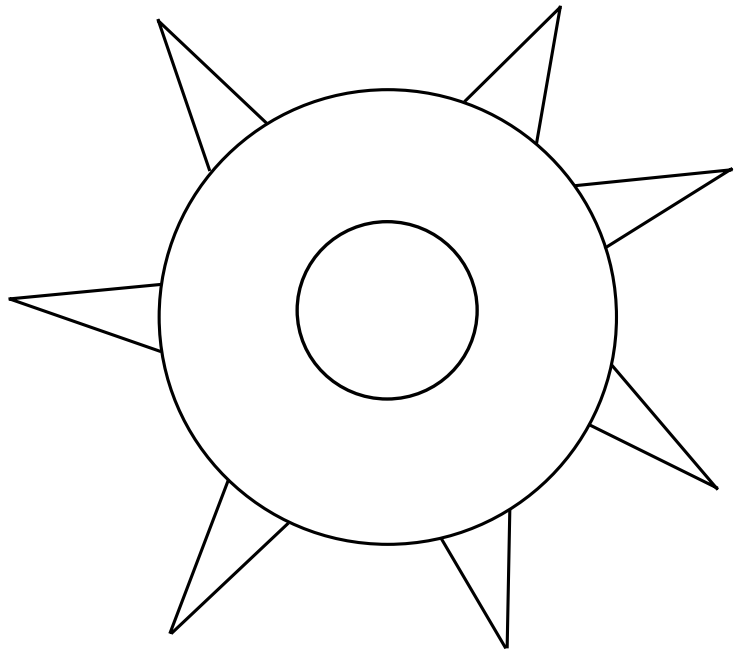

Fig. 9. The Babylonian Map of the World (sketch restored).

The map provides an almost inside-out version of the diagram on CBS 1766 with the world, as seen from above, represented by two concentric circles with triangular projections (most likely seven when complete) radiating outwards from the outer of the two circles rather than placed inside the inner of two circles as on CBS 1766. The map's inner circle represents the central continental area of the Earth's Surface where Babylon is situated; the band between the two circles represents a circumambulating cosmic ocean (*marratu*); and the triangular projections outside the circles represent distant transoceanic regions identified as *nagû*; a term which has the sense of "island," or distant region across or associated with the sea in Babylonian texts.[32] This same view of the world finds expression in the introductory line of the late-period *ziqpu*-star tablet AO 6478 which too refers to seven *nagû* and the cosmic sea:[33]

7 ⌜na-gu-ú ša-ṭir⌝-ma u ⌜ma-ṣu-ma ŠA?⌝-š[u] ⌜NU ZU-ma ša⌝ A.AB.BA ina ⌜bi-ri-ti⌝ x [. . .

AO 6478 1′

. . . inscribed with seven *nagû*, which are equal, whose? inside? no one can comprehend, and concerning the sea in between . [. . .].

32. See *MCG*, 30–32.

33. Copies of AO 6478 have been published as *TCL* 6 21 and in F. Thureau-Dangin, "Distances entre étoiles fixes d'après tablette de l'époque des Séleucides," *RA* 10 (1913), 216–17. An edition with transliteration is available in Weidner, *Handbuch* 131–40. For further bibliography see Horowitz and Al-Rawi, "Tablets from Sippara," 171, n. 2.

Thus, although "the Babylonian Map of the World" represents the horizontal situation of the geography of the Earth's Surface, rather than a ferris-wheel type motion of stars, we may have here an indirect link between circles divided into seven parts and *ziqpu*-stars. If this can be extended to CBS 1766 itself, then the diagram and numerical table could describe the motion of *ziqpu*-stars around their circle not in terms of degrees of motion, and/or time, as in the *ziqpu*-star texts, but rather in relation to seven points along their stellar circle. Such a tradition of dividing the starry sky into seven parts is suggested by a passage in *Šurpu*:

> MUL.MEŠ IM.ÙLU.LU IM.SI.SÁ IM.KUR.RA IM.MAR.TU
> IM.MEŠ si-bit-ti li-zi-qu-nim-ma
> li-paṭ-ṭi-ru ma-mit-su
>
> *Šurpu* II 165–67
>
> May the stars of the south wind, north wind, east wind, and west wind,
> the seven winds, blow upon him and
> release his oath.

Finally, still in the realm of the stars, one of two astrological diagrams found on the late-period astrological text *TCL* 6, 13 presents a geometric pattern not dissimilar to that on CBS 1766. Here four equilateral triangles are inscribed inside two concentric circles yielding 12 triangular projections between the two circles.[34] Yet, it is not clear how any of these possible connections help us understand the nature of CBS 1766, and its place in cuneiform culture.

Discussion

Above I have explained the mathematical basis of CBS 1766, offered a proposal to understand its mechanics, and finally presented a number of possible affinities between the text and Mesopotamian astronomy, astrology, and cosmography. Yet, all of the supposed affinities between CBS 1766 and the works enumerated above rest on an unproved proposal that the third word in what I took to be the introductory line of the numerical table, *ziqīpu*, refers in some way to *ziqpu*-stars. Further, even if *ziqīpu* here does indeed come from *zaqāpu,* 'to erect, to point upward', and has the general meaning 'altitudes, heights, etc.', there is not one piece of direct evidence tying our text to stars, nor to any other astronomical phenomena such as 7-day intervals in the phases of the moon,[35] or the seven ancient planets as suggested by A. Jeremias.[36] As such, Hilprecht's identification of CBS 1766 as an astronomical/astrological tablet remains unproven, and one could equally argue that our text has nothing to with astronomy, astrology, or cosmography whatsoever.

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34. For an edition of *TCL* 6, 13 see F. Rochberg-Halton, "TCL 6 13: Mixed Traditions in Late Babylonian Astrology," *ZA* 77 (1987), 207–28 with discussion of the diagram on 226–28 (drawing p. 226, fig. 2). For other cuneiform astronomical/astrological circular tablets and diagrams see Horowitz and Al-Rawi, "Tablets from Sippar," 178–79. For modulo 12 in late-Babylonian astrology see H. Hunger and D. Pingree, *Astral Sciences in Mesopotamia* (Leiden, 1999), 29–30.

35. Cf. Livingstone *MMEW* 22: 2–10 (Inamgišhuranki).

36. See above p. 37.

If not astronomical/astrological/cosmographical, a second possibility is that CBS 1766 is a mathematical work relating to movement along seven points of concentric circles on the basis of modulo 7. Yet, this too seems somewhat inadequate, despite the apparent intricate system of pairs of coordinates underlying the diagram and tables, since the mathematics and mechanics of the diagram and table cannot explain the obscure labels assigned to the points in the diagram. These labels might be best explained as nicknames of some sort, perhaps even for gaming pieces or stations on a board game, or game of chance, involving concentric wheels, rings, disks, or the like.[37] If so, one might suppose that the line above the numerical table gave basic rules, and the numerical table itself provided possible moves. Such a situation would be most applicable to modulo 7 where a move of five and a four (9 = modulo 7 : 2), would yield the same result as that of "snake-eyes"; two ones, and a move of 7 (= modulo 7: 0) would result in no change in position; perhaps the reason that the sum 7 = 0 is omitted from the mathematical tables on CBS 1766.[38] Yet, this identification too rests more on the author's fancy than on hard facts, and the author realizes that additional, perhaps better ideas about the nature of CBS 1766 and its place in cuneiform culture may be offered by others in the future.

37. A number of board games are known from Ancient Mesopotamia, the most famous being "The Royal Game of Ur," which is best known from examples from "the Royal Cemetery" and has been recently re-issued in modern form by the British Museum. For the subject of ancient Near Eastern Games see I. Finkel, *Ancient Board Games* (New York, 1998). Earlier see brief summaries by K. R. Nemet-Nejat in *Daily Life in Ancient Mesopotamia* (Westport, 1998), 165–66 (with a reference to six sided dice on p. 165), and M. Stohl, "Private Life in Ancient Mesopotamia," in J. M. Sasson, *Civilizations of the Ancient Near East* (New York, 1995), 498–99 (Entertainment); and W. Hallo, "Games in The Biblical World," *Eretz Israel* 24 (Malamat Volume; 1993), 83*–88*. Of course, games can be used for gambling or adapted for use as divination devices. See V. A. Hurowitz, "True Light on The Urim and Thummim," *JQR* 88 (1997), 272–74.

38. Six sided dice could not be used for CBS 1766 since the table includes the numeral 7.