

CHAPTER EIGHTEEN

Mesopotamian Cosmology

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“Wise men,” said Socrates, “say that heaven and earth and gods and men are bound together by communion and friendship, orderliness, temperance, and justice and it is for that reason they call this Whole a Cosmos” (Plato 1984, p. 297 Gorgias 508a). This neat description resembles, in some of its aspects (orderliness, justice), ancient Mesopotamian thought about the world, but no Sumerian or Akkadian term was equivalent to the Greek word *cosmos*. Not only was there no word for it, but cosmology, either as an inquiry into the nature of the world, or as a part of astronomical thought about the origins and structure of the universe, was not the focus of any systematic inquiry in ancient Mesopotamia. The absence of a systematic treatment of topics we regard as essential to the conception of the world, however, does not mean that such conceptualization did not exist. The notion of orderliness and justice arguably connects the Mesopotamian with Socrates’ definition of *cosmos*.

Cosmic order and justice in ancient Mesopotamia, however, were altogether different from the Greek tradition. The principle difference may be found in the fact that Greek philosophical culture focused on the idea of nature (*physis*), first in the sense of primordial matter and second the processes inherent to material things which account for their growth and behavior (the nature of things) (Naddaf 2005). The Mesopotamian orientation to the world of observation and experience was not in relation to such a concept, and must be conceived of without appeal to it (Rochberg 2016). The idea of cosmic concord, which was a central point in Greek cosmologies looking to explain the material constituents, geometrical structure, and the law of measure, was never considered in ancient Mesopotamia as a characteristic of the *cosmos* itself apart from the gods who were active in it.

Essential parts of a Mesopotamian cosmology can be reconstructed from Sumerian and Akkadian mythology, hymns, celestial divination, and astronomical texts, and can show Mesopotamian views of the creation, structure, and workings of parts of the universe. Here we pose questions to the mostly literary sources in which cosmological subjects

appear. Although the questions below were not explicitly formulated by the ancient scribes in texts, what may be viewed as answers were expressed in a variety of textual genres. The purpose of this pastiche method of proceeding is to afford a view into parts of a Mesopotamian cosmology not accessible in any one source alone or at any single period or place in Mesopotamian history. I have adopted as the format of presentation what Edward Grant described as “the most widely and regularly used format for medieval cosmology and for natural philosophy in general,” that is, “the *questio*, or question format” (Grant 1996, p. 23).

What is “the World”?

A notion of “world,” in the sense of the whole of creation, is expressed as the union of the two principal parts, heaven and earth, and taken as a pair in Sumerian as *an.ki* “heaven, earth” and in Akkadian as *šamû u ersetu* “heaven and earth (or underworld).” The basic meaning of terms meaning “all” points to the notion of the “entire (inhabited) world,” and by extension “all” or “the universe.” Other words such as “all (that exists),” and “totality” (*kiššatu*, *kibrātu*, *kibrāt erbetti*) similarly could refer to all places or people (or gods), and so in some contexts connoted “the universe.” The totality of the world comprised regions beyond the reach of human perception, such as the interior freshwater abyss “which cannot be seen” (Horowitz 1998, p. 317), but which nonetheless were imagined in relation to the world of human beings.

The world as a whole was referred to in the descriptions of temples that filled the entirety of the cosmos from top to bottom. This motif was repeated often in temple hymns and royal inscriptions that concerned the building of ziggurats and temples, whose tops were so high as to “rival heaven” and whose foundations so deep as to reach into the underworld. The metaphor was traceable to the early third millennium BCE in an archaic hymn: “Great, true temple, reaching the sky, temple, great crown, reaching the sky, temple, rainbow, reaching the sky, temple, whose platform(?) is suspended from the midst of the sky, whose foundation fills the Abzu [the abyss]” (Biggs 1971, p. 201). It was also a way of expressing great magnitude, as in the description of a mountain encountered by Sargon II (721–705 BCE) on campaign, “whose summit above leans against the heavens, and whose base, below, is firmly rooted in the nether world.” The motif was also applied to mythological mountains in the Gilgamesh Epic (George 1999a, 71 IX 38–41) that reached up to the base of heaven and down to the netherworld, as well as in the Erra Epic, to the sacred tree, whose crown touched heaven and whose roots penetrated the netherworld (Foster 1993, p. 779).

How did the World Originate?

An essential element in Mesopotamian mythology about the origin of the world was that the world came to be as a result of the separation of heaven and earth. This most basic cosmogonic event accounted for these two fundamental parts of the universe. The motif was preserved in the introduction to the Sumerian myth Gilgamesh, Enkidu, and the

Netherworld in which the region “heaven” was separated from earth and “carried off” by the god An (“sky”) and “earth” became the possession of Enlil (“Lord Wind”) (Shaffer 1963, pp. 48–49, 99). The cosmic deities in this myth were, according to divine genealogy, offspring of the goddess Nammu, who represented an eternal watery state. The primeval mother gave birth to the undifferentiated above and below, which then became the two principal elements of all further cosmic evolution. She existed before the differentiated cosmic regions, as seen in her epithet “mother who gave birth to heaven and earth.”

A tablet from the Early Dynastic period around 2400 BCE introduced heaven and earth before any gods and before sunlight or moonlight (Sjöberg 2002, pp. 229–239). There An “heaven” and Ki “earth” were personified, and heaven was “a youthful man” (Sjöberg 2002, p. 231). The cosmic realms of heaven and earth were also personified as father and mother, as in a composition which accounted for the birth of Azag, the demonic opponent of the warrior god Ninurta, by the union of An and Ki (Jacobsen 1976, p. 95 n. 85). A chief attribute of the divine sky was its generative powers, and the rains from the sky were said to be semen engendering the vegetation on earth (Cagni 1969, p. 61). But in the theology of the religious capital, Nippur, An was not the creator god. This role was taken by Enlil.

In a list of gods, scribes described the descent of the gods. The sky god An descended from Uraš and Ninuraš “Earth and Lady Earth” (Lambert 1975, pp. 51–54). In what seems to echo the descent of the sky god An, the earth god Enlil was derived from Enki (and Ninki) “Lord (and Lady) Earth,” not to be confused with Enki Nudimmud, the god of sweet waters. The original unified whole of heaven and earth was separated by the god Enlil, who then introduced into the sky the god Nanna, the moon. The moon god produced children, the sun god Utu and the goddess Inana. With the construction of the genealogies, a generational hierarchy took shape within the pantheon, and An, Enlil, and Enki became a trinity of great gods.

Another strain of cosmogony presented heaven and earth as the divine offspring of ancestor divinities, rather than the result of a cosmogonic separation. The Akkadian creation poem saw the origins of the gods in the commingled waters of the male *Apsû* and the female Tiamat, who in time engendered gods within themselves. From these original divine essences came the ancestry of Marduk; from Anšar “the totality of sky” and Kišar “the totality of earth” came An, the sky god, who produced Ea Nudimmud, Marduk’s father. The creation poem was a nationalistic Babylonian cosmogony, composed sometime before the reign of Nebuchadnezzar I (1124–1104 BCE) and constructed to explain the elevation of the Babylonian national god Marduk to supremacy among the gods and to attribute order in the universe to his rule (Hunger and Pingree 1999, p. 62). The principal revision over the older Sumerian cosmogonic tradition was in the identity of the creator, no longer Enlil but Marduk, grandson of Anu and son of Ea.

In the account of Marduk’s rise to kingship, creation took place following his battle to defend the gods from attack by their evil mother Tiamat. The way had been prepared by Marduk’s father Ea, Enki in Sumerian, who slew *Apsû* and established his own dwelling on the “corpse,” the realm of sweet waters. Marduk fought Tiamat and her host of monsters and demons, a theme taken over from the mythology of the god Ninurta and his cosmic battle against chaos (Lambert 1985, pp. 55–60). Elements of Sumerian cosmogony persisted, but the supreme rule of Enlil and the divine ordinances of the old

mythology were replaced by Marduk's universal kingship and his legitimate possession of the "tablet of destinies."

Marduk fashioned and arranged the physical world. Although the birth of the sky god had taken place generations before, Marduk took the carcass of the slain sea-mother Tiamat and split her body and set up half of her "as a cover," thereby creating the region of heaven. He made use of other parts of her watery body to create the natural world of wind, rainfall, mists, and the rivers Tigris and Euphrates from her eyes. Her tail became "the Great Bond" tying the two halves of the world together (Foster 1993, p. 380 V 59).

What is the Relation between the Gods and the Phenomenal World?

The very question of the relation between gods and the world can easily imply an anachronistic notion of the separation between a physical realm and some other realm of being, a notion that is, by its very term, derived from the Greek conception of nature (*physis*). Certainly the Assyro-Babylonian scribes directed their attention to phenomena, many of which we would classify as natural phenomena, but their vocabulary does not rely on such a distinction and indeed the phenomena comprising divinatory signs were not limited to that category of things. The scaffolding of cuneiform scribal-scholarly thinking about the world, therefore, must not be conflated with "nature" or "the physical world."

Mythological texts and hymns preserved ideas of divine agency. As forces over the basic parts of the world, the three great gods Anu, Enlil, and Ea inhabited specific regions of the cosmos. Thus, in the myth of Atra-hasis the divine trinity cast lots, divided the universe, and came to be identified with heaven, earth, and the subterranean waters of *Apsû* (Lambert et al. 1969, p. 43; Jacobsen 1976, p. 121). Celestial gods, such as the moon god Nanna, the sun god Utu, and Inana, the planet Venus, were viewed as manifest in the heavenly bodies and as the personified powers in these phenomena. The oldest attested Near Eastern storm god, Enlil, brought both the spring winds holding the good rains that made plants flourish as well as the destructive storm cloud with its flood waters. The clouds that produced rains and allowed the crops to grow came through Enlil's agency, but he was also immanent in the storm itself, as a text says, "The mighty one, Enlil ... he is the storm" and "his word, a storm cloud lying on the horizon, its heart inscrutable" (Jacobsen 1976, pp. 101–102). His hymns showed his benevolent nature as a fertility god, but lamentation texts revealed him as the destroyer of farmlands, animals, and people (Green 2003, pp. 34–41). Enlil's influence, both positive and negative, was therefore seen as working through the forces of the atmosphere that embodied the god but were also transcended by him.

The other gods too were not viewed simply as the personifications of their cosmological regions, but as transcending the limits of the phenomenal world experienced by human beings. In the hymn to the sun god, Šamaš saw into the heavens as one would into a bowl, but the vision of the god was greater than the limits of both the heavens and the entire earth (Lambert 1960, p. 134). The scale of the world was dwarfed by the greatness of the deity when a hymn referred to the god Ninurta as wearing "the heavens on his head like

a tiara, he is shod with the netherworld as with [san]dals,” and in a wisdom composition we hear of “Marduk! The skies cannot sustain the weight of his hand” (Foster 1993, p. 497, 310). Marduk’s transcendence of the phenomenal experiential world was also expressed in a prayer recited during the Babylonian New Year’s festival: “the expanse of heaven is (but) your insides.” If this was the nature of the deity, then natural phenomena, such as storms, the sky, or the moon, were an embodiment of a divine power, and could be a manifestation of an anthropomorphic deity, but were not personified as living beings themselves. The gods were, strictly speaking, not “in” nature, though we might conceive of it in that way. They were manifestly involved, however, in the world of phenomena, as agents of protection and destruction alike. As agents of change in the world, they were simultaneously in, of, and beyond the world of human experience.

Is there Order and Justice in the Universe?

As forces and agents affecting the totality of phenomena and human experience, the gods brought order to the cosmos through authority and law. The cosmos was not seen as a self-governing body, but as ruled by divine law. By virtue of his exalted position, Anu, the supreme divine sovereign, was author of both order and chaos. He engendered the forces of disorder and chaos in the form of seven semi-divine entities, or “demons,” but in some contexts appeared as protector. The dual role of Anu as creator as well as controller of chaos was paralleled by Enlil, who was at once the bringer of good to humanity as well as the agent of its destruction.

Ninurta was a defender of world order (Vogelsang 1988; Annus 2002). Ninurta’s mythic foes represented agents of cosmic disorder. Asag, the child of An and Ki, appeared in magical texts as a demon responsible for disease and death. The winged lion–dragon of iconography may be identified with the Asakku, or Anzû, described in the myth as a lion–bird monster (Black and Green 199, pp. 107, 121). The association of Ninurta with kingship was seen in the story of his battle with Anzû, who flew off with the tablet of destinies, Enlil’s emblem of divine executive power. Ninurta’s defeat of chaos resulted in his elevation to the kingship, even over his father, Enlil. In view of the image of the human king not only as divinely legitimated but also as an earthly reflection of divine kingship, Ninurta’s role as cosmic hero was an essential ingredient in royal ideology (Annus 2002).

The “tablet of destinies” was another representation of the idea of universal order. In the creation poem Tiamat elevated Qingu to supreme status in the divine assembly and gave him the tablet of destinies to ensure the power of his word. Marduk then vanquished Tiamat and her horde and wrested the tablet from the illegitimate possession of Qingu, symbolizing the triumph of order over chaos. Marduk became supreme sovereign over the gods and the universe, which he proceeded to organize. Marduk presented the tablet to Anu, as a restoration of the emblem of supreme divine executive rank to its original place (Foster 1993, p. 380 V 70).

The idea that order in the world as a whole came about through divine command is well supported in hymns, mythology, and in the principle of divination. In addition to Anu, Enlil, Ninurta, and Marduk, other gods established order by means of their decrees. The sun god was addressed as the power that kept the entire universe in check, both above and

below: “In the lower regions you take charge of the netherworld gods, the demons, the Anunna-gods, in the upper regions you administer all the inhabited world” (Foster 1993, p. 537). Ištar too was portrayed as bringing order to the cosmos by issuing decrees. She was praised as one who “ordains destiny foremost with Enlil” and “sets out regulations for the great gods, as Anu does.” Also she decreed destinies and “render[ed] final judgement and decision, the command for heaven and netherworld” (Foster 1993, pp. 505–506, 509–511). Like Marduk she “holds the lead rope of heaven,” the symbol of ultimate control; “She alone is to grasp the bridle of heaven and underworld!” (George 1992, p. 257).

The idea of order and justice that characterized the Mesopotamian conception of the world as a whole was tied to divine will. The power to decree all things included evil and misfortune. Given the sometimes incomprehensible mind of the gods, Mesopotamian culture developed divination to gain foreknowledge of what the deities determined would occur, magic to entreat the gods, and incantations to appease them.

By Means of What Force or Agency Do Things Occur in the World?

Divine design, decree, and judgment were conceived as the means by which order and disorder were brought to the world. Because institutions of political power were projected upon the divine realm, the image of the gods as rulers and judges took form. The designations of the gods as determiners of the “nature of things,” the “destinies of life,” the ones who drew the “cosmic designs” and the “designs of life,” evoked the conception of gods as kings who ordered existence. On the divine plane the act that brought forth existence and order was conceived of as “determining destiny.” In the temple hymn for the city of Isin, sanctity and authority was conveyed in calling the temple the “place where An and Enlil determine destiny” (Sjöberg and Bergmann 1969, p. 39).

Divination showed that agency was placed in the hands of the gods who both made phenomena appear and determined the meaning of signs for events that would happen on Earth. The use of the word “decision” or “verdict” to denote the consequence (we would say “prediction”) of an omen points to an interpretation of omens as collections of divine “judgments” (Rochberg 2003, p. 178). Prophecy texts shared this terminology, like “its decision concerns Elam: Elam will lie waste, its shrines will be destroyed, the regular offerings of the major gods will cease...” (Biggs 1967, p. 124). Šamaš and the storm god Adad, as gods of divination, sat as kings “on thrones of gold, dining from a tray of lapis” to render judgment in the form of the signs seen on the liver of the sacrificed lamb (Foster 1993, p. 149).

Already clear in Sumerian mythology, divine decrees functioned as determiners of what was. The same ideology continued in Babylonian and Assyrian religion, as can be seen in the creation poem where Marduk was made king of all the gods, his status being demonstrated by his ability to decree the things that existed – to create and destroy at will by command: “They set up among them a certain constellation, to Marduk their firstborn said they these words, ‘Your destiny O Lord, shall be foremost of the gods. Command destruction or creation, they shall take place. At your word the constellation shall be destroyed, Command again, the constellation shall be intact’” (Foster 1993, p. 372 IV 19–24).

The gods of the destinies were the seven Anunnaki (Lambert et al. 1969, p. 146). Following the establishment of Marduk's new shrine in Babylon in which he sat upon the "dais of destinies," "the seven gods of destinies were confirmed forever for rendering judgment" (Foster 1993, p. 386 VI 81). The list of the shrines enumerated the seven seats for Anu, Enlil, Ea, Šamaš, Ninurta, Nabû, and Adad(?) (George 1999b, p. 74). Ninurta, together with An and Enlil, decreed destinies for humankind in the *Apsû* (Annus 2002, p. 25).

What is the Place of Humankind in Relation to the Whole?

In a world view where divine power was conceived in terms of rulers, human beings fell into place within the cosmic framework as the ruled, a subject population to support and revere the gods. The motif of the creation of man to toil for the gods went back to the Old Babylonian myth of the hero Atra-hasis, the favorite of Enki/Ea, who survived the great flood sent by Enlil to wipe out all humankind. In this composition Enki and the "Mistress of the gods" formed man from clay mixed with the flesh and blood of a god slaughtered "that god and man may be thoroughly mixed in the clay" (Lambert et al. 1969, p. 59 I 212–123). The gods not only mixed divine flesh and blood with the clay; the Igigi gods spat on it and Ea trod upon it. The actual creation was carried out in the house of destiny by the birth goddess Mami. In another Sumerian tradition, Enlil created humankind in the place where heaven was separated from earth, "where flesh came forth," and he accomplished this by use of the hoe (Black et al. 1998–2006: t.5.5.4, lines 1–7). Marduk not only eased the burden of the gods by the creation of mankind, but he "redeemed" the gods, his enemies, with man's creation and was dubbed "destroyer of the gods of Tiamat, who made men out of their substance" (Foster 1993, p. 397 VII 88–90).

The condition of man as forever subject to the determinations of gods was articulated in the myth of Adapa, the wise but all-too-human sage, who was made wise by the god Ea himself. In a moment of anger, Adapa disabled the south wind, which had capsized his boat, and in consequence was summoned to heaven to explain why the wind no longer blew. After achieving his ascent to heaven and thereby transcending the mundane world, he nonetheless failed to transcend his nature. Adapa's story was about a god-fearing man who failed to make the right decision, in his case to accept the bread and water of eternal life offered to him by Anu. Neither his purity nor his wisdom helped him and he remained mortal (Foster 1993, pp. 429–434).

What is the Relation of Earth to Heaven?

A vertical arrangement of cosmic regions or levels comes across in references to the extent of the entire world, placing heaven above earth and earth above the *Apsû* and the netherworld. The basic triple structure of heaven, earth, and netherworld was further divided into the Upper, Middle, and Lower Heavens, and the Upper, Middle, and Lower Earths. Below the heavens, the lower half of the world was comprised first of Upper Earth, where the "souls"

of mankind were settled (Horowitz 1998, pp. 3–4). Middle Earth was the residence of Ea, and to the depths of Lower Earth were consigned the 600 Anunnaki gods. These 600 gods were associated with the land of the dead, where the god Nergal ruled. Above the realm of mankind were the three heavens, populated by gods and stars. In accordance with the symmetry of this world picture, the point where the earth of human beings met the heaven of the observable stars became a metaphysical center, the borderline between divine and human.

The whole was bound together as one coherent structure by the mythical “bonds” that held the level of the heavens to the lowest level of the netherworld. A number of ropes served the purpose. The god who held such a cosmic rope exercised control over the universe like the handler who controlled an animal on the other end of a lead-rope. Such an image was found in the divine epithet “who holds the lead-rope of heaven and netherworld” and was implied in the epithet “who holds the totality of the heavens and lands” or “who holds the totality of heaven and netherworld,” both of which were used for Marduk (Tallqvist 1974, pp. 242–243). Another image was of a boat’s mooring-rope. The name of the temple of Marduk in Babylon was explained in a commentary as the “house of the great mooring rope of heaven.”

Akkadian “earth” in a cosmological sense denoted both earth and the netherworld. The term “earth” as “netherworld” can be found in the XIIth Tablet of Gilgamesh (Shaffer 1963). A few sources confirmed the identification of the place where netherworld deities resided as “earth,” while others clearly meant the physical earth upon which we stand (Horowitz 1998, pp. 273–274, Lambert et al., p. 91:48). The use of one term to refer both to the Earth and the place of the dead was seen as well in the poetic term “great Earth.”

The question of whether there was a cosmic mountain has been debated, as well as what relation it may have had to another primordial cosmic locality, the “sacred mound.” The cosmic “sacred (shining) mound,” was the location both of the birth of the gods and the divine assembly. It was the place to which Ninurta repaired following his triumphant presentation of the vanquished gods to Enlil, and where he was called “king of the sacred mound.” The sacred mound in heaven, also thought of as “mountain of heaven and earth,” with its foundation upon the cosmic *Apsû*, had its earthly parallel in the sacred centers of the world, Nippur, Babylon, or Assur (Wiggermann 1992, pp. 285, 295). In a Neo-Assyrian text that enumerated the cosmic levels, Marduk’s “high throne-dais” was located in the Middle Heaven. It was the place where the gods decreed the destinies and became the name of the earthly throne-dais of Enlil in Nippur, as well as later that of Marduk in Babylon, the god Assur in the city of Assur, and Anu in Uruk. On the celebration of the New Year, Marduk sat on the Dais of Destinies as “king of the gods in heaven and earth” to decree the destinies. The celebration of the New Year in the seventh month was reflected in the month name, “month of the sacred mound.” This site therefore held a central place in the cosmos and was paralleled in the earthly center of the temple where the deities decreed destiny.

What is the Structure of the Heavenly Regions?

The tradition of three superimposed heavenly realms was known in first millennium texts. The highest heaven belonged to Anu and was populated with 300 Igigi or great gods (Livingstone 1989, pp. 99–102). Middle Heaven belonged to the Igigi, and Marduk had

his throne there. Stars and constellations were drawn upon the surface of the Lower Heaven. While invocations to seven heavens and seven earths occurred in Sumerian incantations, the image of a plurality of heavens found there occurred only in incantations. The seven heavens and earths were invoked alongside other groups of seven entities for magic. Being magical rather than cosmological, the seven heavens and earths were not necessarily related to the three heavens and earths found in other texts.

The cosmological picture as presented in the passages concerning the three heavens also entailed poetic speculation about the heavens as made of different stones. These stones varied in color, the heaven of Anu being reddish, speckled with white and black, the middle heaven being blue stone like lapis lazuli, and the lower heaven being translucent jasper, either blue or grey (Horowitz 1998, pp. 9–15). This image was hardly an attempt at empirical description, but presumably the projection of mythological or other associations between stones and gods. Equally poetic was the additional statement that the stars were drawn, or inscribed as “writing,” upon the stone surface of the heavens (Livingstone 1989, p. 100). This metaphor stressed the meaning of the stars as signs “written” by the gods for human beings to observe and from which to forecast the future. The same image of drawing the stars appeared in the series of astronomy tablets.

The heavens contained the waters of Tiamat, which were guarded and held in by a tightly stretched skin, no doubt a reflection in mythological form of the empirical relation between the sky and precipitation (Foster 1993, pp. 376–377 IV 137–140). In literary texts the celestial realm of the planetary deities was sometimes denoted by the term “base of heaven,” but taken to mean “firmament,” as in “they installed Sin, Šamaš, and Ištar to keep the firmament in order” (Horowitz 1998, p. 239) and “through her (Inana as the evening star) the firmament is made beautiful in the evening” (Sjöberg and Bergmann 1969, pp. 36, 115; Horowitz 1998, pp. 240–241). Astronomical terminology did not include this “firmament,” but used the word “sky” to refer to the place where celestial phenomena were observable. Because of the difference in character between mythology and astronomy, points of contact in their conceptual landscapes are noteworthy. The beginning of Tablet V of the creation poem, which dealt with the regularity of the appearance of heavenly bodies as the work of Marduk, described features of the heavens also referred to in astronomical texts. Marduk arranged the stars into constellations, the “images” of the gods themselves. By means of the fixed stars he organized the year into 12 months, marked by the risings of three stars in each month in their specified “paths” (Foster 1993, p. 378 V 4). He created the zenith, the moon, and the month from the lunar phases.

Celestial divination and astronomical texts required a terminology to specify the positions and times for the occurrences of celestial phenomena. Without the conception of the celestial sphere and its coordinates, a variety of systems denoted celestial positions. The terminology of the “paths” of Anu, Enlil, and Ea was used in early astronomical texts. The Anu path was that which had its gate in the center of the “cattle pen,” or eastern horizon; to the south of it lay the path of Ea and to the north the path of Enlil. The stars may have been associated with the gods Anu, Ea, and Enlil even earlier, but were assigned to these paths according to where on the horizon their risings were observed, or in modern astronomical terms, according to their circles of declination, the distance north or south of the celestial equator (Hunger and Pingree 1989, p. 139). Another system was implied in the device called a “string,” which established a relation between

stars of similar right ascensions that crossed the meridian at the same time (Hunger and Pingree 1999, p. 90–97).

The other “path” of importance was that of the moon, whose track was marked by 18 constellations, recognized at least by around 750 BCE. These constellations were not of equal size, and cannot be used as a standard of reference for the calculation of “distance” along “the path.” Later, to mark the passage of the sun with respect to the fixed stars through the months of the year, these constellations were reduced to 12 and formed the basis for the zodiac. As the planets were observed to hug the path of the sun, or the ecliptic, a larger group of ecliptic stars was identified for the purpose of observing the movement of the planets (Sachs and Hunger 1988, pp. 17–19). Although the 12 constellations of the zodiac gave their names to the zodiacal signs, once the signs were defined by longitude rather than constellation, they became a mathematical reference system of 12 parts of 30°, counted from a defined starting point. In this way, no geometrical dimension was attributed to the heavens in mathematical astronomical texts, whose predictive schemes were strictly arithmetical and linear, and consequently shed no light on the question of the spatial structure of the heavens.

What are the Cosmic Waters?

The cosmic realm called *Apsû*, whose watery depths lay beneath the Earth, appeared in Sumerian and Akkadian mythology. It was the creation, abode, and kingdom of Enki, and was so closely associated with him that Enki’s son, Marduk, was known as “first-born son of the *Apsû*.” Because of Enki’s association with wisdom, magic, and incantations, the *Apsû* was thought of as the fount of wisdom and source of the secret knowledge of incantations. The temple of Enki in the oldest Sumerian city of Eridu was called the E-Abzu, “House of the Abyss.” Later, the temple of Marduk in Babylon was explained as the replica of *Apsû* (George 1992, p. 59). As the counterpart to Enki’s cosmic abode, Marduk’s was also the home of all the gods (George 1999b, pp. 68–70). Enki’s shrine in Eridu too was known as the “holy mound” (George 1993, p. 77; George 1999b). The association of the *Apsû* with the “holy mound” showed the cosmic importance of Ea’s domain as a place for the divine assembly and where destiny was decreed.

What is the Realm of the Dead?

When the entire extent of the world was taken into account, the furthest realm in the direction downward was “the netherworld.” In mythological texts the netherworld existed parallel to the land where human beings existed, but as a land of no return, the land beneath the land where demons could be sent or where gods could descend (Horowitz 1998, pp. 272–273). Also belonging to the depiction of the netherworld in literary texts was the idea of this land being dark and distant, inhabited by ghosts, demons, or gods who ruled over the dead or who brought death. In the only text where cosmic regions were placed relative to one another within an overall scheme, the location of the netherworld was specified as being below the *Apsû*, and so became the lowest of all regions (Livingstone

1989, p. 83). According to another composition the netherworld was the negation of all that was known in the world “above,” on earth and in heaven; therefore it was devoid of light, its river carried no water, and its fields produced no grain (Horowitz 1998, p. 351).

Does the World have a Center?

The notion of an axis of the world focused on cities: first Nippur, then Babylon and Assur. Although the centrality of various cities and temples with respect to heaven and earth attests to a Mesopotamian idea of a cosmic center, it was never employed within a system to account for the motions of the celestial bodies within the cosmos and therefore cannot be understood as implying the Earth was the center of the universe. Nippur’s epithet “bond of heaven and earth/netherworld” reflects the idea of the cosmic regions coming together at the central point of the holy place, the “house of the universe.” In his shrine at Nippur, Enlil was the “lord who determines destinies,” and the shrine was the place “where destinies are decreed.” In an Early Dynastic hymn, Nippur was the “city which is grown together with Heaven, embracing Heaven” (Alster 1976, p. 121). Another epithet of this city touched on the cosmic significance of the place as the “navel of the world,” “the city that produced itself,” interpreted as an etymology for Nippur’s name (George 1992, pp. 146, 441). The idea of the holy city of Nippur influenced later Mesopotamian religious and cosmological thought. In Assur the ziggurat of Assur was seen as the link between heaven and earth in the name “temple, mountain of the entire world” (George 1993, p. 69). At Isin the same idea was attributed to the temple of Ninisina, called “the axis (between) heaven and earth” (Sjöberg 2002, p. 245 n. 30). Enlil was said to have suspended the axis of the world as the first act of creation (Black et al. 1998–2006: t.5.5.4:7).

What is the Nature of the Planetary Bodies?

All celestial bodies, stars, constellations, and planets were called stars (MUL = kakkabu). The planets were further distinguished by a term meaning a kind of sheep, with the idea that their movements were not fixed in relation to one another as were the fixed stars since they “keep changing their positions” (Hunger and Pingree 1989, p. 71). The following brief outline highlights only indications about the divine nature of the planets in Mesopotamian cosmological thought (Brown 2000, pp. 54–80).

A word “moon” deriving from the Sumerian divine name could be used to refer to crescent-shaped objects, but when referring to the moon itself, the divine name for the “moon god” was synonymous with “moon.” Divination texts favored the symbolic writing 30, referring to the schematic or ideal length of the lunar cycle, but even this name for the moon was frequently written with the divine determinative, showing the lack of a distinction between moon and moon god.

Similarly, the word “sun” was indistinguishable from the name of the sun god Šamaš. In a Sumerian hymn to the temple of the god, the rising and setting of the sun were referred to in anthropomorphic terms: “when he the lord reposes, the people repose (with him). When he arises, the people arise (with him)” (Sjöberg and Bergmann 1969, p. 45).

Sumerian hymns reveal that already by the third millennium the planet Venus was seen as the astral form of the goddess Inana or Ištar. She was hailed as “the great lady of the horizon and zenith of the heavens” and she was addressed as “the radiant star, Venus, the great light which fills the holy heavens” (Black et al. 1998–2006: t.4.07.2:112, t.2.5.3.1:89). From the third millennium BCE she was already recognized as both the morning and the evening star, as seen in a seal inscription referring to the festival of Inana (Brown 2000, p. 67). She was associated with Šamaš at sunrise and Ninurta at sunset. In omens Inana could be either male or female: “If Venus rises in the East, she is female, favorable; if she is seen in the West she is male, unfavorable” (Reiner and Pingree 1998, p. 241).

Jupiter was identified with the god Marduk in its name “Marduk Star.” The manifestations of that god in the various appearances of Jupiter took on other names, as when on the eastern horizon he became “Brilliant Youth,” and when in the middle of the sky “the Ford.” In all these guises, Marduk/Jupiter was “the bearer of signs to the inhabited world” (Livingstone 1989, p. 6–10).

One of the names of Mercury was “the jumping one,” which could have been descriptive of the planet’s fast motion and perhaps the fact that it was not often or easily visible. Mercury was associated with the gods Ninurta and Nabû symbolizing the crown prince or son of Marduk (Hunger and Pingree 1989, p. 71, Gössmann 1950, p. 113). The association of Mercury with the two gods may relate to the appearances of the planet as a morning and evening star. The planet was also sometimes referred to as an arrow of the heroic warrior god Ninurta (Annus 2002, pp. 134–135).

Mars was associated with Nergal, god of pestilence. The planet’s name was interpreted as “the one who reveals deaths,” and indeed in the omens the planet portended plague and other evils. But Nergal’s manifestation as a heavenly body was nonetheless glorified in prayer: “Nergal star who rises again and again on the horizon, whose glow (stands) high” (Ebeling 1953, p. 117).

The luminous aspect of the heavenly divine manifestations was their most obvious quality. In Sumerian liturgy the radiance of Venus was frequently mentioned. In one composition the moon god was referred to as “the astral holy bull-calf” who “shines in the heavens like the morning star,” and “spreads bright light in the night” (Black et al. 1998–2006: t.1.8.2.1: 202–204). In the creation poem Marduk’s ninth name was “bright one,” “the shining god who illumines our ways,” and his 49th name was “Ford” = Jupiter, “the star which in the skies is brilliant” (Foster 1993, p. 390 VI 156, 399 VII 126). In omen texts, descriptions of the appearance of the planets included whether they were bright or dim, or of various colors. Brightness or dimness was interpreted in accordance with the quality of the planet, either beneficial or sinister; accordingly it was favorable if a beneficial body was bright, but unfavorable if a sinister body was bright.

Observation of the heavens for the purpose of celestial divination, the solution of calendrical problems, and eventually, the prediction of planetary appearances, led to the recognition of their periodic behavior. The study of the relations between planetary periods became the central focus of astronomical work from about 600 BCE. In Babylonian astronomy the interest in heavenly phenomena was focused upon visibilities. Motion, therefore, was approached as the distance traveled between appearances in the cycle, as between first visibilities. The distance referred to is what astronomers now call the synodic arc, described as the number of degrees of longitude traveled by the planet in one synodic

cycle, between successive appearances of a given synodic phenomenon (e.g., first visibility, or last visibility).

Is there a Cosmological Significance to the Order of the Planets?

The standard order of the planets as given in Babylonian astronomical and other texts (omens, astrology, treaties) did not reflect any conception of a spatial arrangement of the celestial bodies in the cosmos or in relation to Earth. Late Babylonian astronomical texts enumerated the five planets in the sequence Jupiter, Venus, Mercury, Saturn, and Mars (Rochberg-Halton 1988). This arrangement was at odds with the typically Greek geocentric map of the heavens, which organized the five planetary orbits around the Earth in the order Mercury, Venus, Mars, Jupiter, and Saturn, placing the planetary spheres above those of the moon and sun. In the Babylonian sources, however, the order in which the planets were enumerated in texts had nothing to do with geocentric order, but rather with their attributes as gods. Accordingly, Jupiter and Venus were beneficial, but Saturn and Mars were sinister. Mercury held an ambiguous position between the two beneficial and the two sinister stars and was sometimes good and sometimes bad. Old Babylonian references to the planet Mars as a destroyer of the herds suggested an early origin of this doctrine (Rochberg-Halton 1988, p. 235 n. 2). And in the Neo-Assyrian period Jupiter was a herald of propitious omens for Esarhaddon (Borger 1956, p. 17).

Was there a Conception of Circles or Spheres? And Did the Celestial Bodies Move in Them?

The celestial sphere and the spherical earth that were assumed by Western cosmology do not seem to have roots in ancient Mesopotamia. The idea of the cosmos as a sphere was articulated on the basis of metaphysical arguments, first in Plato's *Timaeus* around 400 BCE, that the created world was "a perfect whole and of perfect parts" (Plato 1989, p. 1164, 32 d-33 a). And within that spherical worldview, Greek astronomy from the fourth century BCE to the second century CE constructed geometrical spherical models to describe the motions of the planets. The spherical nature of the Earth was also determined by Aristotle as a consequence of the physics of matter, earth being the heaviest element thus converging in the center of the celestial sphere. In the Ptolemaic cosmology, the spheres of the planets were also arranged in a physical system, occupying the space between the Earth, very small in relation to the whole and fixed at the center, and the sphere of fixed stars that bounded the whole. The distances from one sphere to the next were organized in such a way as to form a system of snugly inter-nested spheres from Earth to the fixed stars, which lay at a distance of approximately 20 000 Earth radii from the Earth itself. It is important to stress the absolute difference between this conception and any notion of cosmic order in cuneiform texts, where distance and physics were not operative considerations.

Instead of the celestial sphere, for the identification of stars and planets the horizon became a reference point in early Babylonian astronomy. Observers named three paths corresponding to roughly defined intervals along the eastern horizon where fixed stars were observed to rise. The interest of Babylonian celestial science in the planetary appearances, as opposed to planetary motion around the celestial sphere, underscores the irrelevancy of the notion of spheres in Babylonian astronomy. The sun was seen as traveling in the zodiac, but this does not necessarily imply that the sun traveled within a sphere (Neugebauer 1955, p. 194). The discovery of the planetary periods and their relations was not dependent upon a spherical image, nor on spherical trigonometry to calculate them. The period of a planet, as conceived in Babylonian mathematical astronomy, was defined as the number of synodic arcs the planet had to complete before it returned to a certain position in the sky, reckoned by degrees of the zodiac.

The image of a spherical world, however, may be discerned in metaphorical passages in literary contexts. Reference to the bowl-shape of the heavens and Earth appeared in a hymn (Lambert 1960, p. 134). Another prayer referred to the heaven of Anu as “the incense burner” of the gods, an object at least circular in shape, but differentiated in other texts from bowls (Ebeling 1953, p. 15). But these passages were not intended as empirical descriptions of the shape of the world.

Outside of the astronomical literature, the heavens were sometimes referred to in the phrase “circle of heaven,” and “circle” is a word used for geometric circles and hoops. In these passages the use of “circle” could be read as metaphoric, reflecting a sense of the totality rather than the shape of the celestial region as a whole. Circular diagrams appeared in a number of early Babylonian astronomical texts, presenting a circular image within which the constellations were placed (Horowitz 1998, p. 206). The early Babylonian reckoning of the length of day given in the texts was underpinned by the concept of the circle of the day measured as 12 “double hours” of 30° each ($= 360^\circ$). The Path of Enlil was a circle described by 26 stars (Horowitz 1998, p. 186). Given such evidence, perhaps the reading of “circle of heaven” or “totality of heaven” need not be mutually exclusive.

Finally, despite the apparent lack of a conception of the celestial sphere in Babylonian astronomy, the periodic return of the planets to their synodic appearances with respect to certain points of longitude seems to presuppose the 360° circle of the ecliptic, the path of the sun. Whether it was conceived of as such, or as a repeating linear sequence of 360 points, however, is difficult to show. Because the aim of Babylonian mathematical astronomy was to predict the appearances of the planets in their synodic moments, the computational schemes devised to achieve this cannot be taken to reflect any particular conception of the shape or dimensions of the cosmos, nor the nature of the motions of the bodies between their synodic appearances.

FURTHER READING

Horowitz (1998) is the most comprehensive treatment of the cosmological geography of ancient Mesopotamia and sets out all the primary sources for the study of the subject. A good overall reference work on astral sciences, with a description of some of the basic texts of early Babylonian astronomy relevant to cosmology, is Hunger and Pingree (1999).

Further to the culture of astral science in the cuneiform world is Rochberg (2004, 2016). Lambert (1975) is a still-useful summary of Mesopotamian cosmology from mythological and theological sources. For more recent detailed studies of such mythological texts, see Wiggermann (1992) and Sjöberg (2002). For the cosmological background of Babylonian religion, see George (1992).

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