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# ELEMENTS OF THE BABYLONIAN CONTRIBUTION TO HELLENISTIC ASTROLOGY\*

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In the scientific literature of the Hellenistic period, references to "Chaldeans" in connection with astrology and astronomy are numerous. The implications of such references, for the history of astrology, however, depend on a closer assessment of the nature and extent of the Babylonian contribution to that branch of Hellenistic science, but an assessment based on cuneiform sources. This paper undertakes such an assessment. Three elements which are demonstrably Babylonian in origin yet form basic and integral parts of Greek astrological doctrine provide the focus of discussion. They are: 1) planetary exaltations, 2) the micro-zodiac, and 3) trine aspect. The differences between the Babylonian and Greek use of these three elements are exemplary of the fact that despite the incorporation of Babylonian elements at the inception of Greek astrology, the overall character and rationale of Greek astrology remains entirely a Hellenistic Greek product.

THE CURRENT GENERAL IMPRESSION THAT ASTROLOGY originated in Babylonia may be credited to the Greeks of the Hellenistic age who often cited generic ancients, such as "Chaldeans" or "Egyptians" when some authoritative source on astrology or other esoterica was needed.<sup>1</sup> Momigliano has evaluated the references to older eastern traditions found in some Greek authors this way:

If we have to resort to a generalization about the fortunes of Oriental thought in the Hellenistic world and in its Roman prolongation, we must say that the mass of writings claiming to be translations from Oriental languages were mainly forgeries by writers in Greek. What circulated in Greek under the names of Zoroaster, Hystaspes, Thoth, and even Abraham was quite simply faked, though no doubt some of the writings contained a modicum of 'Oriental' thoughts combined with Greek ideas.<sup>2</sup>

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\* Revised and expanded version of my paper presented at the one hundred and ninety-fifth meeting of the American Oriental Society held in Ann Arbor, Michigan, April 14-17, 1985.

<sup>1</sup> The putative "debts of Greek wisdom to the East" claimed by Greek authors is reviewed in G. E. R. Lloyd, *Magic, Reason and Experience: Studies in the origins and development of Greek science* (Cambridge, 1979), p. 237f., note 39.

<sup>2</sup> A. Momigliano, "The Fault of the Greeks," in *Wisdom, Revelation and Doubt: Perspectives in the first millennium B.C.*, *Daedalus* 104 (1975), p. 17.

What is of interest for the present investigation, however, is not so much the Greeks' obtuseness to ancient Near Eastern tradition and thought, but the mere fact of their exposure to it, the results of which can be observed in the history of astrology.

Despite the general awareness of the "Orient" on the part of the Greeks from about the eighth century B.C.,<sup>3</sup> evidence for a genuine Greek knowledge of Babylonian history or culture before the Hellenistic period is exceedingly slim. But in the later Hellenistic period, an intensified Greek interest in the ancient scientific traditions of Babylonia begins to be in evidence. The connections made between "Chaldeans" and astrology may represent the continuation of what Momigliano has suggested was a new direction already apparent in the fourth century in which Greeks took a new interest in the East, for example, in Zoroaster, the Magi, or the Egyptian traditions later compiled under the fictitious authorship of Hermes Trismegistus, all of which eventually became associated in the same way with all sorts of speculation having to do with astrology.<sup>4</sup>

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<sup>3</sup> See A. Kuhrt, "Assyrian and Babylonian Traditions in Classical Authors: A Critical Synthesis," in *Mesopotamien und seine Nachbarn, Berliner Beiträge zum Vorderen Orient Bd. I Teil 2* (Berlin, 1982), pp. 539-40.

<sup>4</sup> See Momigliano, "The Fault of the Greeks," p. 16, and see also Momigliano, *Alien Wisdom: The Limits of Hellenization* (Cambridge, 1975), pp. 143-47.

But the vague attributions of occasional "theories" to "Chaldean astrologers" that may be found in a number of Hellenistic scientific works do not in and of themselves provide reliable historical sources for the determination of the origins and sources of astrology.<sup>5</sup> What must be assessed in the light of cuneiform evidence is the degree to which the Greeks understood Babylonian celestial divination as well as astronomy. The adaptation and transformation of several elements from each of these Babylonian traditions (divination and astronomy) to the new science of astrology provides the means for such an assessment.

Before discussing selected examples of some elements of Greek astrology traceable in cuneiform texts, a number of fundamental distinctions between Babylonian celestial divination and Greek horoscopic astrology should be clarified. It is only in the light of these significant differences that the parallels between the two systems may be put in proper perspective.

In Mesopotamia, the prediction of future events from celestial phenomena was obtained not on the presumption of stellar influence, but rather, celestial phenomena were regarded as signs which could indicate impending mundane events. In the technical terminology of divination, *ittu* (GISKIM) "sign" refers to the phenomenon that forms the protasis of the omen and had a neutral connotation, rather like Latin *omen*, which could mean either a foreboding or a sign of fortune.<sup>6</sup> Other words for "omen" that refer more specifically to the apodosis or prediction associated with the sign, often indicate some verbal utterance, as for example, *purussû* "(divine) decision," *qību* "prognostication," or *tēru* "(divine) order," also translated "liver omen" or "oracle." It is clear from such terminology that the meaning of a sign was held to be a communication from a divine source.<sup>7</sup> Signs indicated events in a variety of ways, mostly by means of schematic symmetries, association, and analogy. The relationship between the sign (*ittu*) and its prediction (*purussû*) had no component of causation, nor necessarily of any particular temporal relation, be it synchronistic or sequential.

Greco-Roman astrology set up an opposition between celestial and terrestrial realms, in accordance

with its underlying Aristotelian cosmology. The Babylonians, however, seem not to have had a dualistic cosmic scheme. Evidence from some of the major literary works points to a tendency to divide the cosmos into levels of heavens and earths, forming a generally symmetrical picture in which particular deities are assigned to particular levels or realms.<sup>8</sup> But generalizing statements concerning Babylonian cosmological speculation as a whole are to be avoided, and it is not at all clear if the world-picture which emerges from Babylonian mythology and literature can be assumed to apply equally well to divination. The omen texts of EAE, of course, offer no formal statement of a cosmology. But it may be argued on the basis of the omen literature, that nature was not considered as disassociated from the gods, and that the theory of celestial divination therefore presupposed no notion of a mechanistic cosmos.

On the other hand, the cosmological underpinnings of Greek astrology are clear, and derive from the Aristotelian scheme in which the eight celestial spheres belonging to the seven planets and the fixed stars were set above and around the earth. The sublunar realm, consisting of earth and the four elements, was placed at the center of the whole structure. The celestial bodies were considered eternal and perfect, as indicated by their circular motion, and were set in opposition to the earth, which by contrast was subject to corruption and change, and produced only the rectilinear motions of the elements (earth, air, fire, and water), thereby adding weight to the argument for the dualistic opposition between earth and heaven. The motion of the ether, as explained by Ptolemy, was held to directly affect the sublunar elements, and in this way he physically grounds the claims for direct stellar influence. The mechanistic universe underlying astrology can be seen as a logical extension of the apparent influence of the position of the sun in the zodiac on the seasons and weather on earth,<sup>9</sup> where

<sup>5</sup> O. Neugebauer, *History of Ancient Mathematical Astronomy* (Berlin and New York, 1975), pp. 607–10.

<sup>6</sup> Lewis and Short, *A Latin Dictionary*, s.v.

<sup>7</sup> The nature and history of Mesopotamian divination techniques are discussed in the section "The Arts of the Diviner," in A. L. Oppenheim, *Ancient Mesopotamia* (Chicago and London, 1977<sup>2</sup>), pp. 206–27.

<sup>8</sup> The Sumero-Babylonian cosmology is described by Lambert in "The Cosmology of Sumer and Babylon," in *Ancient Cosmologies*, ed., C. Blacker and M. Loewe (London, 1975), pp. 42–62, where primarily its theological aspect is discussed. Lambert derives his evidence for the plurality of heavens and earths from the major literary works Enūma Eliš, Atra-Ḥasis, Gilgamesh, *bīt mēseri*, and two late scholastic compilations, for which see *KAR* 307:30–38 and *Afo* 19 110 (= AO 8196) iv 20–22. See also my remarks in "Stellar Distances in Early Babylonian Astronomy," *JNES* 42 (1983), 213f.

<sup>9</sup> Ptolemy, *Tetrabiblos* 1.2 (ed., F. E. Robbins, *Loeb Classical Library*, 1980 reprinted).

the mechanism of causation can be explained in terms of Aristotelian physics, not the will of gods. Astrology's claim that the motions of the celestial bodies were not only indications but actual (efficient) causes of change on earth shows astrology to be antithetical to divination, which depends solely on the will of the deity to provide signs.<sup>10</sup>

The fact that the theories, methods, and underlying philosophical rationale of Hellenistic astrology do not resemble those of Babylonian celestial omens raises the question as to the nature and extent of Babylonian influence. Certainly, the many references to the Chaldeans by Greek and Roman writers suggest that the impetus for Greek developments in astrology derived from Babylonia, but the cuneiform evidence to support such a statement, at least for the celestial omens as a source, is strictly limited. At present, a small number of substantive connections between Hellenistic astrology and Babylonian celestial omens are known, suggesting that in a number of instances, Babylonian celestial omen schemata did directly influence the shaping of Greek astrological doctrine.<sup>11</sup> As far as the late Babylonian astrological material (such as nativity omens, astrological procedure texts, and horoscopes) is concerned, additional elements can be pointed to which carried over into Greek horoscopic astrology. Systematic study of this late corpus will have much to contribute to the problems under discussion here.<sup>12</sup>

We may now turn to some specific elements which may be cited in defense of the claim for the Greek dependence on Babylonian traditions. I will discuss three examples, two of which are attested in some form in pre-Seleucid celestial omen texts (examples 1 and 3) and one which stems from texts dating after the fifth century B.C. (example 2). These are 1) the planetary hypsomata, or exaltations, 2) the dodekatomia, literally, the "twelfth parts," or micro-zodiac, and 3) trine aspect. These three examples will illustrate with particular cogency the origin of certain elements of Hellenistic astrology in Babylonian tradi-

tion. An important point of qualification however, must be noted, that within the total frame of Greek astrology, these elements of demonstrable Babylonian origin constitute only a relatively small part. The elaborate theoretical structure of Greek astrology as a whole, whose complete outlines are known to us primarily through late treatises (2nd century A.D. onward), remains a Hellenistic Greek product.

### 1) Planetary Exaltations (*hypsomata*)

In the planetary omens of Enūma Anu Enlil, as well as in late Babylonian astrological texts, a term is found which seems to represent a particularly propitious appearance for a planet. The term *bīt* (É)/KI (*ašar*)<sup>13</sup> *niširti*, means literally "house" or "place of the secret." Its mantic character is suggested by the designation of the planets as *bēlē niširtu ša Elamti* (*Akkadi*) "lords of the secret of GN,"<sup>14</sup> where perhaps the "secret" is the knowledge of omens guarded by the deities, just as the *niširtu* of a given scribal discipline is the secret lore possessed by its scholars.<sup>15</sup>

The term *bīt* or *ašar niširti* also suggests that the "place of secret" be interpreted as a position in the sky that a planet can reach (*kašādu*) or not. The *ašar niširti* of Venus (but not of the other planets) occurs in the planetary omens of Enūma Anu Enlil:

[DIŠ MU]L *Dil-bat* KI *ni-šir-ti* KUR-ud SIG<sub>5</sub> GAR MUL.UR.GU.LA KUR-*ma ana* 2/3 DANNA *i-šaq-qam-ma* "If Venus reaches the place of the *niširtu*, there will be good luck; (comm.) it reaches Leo, it is 2/3 *bēru* high."<sup>16</sup>

<sup>13</sup> As the term KI *niširti* varies freely with É *niširti*, the equivalence of *ašru* and *bītu* given in the synonym list Malku (Malku I 259, also Explicit Malku II 108, both cited CAD s.v. *ašru* A lexical section) seems to favor the reading *ašar niširti* for the spelling with KI. However, since KI, in the meaning "region, location in the sky" (CAD *qaqqaru* A mng. 5b), is common in astronomical usage, one may question whether the reading *qaqqar niširti* is not also possible. Weidner established the identification of Akkadian KI *niširti* and Greek hypsoma in "Beiträge zur Erklärung der astronomischen Keilschrifttexte," *OLZ* 1913, 208–10, and "Babylonische Hypsomatabilder," *OLZ* 1919, 10–16. See also Ungnad, *AFO* 14 (1942), p. 257f., Schaumberger, *Sternkunde und Sterndienst in Babel*, 3. Ergänzungsheft (Münster, 1907), p. 311f., and Schnabel, *ZA* 35 (1924), p. 311.

<sup>14</sup> *STC* 2 pl. 69:25f., cited CAD sub *niširtu* mng. 1a.

<sup>15</sup> See the references quoted in CAD sub *niširtu* mng. 1e1', 2', and 3'.

<sup>16</sup> *ACh* Supp. 34:27 (= K. 3708:3).

<sup>10</sup> For an incisive discussion of the philosophical postulates of astrology and the sceptical attitudes that developed toward these ideas in later Greek philosophy, see A. A. Long, "Astrology: Arguments pro and contra," in *Science and Speculation: Studies in Hellenistic theory and practice*, eds., J. Barnes et al. (Cambridge, 1982), pp. 165–92.

<sup>11</sup> See my "New Evidence for the History of Astrology," *JNES* 43 (1984), 115–40.

<sup>12</sup> See A. Sachs, "Babylonian Horoscopes," *JCS* 6 (1952), 49–74; see also my "TCL 6 13: Mixed Traditions in Late Babylonian Astrology," *ZA* (1987) (forthcoming).

[DIŠ MU]L *Dil-bat* KI *ni-šir-ti la* KUR-ud-ma u it-bal  
KUR ut-ta[h-*has*] “If Venus does not reach the place of  
the *niširtu* but disappears, the land will grieve.”<sup>17</sup>

[DIŠ MUL *Dil-bat ina* IM.MAR].TU IGI-ma KI *ni-šir-ti*  
KUR-ma u TÙM [DINGIR.ME]Š KI KUR.MAR.KI SILIM.MA  
T[UK.MEŠ] “If Venus is seen in the west and reaches  
the place of the *niširtu* and disappears, the gods will  
be reconciled with Amurru.”<sup>18</sup>

[DIŠ MUL *Dil-bat ina* IM.MAR].TU IGI-ma KI *ni-šir-ti*  
*la* KUR-ma u T[ÙM DINGIR.ME]Š KI KUR.MAR.KI *i-šab-*  
*bu-s[u]* “If Venus is seen in the west and does not  
reach the place of the *niširtu* and disappears, the gods  
will be angry with Amurru.”<sup>19</sup> The apodoses indicate  
clearly enough that reaching the *ašar niširti* was favor-  
able, while not reaching it was unfavorable.

When Esarhaddon called attention to the auspicious omens that appeared at the beginning of his reign, the *ašar niširti* of both Venus and Jupiter were mentioned.<sup>20</sup> The constellations (not yet zodiacal signs) within which the *ašar niširti* of these planets were thought to be located, however, are not identified. In the passage concerning Jupiter, however, the month in which Jupiter reached the *ašar niširti* is given, thereby fixing the corresponding longitude of the planet. Without repeating the variants (for which, see Borger Esarh. p. 2), the Venus passage is the following:

i	39	[M]UL. <i>Dilbat nabât</i> <i>kakkabâni</i>	Venus, brilliant one of (all) stars
	40	<i>ina amurri</i>	appeared in the west
ii	1	[ <i>ina harrân šû</i> ]t <sup>d</sup> <i>Ea</i>	in the path of Ea.
	2	<i>innamirma ša kunnu</i>	in order to appease
	3	<i>mâte [ša] sulum</i>	the gods she reached
	4	<i>ilâniša niširtu</i>	the hypsoma and (then)
	5	<i>ikšdamma itbal</i>	disappeared.
	6	MUL <i>Šalbatânu pâris</i>	Mars, who decides
	7	<i>pursê mât Amurri</i>	decision concerning Amurru
	8	<i>ina harrân šû</i> t <sup>d</sup> <i>Ea</i>	shown brightly in the path of Ea.
	9	<i>ib'il sindašu</i>	He showed his charter,
	10	[š]a <i>danân malki u mâtišu</i>	for the strengthening of king and his country as his sign.
	11	<i>ukallim iskimbuš</i>	...
	23	<i>ittât dumqi</i>	When I saw these
	24	<i>šuâtina âmurma</i>	favorable omens,

<sup>17</sup> *ACh Supp.* 34:28, see *CAD* s.v. *naḥāsu* B.

<sup>18</sup> *ACh Supp.* 34:29ff. (= K. 3708:10–11).

<sup>19</sup> *ACh Supp.* 34:31–32 (= K. 3708:12–13).

<sup>20</sup> Borger *Esarh.* 2 ii 4; 17:39.

25 *libbu arḥuṣma*

I took courage in my  
heart

26 *iṭṭib kabatti*

and my feeling was  
confident.

The astronomical data for Venus obtained from Esarhaddon's inscription (Ass. A 8 39–ii 8) is<sup>21</sup> 1) Venus appeared in the west in the path of Ea: On 29 Jan. -679, Venus had its first visibility in the west in the constellation GU.LA (Aquarius), assigned to the path of Ea in MUL.APIN. 2) Venus reached the *niširtu*: One cannot obtain the longitude of Venus at the *ašar niširti* directly from the Esarhaddon text, since no date is given. But if one assumes, on the basis of the later Greek tradition, that the *niširtu* of Venus is located within Pisces (Greek tradition places the hypsoma of Venus in 27° Pisces), then Venus reached the *ašar niširti* (some location in Pisces) on 8 March -679. 3) Venus disappears: Last visibility of Venus in the west was on 5 Oct. -679, with a longitude of 204° (in the constellation Scorpius<sup>22</sup>). 4) Mars is in the path of Ea: In -679, Mars is at 237° (end of Sagittarius<sup>23</sup>) on 29 Jan. (at the time of Venus' first visibility) and at 325° (in Pisces<sup>24</sup>) on 5 Oct (at the time of Venus' last visibility). Therefore, during the entire time referred to in the inscription, Mars remained in the path of Ea (both Sagittarius and Pisces are assigned to the Ea stars in MUL.APIN<sup>25</sup>).

The Jupiter passage (Borger Esarh. 17 11 Episode 13:A, B, and C, p. 17):

34 MUL.SAG.ME.GAR  
*muttanbiṭu*

Jupiter, the one who  
shines brightly,

35 *pâris purussî mat Akkadi*  
*ina Simâni*

the decider of decision  
for Akkad, in Simânu

36 *uqarribma ašar Šamaš*

approached the place  
where

<sup>21</sup> Data given here follows Hunger-Dvorak, *Ephemeriden von Sonne, Mond und hellen Planeten von -1000 bis -601* (Vienna, 1981) and Parpola, *LAS II Appendix C* “Helical Phenomena of Mercury, Venus, Mars and Jupiter.”

<sup>22</sup> For boundaries of the ecliptical constellations appropriate for the Sargonic period, see Parpola, *LAS II Appendix B*, p. 385. The constellation Scorpius had boundaries 210°–224°.

<sup>23</sup> Boundaries of Sagittarius, according to Parpola (see above note 22) are 230°–251°.

<sup>24</sup> Boundaries of Pisces (see above note 22) are 313°–353°.

<sup>25</sup> See E. Reiner and D. Pingree, *Enūma Anu Enlil, Tablets 50–51* (= BPO 2), Table IV, p. 8.

37	<i>uštappā izziz ba'il</i>	the sun appears, <sup>26</sup> stood and was bright.
38	...	...
39	<i>ina ITI Pet-bābi ašar niširti</i>	In the month Pet-bābi he reached the hypsoma
40	<i>ikšudamma ina šubtišu</i>	and establish his position.
41	<i>ikūn</i>	(there).

The astronomical data for Jupiter is: 1) Jupiter approached the area of the sun in Simānu (30 May/29 June): The sun had longitudes 57°.93 -86°.52 (i.e., end of Taurus to end of Gemini) during Simānu of -679, while Jupiter occupied longitudes 67°.98 -74°.68 (within Gemini). 2) In Pet-bābi Jupiter reached the hypsoma. The Elamite month name Pet-bābi is identified, according to the most recent study,<sup>27</sup> with Simānu. A number of exemplars of the month lists, however, equate Pet-bābi with Du'ūzu.<sup>28</sup> If the Esarhaddon passage (11.39-41) which states that the *niširtu* was reached in Pet-bābi refers to Simānu, then Jupiter occupies the same region of the ecliptic as the sun, as stated in lines 35-37, which places Jupiter in the constellation Gemini (between 67°.98 and 74°.68). If, on the other hand, one permits the equation Pet-bābi = Du'ūzu, Jupiter would then have moved to longitudes 74°.68 -81°.08, leaving it between the constellation Gemini (Gemini's boundaries are 54°-75°) and Cancer (87°-92°). In either case, perfect agreement with Greek tradition is not obtained, i.e., to place Jupiter in Cancer (Cancer 15°), although the second alternative, in which Jupiter reached the hypsoma one month after its first visibility, fits slightly better. The value of the data in the Esarhaddon inscription does not lie solely in whether the NA locations of the *bīt niširti* agree with later Greek tradition, since, as we have seen, the ecliptical position of the *bīt niširti* of Venus cannot be determined at all, and for Jupiter, we have been able only to show two possible positions, one in the constellation Gemini, the other "between" Gemini and Cancer, as determined by the NA boundaries of these stars. The text does, however, confirm the meaning of the planetary omen when located in the *bīt niširti* as particularly favorable.

<sup>26</sup> Read Št-stem of (w)apū "to become visible," not šapū, as suggested in Borger *Esarh.*, p. 17 note to line 37.

<sup>27</sup> See E. Reiner, "Inscription from a Royal Elamite Tomb," *AfO* 24 (1973), 97ff., "Excursus: The names of the months in Elam," especially p. 100 Table 3.

<sup>28</sup> For example, Sp. II 381 (Pinches, *PSBA* 34 [1912] 293) [ITU *Pi-ii*]-KÁ = ITU ŠU.NUMUN.NA, f. also *AHw* s.v. *pītu* I.

The locations of the *bīt niširti* of the planets are enumerated in a later astrological/theological commentary of the first century.<sup>29</sup> The language and orthography of the text are late (use of MÚL as determinative; aleph written at the end of plural verb forms, e.g., *ú-kal-lim-u*<sup>3</sup> [1.27] and *in-nam-mar-ru-u*<sup>3</sup> [rev. 6]). Landsberger considered the original composition to be not much older than the Arsacid copy.<sup>30</sup> Lines 24-32 are relevant for the positions assigned to the *bīt niširti*, and represent the section for Du'ūzu.

#### Transliteration

24	<i>ina ITI.ŠU šá né-pi-šú šá sa-kap</i>	LÚ.KÚR <i>ina</i> E.KI <i>i-pu-uš</i>
25	<i>ina šà-bi šá</i> <sup>d</sup> <i>Šal-bat-a-nu u</i> <sup>d</sup> 30	EN.MEŠ <i>ni-šir-tu</i> <sub>4</sub> <i>šá</i> KUR.NIM.MA.KI
26	NIM DIB.MEŠ <sup>d</sup> SAG.ME.GAR <i>u</i> <sup>d</sup> UTU	EN.MEŠ <i>ni-šir-tu</i> <sub>4</sub> <i>šá</i> KUR.URI.KI
27	<sup>r</sup> <i>šū-pul</i> <sup>1</sup> DIB.MEŠ GISKIM.[MEŠ?] <i>šá nu-uk-ku-ri</i>	BAL E.KI <i>u</i> <sup>r</sup> <i>ú-kal-lim-u</i> <sup>r</sup>
28	NAM.BÚR.BI <i>ina</i> URU <i>i-te-pu-uš</i>	KI <i>ni-šir-tu</i> <sub>4</sub> <i>šá</i> <sup>d</sup> 30
29	MÚL.ŠU.GI <i>u</i> MÚL.MÚL MÚL <i>šá</i> [KUR?].NIM.MA.[KI]	
30	KI <i>ni-šir-tu</i> <sub>4</sub> <i>šá</i> <sup>d</sup> UTU MÚL.LÚ.ĤUN.GÁ AN-e [ . . . ]	
31	KI <i>ni-šir-tu</i> <sub>4</sub> <i>šá</i> <sup>d</sup> Šal-bat-a-nu MÚL.Ù[Z . . . ]	
32	KI <i>ni-šir-tu</i> <sub>4</sub> <i>šá</i> <sup>d</sup> SAG.ME.GAR MÚL.[ . . . ]	

#### Translation

24	in Du'ūzu (the month in ) which he performed in Babylon the ritual that drives back the enemy,
25	by means (of the fact) that Mars and the moon, lords of the secret of Elam
26	passed above the ecliptic (and) Jupiter and the sun, lords of the secret of Akkad
27	passed below, they (the planets) showed (a) sign(s) of a change in the reign of Babylon.
28	He has performed the ritual in the city. The place of secret of the moon (is)
29	Perseus and Taurus, star of Elam.
30	The place of secret of the sun (is) Aries of the sky(?) [ . . . ]
31	The place of secret of Mars (is) [Capricorn? . . . ]
32	The place of secret of Jupiter (is) [ . . . ]

<sup>29</sup> See King, *STC* I, p. 212; II pl. 69; translation and philological commentary by Landsberger, "Ein astralmythologischer Kommentar aus der Spätzeit babylonischer Gelehrsamkeit," *AfK* I (1923), pp. 69-82, and see Weidner, *OLZ* 1913, 208f.

<sup>30</sup> *AfK* I (1923), p. 69.

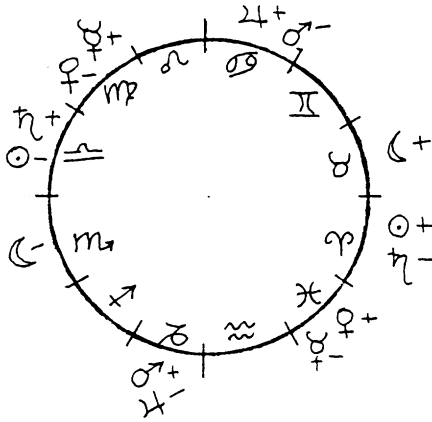


Fig. 1 Exaltations (+) and Depressions (-)

Indirect evidence from a Seleucid Babylonian planetary text (LBAT 1591:5-7)<sup>31</sup> supports the identification of the Babylonian *būt niširti* in the same zodiacal signs as the Greek hypsomata. The text lists the signs in which the planets rise heliacally, and in each case there is agreement with the Greek hypsomata: Jupiter rises heliacally in Cancer; Venus in Pisces; Mars in Virgo; Saturn in Libra<sup>32</sup>; Mars in Capricorn.

In a third century "Festkalender" dated to year 65 of Antiochus (-246), the *būt niširti* of Mercury is also assigned to Virgo: (K.3753:5) <sup>d</sup>GU<sub>4</sub>.UD *ina qaqqar* MÚL.AB.SÍN *ú-šar-ši-du é ni-šir-ti-šú* "Mercury established position in the region of Virgo, his place of secret."<sup>33</sup> Additional references to planetary hypsomata can be obtained from the (mostly 3rd-2nd century) Babylonian horoscopes which sometimes report that the child was born "in the *būt niširti*" of a particular planet. The following summarizes the evidence from the horoscopes: 1) BM 47721:4', dated -250, *ina é ni-šir-tu<sub>4</sub> šá* GU<sub>4</sub>.UD *a-lid* "he was born in the house of secret of Mercury."<sup>34</sup> We know from the

planetary data of this horoscope that Mercury was not visible on this date: GU<sub>4</sub>.UD *šá* [ŠÚ-ú NU] I[G<sub>1</sub>] "Mercury, which had set, was not visible."<sup>35</sup> Mercury was therefore in the same sign as the sun, but the position of the sun is not only no longer preserved on the tablet, but not anywhere near Virgo on the date of this birth (Month II.8).<sup>36</sup> 2) BM 47642 r. 6, dated -223, *ina é ni-šir-tú šá* MÚL.BABBAR [(x)] [a]-*lid* "in the house of secret of Jupiter [(maybe nothing missing)] (the child) was born." This horoscope reports that the child was born "in the *būt niširti* of Jupiter (= Cancer)," but, according to the planetary data given, none of the planets were located in Cancer on the date of the birth. The position of Jupiter given in the horoscope was Scorpius (obv. 6-7 MÚL.BABBAR *u GENNA ina GÍR.TAB*). 3) LBAT \*1466 r. 3-4, dated -201, *ina é ni-šir-tu<sub>4</sub> šá «šá»* MÚL.BABBAR LÚ.TUR x x x "the child [was born?] in the house of secret of Jupiter." When the position of Jupiter is given in obv. 6, Jupiter is said to be *ina TIL A* "at the end of Leo," which does not concur with our identification of the hypsomata of Jupiter in Cancer. The horoscope is datable to 4 Feb. -201 (109 S.E.9 Addaru). On this date, Jupiter was in 26° Virgo (a position possible for the hypsomata of Mercury). Again, we find a discrepancy between the statement that the child was born in the hypsomata of a particular planet and the given location of that planet in the zodiac. 4) BM 36943 r. 2-3, date uncertain, *ina é ni-šir-tu<sub>4</sub> šá Dil-bat* LÚ.TUR *a-lid*. The position given for Venus (obv. 7) appears to be Scorpius, rather than the expected Pisces (ZIB.ME) if Venus was supposed to be in the *būt niširti*. Jupiter, however, was located in Pisces (obv. 6 MÚL.BABBAR *ina ZIB.ME*). 5) BM 32376:4', date uncertain, *ina é ni-šir-tu<sub>4</sub> . . .*, is simply too fragmentary to warrant further comment. Our understanding of the Babylonian *būt niširti* and its application in late Babylonian astrology is unfortunately still quite poor, as the evidence from the horoscopes raises more questions than it answers.

According to Greek astrology, the exaltations are located in the zodiacal signs in which the planets have their most potent influence (see fig. 1). The meaning of the hypsomata in the Greek view, presupposes waxing and waning influence: the hypsomata is the point of greatest influence and the opposite point, 180° from

<sup>31</sup> F. X. Kugler, *Sternkunde und Sterndienst in Babel* (Münster, 1907), vol. 1, pp. 39-41 and pl. 2 Nr. 2.

<sup>32</sup> The writing ZIB is an abbreviation of Zibanitu (Libra), not of ZIB.ME (*zibbātu*, Pisces). See Weidner, *OLZ* 1919, 15, where he cites the text without comment on the reading of ZIB as Libra.

<sup>33</sup> Weidner, *Gestirn-Darstellungen auf babylonischen Ton-tafeln* (Vienna, 1967), p. 11 (lines 1-6) and photo on pl. 11/12, and a complete transliteration in G. McEwan, *Priest and Temple in Hellenistic Babylonia* (Freiburger Altorientalische Studien Bd. 4, Wiesbaden, 1981), p. 174-76.

<sup>34</sup> Unpublished horoscopes are referred to with the kind permission of the Trustees of the British museum. I am

preparing a publication of these texts, based on material gathered by A. Sachs.

<sup>35</sup> BM 47721:2'.

<sup>36</sup> Longitude of the sun on -250 II.8 (= May 6) was Taurus 11°, using Houlden and Stephenson, *A Supplement to the Tuckerman Tables* (Philadelphia, 1986).

Table 1  
Exaltations of the planets

planet	Babylonian <i>bīt niširti</i>	Greek hypsoma
Sun	Aries	Aries 19°
Moon	Taurus	Taurus 3°
Saturn	Libra	Libra 21°
Jupiter	Cancer	Cancer 15°
Mars	Capricorn	Capricorn 28°
Venus	Pisces/Leo	Pisces 27°
Mercury	Virgo	Virgo 15°

the hypsoma, called the tapeinoma or “dejection,” is the point of weakest influence.<sup>37</sup> In the second century A.D., Ptolemy (Tetr. I.19) offered a rationale for the hypsoma and tapeinoma which may be paraphrased as follows: When the sun is in Aries (at the vernal equinox) it makes its transition to the northern and higher arc of the ecliptic and in Libra (autumnal equinox) passes into the southern and lower arc. As the length of the day begins to increase at Aries, so does the power of the sun’s basic nature to produce heat. Aries, therefore is the sign of the sun’s exaltation. For the opposite reasons, Libra is assigned as its depression. Similarly, Jupiter was thought to produce the beneficial north wind and reaches farthest north when it is in Cancer, so Cancer is the hypsoma of Jupiter.

In the fourth century, Firmicus Maternus refers to a Babylonian tradition of planetary exaltations: “The Babylonians called the signs in which the planets are exalted their ‘houses’ . . .”<sup>38</sup> The terminology echoes the *bīt niširti*, although perhaps there was confusion with the Greek “houses” of the planets, a doctrine not yet found in cuneiform material.<sup>39</sup> When the Babylonian evidence for planetary *bīt niširti* is collected (see table 1), a direct correspondence between Babylonian *bīt niširti* and Greek hypsomata is evident in five cases, for the sun, moon, Jupiter, Mars, and Mercury, as Weidner has shown.<sup>40</sup> The original reasons for

<sup>37</sup> See A. Bouché-Leclercq, *L’Astrologie grecque* (Paris, 1899), pp. 192–99.

<sup>38</sup> Firmicus Maternus, *Mathesis* 2, 3, 6, ed. W. Kroll, F. Skutsch, and K. Ziegler, 2 vols. (Leipzig, 1897–1913).

<sup>39</sup> D. Pingree, *The Yavanajātaka of Sphujidhvaja* (Cambridge, Massachusetts and London, England, 1978), vol. II, p. 208 sub 32–33.

<sup>40</sup> Weidner, *OLZ* 1913, 210; *OLZ* 1919, 10–16; Schaumberger, *Sternkunde und Sterndienst in Babel*, 3. Ergänzungsheft (Münster, 1935), p. 311f.

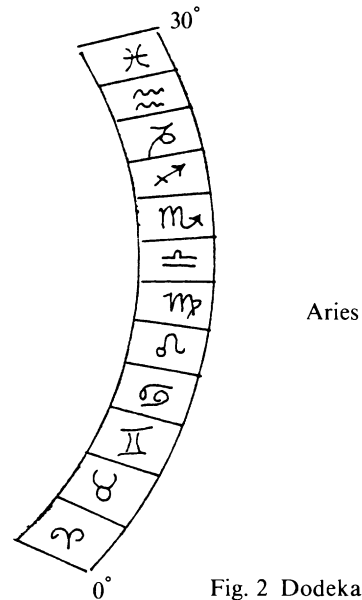


Fig. 2 Dodekatemoria

choosing the specific positions of the planets’ *bīt niširti*, or hypsomata, remain obscure, but the hypsomata of the sun in Aries and the moon in Taurus, suggest some underlying calendaric rationale, since these “planets” occupy these signs at the beginning of the year. The differences between the (Babylonian) *bīt niširti* and the (Greek) hypsoma consist in the fact that 1) the Babylonians designated the general regions (*qaqqaru*) of a particular constellation as the location of the *bīt niširti*, since the origin of the doctrine precedes the invention of the zodiac, whereas the Greek hypsoma was a single point of longitude, specified in degrees within a zodiacal sign (see table 1), and 2) the concept of the *bīt niširti* is to be understood with reference to planetary omens as distinct from hypsomata, which refer to astrological (planetary) influence.

## 2) *Micro-zodiac (dodekatemoria)*

Dodekatemoria represent  $2 \frac{1}{2}^\circ$  segments of the zodiac. These are the result of a subdivision of each zodiacal sign into twelve equal parts, each given the name of a zodiacal sign, beginning with the name of the sign being divided and continuing throughout the other eleven sequentially (see fig. 2). Each zodiacal sign therefore contained a micro-zodiac within its own  $30^\circ$  span. Textual evidence for the micro-zodiac does not antedate the sixth century, since it obviously is dependent upon the existence of the zodiac. To



Table 2  
BRM 4 19:1-4 schema

$l_1$	$l_1$	$l_2$	Dodekatemorion		Translation	
1) I 10	I 10	V 10	UR.A šá HUN ZI	☉ 10°	☊ 10°	☊ of ☉ is the distance
2) I 24	I 24	XI 12	GU šá HUN ZI	☉ 24°	≈ 12°	≈ of ☉ is the distance
3) II 10	II 10	VI 10	KI.DIL.DIL šá MÚL.MÚL ZI	♃ 10°	♄ 10°	♄ of ♃ is the distance
4) II 21	II 21	XI 3	GU šá MÚL.MÚL ZI	♃ 21°	≈ 3°	≈ of ♃ is the distance

date, the earliest textual evidence for the zodiac is found in the two extant horoscopes from the fifth century.<sup>41</sup> Extant "micro-zodiac texts" are all Seleucid.

The Akkadian term for the parts of the micro-zodiac is *zittu* (𒌶.A.LA) meaning "share" or "part," but within this context understood to be 1/12th part: 𒌶.A.LA šá MÚL "the (1/12th) part of the zodiacal sign" (*TCL* 6 14:15)<sup>42</sup> The use of dodekatemoria in Babylonian astrological texts is relatively well attested. A graphic representation may be seen in a number of Seleucid tablets from Uruk, referred to above.<sup>43</sup> In these tablets, for example, an omen concerning a lunar eclipse in Virgo is followed by the iconographic representation of some elements relevant to the omen and below the drawing is a register divided into twelve parts in which the names of the zodiacal signs have been inscribed.<sup>44</sup> The twelve parts begin with Virgo on the left and end with Leo on the far right. Each part is therefore 1/12th of the zodiacal sign Virgo, and the parts are further associated with a city, some plants, trees, and stones, written in corresponding registers below those of the dodekatemoria. Some of the same associations of celestial with terrestrial elements can be found in Hellenistic Greek astrology, as well as in later celestial magic.<sup>45</sup>

In other sources in which the connection between astrology and magic is documented, incantations

(inim.inim.ma) are assigned to the twelve *zittu* of the zodiac.<sup>46</sup> As shown by Neugebauer and Sachs,<sup>47</sup> these two texts provide further evidence that the Greek method of computing dodekatemoria was based on the method reflected in the cuneiform material. The method may be formulated in the following way: Given a position in the zodiac (longitude [ $l_1$ ]), expressed in degrees (n) of a zodiacal sign (z), a second position in the zodiac ( $l_2$ ) may be obtained by multiplying the degrees n by 12 and adding the result to the first longitude:  $l_2 = 12n + n^\circ$  of z. This may be seen in operation in *BRM* 4 19 simply by examining the first few lines, which are tabulated in table 2. In line 1, the position given is I 10 (= Aries 10°). Aries 10° is associated with Leo 10°, which is called "Leo of Aries." Following the abovementioned method of computing dodekatemoria, we multiply 10° (the degrees of Aries) by 12 and travel that many degrees (120°) along the zodiac from Aries to the sign Leo. Adding n degrees of the zodiacal sign, here 10, we reach Leo 10°, as given in *BRM* 4 19:1. the same procedure yields the second position from the first position in the remainder of the text. The term ZI which occurs frequently in Seleucid astronomical texts in the meaning 'travelled distance,' or "velocity,"<sup>48</sup> here refers to the fact that a distance has been travelled from position 1 to position 2.

Another group, comprised of three late Babylonian astronomical texts, refers to the subdivision of zodiacal signs into twelfths. These texts are concerned with the problem of the "rising times" of the 1/12th parts of zodiacal signs.<sup>49</sup> Rising times (anaphora)

<sup>41</sup> A. Sachs, "Babylonian Horoscopes," *JCS* 6 (1952), 54f. (AB 251, -409), and J. M. Durand, *Textes babyloniens d'époque recente* (Paris, 1981), pl. 52 (AO 17649, -410/409).

<sup>42</sup> See A. Sachs, "Babylonian Horoscopes," *JCS* 6 (1952), 65. nativity omen text.

<sup>43</sup> Weidner, *Gestirn-Darstellungen*, pls. 1, 6, 8 and photo on pls. 9-10.

<sup>44</sup> See Weidner, *Gestirn-Darstellungen*, p. 29.

<sup>45</sup> Pingree, "Some of the Sources of the Ghāyat al-Ḥakīm," *Journal of the Warburg and Courtauld Institutes* 43 (1980), 5. See also Weidner, *Gestirn-Darstellung*, p. 17 note 40 and p. 49, where a passage is cited from "Hermes Trismegistus" in which each of the three decans of each zodiacal sign is assigned a stone and a plant.

<sup>46</sup> A. Ungnad, "Besprechungskunst und Astrologie in Babylonien," *AfO* 14 (1944), 251-84.

<sup>47</sup> Neugebauer and Sachs, "The 'Dodekatemoria' in Babylonian Astrology," *AfO* 16 (1952-53), 65-66.

<sup>48</sup> *ACT* glossary, sub ZI, also *AfO* 16 (1952-53) 65.

<sup>49</sup> Schaumberger, "Anaphora und Aufgangskalender in neuen Zippu-Texten," *ZA* 51 (1955), 237-51, for A 3427 (238f.) and *LBAT* 1499 (= SpII 202+) (p. 245f.). To these I have added a third source, *LBAT* 1503; publication of all three forthcoming by the author.

relate to the problem of the variation of daylight length. In early Babylonian astronomy this was perceived as a calendaric matter, but later, in the Hellenistic period, daylight length was treated as an astronomical matter, i.e., as a function of the sun's position in the zodiac. A "rising time" is the time required for a 30-segment of the ecliptic to rise above the horizon. Because both horizon and ecliptic are great circles on the celestial sphere, at any moment one-half of the ecliptic or six zodiacal signs is above the horizon and other half is below. Therefore, during the interval of sunrise to sunset, 180° of the ecliptic will have crossed the eastern horizon.

The length of a day for a given position of the sun in the ecliptic can then be expressed as the sum of the rising times of the 180° of the ecliptic beginning with the sun's position (i.e., the rising time of the semi-circle of the ecliptic from  $\lambda_{\odot}$  to  $\lambda_{\odot} + 180^\circ$ ), that crossed the horizon from sunrise to sunset. It follows that if the time of rising of each individual zodiacal sign is known, the length of day for any day of the year is also known ( $C[\text{daylight length}] = \alpha_1 + \alpha_2 + \alpha_3 + \dots + \alpha_6$ ). Neugebauer showed that this theory underlies "col. C" of the Seleucid astronomical ephemerides. The actual values of the rising times, however, are not attested in the *ACT* material.<sup>50</sup>

The new "rising times" texts present a schema for the rising times not of zodiacal signs, but of twelfths of zodiacal signs, i.e., of dodekatemoria, or 2 1/2° segments of the ecliptic. The reference to dodekatemoria is explicit: 𐤂.𐤏.𐤏.𐤀 *reš-tú šá* MÚL.GÍR TAB MÚL.GÍR.TAB *šá* MÚL.GÍR.TAB "first portion (dodekatemoria) of Scorpius (is called) Scorpius of Scorpius." (A 3427:2)<sup>51</sup> These texts give the values of the rising times of the dodekatemoria in UŠ (degrees). The time intervals of the rising of dodekatemoria are, however, not expressed directly, but in terms of meridian crossings by *ziqpu* stars. The *ziqpu* stars are defined as a group of stars that may be seen to pass directly or nearly directly overhead, which is to say, they "culminate," or reach the meridian.<sup>52</sup> The distance covered by a *ziqpu* star in crossing the meridian is termed ZI (analogous to the use of ZI in *BRM* 4 19). It is reasonable to express horizon crossing (rising times) of zodiacal signs in terms of meridian crossings of

*ziqpu* stars because there is a fixed relation between ecliptical longitudes (degrees on the ecliptic) and right ascension (degrees on the equator), produced by the angle at which the ecliptic is inclined to the equator. The manner in which the texts give rising times of the dodekatemoria in terms of meridian crossings in fact represents a pre-trigonometric attempt to solve the problem of the relationship between longitude (degrees on the ecliptic) and right ascension (degrees on the equator).<sup>53</sup> The values of rising times of all twelve dodekatemoria are provided for a number of zodiacal signs (expressed as ZI PAP n UŠ "the distance a total (of) n degrees"). These totals represent the value of the rising time of an entire zodiacal sign. In a few cases, the totals (PAP n UŠ) concur with the values of rising times (of "System A") which occur in Greek sources.<sup>54</sup> The three cuneiform texts concerned with the rising of dodekatemoria are the only extant Babylonian sources in which actual values of rising times are given. In *ACT* tables and procedure texts the same values can be demonstrated to underlie the schema for variation in daylight length, as Neugebauer has shown,<sup>55</sup> but the values themselves are not stated there.

In Greek astrology the dodekatemoria had the function of further modifying the influence of a planet, its influence being determined not only by its location in a particular sign of the zodiac, but also by its location in the sign of the dodekatemoria.<sup>56</sup> Further developments in Hellenistic astrology resulted in the subdivision of zodiacal signs into additional portions, such as 1/3's of signs (10° segments), called decans after the Egyptian usage.<sup>57</sup> In this way, the 36 decans of Egyptian star-clocks were brought into a fixed relation with the 12 Babylonian zodiacal signs. A

<sup>50</sup> Neugebauer, "On some Astronomical Papyri and Related Problems of Ancient Geography," *TAPS* 32 (1942), 253–55; also idem, "The Rising Times in Babylonian Astronomy," *JCS* 7 (1953), 100–102.

<sup>51</sup> See *ZA* 51, 238.

<sup>52</sup> Schaumberger, "Die Ziqpu-Gestirne nach neuen Keilschrifttexten," *ZA* 50 (1952), 214–29.

<sup>53</sup> See Neugebauer, *TAPS* 32 (1942), p. 262. Note that "trigonometry" was not unknown to Babylonian mathematics, see Neugebauer *MKT* 1, p. 180 for some trigonometric topics in OB math ("chord and arrows"). But as Neugebauer points out (*A History of Ancient Mathematical Astronomy* p. 772 note 2), no trigonometry has yet been found in Babylonia in the solution of astronomical problems.

<sup>54</sup> See the references in Neugebauer *TAPS* 32 (1942), p. 257 note 37 [Vettius Valens I, 7 ed. Kroll (Berlin, 1908), p. 23], and p. 258 note 45 [Firmicus Maternus II, 11 ed. Kroll-Skutsch (Leipzig, 1907), p. 53f.].

<sup>55</sup> *JCS* 7 (1953), 100–102, also Neugebauer, *A History of Ancient Mathematical Astronomy*, pp. 368f.

<sup>56</sup> Bouché-Leclercq, *L'Astrologie grecque*, p. 299–304, and sources on p. 299 note 1 and 216 note 3.

<sup>57</sup> Neugebauer and van Hoesen, *Greek Horoscopes* (Philadelphia, 1959), p. 5f.

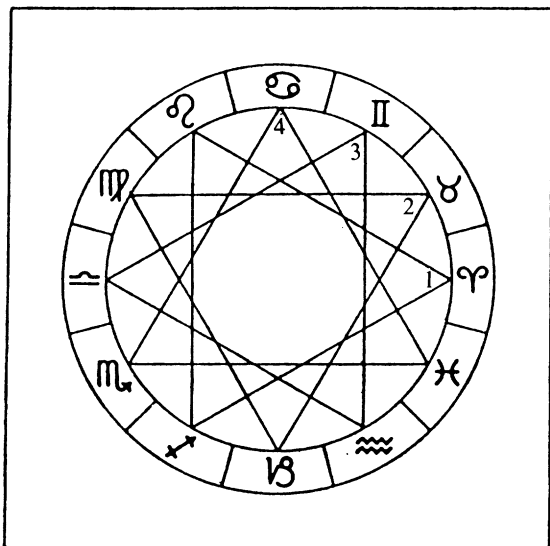


Fig. 3 Trine aspect

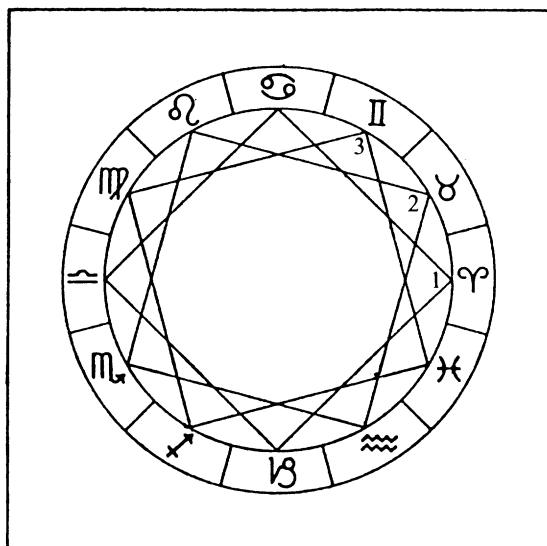


Fig. 4 Quartile aspect

great many more subdivision of signs are found in Indian astrology. A total of 19 different portions of varying orders of magnitude, from halves of signs ( $15^\circ$  segments) to the so-called *liptika* ( $1/60^\circ$  segment, from Greek *lepton* "minute") of which there were 1800 per zodiacal sign.<sup>58</sup>

### 3) Trine Aspect

As shown in figs. 3–6, geometrical relationships between signs of the zodiac were established by grouping signs in twos, threes, fours, and sixes. By means of geometrical figures—diameter, triangle, square, hexagon—planets located in certain signs could be said to be related by the aspects termed opposition, trine, quartile, or sextile. Aspect functioned as one of the chief theories for interpreting relative influence of celestial bodies in the zodiac and for determining the situation of the heavens as a whole at the moment of birth.<sup>59</sup>

Only the trine aspect has appeared thus far in cuneiform sources. The evidence for this is found in omen protases with the following data: the position in the zodiac of the eclipsed moon, and in the same sign also the planets Venus and Jupiter, grouped with the positions of Saturn and Mars in two other zodiacal

signs. In each case, the three signs stand in relation to each other precisely in the manner of the Greek trine.<sup>60</sup> Indeed, the groups of three related in this particular way are identified as "Chaldean" by Geminus.<sup>61</sup> The Babylonian grouping of three signs seems to be the result simply of the schematic arrangement of twelve elements (here zodiacal signs) into four groups of three elements each, rather than the result of some geometrical or spatial relation. The Babylonian version shares with the Greek counterpart the form of a schematic arrangement of twelve zodiacal signs in four groups of three where the first group contains signs 1, 5, and 9 (where 1 = Aries) in the series, the second group contains signs 2, 6, and 10, and so on. But the schematic arrangement is found applied to the twelve months of the schematic (solar) year in a seventh century celestial omen commentary.<sup>62</sup> Clearly, the Babylonian version does not depend on a geometrical relationship, indeed was not exclusively applied to the zodiac, but seems rather to have been based on purely schematic correspondences and associations between elements in a series of twelve.

<sup>58</sup> See my "New Evidence for the History of Astrology," *JNES* 43 (1984), 123–25 and 134–36.

<sup>61</sup> Geminus, *Isagoge*, ch. 2, 5–11, see ed., Manitius, *Gemini Elementa Astronomiae* (Leipzig, 1898).

<sup>62</sup> *ACh Supp.* 2 118 rev. 2–3, see *JNES* 43 (1984), 128 note 50.

<sup>58</sup> Pingree, *Yavanajātaka* II, p. 208.

<sup>59</sup> Bouché-Leclercq, *L'Astrologie grecque*, pp. 165–79.

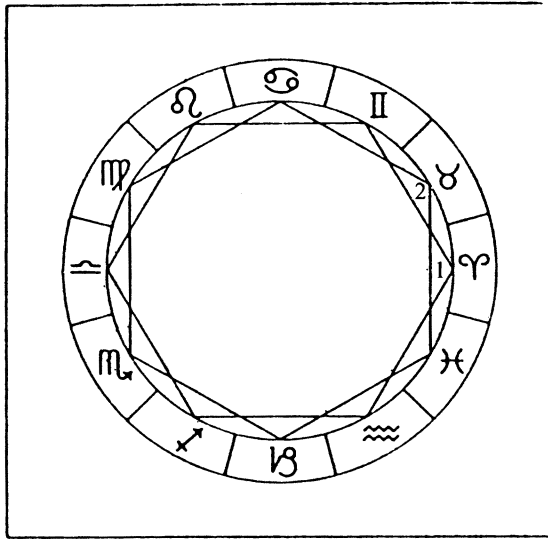


Fig. 5 Sextile aspect

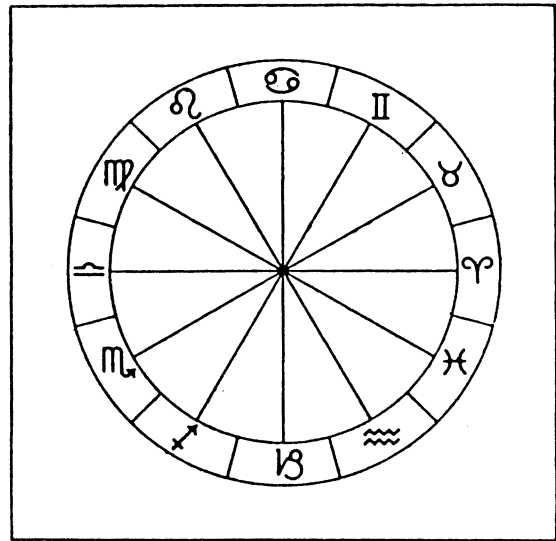


Fig. 6 Opposition

A final piece of evidence can be adduced, which unfortunately obscures rather than illuminates the picture of how the Babylonians might have viewed "trine aspect." In a late planetary astrological text, *TCL* 6 13, a diagram, formally identical to that of the Greek trine, is drawn. The diagram shows a circle into which four triangles are inscribed. Around this circle (rev. of tablet) twelve points are designated with the names of the twelve months. In addition, names of planets (Jupiter is omitted) are inscribed beside each month name, in an apparently irregular sequence. The planets do not assume configuration in accordance with trine aspect, although the geometrical design is in fact identical to the representation of the triplicities in Greek astrology. With no clues from the accompanying text, the significance of the diagram remains obscure.<sup>63</sup>

As indicated by the examples discussed above, the evidence for substantive Babylonian influence on the astrology of the Greeks derives largely from the later periods of cuneiform tradition, i.e., the Achaemenid and Seleucid periods. The most fundamental tool for Greek astrology, the zodiac, is of Babylonian origin in the fifth century.<sup>64</sup> Not only is the Babylonian origin

of the zodiac assured on the basis of cuneiform documentation, but, as Neugebauer has demonstrated from the deviation ( $\approx 5^\circ$ ) between modern longitudes and those given in Greek horoscopes, the astrological literature of the hellenistic and Roman period continued to use the norming point of the Babylonian zodiac (Aries  $8^\circ$  or  $10^\circ$ ).<sup>65</sup> In two cases, the exaltations (hypsomata) and the forerunners of trine aspect, textual evidence traces the origins of these doctrines to the seventh century and even earlier traditions in the celestial omens of Enūma Anu Enlil. The Babylonian elements which can be pinpointed as direct contributions to Greek astrology, specifically, the planetary exaltations, the dodekatemoria, and trine aspect, represent significant features of the later system.

We may conclude that the claim often made since the Hellenistic period for the Babylonian origin of

<sup>63</sup> See my forthcoming, "*TCL* 6 13; Mixed Traditions in Late Babylonian Astrology."

<sup>64</sup> See note 41 above, and add the following references for Achaemenid period astronomical texts in which a zodiac

of 12 fixed-length ( $30^\circ$ ) signs is attested (note that these texts compute phenomena dated to the Achaemenid Period, but the tablets were written at a date sometime later): Neugebauer-Sachs, "Some Atypical Astronomical Cuneiform Texts," *JCS* 21 (1967), 197f. ( $\approx -430$ ); Aaboe-Sahcs, "Two Lunar Texts of the Achaemenid Period from Babylon," *Centaurus* 14 (1969), p. 3f. ( $\approx -400$ ), and 17 Text B obv. col. v (with heading lu-maš, records phenomena for -474).

<sup>65</sup> See Neugebauer, *A History of Ancient Mathematical Astronomy*, p. 594; also Neugebauer-van Hoesen, *Greek Horoscopes*, p. 180ff.

astrology is admissible, but with important qualifications. This claim can be supported in the most general way for the original impetus for prognostication on the basis of astronomical phenomena, but cuneiform evidence confirms the transmission of only a very few "doctrines" of Babylonian celestial omen astrology to the Greeks. The evidence for the means of transmission remains exceedingly limited; indeed, the burden of proof rests on the attested parallels. The differences between the perception and understanding of celestial phenomena between the two cultures cannot be overestimated. The Babylonians regarded celestial phenomena as potential signs (as they did all natural phenomena) in accordance with a view of nature as inseparable from the divine. Adherents of Greek astrology, on the other hand, saw the celestial phenomena as causes in accordance with a view that physical events had determinate natural causes, dissociated from gods (often, however, retaining the belief in the possibility of divine intervention).<sup>66</sup> For

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<sup>66</sup> This is true of "hard" astrology, which, however, was the extreme deterministic position on a continuum from

this reason, in the later astrology, elements common to both systems took on radically different character and function. Despite the presence of "Babylonian" elements, the philosophical rationale of Greek astrology and its doctrine of interpretation are all Hellenistic Greek in origin and explainable only in terms of Greek tradition itself.<sup>67</sup>

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those who regarded the heavenly bodies as mere signs of human affairs (Plotinus, see A. A. Long [above note 10], p. 187f.) to the hard determinists and astral fatalists. My point is not meant to over-generalize about Greek astrological thought, but to contrast with ancient Mesopotamia, the view reflected in varying degrees in Greek astrology, of nature as separable from divine action. See the discussion of nature and cause in G. E. R. Lloyd, *Magic, Reason and Experience*, pp. 49-58.

<sup>67</sup> This view is in agreement with that expressed by Neugebauer in *A History of Ancient Mathematical Astronomy*, p. 613; see also Neugebauer, *The Exact Sciences in Antiquity* (New York, 1969), p. 170.