THE HEAVENLY WRITING

In antiquity, the expertise of the Babylonians in matters of the heavens was legendary, and the roots of both western astronomy and astrology are traceable in cuneiform tablets going back to the second and first millennia B.C. *The Heavenly Writing* discusses Babylonian celestial divination, horoscopy, and astronomy, the differentiations and interconnections within them, and their place in Mesopotamian intellectual culture. Focusing chiefly on celestial divination and horoscopes, it traces the emergence of personal astrology from the tradition of celestial divination and the way astronomical methods were employed for horoscopes. It further takes up the historiographical and philosophical issue of the nature of these Mesopotamian "celestial sciences" by examining elements traditionally of concern to the philosophy of science (empiricism, prediction, and theory) in relation to the Babylonian material without sacrificing the ancient methods, goals, and interests to a modern image of science.

This book will be of particular interest to those concerned with the early history of science and the problems introduced by modern distinctions among science, magic, and religion for the study and understanding of ancient cultures.

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THE HEAVENLY WRITING

DIVINATION, HOROSCOPY, AND ASTRONOMY IN MESOPOTAMIAN CULTURE

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For my parents,

my children Jacob and Gemma,

my husband Perce,

and in memory of Paul

It is the privilege of antiquity to mingle divine things with human.

Livy, *History of Rome,* Bk 1, 7

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PREFACE

Already more than 100 years since their decipherment and almost 50 years since their general availability in translation, the continued obscurity of Babylonian sources within the general history of science, as compared, for example, with those of ancient Greece, reflects a persistent historiography of science, influenced by a particular classification of knowledge and its implicit criteria. Although the argument for the legitimacy of Babylonian astronomy for the history of science has frequently been in terms of the degree to which it directly contributed to the European tradition, the classification and nature of Babylonian astronomy as "science" apart from its position in the patrimony of modern exact sciences still warrants discussion.

Largely through the work of Otto Neugebauer, efforts to reconstruct the history of science in ancient Mesopotamia have concentrated on the exact sciences. Neugebauer's focus on the relation between mathematics and astronomy, especially on the internal mathematical structures that distinguish the Late Babylonian astronomical texts, determined the tenor of research in Babylonian science for much of the twentieth century. His commitment to the recovery and detailed analysis of the Babylonian ephemerides stemmed from the belief that only specialization produces sound results. Indeed, the recovery of the contents of Babylonian mathematical astronomy and the subsequent work on this material by others, both before him (J. Epping and F. X. Kugler) and after (A. J. Sachs, A. Aaboe, B. L. van der Waerden, P. Huber, J. P. Britton, L. Brack-Bernsen, and N. M. Swerdlow), as well as the progress made in the study of what is sometimes referred to as the nonmathematical Babylonian astronomy by A. J. Sachs, H. Hunger, and D. Pingree, prove critical for our understanding of other aspects of Babylonian celestial inquiry, especially celestial divination and its relationship to astronomy.

Whether or how to differentiate between "astrology" and "astronomy" is strictly a matter of convenience when describing the content of a text from the cuneiform corpus of celestial science. There are no "native" Akkadian counterparts to the terms astrology (*astrologia*) or astronomy (*astronomia*). Even the distinction between these terms as applied from Late Antiquity through the Middle Ages varied from one author to another and did not necessarily imply a difference in status such as we make between science and magic. For the present purposes, then, if a text contains forecasts of mundane events it is "astrological"; otherwise it is "astronomical." I apply these terms strictly for descriptive convenience, without further implication that such a native classification existed, much less any of its connotations. There is a further potential terminological problem in applying "astrology," with its associations to Hellenistic Greek theories of stellar influence and fatalism, to the Babylonian material, which does not share a common cosmological or methodological basis with Greek astrology. But, I would argue, the term astrology may be used as a general rubric for Mesopotamian astral and genethlialogical omens as well as for the Babylonian horoscopes, without conflating these with later forms of Greek astrology, some of which in fact are the legacy of ancient Mesopotamian tradition.

Early in the twentieth century, within the confines of assyriology, sources for Babylonian "astrology," more properly celestial divination, claimed the attention, most notably, of C. Virolleaud and E. Weidner, whose work still provides a solid foundation for incorporation of these sources into a broader picture of science in the ancient Near East. Obviously the big picture cannot be restored without a systematic corpus. Editions of the primary texts still need to be completed, but the past decade has seen the publication of a great many celestial divinatory and otherwise astronomical texts. Research in the area of Babylonian celestial and other divinations, as well as a variety of classifications of magic, can only further our understanding of Babylonian science as conceived and practiced in ancient Mesopotamian culture and represented by an interrelated set of texts. In much the same way as historians of the Scientific Revolution now recognize the continuation of the tradition of natural magic and the significance of the religious background of Renaissance science, students of Babylonian science acknowledge the continuation of the traditions of divination and magic throughout the late period of the mathematical astronomical texts and are beginning to take account of the relationships among these diverse text types.

This book began with a desire to come to terms with the nature of science as a cultural phenomenon in ancient Mesopotamia. The core of Mesopotamian science has been traditionally identified in the corpus of mathematical astronomy along with its closely related materials, the so-called astronomical diaries and other nontabular astronomical texts (often designated as nonmathematical astronomy in the literature). With respect to the entire span of extant cuneiform texts, these sources are situated for the most part in the second half of the first millennium B.C., or roughly from 600 B.C. to the Common Era. This Late Babylonian astronomy represents one of, if not "the," principal body of sources for the history of the exact sciences in ancient Mesopotamia. Indeed, the chapters on Mesopotamia in Neugebauer's widely read *Exact Sciences in Antiquity* deal precisely with this corpus, as does Book II of his *History of Ancient Mathematical Astronomy*. These astronomical cuneiform texts, including the predictive and tabular as well as the observational and nontabular, were, however, products of a particular intellectual tradition that encompassed other astral sciences, such as celestial divination, personal horoscopy, and astral magic.

Sources for these other astral sciences have a history that reaches back to the second millennium B.C. and belong to an already highly diversified and formal scribal tradition, well known from Sumero–Akkadian lexicography, legal and economic, liturgical, and literary texts. The bulk of the surviving evidence of this earlier tradition in celestial science, in fact, consists not of astronomy but of celestial divination. An assessment of the character of celestial sciences in Mesopotamia must not only include this important body of sources, but also must take account of the persistent authority of the omen tradition as evidenced by the continued copying of these texts throughout the period of Late Babylonian astronomy. Despite obvious methodological differences among the text genres of Mesopotamian celestial science, close connections between the disparate parts of that scribal tradition argue forcibly against imposing any ideological separation between the texts considered to represent the "exact science" of astronomy on one hand and the divinatory or astrological forms of interest in the heavens on the other, as though these stemmed from two altogether different schools of thought.

This poses a question, now very much on the minds of historians of science, as to the implications of classifying sources such as the cuneiform corpus of celestial inquiry, or other similar premodern corpora, as "science." The reconstruction of the early history of science once suffered as a result of

circumscribing astrology and magic as "superstition" or, at best, "pseudo-science," and accordingly distorted early science in an effort to see a modern image of science in ancient sources. Although no longer accepted, that position was prevalent in studies in the history of science written over the course of the first half of the twentieth century, at a time when philosophers of science were keen to develop criteria by means of which science could be defined in an ideal ahistorical sense. As far as ancient Near Eastern science is concerned, an exposition of the interaction between "astronomy" and "astrology," which sees not only the distinctions but also the interconnections among the methods, goals, and basic content of these parts of Mesopotamian celestial science, can help to redress this old and in some ways lingering historiographical problem directly.

If we are to take account of the culture of ancient Mesopotamian science, we need to explore the ideological background for celestial divination and its related textual sources, including astronomy, which was rooted in an acceptance of divine influence in the world, not only the world of humankind, but of physical (natural) phenomena as well. The sources do not recognize a problem with reconciling knowledge of perceptible physical facts with beliefs about the participation of the divine in the phenomenal world. That ancient Mesopotamian scribes deemed the knowledge of heavenly phenomena and of the meanings of these phenomena as portents in some sense "sacred" does not diminish the relevance of their texts for the history of science. I have therefore opted not to avoid the use of the word "science" for the diverse products of Mesopotamian intellectual culture. If the material under study, to an ancient scribe, belonged to one coherent, albeit multifaceted, discipline, to a modern interpreter, the same body of evidence may be viewed within a variety of classifications of knowledge, namely, science, magic, or even, in some basic sense, religion. The demarcations between these intellectual and spiritual pursuits, by means of which we attempt to know and classify the ancient Mesopotamian tradition in our own terms, are exceedingly difficult to draw. Such demarcations carry implicit stakes as well, that of the identification of the origins of science being, perhaps, the highest, given the value our culture places on the "epistemic authority" of science.

This book is in no way a summary or a survey of the astronomical or astrological content of cuneiform astronomical and celestial divination texts. Such is available in Volume 44 of the Handbuch der Orientalistik, *Astral Sciences in Mesopotamia* (1999) of H. Hunger and D. Pingree. My interest in Babylonian astronomy is not to explicate its content in order to place it as an episode in the narrative history of astronomy. Nor is my

interest in Babylonian horoscopy to establish it as continuous with the later history of astrology. Such goals have been set and achieved already in the secondary literature on the subject. The primary goal of this study is to locate and define interconnections among the various and diverse parts of the Mesopotamian scribal traditions of celestial science, that is, celestial divination in the form of omens, personal astrology in the form of horoscopes, as well as some parts of the astronomical text corpus. The presentation of evidence is therefore selective rather than comprehensive.

I do not mean in the process of this inquiry to obscure the real and important distinctions also found throughout these sources, distinctions that led the ancient scribes to create divisions in text genres in accordance with method or subject matter. Such distinctions along the lines of content or method, however, are not viewed here as contradicting the central thesis that continuities in thought and objective, discernible in certain celestial scientific text genres, help us to reconstruct a cultural background for the activities of scribes engaged in the study of the heavens. Of particular importance is the location of the Babylonian horoscopes in relation both to celestial divination texts as well as to astronomical texts. By an examination of the extent to which elements of earlier divination and contemporaneous astronomical traditions are present in the content as well as the objectives of Babylonian horoscopes, a number of connections can be found there.

Secondarily, I wish to consider the place of Babylonian celestial inquiry, particularly with respect to celestial divination and horoscopy, within the history of science in a broader context. The cuneiform mathematical astronomical corpus, taken in isolation, is readily classifiable as scientific for its quantitative and predictive character as well as its firm empirical foundations. However, although the mathematical astronomical sources form a well-defined domain of knowledge and practice, they may be seen to come within the range of activities of a class of scribes whose interests also included celestial divination and horoscopy. If these diverse parts of Babylonian celestial inquiry, that is, astronomy, celestial divination, and horoscopes, indeed constituted branches of a single composite celestial science, how are we to understand those parts (celestial divination and horoscopes) that traditionally have been less readily classifiable as science? I do not claim that celestial divination can be classified as science in the same way as astronomy. At the same time, a classification of Babylonian celestial divination and horoscopy as sciences can be made in a more substantive way than simply by association with Late Babylonian astronomy or in terms of their status as ancestral to western astronomy and astrology.

In this work, the interest is less in tracing a historical development of astronomy from celestial divination, and more in the diverse intellectual occupations of the scribes who produced the cuneiform corpus in which astronomical subjects are central. By means of this perspective, the historical reconstruction that once derived "science," in the form of legitimate astronomy, from primitive lunar, planetary, and stellar omens in accordance with a religion-(or magic-)to-science scheme is seen to be untenable. Accordingly, science, hence the possibility of a scientific culture, is not viewed as emerging from a magical–religious culture, but as fully integrated with it. In the face of the cuneiform evidence, the dichotomy between such hypothetical cultures is artificial and ahistorical.

The first two chapters are stage setting in nature. Chapter 1 investigates and chronicles the early history of the reception of Babylonian celestial science, particularly the astronomical texts, into the history of science in general. This is of interest both for the light (or perhaps shade is the better word here) cast on the history of our understanding of science's past, and as a starting point for redressing the issues raised. Ideological obstacles to the reception and full integration of Babylonian celestial divinatory, astronomical, and astrological texts within the history of science are traced and then reconsidered in Chapter 7 in light of the evidence presented throughout this study, as well as more recent discussion among historians of science as to the classification of premodern sciences. To place celestial divination in its broader intellectual context, Chapter 2 surveys the omen corpora within which celestial omen texts must be viewed. In this way, the "astrological" part of Babylonian scholarly divination is not taken uncritically as a class of texts more suited to classification as science than other groups of noncelestial omens. Chapter 3 introduces our central evidence, which is the class of so-called horoscope texts. Chapters 4 and 5 examine the connections, both philological and ideological, between horoscopes and other sources for celestial inquiry, namely celestial omens and astronomical texts. An attempt is made to reconstruct the Mesopotamian conception of the role of the divine in celestial divination, by examining the evidence for the diviners' understanding of the relations between the gods, the heavenly phenomena, and human society. To recognize the central place of the divine in the belief and practice of celestial and other forms of divination, however, does not promote a classification of this material as part of "religion" rather than as "science." It only further demonstrates the inapplicability of a division between science and religion in this historical context. Chapter 6 focuses on the scribes who produced these text corpora, in particular, their activities within the institutions that supported them,

that is, the palace and the temple. I consider also the nature of knowledge in the scribal repertoire of texts and the relationships between the professional celestial science experts and those of other areas of scholarship. Finally, Chapter 7 reopens some of the chief issues in the investigation of the nature of science, for example, empiricism, prediction, and theory, in the light of ancient Mesopotamian evidence, in particular, astronomical texts, omens (celestial and otherwise), and horoscopes. The chief motivating historical problem of this chapter is how best to justify classification of ancient Mesopotamian scribal traditions of celestial inquiry as science. The exploration of this problem requires some reflection on the interpretation of another culture's systems of thought and belief, and the applicability of the categories available with which to classify them, especially with respect to science and scientific thought. My objective, though, is not to attempt to recapture the meaning of science "in Babylonian terms," either as a relativistic response to outmoded criticisms that there was no science in the ancient Near East, or as an alternative to the focus on the exact sciences as the chief contribution of Mesopotamia to the history of science. In fact, there are no Babylonian terms for science, so an investigation of their "science" is, strictly speaking, an exercise in anachronism. The dangers of anachronism are of course distortion and misrepresentation of historical ideas and practices. But we come to historical material from a distant vantage point, and with analytical categories that may or may not apply to the subject of interest. As long as the goal is, in this case, to make the cuneiform texts concerning celestial inquiry intelligible, the use of non-Mesopotamian categories to analyze these texts can be productive. I am also not concerned with "how true" or "how good" Mesopotamian science was. Here, the problem of demarcating cultural boundaries of science will be of a different kind from the oft-played demarcation game whose object is to separate real science from pseudoscience by means of epistemological or methodological criteria derived from modern construals of science. Some of these criteria, such as empiricism as a foundation of knowledge, theory as a result of the study of phenomena, or prediction as an aim, will still figure prominently as I consider possible ways of analyzing the cuneiform corpus of celestial divination and astronomy. At no point am I interested in establishing whether any of the cuneiform astronomical or astrological sources consist in a Babylonian "science" in any sense other than our own. But rather than condemn the very question of "how is cuneiform celestial inquiry classifiable as science" as unintelligible within the context of ancient Mesopotamian cultural values, I maintain its continuing interest and value for the history of science, because finally,

the question is not how "they" thought about science, but how we do. Indeed, cuneiform texts of divinatory, astrological, and astronomical content belong to the history of science not because the Babylonians thought of these intellectual inquiries as "science," but because, in assessing the nature and practice of their activities, we can reasonably place Mesopotamian divination, astrology, and astronomy in a larger context that is meaningful within and for the history of science.

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ABBREVIATIONS

A	tablets in the Oriental Institute, University of Chicago
AAT	Craig, *Astrological–Astronomical Texts*
ABCD	Rochberg-Halton, *Aspects of Babylonian Celestial Divination*
ABL	Harper, *Assyrian and Babylonian Letters*
ABRT	Craig, *Assyrian and Babylonian Religious Texts*
ACh	Virolleaud, *L'astrologie chaldéenne*
ACT	Neugebauer, *Astronomical Cuneiform Texts*
AfO	*Archiv für Orientforschung*
AMT	Thompson, *Assyrian Medical Texts*
AnOr	*Analecta Orientalia*
AOAT	Alter Orient und Altes Testament
ArOr	*Archiv Orientalní*
Bagh.Mitt.	*Baghdader Mitteilungen*
BBSt	King, *Babylonian Boundary Stones*
BH	Rochberg, *Babylonian Horoscopes*
BiOr	*Bibliotheca Orientalis*
BM	tablets in the British Museum
BMS	King, *Babylonian Magic and Sorcery*
BPO	Reiner and Pingree, *Babylonian Planetary Omens*
BRM	Clay, *Babylonian Records in the Library of J. Pierpont Morgan*
CAD	*The Assyrian Dictionary* of the Oriental Institute of the University of Chicago
CH	Code of Hammurabi
CRRAI	*Compte rendu, rencontre assyriologique internationale*

CT	*Cuneiform Texts from Babylonian Tablets in the British Museum*
EnEl	*Enūma eliš*
HAMA	Neugebauer, *A History of Ancient Mathematical Astronomy*
HUCA	*Hebrew Union College Annual*
Hunger–Pingree, *MUL.APIN*	Hunger and Pingree, *MUL.APIN: An Astronomical Compendium in Cuneiform*
Hunger–Pingree, *Astral Sciences*	Hunger and Pingree, *Astral Sciences in Mesopotamia*
JAOS	*Journal of the American Oriental Society*
JCS	*Journal of Cuneiform Studies*
JHA	*Journal for History of Astronomy*
JHS	*Journal of Hellenic Studies*
JNES	*Journal of Near Eastern Studies*
KAR	Ebeling, *Keilschrifttexte aus Assur religiösen Inhalts*
KUB	Keilschrifturkunden aus Boghazköi
LAS	Parpola, *Letters from Assyrian Scholars to the Kings Esarhaddon and Aššurbanipal, Parts I–II*
LBAT	Sachs, *Late Babylonian Astronomical and Related Texts*
LKA	Ebeling, *Literarische Keilschrifttexte aus Assur*
MAOG	*Mitteilungen der Altorientalischen Gesellschaft*
MARI	*Mari: Annales de recherches interdisciplinaires*
MDOG	*Mitteilungen der Deutschen Orient-Gesellschaft*
MNB	tablets in the Louvre Museum
MSL	Landsberger, *Materialien zum sumerischen Lexikon*
NABU	*Nouvelles assyriologiques brèves et utilitaires*
NBC	tablets in the Babylonian Collection, Yale University Library
ND	tablets in the Iraq Museum, Baghdad
OECT	*Oxford Editions of Cuneiform Texts*
OIP	Oriental Institute Publications
PAPS	*Proceedings of the American Philosophical Society*
P. Oxy.	Grenfell, Hunt, et al., *The Oxyrhynchus Papyri*
RA	*Revue d'assyriologie*
SAA	State Archives of Assyria

Sachs–Hunger, *Diaries*	Sachs and Hunger, *Astronomical Diaries and Related Texts from Babylonia*
SSB	Kugler, *Sternkunde und Sterndienst in Babel*
TCL	*Textes cunéiformes du Louvre*
UCP	University of California Publications in Semitic Philology
UET	Ur Excavations, Texts
UM	tablets in the University Museum, University of Pennsylvania
VAB	Vorderasiatische Bibliothek
VAT	tablets in the Vorderasiatisches Museum, Berlin
WO	*Welt des Orients*
WVDOG	*Wissenschaftliche Veröffentlichungen der Deutschen Orient-Gesellschaft*
YOS	Yale Oriental Series, Babylonian Texts
ZA	*Zeitschrift für Assyriologie*

CHRONOLOGICAL REFERENCES AND AKKADIAN AND ASTRONOMICAL TERMINOLOGY

CHRONOLOGY OF ANCIENT MESOPOTAMIAN HISTORICAL PERIODS

Babylonian astronomical texts and horoscopes give dates using the Seleucid Era (abbreviated S.E.). In this earliest civil era, the regnal years of Seleucus I, who conquered Babylon in 312 B.C., continued to be counted after his death. The relation between years S.E. and years in the Christian Era are S.E. 0 = −311/−310 (=312/311 B.C.). Therefore S.E. 50 = −261/−260 (=262/261 B.C.) and S.E. 400 = A.D. 89/90.

Also used (after 141 B.C.) is the era instituted with the Parthian conquest of Mesopotamia, the Arsacid Era (abbreviated A.E.), named for regnal years of Arsaces I (250–248 B.C.). The equivalence among A.E., S.E., and years in the Julian calendar is A.E. 0 = S.E. 64 = −247/−246 (=248/247 B.C.).

The convention of representing Julian years B.C./A.D. is followed here, but note their equivalence to negative A.D. years, that is, year $(n + 1)$ B.C. $= -n$.

CHRONOLOGY OF MESOPOTAMIAN HISTORY AND THE PERIODIZATION OF CUNEIFORM TABLETS

Early Dynastic, 3000–2334 B.C.
Akkadian, 2334–2154 B.C.
Ur III, 2112–2004 B.C.
Old Babylonian, ca. 2000–1600 B.C. (includes Isin and Larsa dynasties)
Middle Babylonian (Kassite dynasty), ca. 1600–1100 B.C.
Neo-Babylonian (Chaldean dynasty), 625–539 B.C.
Old Assyrian, ca. 2000–1350 B.C.
Middle Assyrian, ca. 1350–1000 B.C.

Neo-Assyrian, ca. 1000–612 B.C.
Persian (Achaemenid dynasty), 539–331 B.C.
Hellenistic (Seleucid dynasty), 312 B.C.–A.D. 64
Parthian (Arsacid dynasty), 250 B.C.–A.D. 224
Sasanian, A.D. 224–A.D. 651

See C. B. F. Walker, "Mesopotamian Chronology," in Dominique Collon, *Ancient Near Eastern Art* (Berkeley, CA/Los Angeles: University of California Press, 1995), pp. 230–8 and J. A. Brinkman, "Mesopotamian Chronology of the Historical Period," in A. L. Oppenheim, *Ancient Mesopotamia: Portrait of a Dead Civilization* (Chicago/London: University of Chicago Press, rev. edition by E. Reiner, 1977), pp. 335–48.

TYPOGRAPHY OF SUMERIAN AND AKKADIAN WORDS

Sumerian: Lowercase Roman, separated by periods; for example, dub. mul. an. kù (holy tablet of the heavenly stars/writing). Akkadian transliteration: Lowercase Roman, separated by dashes; for example, A-ri-is-tu-ug-gi-ra-te-e (Aristokrates). Akkadian transcription: Italics; for example, *kima šiṭir šamê* (like the heavenly writing). Sumerian logograms: Small capitals, separated by periods; for example, MUL.APIN (Plow Star). Note also the following assyriological typographical convention: The use of determinatives is represented by superscripts preceding the word so determined. For example, divine names are indicated in cuneiform by means of the "divine determinative" dingir (the Sumerian word for god). In this work, the divine determinative is transcribed as a superscripted "d" preceding divine names, as in the writing of the name of the moon god ^{d}Sin or ^{d}30.

AKKADIAN MONTHS (STANDARD BABYLONIAN/LATE BABYLONIAN LOGOGRAPHIC SPELLINGS)

I	*Nisannu* (ITI.BARA$_2$/BAR), March/April
II	*Ajaru* (GU$_4$), April/May
III	*Simanu* (SIG), May/June
IV	*Du'ūzu* (ŠU), June/July
V	*Abu* (NE), July/August
VI	*Ulūlu* (KIN), August/September
VII	*Tašrītu* (DU$_6$), September/October
VIII	*Arahsamna* (APIN), October/November
IX	*Kislīmu* (GAN), November/December

X *Ṭebētu* (AB), December/January
XI *Šabaṭu* (ZÍZ), January/February
XII *Addaru* (ŠE), February/March
Intercalary XII *Addaru arkû* (ŠE.DIRI)

NAMES OF ZODIACAL SIGNS (LATE BABYLONIAN SPELLINGS)

I Aries (HUN, LU), Hired Man
II Taurus (MÚL.MÚL), Stars, Bull of Heaven
III Gemini (MAŠ.MAŠ), Twins
IV Cancer (ALLA), Crab
V Leo (A), Lion
VI Virgo (ABSIN), Furrow
VII Libra (RÍN), Scales
VIII Scorpius (GÍR.TAB), Scorpion
IX Sagittarius (PA), Pabilsag
X Capricorn (MÁŠ), Goat-Fish
XI Aquarius (GU), Great One
XII Pisces (ZIB.ME), Tails

AKKADIAN NAMES OF THE PLANETS (STANDARD BABYLONIAN/LATE BABYLONIAN LOGOGRAPHIC SPELLINGS)

Moon, Sin (^{d}EN.ZU, ^{d}30/^{d}30)
Sun, Šamaš (^{d}UTU/^{d}20)
Jupiter, Akkadian unknown (SAG.ME.GAR/MÚL.BABBAR)
Venus, Dilbat (^{d}Dele-bat, ^{d}15/Dele-bat)
Mercury, Šihṭu (GU_4.UD/GU_4)
Saturn, Kajamānu (UDU.IDIM.SAG.UŠ/GENNA)
Mars, Ṣalbatanu (^{d}Ṣal-bat-a-nu/AN)

THE GREEK LETTER PHENOMENA

Outer Planets (Saturn, Jupiter, Mars)

Γ, heliacal (morning) rising
Φ, first (morning) station
Θ, acronychal (evening) rising

Ψ, second (evening) station
Ω, heliacal (evening) setting

Inner Planets (Venus, Mercury)

Ξ, evening rising
Ψ, evening (first) station
Ω, evening setting
Γ, morning rising
Φ, morning (second) station
Σ, morning setting

THE HEAVENLY WRITING