

The Cosmos Created in Genesis 1

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ABSTRACT

The people of the ancient Near East (ANE) believed the earth is a flat, circular disk floating on the waters of the abyss. They believed the sky is a solid, dome-like structure that covers the whole earth, holding back a mass of water that exists above it. They also believed that daylight exists independently of the sun. We know this through the religious mythologies, art and iconography they left behind. In this paper it is demonstrated that the cosmos created in Genesis 1 conforms to this model. The first three days of creation are examined. On creation day one day and night are created (Gen 1.3–5). The fact that day and night are created without the need of the earth (created on day three) or the sun (created on day four) shows that the Bible treats the day/night alternation as something independent of the earth's rotation with respect to the sun. Other scripture passages confirm this view. On creation day two the heavens are created as a *rāqî^a* 'firmament' to hold up the waters above (Gen 1.6–8). Scriptures confirm that the Bible views the heavens as a great dome or tent over the earth bent down to meet the earth at its rim or edge. Above this dome are the waters of the *mabbûl* 'flood' (Psa 29.10). There are scriptures which say the *rāqî^a* *haš-šamayim* 'firmament of the heavens' has openings, such as doors or windows. On creation day three the earth is created (Gen 1.9–10). Scriptures, such as Pro 8.27–29, confirm that God created the earth as a circle drawn on the surface of the deep (*tāhôm*). There are also many biblical analogies, such as "the ends of the earth", which can only apply if the earth is conceptualised as a flat, circular disk. One aspect of ANE belief is that the cosmos was created *de novo*, i.e., as new, or as you see it. The sections on domesticated plants and domesticated animals show how this applies to the Genesis 1 creation account.

Introduction

In this paper¹ I present biblical evidence that the creation story in Genesis 1.1–2.3 describes the creation of the cosmos in terms of how people of the ancient Near East (ANE) understood the cosmos to be. The ancients believed the earth is a flat, circular disk founded on the waters of the abyss. They believed the sky is a solid, dome-like structure that covers the whole earth, holding back a mass of water that exists above it. They also believed that daylight exists independently of the sun. The first three days of creation in Genesis 1 are examined in this light.

How the ancient Mesopotamian civilisations understood the world and their origins can be discerned from the many documents these cultures left behind. With respect to the Sumerian civilisation, Horowitz (2011: 134ff) says no Sumerian creation epic such as the Akkadian epic *Enuma Elish*, where Marduk builds and arranges the features of the universe, is known. Instead, evidence concerning Sumerian conceptions of the beginnings of the universe is found in two types of cosmological accounts. First, a number of literary texts open with prologues that record events of early times. Second, some texts recount the distribution of divine duties in early times, including the assignment of the Moon-god and the Sun-god to their heavenly posts. A common feature of these Sumerian accounts is that the cosmos began when earth was separated from heaven. Another common feature is that all was darkness in the beginning. Several accounts speak of the heavens shining before the sun or moon are created. The universe is generally conceived as comprising three regions: heaven, earth, and underworld, and a god controls each region. The Babylonian creation myth is recounted in the "Epic of Creation" also known as the *Enuma Elish*. The Mesopotamian "Epic of Creation" dates to the late second millennium BCE. In this mythological story Marduk destroys Tiamat. Then he rips her corpse into two halves in order to create the fresh waters of heaven and the salt waters of the seas. Marduk then created the calendar, organised the planets, stars and regulated the moon, sun, and weather. After this he hoists heaven above the earth and secures heaven to earth with *durmaḥu* 'lead ropes'.

¹ This paper is a follow-up to Roberts (2013).

The ancient Egyptian beliefs and concepts of creation appear in various sources: Pyramid Texts, Coffin Texts, The Book of the Dead, The Memphite Theology, as well as various hymns,² Wisdom texts,³ and wall bas-reliefs.⁴ These sources show that Egyptian cosmology is both uniform and diverse. Although there are nearly one dozen Egyptian creation myths, the three most dominant arose in the cultic sites of Heliopolis, Memphis, and Hermopolis.⁵ These three interconnect with one another as evidenced by the appearance of some of the gods in more than one tradition. The cosmogonies of Heliopolis and Memphis share more in common with one another than with Hermopolis. However, they all feature the similar concepts of a primordial ocean, a primeval hill,⁶ and the deification of nature.⁷ These three cosmogonies deal specifically with how the god(s) created the world. They do not directly address the creation of humans and animals.⁸ “The earliest recorded cosmogonies seem more concerned with accounting for the origin of the world than for that of mankind or of the animals.”⁹ The Egyptians developed a separate creation tradition to explain the creation of humans and animals, namely the tradition of Khnum, the potter-god.

The worldviews and cosmogonies of the ancient Mesopotamians and Egyptians have certain commonalities of thought. The main purpose of this paper is to show that the Bible shares the same beliefs as to how the world is and how it came to be as those of other ANE peoples. A comparison is made in §2 between ANE and biblical cosmology. The section on creation day one shows that the Genesis account of the creation of day and night follows ANE beliefs about this phenomenon which is different to how we understand the nature of day and night today. ANE peoples believed the sky is a solid, dome-like structure that covers the earth, holding back a mass of water that exists above it. The section on creation day two shows that the Genesis text follows this view. ANE peoples believed the earth is a flat, circular disk floating on the waters of the abyss. The section on creation day three shows that the biblical text follows this view also. One aspect of ANE belief is that the cosmos was created *de novo*, i.e., as new, or as you see it. The sections on domesticated plants and domesticated animals show how this applies to the Genesis 1 creation account.

ANE Cosmology and Biblical Cosmology Compared

There are a set of commonalities in the worldviews of the ancient Mesopotamians and Egyptians as expressed through their religious mythologies, art and iconography. Each of these commonalities of the ANE worldview has a reflection or parallel in OT thought, as illustrated in Table 1.

Table 1: Commonalities of ANE Worldviews and Biblical Cosmology

<u>Commonalities of ANE Worldviews</u>	<u>Biblical Cosmology</u>
The cosmos has been created by the activities of supernatural beings or deities.	Gen 1.1 states that Elohim, the Hebrew title for the Most High God, created the heavens and the earth, i.e., the cosmos, in the beginning.
The cosmos is ordered and governed by supernatural beings or deities.	In Gen 1.3, 6, 9, 11, 14, 20, 24 “God said,” and it was so.
The cosmos has been created out of a primeval watery deep/abyss. The deep is separated into a body of fresh water above and a body of salt water below.	Gen 1.6–8 states that Elohim created the heavens and the earth by separating the waters of the deep (<i>təhôm</i>) into the fresh waters above (<i>mabbûl</i> ‘flood’) and the salt water below (<i>yammîm</i> ‘seas’).
The cosmos is created through stages (activities	Gen 1.1–31 describes the creation of a complete and fully

² See Lichtheim (1973) volume 2, 81–118. Part Two: Hymns, Prayers, and a Harper’s Song.

³ See Hoffmeier (1983: 42).

⁴ See Brandon (1963: 61), Gordon (1982).

⁵ See Brandon (1963: 15).

⁶ This is a pyramid-shaped mound called the *benben*.

⁷ See Ions (1968: 24).

⁸ See Brandon (1963: 14).

⁹ Ibid.

of gods) until it is complete and fully functional.

The cosmos is created *de novo* (as new, or as you see it).

The cosmos is conceived of as tripartite: heaven, earth, and the underworld/deep below the earth

Deities form part of the cosmos, i.e., the sun, the earth, the sky, etc., are deities.

In Mesopotamian creation accounts day and night existed before the creation of the sun-god and the moon-god.

Daylight exists independently of the sun. This is because daylight was present even when the sun was behind a cloud or eclipsed. It made its appearance before the sun rose, and remained after the sun set.

The sky is a solid, dome-like structure that covers the earth, holding back a mass of water that exists above it (see Figure 1).

When it rains and storms, water and wind come through openings in the sky.

The earth is shaped like a flat, circular disk or table top (see Figure 2 Babylonian map of the world).

This flat earth is surrounded on all sides by masses of water (of the primeval deep).

The sun comes out from behind the sky, runs its course along the sky, and then returns behind it.

There are two openings in the sky—the Gates of the East, and the Gates of the West. Through the one the sun enters in the morning to pass out at the other in the evening, and thence pursue its way back by the dark path of the

functional cosmos through phases that take six days. Gen 2.1 says the heavens and the earth were completed in all their vast array.

Gen 1.11–13 says plants are created as *deše* ‘vegetation/pasturage’, *‘ēšēb* ‘cultivated plants’, and *‘ēš pərî* ‘fruit trees’. Gen 1.24–25 says animals are created as *remeš* ‘creepy-crawlies’, *ḥayyâ* ‘wild animals’, and *bəhēmâ* ‘livestock’. The three-way grouping in each case is the traditional Hebrew way of defining the natural world.

Exo 20.4, Deu 4.18, Php 2.10 describe the biblical cosmos as tripartite: the heavens above, the earth beneath and what is underneath the earth (*təhôm/šə ‘ôl*).

In the Gen 1.1–2.3 account there is only one God, Elohim, who creates and governs everything. Elohim is distinct and separate from his creation.

Gen 1.3–5 states that God created day and night before he created the sun (*šemeš*) and the moon (*yārēah*) (Gen 1.14–19). Note that the sun and moon are not named as such as the names represent deities.

Passages such as Pro 4.18, Ecc 12.2, Isa 5.30, Amo 5.8, and Job 38.12 mention daylight (*‘ôr*) as something distinct from the sun (*šemeš*). Also, while there are many passages which speak of the heat of the sun (e.g., Psa 19.6, Isa 18.4, 49.10, Jon 4.8, Rev 7.16) there are not many which speak of its light (only Gen 1.16, Rev 22.5).

Gen 1.6 says God created a *rāqīa’* ‘firmament’ in the midst of the waters of the *təhôm* ‘deep’ to separate the waters below from the waters above.

Gen 7.11 says God opened the sluiceways of heaven (*‘ārubbōt haš-šāmayim*) to allow the waters of the Flood (*mê ham-mabbûl*) to pour down. Then Gen 8.2 says God closed the *‘ārubbōt haš-šāmayim* to stop the rain from falling. Elsewhere in the OT opening the sluiceways of heaven to allow rain to fall is deemed to be a blessing from God, cf. 2 Kgs 7.2, 19, Mal 3.10.

Gen 1.9 states that God commanded the waters below to be gathered together to one place and for the earth (*‘ereš*) to appear. Elsewhere in the OT this is interpreted as the earth being a flat expanse, seen either in the image of a disk or circle upon the primeval waters (Isa 40.22, Job 26.10, Pro 8.27, cf. “circle of the heavens”, Job 22.14) or of an outstretched garment spanning the void (Job 26.7, 38.13).

The earth, with Canaan at its centre (Psa 74.12), was believed to be one mass of land (cf. the “ends of the earth” (Psa 65.5) or its “four corners” (Isa 11.12)) surrounded by an ocean. Gen 49.25, Exo 20.4, Deu 4.18, Deu 33.13 speak of the deep (*təhôm*) beneath the earth. Pro 8.28–29 says the earth is founded on the deep (*təhôm*).

Psa 19.4–6 says the sun comes out of his pavilion (*huppātô*) like a bridegroom. The *huppāh* is where the bridegroom hides before he appears in his splendour for the wedding.

Psa 65.8 refers to the Gates of the East, and the Gates of the West: “You make the going out (*môšā’ē* ‘gates’) of the morning and the evening to shout for joy.”

underworld.

The earth itself is fixed, the heavenly bodies move.

The stars are points of light set in the dome of the sky.

The stars were objects of worship in ANE cultures. They were supposed to foretell events and a whole science was built up around them.

The earth-god produces plants and crops.

Human beings are created to serve the gods, almost as an afterthought.

Psa 19.1–4a says that the glory of God is revealed to all the earth by the starry heavens and 4b–6 says this knowledge of God is revealed to all by the sun which rises at one end of the heavens and makes its circuit to the other end. The sun traverses across the whole earth and nowhere is hidden from its heat.

Gen 1.17 says God set the stars in the firmament of heaven. As such, the stars will fall from heaven in judgment day (Isa 34.4, Mat 24.29, Rev 6.13).

The Israelites were forbidden to worship the stars and their constellations (see Deu 4.19).

Gen 1.11–12 states that God called upon the earth to produce vegetation: seed-bearing plants and fruit trees, according to their various kinds.

In Gen 1.26 God deliberates, “Let us make man...,” so the creation of mankind is not an afterthought. Gen 1.27 shows that the creation of mankind is indeed the climax of God’s creation. Also, rather than being created to serve the gods, mankind in Gen 1.26 are created in God’s image and likeness to rule as God’s representative on earth.

When Gen 1.1–2.3 is compared to the Mesopotamian and Egyptian cosmogonies it is clear that the biblical account speaks into the ANE worldview and only modifies it theologically:

- The Genesis account depicts the one God, Elohim, the God of the Hebrews, as the creator of all things and while he orders and governs his creation he is distinct and separate from it.
- The cosmos does not come about by random interactions or internecine warfare between the gods but instead the cosmos comes into being according to the purposeful order and command of Elohim.
- Mankind is the climax and pinnacle of God’s creation. They are created in God’s image and likeness as male and female to rule over the earth and its creatures as God’s representative.

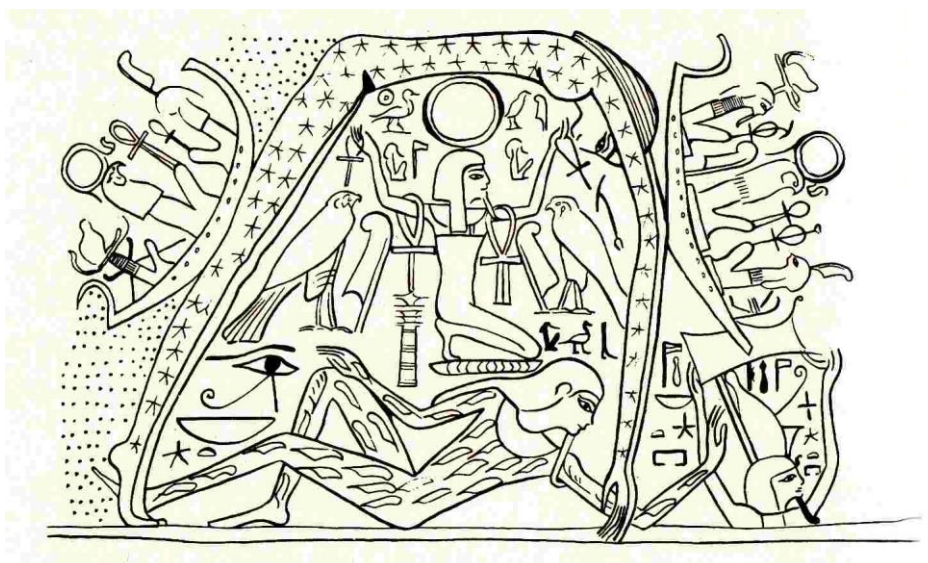


Figure 1: The Ancient Egyptian View of the Cosmos (Keel, 1997: 36)

Figure 1 depicts the ancient Egyptian conception of the cosmos. This pictorial depiction of the cosmos agrees closely with the mythological accounts of how the cosmos was created. It shows the sky-goddess, Nut, represented as a woman, her naked body curved to form the arch of heaven. She is adorned with the stars of heaven. Keel (1997: 36) says alongside the concept of the sky as a woman is an unrelated concept of the sky as a sea traversed by the sun god. He says the idea of a heavenly ocean probably had its origin in the observation that sky and water have the same colour (in Egyptian iconography it is usually blue-green), and that water falls from above. Lying below her is her husband Geb, the earth-god. As a chthonic deity he was associated with vegetation and the underworld. He is depicted with plants, such as barley, and other green patches on his body. It was believed that Geb's laughter was earthquakes and that he allowed crops to grow.

The ancient Egyptians believed that at the end of the day, Nut swallowed the sun-god, Ra, and gave birth to him again the next morning. They had a book of the day and a book of the night. The day and the night were each divided into twelve hours.¹⁰ The book of the day described the passage of the twelve hours of day and the book of the night the passage of the twelve hours of night. Ra is depicted travelling through the day and the night. Day and night are therefore independent of the sun-god Ra.

The famous Babylonian Map of the World at the British Museum (see Figure 2) allows us to see how the ancient Mesopotamians understood the nature of the cosmos to be. It depicts the world as a circular disk floating on an abyss of fresh water with salt water seas all around. This agrees with the mythological account in the Enuma Elish of how the cosmos was created. This map is usually dated to the 5th century BCE but since it concords with the Enuma Elish creation account which scholars date to the Hammurabi period (18th–16th century BCE) it must have been an ancient understanding of how the world was.

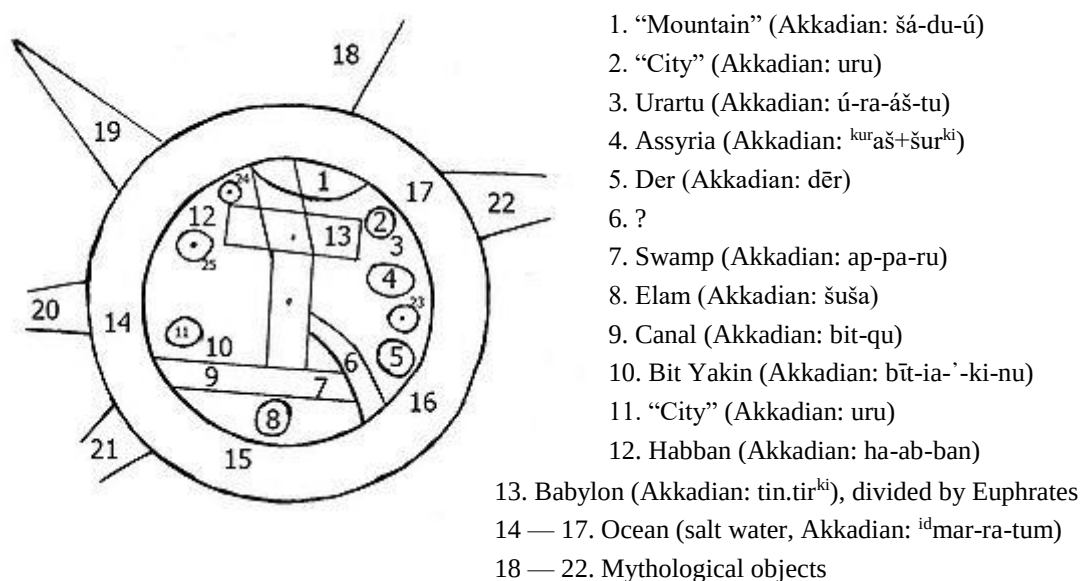


Figure 2: Babylonian Map of the World

It will be shown that the biblical cosmos created in Gen 1.1–2.3 is as depicted in Figure 3. The earth is a flat, circular disk supported by pillars which are founded on the waters of the abyss. Immediately below the earth is Sheol (*šə'ôl*), the realm of the dead. Above is the dome or vault of heaven which supports and keeps aloft the waters above. The stars are embedded in the dome of heaven as fixed points of light and the sun and moon pass along the surface of the dome as moveable light-emitters in the heavens. The light of daytime was created on day one and is independent of the light from the sun which was created on day four. The dome of heaven also rests on pillars. The rim of the

¹⁰ The ancient Egyptians invented the 24-hour day.

dome of heaven (the ends of heaven) meets the rim of the disk of the earth (the ends of the earth) at the horizon. Above the dome of heaven is the throne of God who oversees his creation from heaven. OT passages such as Pss 104.2–3, 5–9, 148.4, Job 26.11, 37.18, 38.4–11, Pro 8.28–29, Amos 9.6 confirm this biblical view of the cosmos. Exo 20.4, Deu 4.18, Php 2.10 describe the biblical cosmos as tripartite with the heavens above, the earth beneath and what is underneath the earth.

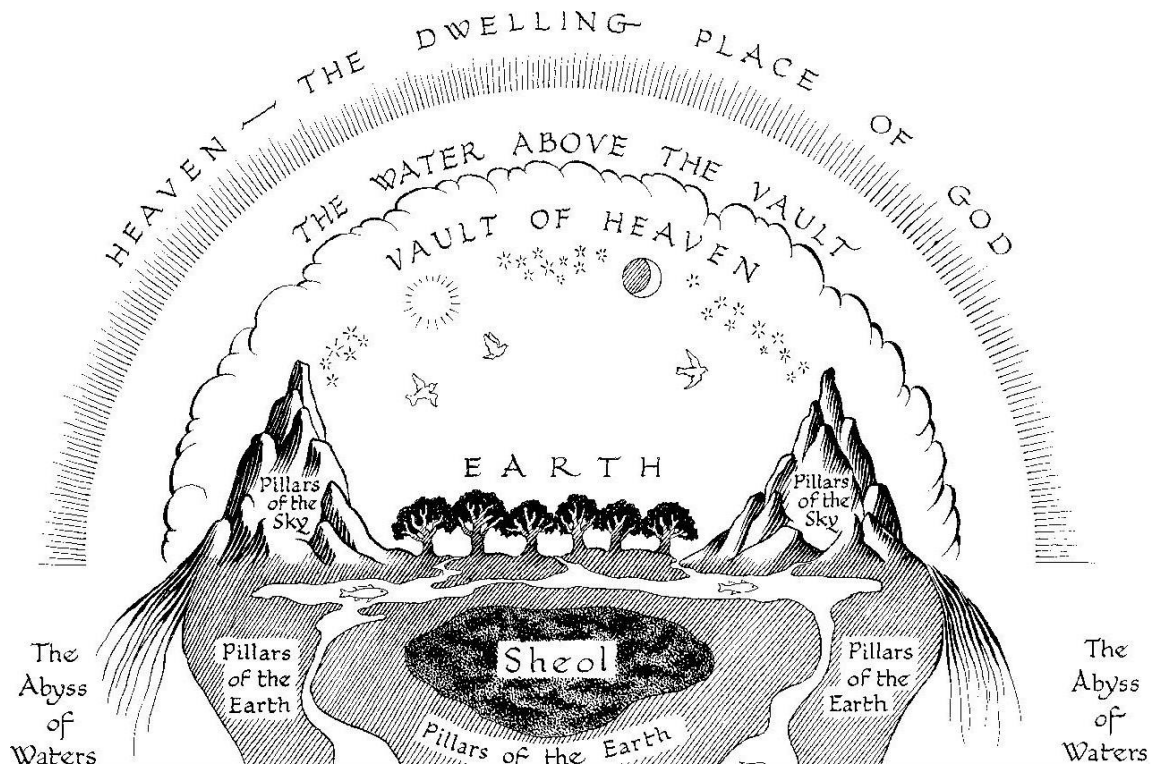


Figure 3: A Picture of Biblical Cosmology (Reyburn and Fry, 2000)

Creation Day One

On creation day one day and night are created (Gen 1.3–5).

Gen 1.3–5: ³wayyō' mer [and-he.said] 'ēlōhīm [Elohim] yəhî [he.will.become] 'ôr [light] wayəhî-'ôr [and-it.was.light] ⁴wayyarə' [and-he.saw] 'ēlōhīm [Elohim] 'et-hā'ôr [ACC-the-light] kî-tôb [that-good] wayyabədel [and-he.separated] 'ēlōhīm [Elohim] bēn [between] hā'ôr [the-light] ūbēn [and-between] haḥōšek [the-darkness] ⁵wayyiqərā' [and-he.called] 'ēlōhīm [Elohim] lā'ôr [to-light] yôm [day] wəlaḥōšek [and-to-darkness] qārā' [he.called] lāyəlā [night] wayəhî-'ereb [and-he.became-evening] wayəhî-bōqer [and-he.became-morning] yôm [day] 'eḥād [one] (Hebrew)¹¹

Gen 1.3–5: ³And God said, “Let there be light,” and there was light. ⁴And God saw that the light was good. And God separated the light from the darkness. ⁵God called the light Day, and the darkness he called Night. And there was evening and there was morning, day one.¹²

Gen 1.3–5 says God first created light ('ôr) and then created day (yôm) and night (lāyəlā) by separating the light from the darkness (ḥōšek). The refrain *And there was evening ('ereb) and there*

¹¹ Hebrew text is presented in roman transcription for the benefit of those who do not read the Hebrew orthography. It is the transcription used in SIL International's Bible Analysis and Research Tool (BART). See Table 4 and Table 5.

¹² Unless otherwise specified, scripture quotations are from the Holy Bible, English Standard Version® (ESV®), copyright © 2001 by Crossway Bibles, a publishing ministry of Good News Publishers. Used by permission. All rights reserved.

was morning (*bōqer*) confirms that day and night has been created. *‘ereḥ* ‘evening’ signifies the end of day one and *bōqer* ‘morning’ signifies the beginning of another day.¹³ In the OT, *bōqer* is usually used to indicate the beginning of the day rather than the term *mizārāḥā* ‘sunrise’. The term *mizārāḥā* is instead used to indicate an eastward direction. Likewise, the term *‘ereḥ* is normally used to indicate the end of the day rather than the expression for sunset *kāḇô* ‘*haš-šemeš* ‘goes the sun’. However, even though *bōqer* normally includes a sunrise and *‘ereḥ* normally includes a sunset, in Gen 1.5 there is an evening (*‘ereḥ*) without a sunset and a morning (*bōqer*) without a sunrise. Day and night were thus created independently of the sun.

This makes no sense from a modern cosmological perspective as we now know that day and night are produced by the earth’s rotation with respect to the sun. So you would need to have the sun and a rotating earth to create day and night in modern terms. But according to the Gen 1.1–2.1 creation account the earth is not created until day three (Gen 1.9–10) and the sun is not created until day four (Gen 1.14–19). However, from an ANE perspective Gen 1.5 makes perfect sense. Walton, Matthews & Chavalas, eds. (2000: 28) say: “The people of the ancient world did not believe that all light came from the sun. There was no knowledge that the moon simply reflected the light of the sun. Moreover, there is no hint in the text that “daylight” was caused by sunlight. The sun, moon and stars were all seen as bearers of light, but daylight was present even when the sun was behind a cloud or eclipsed. It made its appearance before the sun rose, and remained after the sun set.”

To make Gen 1.3–5 concord with a modern cosmological view, some apologists¹⁴ think that on the first three days of creation it was God himself who was the source of the daylight.¹⁵ But this would be theologically unacceptable as it would make God part of his creation and part of the heavens and earth created in Genesis 1. A key theme of the polemic nature of Genesis 1 is that Elohim, the Creator God of the Hebrews, is separate from and transcendent to his creation. This is contrary to other ANE religions where deities of one kind or another populate the heavens and the earth. For example, the sun and the moon are not named as such when they are created (Gen 1.14–16). They are simply called the greater and lesser luminaries (*mā’ōrōt*). This is because the names *šemeš* ‘sun’ and *yārēah* ‘moon’ represent deities in ancient Mesopotamian cultures. The idea that Elohim would function as a luminary for the first three days of his creation would contradict this polemic. Other scholars think that God must have created an anonymous light-giving body before he created the sun.¹⁶ But this too would be theologically unsatisfactory as it would mean that God created a foundational entity¹⁷ for the cosmos that only lasted three days until it was replaced by the “real sun”. A theme of the first three days of creation in the Genesis 1 account is the orderly progression from chaos to cosmos through the process of separation. The idea that God would use a “temporary sun” while he was constructing the foundations of the cosmos over the first three days of creation and then discard it on day four and replace it with the sun we see is nonsensical.

The separation of light and dark to create day and night is also not understandable from a modern view. Since we live on a rotating globe there is always daylight on one side of the planet and night on the other side. The “separation” of day and night is dependent on which side of the planet you are on, i.e., whether it is the side facing the sun or not. But the problem with this understanding is again that the earth is not created until day three (Gen 1.9–10). So, on day one there was no planet earth to provide the rotation to separate day and night. There was also no sun to shine on the earth.

However, in ANE cosmology, day and night is a fundamental component of the cosmos. In Mesopotamian creation accounts day and night existed in the beginning before the sun-god or the moon-god were created. Job 26.10 confirms the biblical understanding from Gen 1.3–5 that day and night were created as separated domains before the earth was created. Pro 8.27 says that God created the

¹³ BDB (2010 [1906]: 133) says *bōqer* means ‘morning’. It is a point of time, a time at which, never during which. BDB (2010 [1906]: 787) says *‘ereḥ* means ‘sunset, evening’.

¹⁴ An apologist is someone who offers an argument in defence of something controversial.

¹⁵ Calvin (2007 [1847]: 37) surmises that this passage teaches that God is the ultimate source of light and he chooses to impart light to us through the sun and the moon. In other words, God functions as the daylight for the first three creation days.

¹⁶ See John Gill’s comments against Gen 1.3–5 in Gill (1748–63). Hamilton (1990: 120) says that what the author states is that God caused the light to shine from a source other than the sun for the first three “days”.

¹⁷ Understood in modern terms as a source for daylight.

earth by first inscribing a circle on the surface of the primordial deep (*tāhôm*). The ancients understood that the earth was a flat, circular disk floating on top of the waters of the deep, and that the heavens were a dome over the earth. The circle of the earth in Pro 8.27 is where the rim of the circular earth and the rim of the heavenly dome meet. Job 26.10 refers to this creation activity and says that the circle of the earth was drawn at the boundary between light (day) and darkness (night). Thus the existence of day and night preceded the creation of the earth.

Job 26.10: ḥōq-ḥāḡ [(he has drawn) boundary-circle] ‘al-pānê-māyim [on-face.of-waters] ‘aḏ-taklîṭ [to-end.of] ‘ôr [light] ‘im-ḥōšek [with-darkness] (Hebrew)

Job 26.10: He has inscribed a circle (*ḥōq-ḥāḡ*) on the face of the waters at (‘*aḏ*-) the boundary between light (‘*ôr*) and darkness (*ḥōšek*). (ESV)

Job 26.10: He marks out the horizon (*ḥōq-ḥāḡ*) on the face of the waters for (‘*aḏ*-) a boundary between light (‘*ôr*) and darkness (*ḥōšek*). (NIV)¹⁸

Pro 8.27: When he established the heavens, I was there; when he drew a circle (*ḥûḡ*) on the face of the deep (‘*al-pānê tāhôm*),

Notice that there is a subtle difference in how the ESV translates Job 26.10 and how the NIV translates this verse. The point of interest is in how the preposition ‘*aḏ*- is translated. BDB (2010 [1906]: 723) says ‘*aḏ*- means ‘as far as, even to, up to’ with respect to a spatial dimension. The ESV translates ‘*aḏ*- as *at* which is within the domain of meaning for this preposition in this context. Translating with *at* also implies that the boundary between light and darkness existed before the circle (of the earth) was drawn. However, the NIV translates ‘*aḏ*- as *for*. First, ‘for the purpose of’ is not part of the meaning of this Hebrew preposition. Second, *for* suggests that the drawing of the circle created the boundary between light and darkness. This, in turn, implies that this boundary did not exist before the creation of the earth. But this implication¹⁹ is not in the original Hebrew and is only introduced by the English translation. The NIV is concerned to concord the biblical text with a modern cosmological understanding through the translation.

Furthermore, passages such as Pro 4.18, Ecc 12.2, Isa 5.30, Amo 5.8, and Job 38.12 suggest that in the biblical worldview the day has its own light independent of the sun. Pro 4.18 refers to the first light of daylight (‘*ôr*) rather than the first light of the rising sun. And the rest of the verse speaks of the full light of the day (*yôm*) rather than the full light of the sun. Ecc 12.2 distinguishes the light of the day (‘*ôr*) from the sun (*šemeš*), the moon (*yārēah*) and the stars (*kôḳābîm*). Isa 5.30 speaks of darkening the daylight (‘*ôr*) rather than darkening the sun and Amo 5.8 says God darkens the day (*yôm*) into night (*lāyālâ*). In Job 38.12 God asks Job if he has commanded the morning (*bôqer*) to dawn the day rather than the sun. *Bôqer* is the term used in the refrain “and there was evening (‘*ereḇ*) and there was morning (*bôqer*)” in Gen 1. The skirts (*kanpōṭ*) of the earth in Job 38.13 refer to the horizon where the dome of heaven meets with the rim of the disk of the earth. Within this worldview there is no difficulty in understanding that God created the light of day before he created the sun and moon as light-givers or luminaries (*mā’ôrōṭ*) to govern the day and the night.

Pro 4.18: The path of the righteous is like the first gleam of dawn (‘*ôr*), shining ever brighter till the full light (‘*ôr nōḡah*) of day (*yôm*). (NIV)

Ecc 12.2: ...before the sun (*šemeš*) and the (day)light (‘*ôr*) and the moon (*yārēah*) and the stars (*kôḳābîm*) are darkened

Isa 5.30: And if one looks to the land (*hā-’āreš*), behold darkness and distress and the (day)light (‘*ôr*) is darkened by its clouds.

Amo 5.8: He who made the Pleiades and Orion, and turns deep darkness into the morning and darkens the day (*yôm*) into night (*lāyālâ*),

¹⁸ Scriptures marked NIV are taken from the New International Version (NIV): Scripture taken from The Holy Bible, New International Version ®. Copyright© 1973, 1978, 1984, 2011 by Biblica, Inc.™. Used by permission of Zondervan.

¹⁹ Implication is the conclusion that can be drawn from something although it is not explicitly stated.

Job 26.10: He has inscribed a circle (*hûḡ*) on the face of the waters at the boundary between light (‘*ôr*) and darkness (*hōšēk*).

Job 38.12–13: ¹² “Have you commanded the morning (*bōqer*) since your days began, and caused the dawn (*šahar*) to know its place, ¹³ that it might take hold of the skirts (*kanpōt*) of the earth, and the wicked be shaken out of it?

It is also the case that whereas there are many passages which speak of the heat of the sun (e.g., Psa 19.6, Isa 18.4, 49.10, Jon 4.8, Rev 7.16) there are not many which speak of its light (only Gen 1.16, Rev 21.23, 22.5). This suggests that it is the heat of the sun that has impact on daily life rather than its light.

Augustine of Hippo writing in the 4th century CE²⁰ knew that the world was a sphere from Greek science and philosophy²¹ and that when the sun shines on one side of the world it must be night on the other side. He also realised that because the sun travels around the world it is always day somewhere and it is always night somewhere.²² So you can only have the day-night alternation if you stay in the one place on the surface of the earth. He then says this forces us to believe that God was in one part of the world when he created daylight and had to remain there until the night came for it to be evening and the end of the first day. He concluded that this would be theologically absurd. So from the time of Augustine in the 4th century CE it has been known that the creation of day and night described in Gen 1.4–5 cannot be made to agree with the earth being a globe. Fourteen centuries later John Calvin also struggled to understand how there could be a separation of day and night on a rotating earth where it is always day on one side and night on the other side.²³

Note too that the day and night alternation is created before the heavens are created on day two (Gen 1.6–8) and the earth is created on day three (Gen 1.9–10). This means that day and night as a foundational component of the cosmos should apply to heaven as well as to earth. In Rev 4.8 and 7.15 this application is expressed. Rev 4.8 describes a vision of the four living creatures around the heavenly throne praising God unceasingly day (ἡμέρας) and night (νυκτός). Rev 7.15 describes the great multitude in white robes standing before the throne of God, serving him day (ἡμέρας) and night (νυκτός) in his temple.

Rev 4.7–8: ⁷ ...And around the throne, on each side of the throne, are four living creatures, full of eyes in front and behind: the first living creature like a lion, the second living creature like an ox, the third living creature with the face of a man, and the fourth living creature like an eagle in flight. ⁸ And the four living creatures, each of them with six wings, are full of eyes all around and within, and day and night (ἡμέρας καὶ νυκτός) they never cease to say, “Holy, holy, holy, is the Lord God Almighty, who was and is and is to come!”

Rev 7.15: Therefore they (the great multitude in white robes (Rev 7.9)) are before the throne of God, and serve him day and night (ἡμέρας καὶ νυκτός) in his temple; and he who sits on the throne will shelter them with his presence.

The meaning of Greek temporal expressions is determined by what case the words are in.²⁴ The words ἡμέρας ‘day’ and νυκτός ‘night’ are in the genitive case.²⁵ The genitive of time expresses the *kind* of time or the time during which something happened. So this means the activities described in Rev 4.8 and 7.15 occurred during both the day and the night. The temporal expressions ἡμέρας καὶ νυκτός ‘day and night’ / νυκτός καὶ ἡμέρας ‘night and day’ as genitive of time also occur in Mrk 5.5,

²⁰ See Augustine (1982).

²¹ In about 350 BCE, the Greek philosopher Aristotle observed that the curved umbral shadow of the earth on the moon during a lunar eclipse was a proof that the earth was in fact spherical. Up until this time the common belief in ancient times was that the earth was a flat disk floating on the waters of the abyss.

²² Although Aristarchus of Samos (300–210 BCE) deduced a scientific heliocentric model of the solar system, Ptolemy (200 CE) proposed an earth centred universe, with the sun and planets revolving around the earth and this view prevailed until the Middle Ages.

²³ See Calvin (2007 [1847]: 37).

²⁴ See Robertson (1919: 495).

²⁵ The nominative case forms are ἡμέρα ‘day’ and νύξ ‘night’.

Luk 18.7, Act 9.24, 1 The 2.9, 3.10, 1 Tim 5.5, 2 Tim 1.3. In each instance, the meaning is ‘during the day and the night’.

Mrk 5.5: Night and day (παντὸς νυκτὸς καὶ ἡμέρας) among the tombs and on the mountains he was always crying out and cutting himself with stones. [genitive of time]

Luk 18.7: And will not God give justice to his elect, who cry to him day and night (ἡμέρας καὶ νυκτός)? [genitive of time]

Act 9.24: but their plot became known to Saul. They were watching the gates day and night (ἡμέρας τε καὶ νυκτός) in order to kill him, [genitive of time]

1 The 2.9: or you remember, brothers, our labour and toil: we worked night and day (νυκτὸς καὶ ἡμέρας), that we might not be a burden to any of you, [genitive of time]

1 The 3.10: as we pray most earnestly night and day (νυκτὸς καὶ ἡμέρας) that we may see you face to face and supply what is lacking in your faith? [genitive of time]

1 Tim 5.5: She who is truly a widow, left all alone, has set her hope on God and continues in supplications and prayers night and day, (νυκτὸς καὶ ἡμέρας) [genitive of time]

2 Tim 1.3: I thank God whom I serve, as did my ancestors, with a clear conscience, as I remember you constantly in my prayers night and day (νυκτὸς καὶ ἡμέρας). [genitive of time]

Less frequently, the temporal expression νύκτα καὶ ἡμέραν ‘night and day’ occurs in the accusative case, as in Luk 2.37 and Act 26.7. The accusative of time expresses the *extent* of time. The meaning in these examples is thus ‘for the length of the day and night’. In other words, the activities occurred throughout the whole day and the whole night.

Luk 2.37: and then as a widow until she was eighty-four. She did not depart from the temple, worshiping with fasting and prayer night and day (νύκτα καὶ ἡμέραν). [accusative of time]

Act 26.7: to which our twelve tribes hope to attain, as they earnestly worship night and day (νύκτα καὶ ἡμέραν). [accusative of time]

The expression ἡμέρας καὶ νυκτός in the genitive therefore has a precise meaning of ‘during the day and the night’ which is different to the accusative of time expressed by νύκτα καὶ ἡμέραν. While νύκτα καὶ ἡμέραν (accusative of time) entails the activity occurred throughout the night and the day, ἡμέρας καὶ νυκτός (genitive of time) does not have this entailment.²⁶ Hence, the genitive ἡμέρας καὶ νυκτός ‘day and night’ in Rev 4.8 can be qualified with ἀνάπαυσιν [rest] οὐκ [not] ἔχουσιν [they. have] ‘not resting’. But in order for ἡμέρας καὶ νυκτός to have the temporal meaning of ‘during the day and the night’ there must be a ‘day’ and ‘night’ to refer to in this context as the kind of time. The context of Rev 4.8 and 7.15 is heaven. Therefore there must be day and night in heaven.

In support of this conclusion, in Rev 6.9 John sees the souls (ψυχὰς) of those who had been slain for the word of God and for the witness they had borne under the altar in the temple. They cried out with a loud voice, “O Sovereign Lord, holy and true, how long before you will judge and avenge our blood on those who dwell on the earth?” (Rev 6.10). Then they were each given a white robe and told to rest a little longer, until the number of their fellow servants and their brothers should be complete, who were to be killed as they themselves had been (Rev 6.11). The use of the temporal expressions “how long” and “rest a little longer, until...” indicate that time is passing in the celestial temple/heaven. Therefore the use of day and night (ἡμέρας καὶ νυκτός) in Rev 4.8 and 7.15 must also be a reference to time passing. The means of indicating the passage of time that God made in the beginning is the day and night alternation he created on day one (Gen 1.3–5). This applies to the whole cosmos including heaven.

Rev 6.9–11: ⁹ When he opened the fifth seal, I saw under the altar the souls of those who had been slain for the word of God and for the witness they had borne. ¹⁰ They cried out with a loud voice, “O Sovereign Lord, holy and true, how long before you will judge and avenge our blood on those who dwell on the earth?” ¹¹ Then they were each given a white robe and told to rest a

²⁶ That is, it does not have this requirement for its truth value.

little longer, until the number of their fellow servants and their brothers should be complete, who were to be killed as they themselves had been.

The day and night alternation only ceases in the new heaven and earth. See Rev 21.22–25, 22.5. These passages in Revelation refer to the separation of day and night in Gen 1.3–5 and say there will be no more night (darkness) in the new heaven and earth. They also refer to Gen 1.15 where the sun and the moon are created to give light upon the earth. Since there will no longer be night, i.e., a day/night alternation, there will no longer be the need of the sun and the moon to separate these domains (Gen 1.14).

Rev 21.22–25: ²² And I saw no temple in the city, for its temple is the Lord God the Almighty and the Lamb. ²³ And the city has no need of sun or moon to shine on it, for the glory of God gives it light, and its lamp is the Lamb. ²⁴ By its light will the nations walk, and the kings of the earth will bring their glory into it, ²⁵ and its gates will never be shut by day (ἡμέρας)—and there will be no night (νύξ) there.

Rev 22.5: And night will be no more. They will need no light of lamp or sun, for the Lord God will be their light, and they will reign forever and ever.

Gen 1.14–15: ¹⁴ And God said, “Let there be lights in the firmament of the heavens to separate the day from the night. And let them be for signs and for religious festivals and for days and years, ¹⁵ and let them be lights in the firmament of the heavens to give light upon the earth.

The biblical view that the sun is not the source of daylight created on day 1 was also part of the belief system of the Early Church. St Ambrose (born 337 CE) wrote in his *Hexameron*: “We must remember that daylight is one thing and sunlight, moonlight and starlight another – the sun’s purpose is to give daylight additional brilliance.” This understanding is also clearly illustrated by the mosaics in St Mark’s cathedral (rebuilt in the 11th cent. CE) in Venice and by the frescos in the baptistry in Florence and the basilica of St Francis at Assisi, all of which show the Creator placing in the sky two disks of equal size distinguished only by their colour or by an inscription.

Creation Day Two

On creation day two the heavens are created (Gen 1.6–8).

Gen 1.6–8: ⁶ wayyō’mer [and-he.said] ’ēlōhîm [Elohim] yəhî [he.will.become] rāqîa’ [firmament] bəṭōl [in-midst.of] hammāyim [the-waters] wîhî [and.he.will.become] maḥdîl [separating] bēn [between] mayim [waters] lāmāyim [to-waters] ⁷ wayya’as [and-he.made] ’ēlōhîm [Elohim] ’et-hārāqîa’ [ACC-the-firmament] wayyaḥdēl [and-he.separated] bēn [between] hammayim [the-waters] ’āšer [which] mittahat [from-under] lārāqîa’ [the-firmament] ūbēn [and-between] hammayim [the-waters] ’āšer [which] mē’al [from-on] lārāqîa’ [the-firmament] wayəhî-kēn [and-it.was-so] ⁸ wayyiqrā’ [and-he.called] ’ēlōhîm [Elohim] lārāqîa’ [the-firmament] šāmayim [heavens] wayəhî-’ereḇ [and-he.became-evening] wayəhî-bōqer [and-he.became-morning] yôm [day] šēnî [second] (Hebrew)

Gen 1.6–8: ⁶ And God said, “Let there be an expanse (*rāqîa’*) in the midst of the waters, and let it separate the waters from the waters.” ⁷ And God made the expanse and separated the waters that were under the expanse from the waters that were above the expanse. And it was so. ⁸ And God called the expanse Heaven (*šāmayim* ‘heavens’). And there was evening and there was morning, the second day.

As already mentioned, ANE peoples believed the sky is a solid, dome-like structure that covers the earth, holding back an ocean of water that exists above it. This is where precipitation comes from. See the ancient Egyptian understanding of the cosmos depicted in Figure 1. The Mesopotamian Enuma Elish “Epic of Creation” dates to the late second millennium BCE. In this mythological story Marduk destroys Tiamat. Then he rips her corpse into two halves in order to create the fresh waters of heaven and the salt waters of the seas. After this he hoists heaven above the earth and secures heaven to earth

with *durmāhu* ‘lead ropes’.²⁷ In the Enuma Elish the heavens are portrayed as being more like a tent canopy than a solid dome.

Against this background, Gen 1.6–8 says God created a *rāqîa* ‘to separate the waters above from the waters below. In order to achieve this kind of separation the *rāqîa* must be something solid, even watertight. The noun *rāqîa* is derived from the verb *rāqa*, which means ‘to hammer out flat’²⁸ as in *riqqū ‘ê paḥîm* ‘hammered plates’ (Num 16.38[17.3]).²⁹ Therefore *rāqîa* in Gen 1.6–8 would have been understood as denoting a metal plate or sheet of some kind.³⁰ Gen 1.17 says God set the sun, moon and stars in the *rāqîa* *haš-šamayim*. The Hebrew verb translated “set” here is *nātan*, and it has three senses: 1. ‘give,’ 2. ‘put’ or ‘set,’ and 3. ‘make’ or ‘constitute’.³¹ When *nātan* is used with the second sense elsewhere in the OT where a physical object is placed in a location, then the location has to be something with physical substance (cf. Exo 25.30 where ‘table’ has physical substance, Exo 40.5 where ‘ark’ has physical substance, 2 Kgs 12.9 where ‘altar’ has physical substance, 2 Chr 4.7 where ‘temple’ has physical substance). Therefore the implication in Gen 1.17 is that *rāqîa* has physical substance for the sun, moon and stars to be “set (*nātan*)” in it. Furthermore, Gen 1.20 says (in the Hebrew) “let birds fly above the earth across the surface (*pānê* ‘face’) of the firmament (*rāqîa*) of the heavens (*haš-šamayim*).” Here *pānîm* literally means “faces” and is the same word as used in Gen 1.2: “...and darkness was over the face (*pānê*) of the deep. And the Spirit of God was hovering over the face (*pānê*) of the waters.” In both v. 17 and v. 20 *pānîm* means ‘surface’. A surface is a flat, two-dimensional area. The depiction given in Gen 1.20 is therefore of the birds flying above the earth and across the surface of the dome of the sky above.

Gen 1.16–18: ¹⁶ And God made the two great lights—the greater light to rule the day and the lesser light to rule the night—and the stars. ¹⁷ And God set (*yittēn*) them in the expanse (*rāqîa*) of the heavens (*šamayim*) to give light on the earth, ¹⁸ to rule over the day and over the night, and to separate the light from the darkness. And God saw that it was good.

Gen 1.20: And God said, “Let the waters swarm with swarms of living creatures, and let birds fly above the earth across the surface (*pānê* ‘face’) of the firmament (*rāqîa*) of the heavens (*šamayim*).”

Descriptions of *rāqîa* elsewhere in the OT also depict it as something flat with physical substance. Psalm 19 is a Psalm of David. Vv. 1–6 declare how God reveals himself to his people through his creation. V. 1 specifically says: “the *rāqîa* above proclaims his (God’s) handiwork.” In this case *rāqîa* (v. 1) is identified with the sky (described as a tent (*’ōhel*) in v. 4) where the sun rises each day at one end of the heavens, makes its circuit across the sky, and goes down at the other end of the heavens (Psa 19.4b–6). The sky (*rāqîa*) is thus depicted as a domed tent canopy across which the sun passes. The *huppāh* is the tent or pavilion where the bridegroom hides before he appears in his splendour for the wedding. Thus, the sun is conceived of as existing in a hidden compartment behind the sky (*rāqîa*) before it rises. Notice too that Psa 19.6 says the sun goes from one end (*qāṣēh*) of heaven to the other end (*qāṣēh*) of heaven.³² This confirms the psalmist thinks heaven is a dome of some sort that meets the earth at its rim.

Psa 19.1–6: ¹ The heavens (*haš-šamayim*) declare the glory of God, and the sky (*rāqîa*) above proclaims his handiwork. ² Day to day pours out speech, and night to night reveals knowledge. ³ There is no speech, nor are there words, whose voice is not heard. ⁴ Their voice goes out through all the earth (*’ereṣ*), and their words to the end of the world (*tēbēl*). In them he has set a

²⁷ It seems this suspension of earth from heaven is alluded to in Job 26.7: He (*’ēl* ‘God’) stretches out the north (*šāpōn*) over the void (*tōhū*) and hangs the earth (*’ereṣ*) on nothing (*bālî-mā*).

²⁸ See Klein (1987: 628), BDB (2010 [1906]: 956), NIDOTTE Vol 3 (1997: 1198), Harris, ed., (1999 [1980]), Baker, ed., (1994: 2367).

²⁹ The [17.3] in square brackets indicates the chapter and verse number in the Hebrew Masoretic Text.

³⁰ The denotation of a word is the object or concept to which a word refers.

³¹ See BDB (2010 [1906]: 678–82).

³² It is not explained in the Bible how the sun gets back from where it sets in the west to where it rises in the east. The actual explanation is that it is because the earth spins on its axis in an easterly direction. But it was not until Nicolaus Copernicus in 1543 proposed a heliocentric model of the universe that the earth’s easterly rotation began to be established.

tent (*’ohel*) for the sun (*šemeš*),⁵ which comes out like a bridegroom leaving his chamber (*huppā’ô*), and, like a strong man, runs its course with joy.⁶ Its rising is from the end of the heavens (*mi-qṣēh haš-šāmayim*), and its circuit to the end of them (*’al-qāṣōtām*), and there is nothing hidden from its heat.

Psalms 150 is the last Psalm. The exhortation in v. 1 to praise God in his mighty heavens is literally *bi-rāqī’ā* ‘*uzzô* ‘in the firmament of his (God’s) strength’. Here *rāqī’ā* is depicted as something strong and firm which glorifies God. In Ezekiel’s vision (Ezk 1.22, 23, 25, 26, 10.1) *rāqī’ā* is described from the perspective of heaven as something solid and flat, sparkling like ice, and which is awesome to behold. In Revelation a similar vision says: “Also before the throne there was what looked like a sea of glass, clear as crystal.” (Rev 4.6)

The biblical understanding that the sky is something hammered or stretched out flat and solid is also supported by Job 37.18, Isa 42.5, 44.24, 51.13, Zech 12.1. The verb *nāṭā* in Isa 51.13 and Zech 12.1 means ‘stretch out, spread out, extend, incline, bend’.³³ The passages in Isa 34.4a and Rev 6.14 liken the heavens to a scroll that can be rolled up. Therefore the conceptual metaphor³⁴ expressed in these passages is that God has created the heavens as a great dome or tent canopy over the earth and bent it down to meet the earth at its rim or edge.

Job 37.18: “Can you, like him, spread out (*rāqa*) the skies (*šəḥāqīm* ‘clouds’), hard as a cast metal mirror?”

Isa 42.5: Thus says God, the LORD, who created the heavens and stretched (*rāqa*) them out, ...

Isa 44.24: I am the LORD, who made all things, who alone stretched out (*rāqa*) the heavens, ...

Isa 51.13: ... and have forgotten the LORD, your Maker, who stretched out (*nōṭeh*) the heavens ...

Zech 12.1: Thus declares the LORD, who stretched out (*nōṭeh*) the heavens ...

Isa 34.4a: All the host of heaven (*šəbā’ haš-šāmayim*) shall rot away, and they (*haš-šāmayim*) will roll up like a scroll.

Rev 6.14: The sky (οὐρανὸς ‘heaven’) vanished like a scroll that is being rolled up, and every mountain and island was removed from its place.

Elsewhere in the Bible, the firmament of heaven (*rāqī’ā haš-šāmayim*) is depicted as having openings. Gen 28.12 says Jacob dreamed he saw a ladder set up on the earth and the top of it reached to heaven. He saw the angels of God were ascending and descending on it. After his dream, Jacob was afraid and said, “How awesome is this place! This is none other than the house of God, and this is the gate (*ša’ar*) of heaven.” (Gen 28.17) Rain (Gen 7.11, 8.2, Jgs 5.4, Deu 11.11) and dew (Gen 27.28, 39, Deu 33.28) come down from heaven. Psalms 78.23–24 says the Israelites wandering in the wilderness received manna and grain through doors (*daltē*) in heaven. In Rev 4.1 John says he saw a door (θύρα) standing open in heaven (οὐρανῶ).

Psalms 78.23–24: ²³ Yet he commanded the skies (*šəḥāqīm* ‘clouds’) above and opened the doors of heaven (*daltē šāmayim*), ²⁴ and he rained down on them manna to eat and gave them the grain of heaven.

Rev 4.1: After this I looked, and behold, a door (θύρα) standing open in heaven (οὐρανῶ)!

As well as gates and doors the biblical heaven has windows or sluiceways (*’ārubbōt*), through which rain (Gen 7.11, 8.2), grain (2 Kgs 7.2, 19), or blessings (Mal 3.10) can come down to earth. Most commentators say “the windows of the heavens were opened” in Gen 7.11 is a figure of speech for a heavy downpour and this expression should not be understood as literally referring to windows or sluiceways in heaven. But in the expression “the windows of the heavens were closed” in Gen 8.2 the reference to *’ārubbōt* ‘windows’ must be literal as here they are being closed rather than opened.

³³ See BDB (2010 [1906]: 639–41).

³⁴ A conceptual metaphor is a metaphor (or figurative comparison) in which one idea (or conceptual domain) is understood in terms of another.

Furthermore, Gen 7.12 says ‘And rain fell upon the earth forty days and forty nights.’ The *wa-yəhî* ‘and it was’ at the beginning of the verse is a *waw*-consecutive verb and this indicates that the rain falling on the earth follows the event described in the preceding clause. The preceding clause says ‘and the windows of the heavens were opened’. If this clause is understood literally then the opening of the windows of heaven is the cause of rain falling on the earth for forty days and forty nights. This makes sense. However, if this clause is understood figuratively then the cause of the rain falling for forty days and nights is a heavy downpour of rain. This does not make sense. So, the author of these passages is referring to what he understood to be literal windows in heaven. The motive for interpreting “the windows of the heavens were opened” in Gen 7.11 figuratively is because a literal interpretation would not agree with a modern understanding of the world. But Gen 7.11 and 8.2 are written from an ANE view of the world.

Gen 7.11: In the six hundredth year of Noah’s life, in the second month, on the seventeenth day of the month, on that day all the fountains of the great deep burst forth, and the windows of the heavens (*ʾarubbōt haš-šamayim*) were opened.

Gen 7.12: *wa-yəhî* [and-it.was] *hag-gešem* [the-downpour] ‘*al-hā-’āreš* [on-the-earth] ‘*arəbā’im* [forty] *yôm* [day] *wə-’arəbā’im* [and-forty] *lāyālā* [night] (Hebrew)

‘And rain fell upon the earth forty days and forty nights.’

Gen 8.2: The fountains of the deep and the windows of the heavens (*ʾarubbōt haš-šamayim*) were closed, the rain from the heavens was restrained,

There are also many passages in the NT which speak of the heavens (οὐρανός) being opened. Mrk 1.10 says heaven was torn open. The implication from these passages is that heaven is conceived of as being something like a great wall which is normally closed preventing anyone from seeing inside.

Mat 3.16: And when Jesus was baptised, immediately he went up from the water, and behold, the heavens (οἱ οὐρανοί) were opened to him, and he saw the Spirit of God descending like a dove and coming to rest on him;

Mrk 1.10: And when he came up out of the water, immediately he saw the heavens (τοὺς οὐρανοὺς) being torn open and the Spirit descending on him like a dove.

Luk 3.21: Now when all the people were baptised, and when Jesus also had been baptised and was praying, the heavens (τὸν οὐρανὸν) were opened,

Jhn 1.51: And he said to him, “Truly, truly, I say to you, you will see heaven (τὸν οὐρανὸν) opened, and the angels of God ascending and descending on the Son of Man.”

Act 7.56: And he said, “Behold, I see the heavens (τοὺς οὐρανοὺς) opened, and the Son of Man standing at the right hand of God.”

Act 10.11: and saw the heavens (τὸν οὐρανὸν) opened and something like a great sheet descending, being let down by its four corners upon the earth.

While the biblical view that the heavens are a solid dome over the earth is completely alien to how we understand the heavens to be today, it may surprise some to know that the idea that the heavens are solid at some level was not finally abandoned until the 17th century CE. After Greek astronomers worked out in the 4th and 3rd century BCE that the earth is a sphere from observing that the earth throws a circular shadow on the moon during a lunar eclipse they developed a cosmological model of celestial spheres.³⁵ In this model the apparent motions of the fixed stars and the planets are accounted for by treating them as embedded in rotating spheres made of an aetherial, transparent fifth element (quintessence),³⁶ like jewels set in orbs. The medieval scholastics³⁷ adopted a cosmology that fused the ideas of the Greek philosophers Aristotle and Ptolemy. This cosmology involved celestial orbs,

³⁵ Prior to this, ancient cultures understood the earth to be a circular disk floating on the waters of the abyss.

³⁶ The other four elements of existence were in order of elevation earth, water, air and fire.

³⁷ Scholasticism is a method of critical thought which dominated teaching by the academics of medieval universities in Europe from about 1100–1700.

nested concentrically inside one another, with the earth at the centre. The outermost orb contained the stars and the term “firmament” was then transferred to this orb. Even the heliocentric model of Copernicus included an outer sphere that held the stars (and by having the earth rotate daily on its axis it allowed the firmament to be completely stationary). Tycho Brahe’s studies of the nova of 1572 and the comet of 1577 were the first major challenges to the idea that orbs existed as solid, incorruptible, material objects. In 1584, Bruno proposed a cosmology without firmament: an infinite universe in which the stars are actually suns with their own planetary systems.³⁸ After Galileo began using a telescope to examine the sky, it became harder to argue that the heavens were perfect, as Aristotelian philosophy required. By 1630, the concept of solid orbs was no longer dominant.

The waters above created in Gen 1.6–8 are another integral part of the biblical cosmos. Their primary function is to provide rain on the earth as Psa 104.13 indicates. In Psa 148.2–6 the waters above the heavens are called upon as part of the heavenly host along with angels, and the sun, moon and stars to give praise to God. The note at Psa 148.4 in *The NIV Study Bible* refers the “waters above the skies” in verse 4 to Gen 1.7 and also compares these waters with the “ocean depths” in verse 7. This indicates that here the psalmist is referring to the waters above the *rāqîaʿ* and the waters below the *rāqîaʿ* as God created them in Gen 1.7.

Psa 104.13: He waters the mountains from his upper chambers (lit. upper rooms); the earth is satisfied by the fruit of his work. (NIV)

Psa 148.1–6: ¹ Praise the LORD! Praise the LORD from the heavens; praise him in the heights! ² Praise him, all his angels; praise him, all his hosts! ³ Praise him, sun and moon, praise him, all you shining stars! ⁴ Praise him, you highest heavens, and you waters above the heavens (*ham-māyîm ʿāšer mēʿal haš-šāmāyîm*)! ⁵ Let them praise the name of the LORD! For he commanded and they were created. ⁶ And he established them forever and ever; he gave a decree, and it shall not pass away.

Psa 104.2–3 indicates that the waters above are regarded as the foundations of heaven. Psa 104.3 and Deu 33.26 describe God as riding through the heavens on the clouds.

Psa 104.3: He lays the beams of his chambers on the waters (*bam-mayim*); he makes the clouds (ʿ*ābîm*) his chariot; he rides on the wings of the wind;

Deu 33.26: There is none like God, O Jeshurun, who rides through the heavens (*šāmāyîm*) to your help, through the skies (*šəḥāqîm* ‘clouds’) in his majesty.

Jer 10.13, 51.16, Job 12.15, 26.8 show that the waters above are under the control of the Lord God to bless or withhold blessing:

Jer 10.13 and 51.16: When he thunders the waters in the heavens (*mayim baš-šāmāyîm*) roar; he makes clouds rise from the ends of the earth. He sends lightning with the rain and brings out the wind from his storehouses. (NIV)

Job 12.15: If he withholds the waters (in the heavens) (*bam-mayim*), they dry up; if he sends them out, they overwhelm the land.

Job 26.8: He binds up the waters (of heaven) (*mayim*) in his thick clouds (ʿ*ābāyw*), and the cloud (ʿ*ānān*) is not split open under them.

The waters above can be used in judgment. Gen 7.4 says in seven days God will cause rain (*mamāḏîr*) to fall on the earth for forty days and forty nights. This rain will come from the waters of the flood (*ham-mabbûl*) (Gen 7.7) and will require the windows of heaven (ʿ*ārubbōt haš-šāmāyîm*) to be opened to release them (Gen 7.11). Then for the waters of the flood to cease required that God close the windows of heaven (Gen 8.2). The author of Genesis says ʿ*ārubbōt haš-šāmāyîm nīpātāhû* ‘the windows of heaven were opened’ (Gen 7.11) and ʿ*ārubbōt haš-šāmāyîm way-yikkālē hag-gešem min-haš-šāmāyîm* ‘the windows of heaven were closed and the rain from heaven was restrained’ (Gen

³⁸ In 1600 CE, Giordano Bruno was burnt at the stake for his heretical teaching. Although historians agree that his heresy trial was not a response to his astronomical views but rather a response to his philosophy and theology, 19th- and early 20th-century commentators regarded him as a martyr for science.

8.2). Opening and closing the windows of heaven is the means by which God passed judgement on the earth.

Gen 7.7: And Noah and his sons and his wife and his sons' wives entered the ark to escape the waters of the flood (*mê ham-mabbûl*).

Gen 7.11: In the six hundredth year of Noah's life, in the second month, on the seventeenth day of the month, on that day all the fountains of the great deep burst forth, and the windows of the heavens (*'ărubbōt haš-šāmayim*) were opened.

Gen 8.2–3: ² The fountains of the deep and the windows of the heavens (*'ărubbōt haš-šāmayim*) were closed, the rain from the heavens (*haq-gešem min-haš-šāmāyim*) was restrained, ³ and the waters (*mayim*) receded from the earth continually.

The term *mabbûl* is rare in the OT and only occurs outside of Genesis 7–11 in Psa 29.10. The two opening verses of Psalm 29 set the scene for this psalm in heaven. V. 3 speaks of God's majestic power over "the mighty waters." Exo 15.10 in the Song of Moses and Miriam gives praise that the Egyptians were overwhelmed by the mighty waters of the sea. However, Psa 29.10 says God is enthroned in heaven over the flood (*lam-mabbûl*).³⁹ Thus the psalmist identifies *mabbûl* with the waters above the *rāqî'a*.

Psa 29.3, 10: ³ The voice of the LORD is over the waters; the God of glory thunders, the Lord thunders over the mighty waters (*mayim rabbîm*). ... ¹⁰ The Lord sits enthroned over the flood (*lam-mabbûl*); the Lord is enthroned as King forever. (NIV)

Therefore the scriptures view the waters above the firmament (*rāqî'a*), the *mabbûl*, as (i) created in the beginning, (ii) integral to the proper functioning of the cosmos, (iii) the foundation of heaven, (iv) can be used by God to bless or withhold blessing, and (v) can be used by God as the *mabbûl* of judgment.

English versions divide into those that translate *rāqî'a* from an ANE cosmological worldview and those that try to concord the translation of this word to a modern cosmological perspective. To illustrate a translation that tries to concord to a modern cosmological perspective, consider how the TEV translates *rāqî'a* in Genesis 1. Initially, in Gen 1.6–8, the TEV translates *rāqî'a* with *dome*. This is a good equivalent as *dome* means 'a round roof that is built on a flat circular base' (COBUILD). *Dome* also implies something solid. Then in Gen 1.8 the TEV has "He named the dome 'Sky'." The Hebrew word here is *šāmayim* 'heaven(s)'. *Haš-šāmayim* is the place above where the angels, the sun, moon and stars, and the waters above are located (see Psa 148.2–4). God is also in heaven (see 1 Kgs 8.30, Psa 102.19). *Sky*, on the other hand, refers to the space of the atmosphere around the earth which looks blue in the daytime and dark at night. The concept of "sky" covers everything you can see when you look up, including the sun, moon and stars, but this concept does not include the idea that there is a great body of water above the sky, nor the idea that God lives in the sky. However, the primary meaning of *heaven* is that it is the place where God lives.⁴⁰ Using *heaven* to translate *šāmayim* would therefore be closer to what *šāmayim* denotes in Gen 1.8. By using *sky* to translate *šāmayim* in Gen 1.8 the TEV concords the creation account to a modern cosmological worldview. But the modern notion of "sky" does not exist in the biblical worldview. The nearest equivalent to "sky" in the Hebrew is *šahaq*. NIDOTTE Vol 4 (1996: 83) says this word is used 21 times in the OT. In more than half of the instances, *šahaq* denotes clouds in the sky (Job 35.5 38.37, Pro 8.28), but it also occurs as a synonym of the heavens (Job 37.18, Psa 36.5[6]). However, the author of Genesis uses *šāmayim* rather than *šahaq* in Gen 1.8 to name *rāqî'a*.

Translations of *rāqî'a* in Genesis 1 in the Today's English Version:⁴¹

Gen 1.6–8: ^{6–7} Then God commanded, "Let there be a **dome** (*rāqî'a*) to divide the water and to keep it in two separate places"—and it was done. So God made a **dome**, (*rāqî'a*) and **it** (*rāqî'a*)

³⁹ The NIV Study Bible note says the reference may be to Noah's flood (see Gen 6.17).

⁴⁰ See 1 Kgs 8.30, Mat 6.9.

⁴¹ Scriptures marked TEV are taken from the Today's English Version (TEV): Scripture taken from Today's English Version first edition copyright© 1976 American Bible Society. Used by permission.

separated the water under **it** (*rāqî^a*) from the water above **it** (*rāqî^a*).⁸ He named the **dome** (*rāqî^a*) “Sky.” (*šāmayim*) Evening passed and morning came—that was the second day.

Gen 1.14–19:¹⁴ Then God commanded, “Let lights appear in the **sky** (*bi-riqî^a* *haš-šāmayim*) to separate day from night and to show the time when days, years, and religious festivals begin;¹⁵ they will shine in the **sky** (*bi-riqî^a* *haš-šāmayim*) to give light to the earth”—and it was done.¹⁶ So God made the two larger lights, the sun to rule over the day and the moon to rule over the night; he also made the stars.¹⁷ He placed the lights in the **sky** (*bi-riqî^a* *haš-šāmayim*) to shine on the earth,¹⁸ to rule over the day and the night, and to separate light from darkness. And God was pleased with what he saw.¹⁹ Evening passed and morning came—that was the fourth day.

Gen 1.20:²⁰ Then God commanded, “Let the water be filled with many kinds of living beings, and let the **air** be filled with birds (*wā ṣōp̄ yā ṣōp̄p̄ ṣal-hā-āreš ṣal-pānē rāqî^a haš-šāmayim*).”

The term *rāqî^a* occurs three times in Gen 1.14–19 as part of the expression *rāqî^a haš-šāmayim* ‘firmament of the heavens’. If the TEV were consistent with what has gone before then this expression would be translated as *dome of the sky*. But the TEV translates *rāqî^a haš-šāmayim* with just *sky*. If the TEV were to use *dome of the sky* in Gen 1.14–19 then this would imply that God set the sun, moon and stars in the earth’s atmosphere and this would not concord with a modern worldview. Then *rāqî^a* occurs finally in Gen 1.20 as part of the sentence *wā ṣōp̄ yā ṣōp̄p̄ ṣal-hā-āreš ṣal-pānē rāqî^a haš-šāmayim*. The full translation of this sentence is: “Let the birds fly above the earth and over/ across the surface of the dome of the sky.” But the TEV translates this with “let the *air* be filled with birds.” Whereas the Hebrew makes it explicit that *rāqî^a* should be conceived of as a solid dome with a surface, the TEV obscures this meaning by translating *ṣal-hā-āreš ṣal-pānē rāqî^a haš-šāmayim* with *air*. Technically, this is an accurate translation. The Hebrew says the birds fly in the space between the earth below and the dome of the sky above. From a modern perspective this would be the air of the earth’s atmosphere and so *air* is an accurate translation for the place where birds fly. But this translation, in effect, equates *rāqî^a* with the earth’s atmosphere. The problem then is that in the TEV Gen 1.1–2.3 creation account *rāqî^a* denotes multiple entities which are quite different to each other. In Gen 1.6–8 *rāqî^a* denotes a dome capable of holding aloft the waters above, in Gen 1.14–19 *rāqî^a haš-šāmayim* denotes the place where the sun, moon and stars are set, and in Gen 1.20 *rāqî^a haš-šāmayim* denotes the place where the birds fly. But there is no evidence from the Hebrew text that *rāqî^a* has a different meaning in each of these instances. Also translating *rāqî^a* with these different denotations makes it somewhat difficult to make sense of the creation account from a modern cosmological perspective. How does the earth’s atmosphere hold the waters aloft? What are these waters in the sky? How can the birds fly where the sun, moon and stars are? Whereas if we read Gen 1.1–2.3 from the perspective of a biblical cosmology as depicted in Figure 3 then it is a coherent account. But this reading would only be available in the English translation if *rāqî^a* was consistently translated as *dome (of heaven/the heavens)*.

The TEV migrates from an initial ANE denotation of *rāqî^a* as *dome*, which implies a biblical cosmic geography, to a modern worldview where *rāqî^a* is equated with *sky*, as understood in modern terms. This makes the creation account incoherent with either worldview. For example, in Gen 1.6–8 the waters above the sky is incoherent with a modern worldview and identifying *šāmayim* with “sky” (*šahaq*) is incoherent with a biblical worldview. Most translations present either an ANE worldview or a modern worldview. Those English translations that translate according to an ANE cosmological perspective are: KJV, ASV, RSV, NKJV, Amp *firmament* (this is a transliteration from the Latin *firmamentum*), NAB, TEV, NRSV, Schocken, CEV *dome*, Moffatt, NEB, REB, NJB, TNIV *vault*, Knox *solid vault*, and BBE *solid arch*. Those that translate according to a modern cosmological perspective are: Fenton, YLT, NASV, NIV, NET, Tanakh, ESV *expanse*, NLT (1996, 2004), NIRV, NLT *space*, GW *horizon*, EVD *air*, NCV *something*, *air* and LB, Message/Remix *separate* (v). Note that with these latter renderings only *expanse*, *space* and *horizon* are translations of *rāqî^a*. The NCV, LB and Message/Remix actually avoid specifying what *rāqî^a* is in their translations. It is also interesting to note how translations of *rāqî^a* have been updated in translation revisions. The NIV *expanse* has been changed to *vault* in the TNIV (a modern worldview to an ANE worldview switch of denotation) but the ASV *firmament* has been changed to *expanse* in the NASV (an ANE worldview to

a modern worldview switch of denotation). The RSV has *firmament* while the NRSV has the more colloquial *dome*, and the NLT (1996, 2004) translates *rāqîa'* as *space* in both cases.

I would maintain, however, that translating *rāqîa'* with *expanse* or *space* or *horizon* is inaccurate in each case. I have argued, and many biblical exegetes agree, that the lexical meaning of *rāqîa'* is that of a flat plane, such as a plate (of metal/glass) or a sheet (of fabric/metal). The verb *expand*, from which the noun *expanse* is derived, means to increase in size, more specifically, to increase in amount or volume. For example, a property of a gas is that *a gas will expand to fill whatever space it occupies*. COBUILD says for its definition of the word *expanse* that “an **expanse** of sea, sky, etc. is a very large amount of it that you can see from a particular place.” Therefore the intensional meaning of the English word *expanse* includes the notion of ‘large amount of’ which the Hebrew word *rāqîa'* does not have as part of its intensional meaning.⁴² In addition, the Hebrew word *rāqîa'* has as part of its intensional meaning something substantive, capable of holding the waters of the heavens in place. The English word *expanse* lacks this semantic content in its intensional meaning. Therefore *expanse* is an inaccurate translational equivalent for *rāqîa'*. Those English versions that translate *rāqîa'* in Gen 1.6–9, 14–18, 20 with *expanse* seek to concord the biblical creation account with modern cosmology.

The NLT (1996) and revised NLT (2004) both translate *rāqîa'* with *space*. The stated purpose of the NLT (2004) is to improve the accuracy of the translation in rendering the correct meaning of the biblical source text while maintaining clarity of understanding in natural modern English. Much of Genesis 1 in the NLT (2004) revision has been changed to reflect more of what the Hebrew text actually says. But Gen 1.6 in NLT (2004) still has *space* for *rāqîa'*: Then God said, “Let there be a **space** (*rāqîa'*) between the waters, to separate the waters of the heavens from the waters of the earth.” But *space* is arguably a more inaccurate translational equivalent for *rāqîa'* than *expanse*, since *space* more explicitly defines a volume. This rendering of *rāqîa'* as a space also makes the account incoherent. How does a space support the waters above in Gen 1.7? Furthermore, if the author of Gen 1.6 had intended to denote that a “space” separated the waters of the heavens from the waters of the earth he could have used the Hebrew word *rewah* ‘space’ to do so, as he does in Gen 32.16, for example. The motivation for translating *rāqîa'* with *space* is to concord the biblical text with a modern understanding of the universe.

Gen 32.16: These he handed over to his servants, every drove by itself, and said to his servants, “Pass on ahead of me and put a **space** (*rewah*) between drove and drove.”

God’s Word for the Nations Gen 1.6–8:

⁶ Then God said, “Let there be a **horizon** (*rāqîa'*) in the middle of the water in order to separate the water.” ⁷ So God made the **horizon** (*rāqîa'*) and separated the water above and below the **horizon** (*rāqîa'*). And so it was. ⁸ God named [what was above] the **horizon** (*rāqîa'*) sky. There was evening, then morning—a second day. (GW)⁴³

The God’s Word for the Nations (1995) version translates *rāqîa'* with *horizon*. This may be because of: “I was there when he set the heavens in place, when he marked out the horizon (*hûḡ*) on the face of the deep” (Pro 8.27). However, Pro 8.27 describes the ANE notion that the horizon is where the sky is sealed to the earth to prevent the cosmic waters above the sky and below the earth from flooding into the cosmos. Translating *rāqîa'* as *horizon* in Gen 1.6–8 does not explain how the *rāqîa'* holds the waters above aloft. This rendering of *rāqîa'* as *horizon* also produces inconsistencies with the GW translation. Whereas the Hebrew says *way-yiqərā' 'ēlōhîm lā-rāqîa' šāmayim* “and God called the *rāqîa'* heaven,” the GW has to adjust this to “God named [what was above] the horizon sky” as the horizon is obviously not the heavens or the sky. In addition, if the author of Genesis had wanted to denote that it was the horizon he had in mind in Gen 1.6–8 he could have used the Hebrew

⁴² The intensional definition of a word specifies the necessary and sufficient conditions for when the word should be used. For example, an intensional definition of the word *bachelor* is ‘unmarried man’.

⁴³ Scriptures marked GW are taken from the God’s Word (GW): Scripture taken from God’s Word ® copyright© 1995 by God’s Word to the Nations. All rights reserved.

word for this concept, *hûḡ* ‘circle, compass, circuit, horizon’, as in Pro 8.27. The motivation for translating *rāqī^a* with *horizon* is to concord the biblical text with modern cosmology.

Creation Day Three

On creation day three the earth is created (Gen 1.9–10).

Gen 1.9–10: ⁹ wayyō’mer [and-he.said] ’ēlōhîm [Elohim] yiqqāwû [they.will.together] hammayim [the-waters] mittaḥat [from-under] haššāmayim [the-heavens] ’el-māqōm [to-place] ’ehād [one] wəṭērā’eh [and-she.will.be.seen] hayyabbāšā [the-dry] wayəhî-kēn [and-it.was-so] ¹⁰ wayyiqrā’ [and-he.called] ’ēlōhîm [Elohim] layyabbāšā [to-dry] ’ereš [earth] ûlāmiqwēh [and-to-confluence.of] hammayim [the-waters] qārā’ [he.called] yammîm [seas] wayyarə’ [and-he.saw] ’ēlōhîm [Elohim] kî-tôb [that-good] (Hebrew)

Gen 1.9–10: ⁹ And God said, “Let the waters under the heavens be gathered together into one place, and let the dry land appear.” And it was so. ¹⁰ God called the dry land Earth, and the waters that were gathered together he called Seas. And God saw that it was good.

BDB (2010 [1906]: 387) say that the meaning of *yabbāšā* in Gen 1.9–10 is dry land as opposite to sea. NIDOTTE Vol 2 (1997: 394) says that *yabbāšā* in Gen 1.9–10 refers to the dry ground that God brought out of the water at creation. Harris, ed., (1999 [1980]) says that *yabbāšā* emphasises “dry land” in contrast to bodies of water (cf. Jon 2.11). Thus the separation of *yabbāšā* from the waters gathered into one place depicts the creation of two separate domains designated “earth” (’ereš) and “seas” (*yammîm*). In Gen 1.26 mankind is given dominion and rule over these separate domains referred to as “the sea” (*hay-yām*) and “all the earth” (*kol-hā-’āreš*).

Gen 1.26: Then God said, “Let us make man in our image, in our likeness, and let them rule over the fish of the sea (*hay-yām*) and the birds of the heavens (*haš-šāmayim*), over the livestock, over all the earth (*kol-hā-’āreš*), and over all the creatures that move along the ground (*hā-’āreš*).” (NIV)

NIDOTTE Vol 1 (1997: 518) says ’ereš has a broad range of meaning, from the whole earth, through particular countries, especially the land of Israel, local districts, the soil, to the ground inside a tent (Jos 7.21). BDB (2010 [1906]: 76) say ’ereš has these senses: 1) the whole earth or earth opposite to heaven, 2) a country, territory, 3) ground, soil, 4) people of the land. Since there is no country or territory in view in Gen 1.10 and people did not exist at this point in the creation story the options for the meaning of ’ereš in Gen 1.10 are limited to ‘the whole earth’ or ‘ground, soil’. The first meaning would be appropriate for the domain that mankind is to live in and to rule over but not the second meaning. I therefore conclude that ’ereš in Gen 1.10 must refer to the whole earth as a domain of creation separate from the domain of *yām/yammîm*. Traditionally, ’ereš in Gen 1.10 has been translated as “Earth/earth” in English versions. However, some more modern versions (i.e., NIV, NET, NLT, CEV, Rotherham, NIRV, EEB) translate ’ereš as “land” here. This is because understanding ’ereš in Gen 1.10 as planet earth makes no sense from a modern cosmological viewpoint. But “land” meaning ‘a part of the world that is solid dry ground rather than the sea’ is not available as a sense of ’ereš. Therefore, “land” is an inaccurate translation of ’ereš in Gen 1.10. The motivation for translating ’ereš in Gen 1.10 as “land” is again to concord the Hebrew text with a modern cosmological interpretation.

What is the form of the earth that appears out of the waters in Gen 1.9? Pro 8.27–29 provides further details of how God created the earth in Gen 1.9–10. First, he established or set up (*kûn*)⁴⁴ the heavens. Then God drew or inscribed (*hāgaq*)⁴⁵ a circle (*hûḡ*)⁴⁶ on the surface (*pənê*) of the deep (*təhôm*) in order to create the earth. The Hebrew term *hûḡ* can only be understood as “circle” in this context, since the verb *hāgaq* means to engrave, inscribe or draw on a flat surface. Pro 8.27 cannot mean that God drew a sphere on the surface of the deep, for example. Apart from the fact that the primary meaning of *hāgaq* is to cut into and any sphere produced by the action of this verb would be a

⁴⁴ See BDB (2010 [1906]: 465–67).

⁴⁵ See BDB (2010 [1906]: 349), NIDOTTE Vol 2 (1997: 40–41).

⁴⁶ See BDB (2010 [1906]: 295).

hollow one, the term for a sphere or ball in Hebrew is *kaddûr* (Isa 22.18) and this term is not used in Pro 8.27. Furthermore, Pro 8.28 speaks of God establishing the fountains (*ʾnôl*) of the deep (*təhôm*). These are the same fountains that burst open in Gen 7.11. They necessarily connect the surface of the earth to the deep below. Pro 8.29 says God marked out (*ḥāgaq*) the foundations (*môṣəḏê*) of the earth. The primary meaning of *ḥāgaq* is to cut into and it is used in Isa 22.16 to describe the process of hewing out a tomb in the rock. Therefore the metaphorical concept depicted in Pro 8.29 is of God hewing out the foundations of the earth in the deep below the earth.

Pro 8.27–29: ²⁷ When he established (*kûn*) the heavens, I [Wisdom] was there; when he drew (*ḥāgaq*) a circle (*ḥûḡ*) on the face (*pəne*) of the deep (*təhôm*), ²⁸ when he made firm the skies (*šəḥāqîm* ‘clouds’) above, when he established the fountains (*ʾnôl*) of the deep (*təhôm*), ²⁹ when he assigned to the sea its limit, so that the waters might not transgress his command, when he marked out (*ḥāgaq*) the foundations (*môṣəḏê*) of the earth,

The noun *ḥûḡ* in Pro 8.27 is derived from the verb *ḥāḡ* which only occurs in Job 26.10. Here it refers to the horizon where heaven and earth meet. The noun *ḥûḡ* also occurs in Job 22.14 and Isa 40.22. In Job 22.14 it is the circle (*ḥûḡ*) of heaven and in Isa 40.22 it is the circle (*ḥûḡ*) of the earth. The derived noun *məḥûḡâ*, which means “circle instrument” a device used to make a circle commonly called a compass, also occurs in Isa 44.13.

Job 26.10: He has inscribed a circle (*ḥûḡ*) on the face (*pəne*) of the waters at the boundary (*taḵlîl*) between light and darkness.

Job 22.14: Thick clouds veil him, so that he does not see, and he walks on the vault (*ḥûḡ*) of heaven.

Isa 40.22: It is he who sits above the circle (*ḥûḡ*) of the earth, and its inhabitants are like grasshoppers; who stretches out the heavens like a curtain, and spreads them like a tent to dwell in;

Isa 44.13: The carpenter stretches a line; he marks it out with a pencil. He shapes it with planes and marks it with a compass (*məḥûḡâ*).

Some English versions of the Bible, such as KJV, Webster and Jubilee, translate *ḥûḡ* in Job 22.14 as “circuit” of heaven. However, most modern versions translate *ḥûḡ* here as “vault” of heaven (e.g., RSV, TEV (dome), NIV, REB, NLT, NET, BBE (arch), Amp). On the other hand, two versions translate *ḥûḡ* in Job 22.14 with the same meaning as this word has in Pro 8.27 and Job 26.10. The CEB translates with “rim” and the ISV translates with “horizon.” Since the primary meaning of *ḥûḡ* is ‘circle’ the translations of “vault” or “dome” are not equivalents of *ḥûḡ* since these entities are hemispheres and three-dimensional rather than two-dimensional. The translations of “rim” (CEB) and “horizon” (ISV), on the other hand, are suitable equivalents for *ḥûḡ* in this context. This interpretation identifies the circle of heaven in Job 22.14 as the rim of the dome (*rāqîʿ*) of heaven that meets the circle of the earth in Isa 40.22.

Job 22.14: Clouds conceal him so he can’t see while he walks on heaven’s rim (*ḥûḡ*). (CEB)

Job 22.14: Thick clouds cover him so he can’t see as he walks back and forth at heaven’s horizon (*ḥûḡ*). (ISV)⁴⁷

Dan 4.10–11[7–8]: ¹⁰ The visions of my head as I lay in bed were these: I saw, and behold, a tree in the midst of the earth, and its height was great. ¹¹ The tree grew and became strong, and its top reached to heaven, and it was visible to the end of the whole earth (*lā-sôp ʾarə ʾā*).

That the earth is envisioned as a flat disk in the OT is also reflected in Nebuchadnezzar’s vision as recounted in Dan 4.10–11[7–8]. Here, Nebuchadnezzar told Daniel that he saw a tree in the midst of the earth, which was of a great height and was visible to the ends of the earth (*lā-sôp ʾarə ʾā*). Daniel

⁴⁷ Scriptures marked ISV are taken from the International Standard Version (ISV): Scripture taken from International Standard Version, copyright© 1996–2008 by the ISV Foundation. All rights reserved internationally.

interpreted the great tree as the dominion of the king which reaches up to the sky and extends to distant parts of the earth (Dan 4.22[19]). However, such a tree could only be seen from the ends of the earth if the earth was conceived of as being flat and circular. If the earth was a globe then no matter how tall the tree was it could not be seen by anyone beyond the horizon.

The exegesis that the biblical earth (*'eres*) is understood to be a flat, circular disk is supported by the fact that there are many OT references to the ends or edges of the earth. The commonest term used to refer to the “ends of the earth” is *qāṣēh* which means ‘end, extremity; border, outskirts, edge, boundary, brink’.⁴⁸ This term is used in Deu 13.7[8], 28.49, 64, Job 28.24, Pss 46.9[10], 61.2[3], 135.7, Pro 17.24, Isa 5.26, 40.28, 41.5, 9, 42.10, 43.6, 45.22, 48.20, 49.6, 52.10, 62.11, Jer 10.13, 25.31, 33, 51.16. The related term *qāṣēw* ‘ends’ is used in Pss 48.10(11), 65.5(6), Isa 26.15, Job 38.13, Isa 26.15. Another common term for “ends of the earth” is *'ap̄sē* ‘end, extremity’,⁴⁹ which is used in Pss 2.8, 22.27[28], 48.10[11], 59.13[14], 65.5[6], 67.7[8], 72.8, 98.3, Pro 30.4, Mic 5.4[3], Zech 9.10. Several other terms are also used to refer to the “ends of the earth.” This includes *kānāp̄* ‘wing (of bird), extremity’⁵⁰ in Job 38.12 and Isa 24.16, and *gəbūlōt* ‘border, boundary’⁵¹ in Psa 74.17. If the earth is a globe then its surface cannot have an end or edge or boundary or limit of any sort, since in whichever direction you go you will always be on its surface. However, if the earth is conceptualised as a two-dimensional circular disk then if you travelled far enough in any direction you would eventually reach the edge of the disk—the ends of the earth. Job 28.24 says God can see the whole earth when he looks to the ends of the earth (*li-qṣōt hā-'āreṣ*).

Job 28.24: For he (God) looks to the ends of the earth (*li-qṣōt hā-'āreṣ*) and sees everything under the heavens.

There are many scriptures where the “end(s) of the earth” is used as a measure of the whole earth. In Deu 28.64 *qāṣēh hā-'āreṣ* is used to refer to the whole earth (all peoples) from one end of the earth (*qāṣēh hā-'āreṣ*) to the other end (*qāṣēh hā-'āreṣ*). In this case, *qāṣēh hā-'āreṣ* is used as a measure of the whole earth. In Job 28.24 God looks to the ends of the earth (*qṣōt hā-'āreṣ*) and sees the whole earth. Job 38.13 says the earth can be taken hold of by its *kānāp̄ōt* ‘extremities, corners, skirts’ to shake the wicked from the earth. Psa 46.9[10] says the Lord makes wars cease to the end of the earth (*qāṣēh hā-'āreṣ*), i.e., throughout the whole world. Psa 48.10[11] says praise to God will reach the ends of the earth (*qāṣēw 'eres*), i.e., the whole world. Psa 72.8 says God’s dominion may reach from the River Euphrates to the ends of the earth (*'ap̄sē 'āreṣ*) so that all kings may fall down before him and all nations may serve him (v. 11). Psa 98.3 says God’s steadfast love and faithfulness to Israel is a testimony of God’s salvation to all the ends of the earth (*'ap̄sē 'āreṣ*), i.e., all the peoples of the earth. In Isa 24.16 ends of the earth (*kānāp̄ hā-'āreṣ*) refers to the whole world. In Isa 42.10 end(s) of the earth (*qāṣēh hā-'āreṣ*) refers to the whole world including those who inhabit the coastlands. In Isa 43.6 God’s people are brought from the end(s) of the earth (*qāṣēh hā-'āreṣ*), i.e., the whole world, including the north and the south. In Isa 48.20, 49.6, Jer 25.31, 33 end(s) of the earth (*qāṣēh hā-'āreṣ*) refers to the whole world. In Dan 4.11[8], 22[19] end of the earth (*sōp̄ 'arə 'ā*) refers to the whole world. In Mic 5.4[3] and Zech 9.10 ends of the earth (*'ap̄sē 'āreṣ*) refers to the whole world. The “end(s) of the earth” can only function as a measure of the whole earth if the earth is conceptualised as a flat, circular disk. If the earth is a globe it does not have “ends” to be measured by.

The notion that the earth has ends, limits and boundaries also occurs in the NT (see Mat 12.42, Luk 11.31, Act 1.8, 13.7, Rom 10.18). The Greek words used for “ends” of the earth are πέρας ‘end, limit, boundary, conclusion’ and ἐσχάτος ‘farthest, end, last’.

Mat 12.42: The queen of the South will rise up at the judgment with this generation and condemn it, for she came from the ends (πέρας) of the earth (γῆς) to hear the wisdom of Solomon, and behold, something greater than Solomon is here.

⁴⁸ BDB (2010 [1906]: 892)

⁴⁹ BDB (2010 [1906]: 67)

⁵⁰ BDB (2010 [1906]: 489)

⁵¹ BDB (2010 [1906]: 148)

Luk 11.31: The queen of the South will rise up at the judgment with the men of this generation and condemn them, for she came from the ends (πέρας) of the earth (γῆς) to hear the wisdom of Solomon, and behold, something greater than Solomon is here.

Act 1.8: But you will receive power when the Holy Spirit has come upon you, and you will be my witnesses in Jerusalem and in all Judea and Samaria, and to the end (ἐσχάτος) of the earth (γῆς)."

Act 13.47: For so the Lord has commanded us, saying, "I have made you a light for the Gentiles, that you may bring salvation to the ends (ἐσχάτος) of the earth (γῆς)."

Rom 10.18: But I ask, have they not heard? Indeed they have, for "Their voice has gone out to all the earth, and their words to the ends (πέρας) of the (inhabited) world (οἰκουμένης)."

Mat 24.27 and Luk 17.24 say the coming of the Son of Man will be as visible to all on the earth as when the lightning (ἀστραπή) flashes from the eastern horizon to the western horizon. This metaphorical comparison can only apply if the earth is conceived of as being a flat disk with the eastern and western horizon being the opposite extremities of the disk.

Mat 24.27: For as the lightning (ἀστραπή) comes from the east and shines as far as the west, so will be the coming of the Son of Man.

Luk 17.24: For as the lightning (ἀστραπή) flashes and lights up the sky (οὐρανόν) from one side to the other, so will the Son of Man be in his day.

In contrast to the earth's outer limits, a centre or navel of the earth (*ṭabbûr*) is mentioned just once (Ezk 38.12, cf. Jgs 9.37, Jub 8.19). Stadelmann (1970: 147–54) suggests that Jerusalem (cf. Ezk 5.5), and possibly Bethel at an earlier time (cf. Gen 28.10–12, 17–18), were considered in this light, in keeping with the views of many ANE and other peoples that their central sanctuary or capital city represented such a centre. In Jub 8.19 it is Mount Zion that is the centre of the navel of the earth. However, for any point on the surface of the earth to be regarded as the centre of the earth would require the earth to be a flat disk. The centre of a spherical earth would be deep within the earth at its inner core.

Ezk 38.11–12: ¹¹ ... 'I will go up against the land of unwallled villages. I will fall upon the quiet people who dwell securely, all of them dwelling without walls, and having no bars or gates,' ¹² to seize spoil and carry off plunder, to turn your hand against the waste places that are now inhabited, and the people who were gathered from the nations, who have acquired livestock and goods, who dwell at the centre (*ṭabbûr*) of the earth.

Ezk 5.5: "Thus says the Lord GOD: This is Jerusalem. I have set her in the centre (*bəṭlôk*) of the nations, with countries all around her."

Jub 8.19: And he knew that the Garden of Eden is the holy of holies, and the dwelling of the Lord, and Mount Sinai the centre of the desert, and Mount Zion--the centre of the navel of the earth: these three were created as holy places facing each other.

We also saw that for light and darkness to be separated into day and night in Gen 1.4–5 that this could not apply if the earth was a globe, since on a globe it is always daylight on one side and night on the other side. Also, morning and evening can only be achieved on a globe at a fixed point on the surface of a globe that is rotating. Yet the scriptures describe the earth as being fixed and immovable, as in 1 Chr 16.30, Pss 93.1, 96.10 and 104.5, while the heavenly bodies, such as the sun, moon and stars, move with respect to the earth. Cf. Ps 19.5–6 where the sun runs its course from one end of the heavens to the other, Jos 10.12–14 where Joshua commands both the sun and the moon to stand still in the sky, and Job 38.31–33 where God challenges Job to control the movement of the constellations of stars. Again, this does not agree with our current knowledge. The earth does not stand still. It rotates on its axis once every 24 hours and it orbits around the sun at 107,300 km/h. The moon orbits around the earth in approximately 27.32 days. In fact, the earth and the moon orbit about their barycentre (common centre of mass), which lies about 4,600 km from earth's centre. Measurements of gas velocities in the solar neighbourhood show that the sun, and everything in its vicinity, orbits the

centre of the Milky Way galaxy at a speed of about 220 km/s. So for the sun and the moon to literally stand still in the sky, as it says in Jos 10.12–14, would require that the whole universe stopped moving for a day!

1 Chr 16.30: ...tremble before him, all the earth (*'ereṣ*); yes, the world (*tēbēl*) is established; it shall never be moved.

Psa 93.1: The LORD reigns; he is robed in majesty; the LORD is robed; he has put on strength as his belt. Yes, the world (*tēbēl*) is established; it shall never be moved.

Psa 96.10: Say among the nations, "The LORD reigns! Yes, the world (*tēbēl*) is established; it shall never be moved; he will judge the peoples with equity."

Psa 104.5: He set the earth (*'ereṣ*) on its foundations, so that it should never be moved.

Psa 19.1–6: ¹ The heavens declare the glory of God, and the sky above proclaims his handiwork. ² Day to day pours out speech, and night to night reveals knowledge. ³ There is no speech, nor are there words, whose voice is not heard. ⁴ Their voice goes out through all the earth (*'ereṣ*), and their words to the end of the world (*tēbēl*). In them he has set a tent for the sun, ⁵ which comes out like a bridegroom leaving his chamber, and, like a strong man, runs its course with joy. ⁶ Its rising is from the end of the heavens, and its circuit to the end of them, and there is nothing hidden from its heat.

Jos 10.12–14: ¹² At that time Joshua spoke to the LORD in the day when the LORD gave the Amorites over to the sons of Israel, and he said in the sight of Israel, "Sun, stand still at Gibeon, and moon, in the Valley of Aijalon." ¹³ And the sun stood still, and the moon stopped, until the nation took vengeance on their enemies. Is this not written in the Book of Jashar? The sun stopped in the midst of heaven and did not hurry to set for about a whole day. ¹⁴ There has been no day like it before or since, when the LORD heeded the voice of a man, for the LORD fought for Israel.

Job 38.31–33: ³¹ "Can you bind the chains of the Pleiades or loose the cords of Orion? ³² Can you lead forth the Mazzaroth in their season, or can you guide the Bear with its children? ³³ Do you know the ordinances of the heavens? Can you establish their rule on the earth?

There are many intractable problems with regard to how the first day was created in Gen 1.3–5 if the earth is conceived of as a globe. But if the earth is conceived of as a flat, circular disk and that daylight is created independently of the sun then these problems disappear. The common belief in the ancient Near East, as exhibited by the Babylonian map of the world in Figure 2, for example, was that the earth is a circular disk floating on the waters of the abyss. The more detailed description of the creation of the earth given in Pro 8.27–29 shows that the account of the creation of the earth given in Gen 1.9–10 agrees with this understanding. There are also passages in the NT which are only comprehensible if the earth is understood to be a flat, circular disk.

Mat 4.8: Again, the devil took him (Jesus) to a very high mountain and showed him all the kingdoms of the world and their glory.

Luk 4.5: And the devil took him (Jesus) up and showed him all the kingdoms of the world in a moment of time.

In Mat 4.8 and Luk 4.5 Jesus would only have been able to see all the kingdoms of the world from the top of a high mountain if the earth was a flat disk reaching to the horizon (the ends of the earth). If the earth were conceived of as a globe then it would not matter how high the mountain was Jesus would not have been able to see all the kingdoms of the world from the top of it. Some might suggest this was a supernatural vision that the devil gave to Jesus (cf. Nebuchadnezzar's vision of a tall tree in the midst of the earth, which was visible to the ends of the earth (Dan 4.22[19])). But if this was a supernatural vision of all the kingdoms of the world then there was no need for Jesus to be on top of a high mountain to have the vision. By comparison, Nebuchadnezzar was lying in his bed when he had his vision (Dan 4.10[7]). So the implication is that Jesus needed to be on the top of a high mountain to be able to see all the kingdoms of the world.

Mat 24.30–31: ³⁰ Then will appear in heaven the sign of the Son of Man, and then all the tribes of the earth will mourn, and they will see the Son of Man coming on the clouds of heaven with power and great glory. ³¹ And he will send out his angels with a loud trumpet call, and they will gather his elect from the four winds, from one end of heaven to the other.

Rev 1.7: Behold, he (Jesus Christ) is coming with the clouds, and every eye will see him, even those who pierced him, and all tribes of the earth will wail on account of him. Even so. Amen.

Mat 24.30 and Rev 1.7 say everyone on the earth (every tribe, every eye) will be able to see the Son of Man coming on the clouds of heaven. But if the earth is a globe then this will not be physically possible. Act 1.9–11 indicates that Jesus will return from heaven in the same way he ascended into heaven before his disciples. Since in Act 1.8 Jesus commands his disciples to be his witnesses in Jerusalem, and in all of Judea and Samaria, and to the ends of the earth we can assume that Jesus ascended into heaven from Jerusalem.⁵² Therefore he will return to Jerusalem when he appears again. However, if the sign of the Son of Man were to appear over Jerusalem then people living on the other side of the world in, say, Australia would not be able to see it. All the tribes of the earth would only be able to see the Son of Man coming on the clouds of heaven if they lived on a circular disk with Jerusalem at its centre. Also, the ends of heaven in Mat 24.31 and the ends of the earth in Act 1.8 refer to the perimeter of the disk of the earth where the dome of heaven meets the circular horizon of the earth. There are no ends or edges on the surface of a globe. The descriptions of the return of Christ given in Mat 24.30–31 and Rev 1.7 are only comprehensible (certainly at the time when they were written) if the earth is conceptualised as being a flat, circular disk.

According to 1 Sam. 2.8 the earth is built on *mātzûq* ‘pillars’: “For the foundations (*mātzûq*) of the earth (‘*ereṣ*) are the LORD’s; upon them he has set the world (*tēḥēl*).” According to Psalm 75.3 the earth is built on ‘*ammûd*’ ‘pillars’: “When the earth (‘*ereṣ*) and all its people quake, it is I who hold its pillars (‘*ammûd*) firm.” Job 38.4–6 says the earth is built on *yāsad* ‘foundations’ and *e’den* ‘footings, sockets’. Job 9.6 also says: “He (God) shakes the earth (‘*ereṣ*) from its place and makes its pillars (‘*ammûd*) tremble.” So in two places (Job 9.6, 38.4–6) Job says the earth (‘*ereṣ*) has pillars (‘*ammûd*), footings (*e’den*) and foundations (*yāsad*).

Job 38.4–6: ⁴ “Where were you when I laid the earth’s (‘*ereṣ*) foundation (*yāsad*)? Tell me, if you understand. ⁵ Who marked off its dimensions? Surely you know! Who stretched a measuring line across it? ⁶ On what were its footings (*e’den*) set, or who laid its cornerstone?

Psa 102.25 says the Lord built the earth in the beginning on foundations (*yāsad*) and Psa 24.2 says the earth is founded on the seas. Psalm 24 is a processional liturgy and the prelude (Psa 24.1–2) proclaims the Lord as the Creator, Sustainer and Possessor of the whole world, and therefore worthy of worship and reverent loyalty as “the King of Glory” (vv. 7–10). Psa 24.1–2 is an allusion to Gen 1.9 and the reference to “the earth” (‘*ereṣ*) and “the world” (*tēḥēl*) makes it clear that the denotation is to the whole earth. The word (‘*al*), translated here with “upon,” can also mean ‘on’ or ‘above’. Thus the psalmist is saying the whole earth is founded on the seas and the rivers. For this description to be coherent the image depicted must be of a flat and circular earth floating on the waters of the deep and surrounded by the waters of the seas. If the image depicted by Psa 24.1–2 is meant to be that of a planet of solid rock beneath our feet and the seas and rivers on the surface of the planet then the description of the earth founded ‘*al*’ ‘upon/on/above’ the seas and rivers makes no conceptual sense.

Psa 102.25: In the beginning you laid the foundations (*yāsad*) of the earth (‘*ereṣ*), and the heavens (*šamayim*) are the work of your hands.

Psa 24.1–2: ¹ The earth (‘*ereṣ*) is the LORD’s, and everything in it, the world (*tēḥēl*), and all who live in it; ² for he founded (*yāsad*) it upon (‘*al*) the seas and established it upon (‘*al*) the waters.

Psa 89.9–11 says that the earth and the heavens are founded on the waters. Rahab represents Chaos in ancient texts such as the Bible.⁵³ This name originally designated the primordial abyss, the water-

⁵² See the argument in Stadelmann (1970: 147–54) that Jerusalem is the centre (*tabbûr*) of the earth.

⁵³ See *NIV Study Bible* note against Psa 89.9–10.

dragon of darkness and chaos, and so is comparable to Leviathan and Tiamat. Rahab later became a particular demon, inhabitant of the sea, especially associated with the Red Sea, in this case sometimes associated with Leviathan. The world could only be founded on the waters of the abyss if the earth was a flat, circular disk.

Psa 89.9–11: ⁹ You rule over the surging sea; when its waves mount up, you still them. ¹⁰ You crushed Rahab like one of the slain; with your strong arm you scattered your enemies. ¹¹ The heavens are yours, and yours also the earth (‘*eres*’); you founded (*yāsād*) the world (*tēḫēl*) and all that is in it.

Psa 136.6 also alludes to Gen 1.9 and *rōqa* ‘the one who spread out’ makes the image of a flat, circular earth floating on the waters of the great deep even clearer. In Pro 8.28 the clouds (*šəḥāqīm*) are contrasted with the fountains of the deep (‘*îṇôl təḥôm*’). These were the two sources of freshwater in the ancient world. Two types of waters upon which the earth is founded are distinguished: the fountains of the deep (‘*îṇôl təḥôm*’) and the sea (*yām*). The earth is founded on the freshwater of the fountains of the deep and the saltwater of the seas, each of which has boundaries set in place to prevent them from flooding the earth (v. 29). 2 Pet 3.5–6 also refers to the creation of the earth as “the earth was formed out of water and by water.” All of these scriptures support the understanding that Gen 1.9–10 describes the creation of the whole earth (‘*eres*’) as a flat disk upon the gathered waters.

Psa 136.6: to him who spread out the earth (*hā-’āres*) above (‘*al*’) the waters (*ham-mayim*), for his steadfast love endures forever

Pro 8.27–29: ²⁷ When he established the heavens, I was there; when he drew a circle (*hûḡ*) on the face of the deep (‘*al-pānê təḥôm*’), ²⁸ when he made firm the skies (*šəḥāqīm* ‘clouds’) above, when he established the fountains of the deep (‘*îṇôl təḥôm*’), ²⁹ when he assigned to the sea (*yām*) its limit, so that the waters (*mayim*) might not transgress his command, when he marked out the foundations of the earth (*môṣadê ’āres*),

2 Pet 3.5–6: ⁵ For they deliberately overlook this fact, that the heavens existed long ago, and the earth was formed out of water and through water by the word of God, ⁶ and that by means of these the world that then existed was deluged with water and perished.

With regard to “the waters under heaven gathered into one place” named “seas” (*yammîm*) in Gen 1.9–10 and “all the fountains of the great deep” opened in Gen 7.11 and closed in Gen 8.2, most Bible commentators and exegetes see the former as water on the surface of the planet and the latter as water in subterranean chambers of some kind. This is the case with *The Geneva study Bible* and John Gill’s exposition. Calvin (2007 [1847]) calls the waters below in Gen 1.7 “terrestrial waters,” i.e., the seas upon the surface of the earth, and he understands the source of the fountains of the great deep (Gen 7.11) to be subterranean waters. Keil & Delitzsch (1866) understand the waters under the firmament in Gen 1.7 are the water upon the globe itself and they understand that the Flood was produced by the bursting forth of fountains hidden within the earth (Gen 7.11), which drove seas and rivers above their banks. Leupold (1942) identifies the “waters below the firmament” in Gen 1.7 as the seas and oceans on the surface of the earth. He says: “Apparently, before this firmament existed, the earth waters on the surface of the earth and cloud waters as we now know them were contiguous without an intervening clear air space. It was a situation like a dense fog upon the surface of the waters.” But then he says the “fountains of the great deep” in Gen 7.11 must be subterranean water of which there is still much and of which there may have been more in early days. Cassuto (1961) says the waters below the expanse in Gen 1.7 refers to “the water of the vast sea, which still covers all the heavy, solid matter below.” He says of the fountains of the great deep in Gen 7.11 that “here the reference is undoubtedly to subterranean waters, which are the source of the springs that flow upon the ground.” The NET Bible note against Gen 1.9 says: “*Let the water...be gathered to one place.* In the beginning the water covered the whole earth; now the water was to be restricted to an area to form the ocean. The picture is one of the dry land as an island with the sea surrounding it.” And against Gen 7.11 the NET Bible says: “*The watery deep.* The same Hebrew term used to describe the watery deep in Gen 1:2 (*tiḥom*) appears here. The text seems to picture here subterranean waters coming from under the earth and contributing to the rapid rise of water.” Morris (1976) also considers the seas in Gen 1.9–10 to be seas and oceans on the surface of the planet and the fountains of the great deep in Gen 7.11 to be

subterranean waters. Henry (1960), on the other hand, identifies the waters below in Gen 1.7 with the seas that cover the earth and the fountains of the great deep as the sea returning to cover the earth, as they had done at first (Gen 1.9).

However, some commentators suggest that the waters gathered into one place in Gen 1.9–10 and the fountains of the great deep in Gen 7.11, 8.2 refer to the cosmic waters that surround the earth. Kidner (1967: 45) identifies *tāhôm* in Gen 1.2 with the literal ocean. But then his comment against Gen 7.11 (ibid: 90–91) says: “We can infer from the statement about the great deep and the windows of heaven a vast upheaval of the sea-bed, and torrential rain; but the expressions are deliberately evocative of chapter 1: the waters above and below the firmament are, in token, merged again, as if to reverse the very work of creation and bring back the featureless waste of waters.” Wyatt (2001: 134) makes the same observation: “The cosmological theme is particularly clear here: the story is an anti-cosmogony, a reversal of the process of creation. Formerly, the *primaeval* waters had been separated by the interpolation of the ‘world’ (*tēhēl*, the habitable world). Now this process is reversed, as the barriers are pierced with windows and sluices opening.” Alter (1997: 32) treats Gen 7.11 as poetry and says: “The surge of waters from the great deep below and from the heavens above is, of course, a striking reversal of the second day of creation, when a vault was erected to divide the waters above from the waters below.” He also says the Flood story abounds in verbal echoes of the Creation story. The Flood is in effect an Uncreation. Wenham (1987: 19–20) comments on Gen 1.7: “...the firmament separates the water in the sky from the seas and rivers.” And against Gen 7.11 he says: “*All the springs...burst open...and the windows of heaven were opened.*” “Springs of the great deep” and “windows of heaven” are poetic phrases suggesting water gushing forth uncontrollably from wells and springs which draw from a great subterranean ocean (“the great deep”) and an unrestrained downpour from the sky. In Babylonian mythology, Adad the weather god controls the rain and, occasionally, the water from the abyss so that the idea of the flood involving disruption of both goes back to pre-Hebrew sources.” Sarna (1989: 55) says against Gen 7.11: “*fountains... floodgates.* This sentence is couched in classic poetic phraseology and parallelistic structure. The description of the cataclysm is incisively brief, in striking contrast to the elaborate detail given in the Gilgamesh Epic. The “great deep” is the cosmic abyssal water introduced in Gen 1.2. The “floodgates of the sky” are openings in the expanse of the heavens through which water from the celestial part of the cosmic ocean can escape onto the earth. In other words, creation is being undone, and the world returned to chaos.” Hamilton (1990: 110) identifies *tāhôm* in Gen 1.2 with the literal ocean. Then his comment against Gen 7.11 says: “There is no doubt that the two sources of water are intended to recall the “waters above and below” of 1:6–7. The Flood uncreates, and returns the earth to a pre-creation period when there was only “waters.” The lower waters are sprung loose when the springs of the great abyss (*tāhôm rabbâ*) are split.”

So, on the one hand, some commentators interpret “the waters under heaven gathered into one place” in Gen 1.9 and “all the fountains of the great deep” in Gen 7.11, 8.2 in terms of how we observe the world to be today, while other commentators try to interpret these concepts from an ANE perspective. But the latter commentators are inconsistent. While they say the waters of the Flood (*mabbûl*) from above and below in Gen 7.11, 8.2 can be understood to be the cosmic waters surrounding the earth flooding back into the cosmos as an anti-cosmogony, they still regard the waters in Gen 1.9 to refer to the seas and oceans on the surface of a spherical globe even though ANE peoples did not know they lived on a spherical globe. This did not become common knowledge until Greek astronomers worked it out in the 3rd century BCE.⁵⁴

The term *tāhôm rabbâ* (singular) ‘great deep’ occurs in Gen 7.11, Psa 36.6, Isa 51.10, Amo 7.4. In Gen 7.11 *tāhôm rabbâ* clearly refers to a great body of water below the earth, while in Psa 36.6, Isa 51.10, Amo 7.4 it refers to the waters of the seas and oceans. This indicates that in biblical thinking *tāhôm rabbâ* is a unitary body of water that is under the earth and fills the seas and oceans.

Gen 7.11: In the six hundredth year of Noah’s life, in the second month, on the seventeenth day of the month, on that day all the fountains of the great deep (*tāhôm rabbâ*) burst forth, and the windows of the heavens were opened.

⁵⁴ See footnote 21.

Psa 36.6: Your righteousness is like the mountains of God; your judgments are like the great deep (*tāhôm rabbâ*); man and beast you save, O LORD.

Isa 51.10: Was it not you who dried up the sea (*yām*), the waters (*mê*) of the great deep (*tāhôm rabbâ*), who made the depths of the sea (*ma ʿāmaqê-yām*) a way for the redeemed to pass over?

Amo 7.4: This is what the Lord GOD showed me: behold, the Lord GOD was calling for a judgment by fire, and it devoured the great deep (*tāhôm rabbâ*) and was eating up the land.

Like the waters above, the waters below are a fundamental part of the biblical cosmos. They are created as a basic component of the cosmos in Gen 1.6–8 and are referred to as “the waters under the earth (*mayim mit-tahat lā-ʾāreṣ*)” in Exo 20.4 and Deu 4.18. Exo 20.4 describes a tripartite cosmos including the heavens above, the earth beneath the heavens and the waters below the earth.⁵⁵ Deu 4.18 describes every creaturely domain as including anything on the earth, in the heavens or in the waters below the earth.

Exo 20.4: You shall not make for yourself a carved image, or any likeness of anything that is in heaven above, or that is in the earth beneath, or that is in the water under the earth (*bam-mayim [in-waters] mit-tahat [from-under] lā-ʾāreṣ [to-earth]*).

Deu 4.16–18: ¹⁶ beware lest you act corruptly by making a carved image for yourselves, in the form of any figure, the likeness of male or female, ¹⁷ the likeness of any animal that is on the earth, the likeness of any winged bird that flies in the air, ¹⁸ the likeness of anything that creeps on the ground, the likeness of any fish that is in the water under the earth (*bam-mayim [in-waters] mit-tahat [from-under] lā-ʾāreṣ [to-earth]*).

Most English versions translate *bam-mayim [in-waters] mit-tahat [from-under] lā-ʾāreṣ [to-earth]* in Exo 20.4 as “in the water(s) under the earth”, which is what the Hebrew says. The CEV has “in the ocean under the earth”. This rendering could identify *mayim* ‘waters’ as the cosmic deep/abyss (*tāhôm*) introduced in Gen 1.2. The NCV, on the other hand, has “in the water below the land”. Here *ʾereṣ* is translated as “land” and this suggests that *mayim* is subterranean waters within the earth. But what kind of creatures could live in such subterranean waters? However, the NIV, TNIV, and NET versions have “the water(s) below” and omit to translate *lā-ʾāreṣ* ‘the earth’, which is the object of *mit-tahat* ‘under’. They omit the vital piece of information in the Hebrew text that allows the reader to understand that Exo 20.4 describes the biblical cosmos as tripartite: heaven above, earth beneath, and the waters under the earth. Instead, this omission seeks to concord the Hebrew with a modern understanding of the cosmos. The Moffatt “in the sea”, GW “in the water” and Message/Remix “in a stream” versions also translate *bam-mayim mit-tahat lā-ʾāreṣ* as something understandable from a modern cosmological perspective. Some versions, such as NLT, do not translate this portion of scripture at all. It would appear that some English translations have decided to omit key parts of the Hebrew text to make the Bible conform to a modern cosmic geography.

If we compare how *bam-mayim mit-tahat lā-ʾāreṣ* is translated in Deu 4.18 we see that in most cases it is exactly the same as in Exo 20.4 or there is a slight variation, such as “water” for “waters” or vice versa, or a change in the preposition “under/beneath/below”. For some versions, there is a more significant difference. TEV and CEV do not mention *bam-mayim mit-tahat lā-ʾāreṣ* in their Deu 4.18 translation, for NCV “the water below the land” becomes the lesser “the water below”, and for NET “the water below” becomes the more elaborative but still inaccurate “the deep waters of the earth”. What do the NET translators seek to denote here? The denotation of *bam-mayim mit-tahat lā-ʾāreṣ* in Deu 4.18 is exactly the same as in Exo 20.4, so it should be translated the same way in each instance.

Nevertheless, “the waters below the earth” referred to in Exo 20.4 and Deu 4.18 are a fundamental part of God’s creation. As with the waters above, the waters below can provide blessings, as illustrated from Gen 49.25, Deu 33.13 and Ezk 31.4, or they can be instruments of judgment, as illustrated from Gen 7.11 and 8.2–3. In Gen 49.25 and Deu 33.13 the verb *rōḇešet tātāt* ‘crouches beneath’ is in the singular grammatical form and refers to a single entity, “the deep”. The deep (*tāhôm*) in Ezk 31.4 is also singular while the rivers (*nahārōtêhā*) coming from it are plural. This is coherent with Gen 1.9

⁵⁵ Php 2.10 in the NT also describes the biblical cosmos as tripartite: “at the name of Jesus every knee should bow, in heaven and on earth and under the earth,”

which says the waters under the heavens were gathered into one place to form a unified body of water. But it would not be coherent with a view that the water below the earth refers to multiple subterranean water chambers. Similarly, Gen 7.11 and 8.2 refer to fountains (plural) of the great deep (*tāhôm rabbâ*) (singular).

Gen 49.25: by the God of your father who will help you, by the Almighty who will bless you with blessings of heaven above, blessings of the deep (*tāhôm*) that crouches beneath, blessings of the breasts and of the womb.

Deu 33.13: And of Joseph he said, “Blessed by the LORD be his land, with the choicest gifts of heaven above, and of the deep (*tāhôm*) that crouches beneath, ...”

Ezk 31.4: The waters nourished it; the deep (*tāhôm*) made it grow tall, making its rivers flow around the place of its planting, sending forth its streams to all the trees of the field.

Gen 7.11: In the six hundredth year of Noah’s life, in the second month, on the seventeenth day of the month, on that day all the fountains of the great deep (*ma ‘āyānōt tāhôm rabbâ*) burst forth, and the windows of the heavens were opened.

Gen 8.2–3: ²The fountains of the deep (*ma ‘āyānōt tāhôm*) and the windows of the heavens were closed, the rain from the heavens was restrained, ³and the waters (*mayim*) receded from the earth continually.

Gen 49.25 and Deu 33.13 indicate that the deep below the earth described in Gen 7.11 and 8.2–3 still exists after the Flood, contrary to the assertion by Morris (1976: 205), for example, that these waters no longer existed after the Flood. There is also a theological argument for why the deep below the earth must exist after the Flood. In Gen 9.11, 14–16 God makes a covenantal promise to Noah that the waters of the *mabbûl* and the *tāhôm* will never again flood the earth. A covenant is a formal agreement between two parties and the making of covenants was a common practice in the ancient Near East. However, with respect to the Noahic covenant, for the injunction to never flood the cosmos again with the waters from above and below to be real these waters must exist when the covenant is made. If it was not possible for God to flood the earth again because the waters of the *mabbûl* and the *tāhôm* have all been “used up” in the Flood then the covenant with Noah has no substance. Isa 54.9–10 refers to this covenant that God made with Noah as still being in place. With regard to the sign of the rainbow (*qesēṭ* lit. ‘hunting bow’⁵⁶), Walton, et. al. (2000: 39) say the designation of the rainbow as a sign of the covenant does not suggest that this was the first rainbow ever seen. The function of a sign is connected to the significance attached to it.

Gen 9.11: I establish my covenant with you, that never again shall all flesh be cut off by the waters (*mayim*) of the flood (*ham-mabbûl*), and never again shall there be a flood (*mabbûl*) to destroy the earth.

Gen 9.14–16: ¹⁴When I bring clouds over the earth and the bow (*qesēṭ*) is seen in the clouds, ¹⁵I will remember my covenant that is between me and you and every living creature of all flesh. And the waters (*ham-mayim*) shall never again become a flood (*mabbûl*) to destroy all flesh. ¹⁶When the bow (*qesēṭ*) is in the clouds, I will see it and remember the everlasting covenant between God and every living creature of all flesh that is on the earth.

Isa 54.9–10: ⁹“This is like the days of Noah to me: as I swore that the waters of Noah should no more go over the earth, so I have sworn that I will not be angry with you, and will not rebuke you. ¹⁰For the mountains may depart and the hills be removed, but my steadfast love shall not depart from you, and my covenant of peace shall not be removed,” says the LORD, who has compassion on you.

Therefore the scriptures view the waters below the earth (*‘ereṣ*), the *tāhôm*, as (i) created in the beginning, (ii) integral to the proper functioning of the cosmos, (iii) the foundation of the earth, (iv) can be used by God to bless or withhold blessing, and (v) can be used by God as the *tāhôm* of judgment.

⁵⁶ BDB (2010 [1906]: 905)

Domesticated Plants

Gen 1.11–13: ¹¹ And God said, “Let the earth (‘*ereš*’) sprout vegetation (*deše*’), plants (‘*ēšeḇ*’) yielding seed, and fruit trees (‘*ēš pāri*’) bearing fruit in which is their seed, each according to its kind (*mîn*), on the earth.” And it was so. ¹² The earth brought forth vegetation (*deše*’), plants (‘*ēšeḇ*’) yielding seed according to their own kinds, and trees bearing fruit (‘*ēš pāri*’) in which is their seed, each according to its kind. And God saw that it was good. ¹³ And there was evening and there was morning, the third day.

Gen 1.11 says God created (actually commanded the earth (‘*ereš*’) to produce) vegetation (*deše*’), plants (‘*ēšeḇ*’) yielding seed, and fruit trees (‘*ēš pāri*’) bearing fruit in which is their seed, each according to its kind (*mîn*). Gen 1.29–30 says these plants (‘*ēšeḇ*’) were to be for food for mankind and for animals and birds. In order to be suitable as a food source for people such plants would need to be cultivated, and therefore domesticated. The wild variety of food plants can be inedible or even toxic. For example, potatoes (*Solanum tuberosum*) are part of the nightshade family and contain toxic compounds known as glycoalkaloids. The Incas of S. America domesticated the potato by breeding out the toxins.⁵⁷ Fruit trees need to be pruned to produce abundant fruit.⁵⁸ The creation of food plants and fruit trees is an example of de novo creation in the Genesis 1.1–2.3 creation story. Food plants and fruit trees are created in the beginning as they are observed to be in the present day world.

The term *deše*’ is often rendered tender grass, i.e., young, fresh grass, such as appears after rain (see Job 6.5: Does a wild donkey bray when it has grass (*deše*’)? and Psa 23.2: He makes me lie down in green (*deše*’) pastures). It is food for the pastoral animals, e.g., cattle, sheep, goats, and for the wild animals. ‘*ēšeḇ*’ ‘herbage’ is plant food for mankind and for animals and birds (see Gen 1.29–30). In the second creation story Gen 2.5 says no ‘*ēšeḇ haš-šādeh*’ ‘herbage of the field’ had yet sprung up because God had not yet sent rain and there was no man to work the ground. This implies that ‘*ēšeḇ*’ in this context refers to cultivated plants, i.e., cereal crops and vegetables, as wild plants do not need man to work the ground in order to grow. Exo 9.22 says God commanded Moses to destroy all the ‘*ēšeḇ haš-šādeh*’ in Egypt with a plague of hail. Here ‘*ēšeḇ*’ again refers to cultivated plants. Gen 2.1 says the heavens and the earth were completed in all their vast array after the six days of creation in Gen 1.3–31. If this did not include domesticated plants that mankind could cultivate and grow for food then the creation would not be complete in every way.

The third food plant group mentioned in Gen 1.11–12 is ‘*ēš pāri*’ ‘fruit-bearing trees’. The Hebrew Bible mentions six types of tree fruit, many of which appear dozens of times:

- | | |
|----------|----------------|
| 1. Grape | 4. Pomegranate |
| 2. Fig | 5. Date |
| 3. Olive | 6. Apple |

These six fruits are an important part of ancient Hebrew culture and are used in at least eight different ways in the Bible. First, many people are named after fruit, e.g., Tamar in Gen 38.6, which means ‘date’, Tappuah in 1 Chr 2.43, which means ‘apple’, and Rimmon in 2 Sam 4.2, which means ‘pomegranate’. Second, fruits are the namesake for a number of cities and towns, e.g., Anab in Jos 11.21, which means ‘grape’, Rimmon (pomegranate) in Jos 15.32 and Tappuah (apple) in Jos 12.17. Third, images of fruit are used as decorations, e.g., the blue, purple, and crimson pomegranates on Aaron’s priestly garments (Exo 28.33–34) and the engraved date palm trees in Solomon’s Temple (1 Kgs 6.29). Fourth, fruits are the subjects of laws, e.g., the law in Num 6.3 that a Nazirite may not eat or drink grape products or the law in Deu 24.20 that one may only beat an olive tree once (the remaining olives are for the poor). Fifth, fruits are used in a number of metaphors and similes such as, “Your breath is like the fragrance of apples” in SoS 7.9 and “I found Israel [as pleasing] as grapes in the wilderness” in Hos 9.10. Sixth, fruits appear in curses and blessings such as “Your olives shall drop off [the tree]” in Deu 28.40 and “[Israel is a blessed] land of wheat and barley, of vines, figs and pomegranates, a land of olive trees and honey” in Deu 8.8. Seventh, fruits are used pedagogically in

⁵⁷ See https://en.wikipedia.org/wiki/History_of_the_potato. (accessed 8 March 2017)

⁵⁸ See Lev 25.3–4, Isa 5.6.

proverbs such as “He who tends to a fig tree will enjoy its fruit” in Pro 27.18 and “Parents eat sour grapes and their children’s teeth are blunted” in Ezk 18.2. Eighth, and perhaps most obvious, fruits appear as objects in narratives, such as in Num 13.23, where the spies of Moses examine the grapes, pomegranates and figs of the land, and in Gen 3, where Eve eats the forbidden fruit and is cast from Eden. While these eight categories are neither rigid nor mutually exclusive, they illustrate the diverse treatment of fruit in the Hebrew Bible. Fruit was much more than a food for the ancient Israelites. It was a symbol that appeared prominently in the culture’s names, laws, proverbs and traditions. Therefore culturally and theologically fruit trees had to be created *de novo* in the beginning.

Table 2: A Selection of Plant Domestication History

<u>Plant</u>	<u>Where Domesticated</u>	<u>Date</u>
Fig trees	Near East	9000 BCE
Emmer wheat	Near East	9000 BCE
Chickpea	Anatolia	8500 BCE
Rice	Asia	8000 BCE
Potatoes	Andes Mountains	8000 BCE
Beans	South America	8000 BCE
Grapes	Georgia	6000 BCE
Bananas	Island Southeast Asia	5000 BCE
Date Palm	Near East	5000 BCE
Olives	Near East	4000 BCE
Cotton	Peru	4000 BCE
Pomegranate	Iran	3500 BCE
Apples	Central Asia	3500 BCE
Coconut	Southeast Asia	1500 BCE
Vanilla	Central America	14th century CE

However, fruits such as grape, fig, olive, pomegranate, date and apple are the product of domestication. Domestication is the process whereby a population of plants or animals is changed by human intervention at the genetic level through a process of selection, in order to accentuate traits that benefit humans. Domesticated plants have not been in existence from the beginning. They have only existed since about 10000 BCE. The account in Gen 1.11–12 of domesticated food plants and fruit trees being created all at once “in the beginning” does not agree with archaeological research into ancient cultures.⁵⁹ This research has found that cultivated food plants and fruit trees were domesticated at different times from about 9000 BCE to the present day and in different places around the world. Fig trees were the first plants to be domesticated in 9000 BCE, closely followed by barley and wheat in 8500 BCE. A sample listing is given in Table 2 to illustrate this. Plant domestication at the beginning of the Neolithic period triggered the first agricultural revolution—the initial transition from nomadic hunting and gathering to settled agriculture—and the creation of domesticated plants by ANE people triggered the beginnings of human civilisation in that part of the world. Therefore, the fact that fruits such as grape, fig, olive, pomegranate, date and apple are the product of human domestication means they could not have been created *de novo* in the beginning, as Gen 1.11–12 says.

Gen 2.8–9 suggests that the garden of Eden was, in fact, an orchard containing various kinds of fruit trees “pleasing to the eye and good for food.” Gen 2.15 says the Lord God took the man and put him in the garden of Eden to work it and take care of it. Fruit trees only need human care and attention if they are domesticated.

⁵⁹ See http://archaeology.about.com/od/domestications/a/plant_domestic.htm, (accessed 8 March 2017)

Domesticated Animals

Gen 1.24–25: ²⁴ And God said, “Let the earth bring forth living creatures (*neṭēš ḥayyâ*) according to their kinds (*mîn*)—livestock (*bāhēmâ*) and creeping things (*remēs*) and beasts of the earth (*ḥayyô ʿereš*) according to their kinds.” And it was so. ²⁵ And God made the beasts of the earth (*ḥayyât ḥā-ʾāreš*) according to their kinds and the livestock (*ḥab-bāhēmâ*) according to their kinds, and everything that creeps (*remēs*) on the ground (*ḥā-ʾāḏāmâ*) according to its kind. And God saw that it was good.

Another example of de novo creation in the Genesis 1.1–2.3 creation story is the creation of domesticated animals. Gen 1.24–25 describes the creation of the land animals and the animal world is classified into three main groups, a favourite device of Hebrew writers and legislators: domestic, wild and small animals.⁶⁰ The term *remēs* usually refers to insects, spiders, reptiles, amphibians and other “creepy-crawlies”, *ḥayyât ḥā-ʾāreš* refers to wild animals, and *bāhēmâ* refers to “cattle/livestock” or domesticated animals. However, none of these groupings are equivalent to a modern biological taxon. So the statement that they were created “according to their kinds (*mîn*)” makes no sense from a modern biological perspective. However, if we understand that *mîn* means ecological functional type then classifying the creatures created in Gen 1.24–25 into domestic and wild animals, and “creepy-crawlies” makes sense. The LXX⁶¹ translates *bāhēmâ* as τετράποδα ‘quadrupeds, domesticated animals,’ *ḥayyâ* as θηρία ‘wild animals,’ and *remēs* as ἐρπετὰ ‘reptiles,’ the Greek equivalent of this Hebrew ecological grouping. Just about all English versions translate *bāhēmâ* in Gen 1.24–25 with a term that refers to domesticated animals: e.g., “cattle” (KJV, Knox, RSV, NASV, REB, NJB, NET, Message, Tanakh, Alter), “livestock” (NIV, NLT, ISV, ESV, CEB), “domestic animals” (TEV, GW), “tame animals” (Rotherham, NCV, CEV). Moffatt has “animals” for *bāhēmâ* and “wild beasts” for *ḥayyât ḥā-ʾāreš*.

However, some might say that *bāhēmâ* in Gen 1.24–25 cannot refer to “cattle/livestock” as the existence of domesticated animals requires human intervention in the reproduction cycle of wild animals in order to produce animals with characteristics and properties that are beneficial to human beings. Therefore domesticated animals could not have been created “in the beginning” by God. In response to this, I offer the following arguments that *bāhēmâ* in Gen 1.24–25 does indeed refer to “cattle/livestock”.

First, the animal groupings described in the first creation account include *ḥayyâtô-ʿereš* “animals of the earth” and *bāhēmâ* “cattle/livestock” (Gen 1.24–25). In the second creation account a distinction is made between *ḥayyât ḥas-ʾāḏeh* “animals of the field” and *bāhēmâ* “cattle/livestock” (Gen 2.20, 3.14). In both creation accounts *bāhēmâ* are distinguished as a separate grouping of animals distinct from the more general “animals of the earth” or “animals of the field”.

Second, the vision of heaven described in Ezekiel 1.2–14 gives a symbolic representation of creation with the four cherubim as follows: “man (*ʾāḏām*),” God’s ordained ruler of creation (see Gen 1.26–28, Psa 8); “lion (*ʾaryēh*),” the strongest of the wild beasts; “ox (*šôr*),” the most powerful of the domesticated animals; and “eagle (*nešer*),” the mightiest of the birds (v.10). Thus, Ezk 1.10 shows that the wild animal and domesticated animal distinction is fundamental to the ordering of creatures in God’s creation.

Third, Gen 1.31 says that at the end of the sixth day God saw that all he had made was very good. Gen 2.1 says the heavens and earth were completed in all their vast array. And Gen 2.3 says God rested from all his work of creating. This included the creation of cattle/livestock (*bāhēmâ*) mentioned in Gen 1.24, 25, without which the creation would not be complete. Psa 148 presents a view of the whole creation giving praise to God. This includes “The wild animals (*ḥa-ḥayyâ*) and all livestock (*kol-bāhēmâ*), creeping things (*remēs*) and flying birds (*ʾōp kânāp*)” (v. 10). Again, *ḥayyâ* ‘wild animals’ and *bāhēmâ* ‘cattle/livestock’ are included separately as part of the whole of creation.

⁶⁰ Wenham (1987: 25).

⁶¹ Septuagint Greek Old Testament.

Fourth, humans (*'ādām*) and *bāhēmā* '(domesticated) animals' are paired in many OT passages: Exo 8.17, 18, 9.9, 10, 19, 22, 25, 11.7, 12.12, 13.2, 19.13, Lev 27.28, Num 3.13, 8.17, 18.15, 31.11, 26, 47, Pss 36.6, 135.8, Jer 7.20, 21.6, 27.5, 32.43, 33.10, 12, 36.29, 50.3, 51.62, Ezk 14.13, 17, 19, 21, 36.11, Jon 3.7, 8, Zep 1.3, Hag 1.11, Zech 2.4[8]. They are paired for these reasons:

- judgement on *'ādām* and *bāhēmā* (e.g., plagues on Egyptians): Exo 8.17, 18, 9.9, 10, 19, 22, 25, 12.12, 19.13, Psa 135.8, Jer 7.20, 21.6, 36.29, 50.3, Ezk 14.21,
- *'ādām* and *bāhēmā* exempt from judgement: Exo 11.7,
- consecration of firstborn *'ādām* and *bāhēmā*: Exo 13.2, Num 3.13, 8.17, 18.15,
- *'ādām* and *bāhēmā* are devoted to the Lord: Lev 27.28, Jer 27.5,
- *'ādām* and *bāhēmā* are plundered: Num 31.11, 26, 47
- the Lord preserves *'ādām* and *bāhēmā*: Psa 36.6,
- a desolate place without *'ādām* and *bāhēmā*: Jer 32.43, 33.10, 12, 51.62,
- famine kills *'ādām* and *bāhēmā*: Ezk 14.13,
- the sword kills *'ādām* and *bāhēmā*: Ezk 14.17,
- a plague kills *'ādām* and *bāhēmā*: Ezk 14.19,
- *'ādām* and *bāhēmā* increase and are fruitful as blessing: Ezk 36.11,
- *'ādām* and *bāhēmā* must repent: Jon 3.7, 8,
- a drought upon *'ādām* and *bāhēmā*: Hag 1.11,
- a measure of Jerusalem with a great number of *'ādām* and *bāhēmā*: Zech 2.4

Fifth, on the other hand, humans (*'ādām*) are never paired with *ḥayyā* '(wild) animals'. Instead, *ḥayyā* are opposed to *'ādām* in various ways:

- *ḥayyā* can be evil and can devour a man (Gen 37.20, 33, Lev 26.6).
- the carcase of a dead *ḥayyā* is unclean (Lev 5.2).
- *ḥayyā* may be eaten if they are clean and not if they are unclean (Lev 11.2, 47).
- *ḥayyā* can be contrasted with *bāhēmā* (Lev 25.7)
- *ḥayyāṭ ḥaš-šādeh* are sent as agents of destruction to destroy *bāhēmā* (Lev 26.22)
- *ḥayyāṭ ḥaš-šādeh* are a danger if they increase (Deu 7.22)
- the bodies of enemies are given to birds of the air (*'ôp ḥaš-šāmāyim*) and the wild animals of the earth (*ḥayyāṭ ḥā-'āreš*) to eat (1 Sam 17.46)
- protection is needed from the beasts of the field (*ḥayyāṭ ḥaš-šādeh*): (2 Kgs 14.9, Job 5.22–23, 37.8, 39.15, 40.20, Psa 79.2, Isa 35.9)

Sixth, the wild animals of the earth/field (*ḥayyāṭ ḥā-'āreš*)/(*ḥayyāṭ ḥaš-šādeh*) is paired with the birds of heaven (*'ôp ḥaš-šāmāyim*) as those who eat unburied bodies but *bāhēmā* (domestic animals) is not paired in this way.

- The bodies of enemies are given to birds of the air (*'ôp ḥaš-šāmāyim*) and the wild animals of the earth (*ḥayyāṭ ḥā-'āreš*) to eat (1 Sam 17.46)
- 2 Sam 21.10: Then Rizpah the daughter of Aiah took sackcloth and spread it for herself on the rock, from the beginning of harvest until rain fell upon them from the heavens. And she did not allow the birds of the air (*'ôp ḥaš-šāmāyim*) to come upon them by day, or the beasts of the field (*ḥayyāṭ ḥaš-šādeh*) by night.
- Psa 79.2: They have given the bodies of your servants to the birds of the heavens (*'ôp ḥaš-šāmāyim*) for food, the flesh of your faithful to the beasts of the earth (*ḥayyāṭ ḥā-'āreš*).

Seventh, in Gen 1.26 mankind are given dominion over the fish of the sea (*dāgāṭ hay-yām*), the birds of heaven (*'ôp ḥaš-šāmāyim*), livestock (*bāhēmā*), all the earth (*kol-ḥā-'āreš*), and all creeping things (*kol-ḥā-remeš*). While *bāhēmā* 'livestock' is mentioned as one grouping of creatures that mankind has dominion over, *ḥayyā* 'wild animals' is not mentioned as this grouping of creatures belongs to "all the earth" (*kol-ḥā-'āreš*). This is because mankind have a different kind of dominion over domesticated animals than they have over the wild animals.

Gen 1.26: Then God said, “Let us make man in our image, after our likeness. And let them have dominion over the fish of the sea (*bi-dḡaṭ hay-yām*) and over the birds of the heavens (*bə-’ôp haš-šāmayim*) and over the livestock (*bab-bəhēmā*) and over all the earth (*bə-kol-hā-’āreš*) and over every creeping thing (*bə-kol-hā-remes*) that creeps on the earth.”

Thus the OT scriptures provide a great deal of corroborating evidence that animals were created as wild (*hayyā*) and domesticated (*bəhēmā*) in the beginning as a fundamental arrangement of God’s creatures. The traditional three-way grouping of wild animals, domesticated animals and creeping things in Gen 1.24 shows that this is de novo creation specifically from the ancient Hebrew perspective of how the world is ordered. However, domesticated animals are the result of human intervention in the reproduction cycle of wild animals. The dog was the first wild animal to be domesticated between 30000–7000 BCE in E. Asia and Africa.⁶² This was followed by the sheep (11000–9000 BCE in SW. Asia), the pig (9000 BCE in the Near East, China, Germany), the goat (8000 BCE in Iran), the cow (8000 BCE in India, Middle East, N. Africa), the cat (7500 BCE in Cyprus, Near East), the chicken (6000 BCE in India, SE. Asia), the donkey (5000 BCE in Egypt), the horse (4000 BCE in the Eurasian Steppes), the dromedary (4000 BCE in Arabia), down to the European rabbit which was only domesticated in 600 CE. Therefore *bəhēmā* ‘domesticated animals’ could not have been created de novo in the beginning as Gen 1.24 says.

Conclusion

The purpose of this paper is to show from the biblical text that the creation story in Genesis 1.1–2.3 describes the creation of the cosmos in terms of how people of the ancient Near East understood the cosmos to be. These people believed the earth is a flat, circular disk founded on the waters of the abyss. They believed the sky is a solid, dome-like structure that covers the earth, holding back an ocean of water that exists above it. They also believed that daylight exists independently of the sun. We can extrapolate these beliefs from the religious mythologies, art and iconography ANE peoples left behind.

We examined what the Hebrew text says about the creation of day and night on day one (Gen 1.3–5), the creation of the heavens on day two (Gen 1.6–8), and the creation of the earth on day three (Gen 1.9–10). Gen 1.3–5 clearly says that God created day and night by separating the light from the darkness on the first day of creation. This is confirmed by the refrain *And there was evening* (*’ereḇ*) and *there was morning* (*bōqer*) in Gen 1.5, since *’ereḇ* indicates the end of the day and *bōqer* indicates the beginning of a new day. While there is no difficulty in understanding that this is what the Hebrew text says, there is difficulty in reconciling this account with a modern view of the nature of the cosmos. We now know that day and night are produced by the earth’s rotation with respect to the sun. But in Genesis 1 the earth is not created until day three (Gen 1.9–10) and the sun is not created until day four (Gen 1.14–19). How can you have day and night without the sun and a rotating earth? How can you have an evening (*’ereḇ*) without a sunset and a morning (*bōqer*) without a sunrise? Apologists have made two main suggestions to reconcile Gen 1.3–5 with a modern understanding of the universe. The first suggestion is that God himself was the source of the daylight. But this is theologically unacceptable as it would make God part of his creation for the first three days of its existence. A key theme of the polemic nature of Genesis 1 is that Elohim is separate from and transcendent to his creation. The second suggestion is that God made an anonymous “temporary sun” for the first three days and this was replaced by the “real sun” on day four. But it is theologically absurd to think that God would shore up the first foundational component of the cosmos—day and night—with a temporary structure. In the end, the only explanation for Gen 1.3–5 that succeeds is that here God begins to create the cosmos as ANE peoples believed it to be. In this cosmos daylight is independent of the light of the sun.

Gen 1.6–8 says God created a *rāqîa’* ‘firmament’ to separate the waters below the firmament from those above the firmament. God then called this firmament “heaven” (*šāmayim*). In Gen 1.14, 15, 17, 20 it is referred to as “the firmament of heaven” (*rāqîa’ haš-šāmayim*). The noun *rāqîa’* is derived from the verb *rāqa*, which means ‘to hammer out flat’. Thus *rāqîa’* means something flat and solid.

⁶² See https://en.wikipedia.org/wiki/List_of_domesticated_animals. (accessed 8 March 2017)

Conceptually, *rāqîa'* needs to be something solid in order to hold up the waters above. The LXX translators agreed with this understanding and translated *rāqîa'* in Genesis 1 as στερέωμα which means “firmness, steadfastness.”⁶³ This understanding of the nature of *rāqîa' haš-šāmayim* is also confirmed by the OT accounts which describe heaven as having openings of various kinds. This includes a gate (*ša'ar*) (Gen 28.17), a door (*daltê*) (Psa 78.23), and windows or sluiceways (*'ārubbōt*) (Gen 7.11, 8.2) which allow rainwater to pass through the firmament of heaven. Even so, what Gen 1.6–8 says does not reconcile with how we observe the sky above us today. The sky is not a solid dome over the earth and there is no ocean of water above such a dome. Apologists have made various suggestions to reconcile Gen 1.6–8 with what we observe today. The main suggestion seems to be that *rāqîa'* refers to the earth's atmosphere and the waters above, identified as the *mabbûl* ‘flood’ in Psa 29.10, is the clouds. However, this explanation does not succeed.

First, with respect to *rāqîa'* being earth's atmosphere, Gen 1.17 says God set the sun, moon and stars in the *rāqîa' haš-šāmayim* ‘firmament of heaven’. If *rāqîa'* refers to earth's atmosphere then this would not agree with a modern understanding of the universe. Gen 1.20 says “let birds fly above the earth across the surface of the firmament of the heavens (*rāqîa' haš-šāmayim*).” If *rāqîa'* refers to earth's atmosphere here then the birds should fly *in* the *rāqîa' haš-šāmayim*, not across its surface.

Second, with respect to the waters above being the clouds, there are a number of scriptures where the waters above the firmament are distinguished from the clouds below the firmament. In Psa 148 praise is called for from the heavens (Psa 148.1–6) and from the earth (Psa 148.7–12). Included in the praise from the heavens is praise from the “waters above the skies” (Psa 148.4) and included in the praise from the earth is praise from the “clouds” (Psa 148.8). Jer 10.13 and 51.16 also distinguish “the waters in the heavens” from the “clouds which rise from the earth”. This indicates that in the biblical worldview the waters above the firmament (*rāqîa'*) are conceived of as something different to the clouds.

Psa 148.1–6: ¹ Praise the LORD! Praise the LORD from the heavens; praise him in the heights above! ² Praise him, all his angels; praise him, all his heavenly hosts! ³ Praise him, sun and moon, praise him, all you shining stars! ⁴ Praise him, you highest heavens, and *you waters above the skies*! ⁵ Let them praise the name of the LORD! For he commanded and they were created. ⁶ He set them in place forever and ever; he gave a decree, that will never pass away. (NIV)

Psa 148.7–8: ⁷ Praise the LORD from the earth, you great sea creatures and all ocean depths, ⁸ lightning and hail, snow and *clouds*, stormy winds that do his bidding, (NIV)

Jer 10.13 and 51.16: When he thunders *the waters in the heavens* roar; he makes *clouds* rise from the ends of the earth. He sends lightning with the rain and brings out the wind from his storehouses. (NIV)

Morris (1976) offers a more controversial apologia. He suggests that the waters above in Gen 1.6–8 are, or were, a water vapour canopy above the earth's atmosphere which subsequently fell to earth during the Flood. However, Morris's theory has no scientific merit. It is purely an ad hoc suggestion to try and make sense of Gen 1.6–8 from a modern perspective. Even creationists have found Whitcomb and Morris's (Whitcomb and Morris, 1961) water vapour canopy theory to be scientifically untenable. Computer models have shown that any canopy able to hold enough water for forty days and nights of rain would have increased atmospheric pressure and thereby raised temperatures on the earth's surface to such an extent that life could not have survived.⁶⁴ Earth would have been like Venus is today where temperatures on the planet's surface are hot enough to melt lead. Walt Brown, on a website for the Center for Scientific Creation (2008), lists a number of scientific problems with the water vapour canopy theory which render it untenable.⁶⁵ In the end, the only interpretation of Gen 1.6–8 that succeeds is that the text says God separated the waters below the firmament from those above the firmament and created an ocean above the sky as the ancients believed.

⁶³ See Trenchard (2003: 146).

⁶⁴ Rush & Vardiman (1990), Vardiman & Bousselot (1998), Vardiman (2003).

⁶⁵ <http://www.creationscience.com/onlinebook/FAQ33.html>. (accessed 8 March 2017)

In Gen 1.9–10 God separated the dry ground (*yabbāšâ*) from the gathered waters. He called the dry ground “earth” (*’ereš*) and he called the gathered waters “seas” (*yammîm*). There are three reasons why *’ereš* here must refer to the whole earth. First, *’ereš* and *yammîm* represent two separated domains: dry land and water. Second, the only sense of *’ereš* available in this context is ‘the whole earth’. Third, Gen 1.6–8 describes how God created heaven and Gen 1.9–10 describes how God created the earth, i.e., the whole earth not just part of it. However, there is a conceptual problem with this. If the earth is a globe how can it “appear” out of the gathered waters? The earth that we know is a rocky planet with water on the surface of the planet. However, in the geography of the biblical cosmos it is the other way around—the waters of the deep (*tāhôm*) are under the earth (see Gen 7.11, 8.2–3, 49.25, Exo 20.4, Deu 4.16–18, 33.13, Ezk 31.4).

Gen 7.11: In the six hundredth year of Noah’s life, in the second month, on the seventeenth day of the month, on that day all the fountains of the great deep (*ma’āyanōt tāhôm rabbâ*) burst forth, and the windows of the heavens were opened.

Gen 8.2–3: ²The fountains of the deep (*ma’āyanōt tāhôm*) and the windows of the heavens were closed, the rain from the heavens was restrained, ³and the waters (*mayim*) receded from the earth continually.

Gen 49.25: by the God of your father who will help you, by the Almighty who will bless you with blessings of heaven above, blessings of the deep (*tāhôm*) that crouches beneath, blessings of the breasts and of the womb.

Exo 20.4: You shall not make for yourself a carved image, or any likeness of anything that is in heaven above, or that is in the earth beneath, or that is in the water (*mayim*) under the earth (*lā-’āreš*).

Deu 4.16–18: ¹⁶beware lest you act corruptly by making a carved image for yourselves, in the form of any figure, the likeness of male or female, ¹⁷the likeness of any animal that is on the earth, the likeness of any winged bird that flies in the air, ¹⁸the likeness of anything that creeps on the ground, the likeness of any fish that is in the water (*mayim*) under the earth (*lā-’āreš*).

Deu 33.13: And of Joseph he said, “Blessed by the LORD be his land, with the choicest gifts of heaven above, and of the deep (*tāhôm*) that crouches beneath, ...”

Ezk 31.4: The waters nourished it; the deep (*tāhôm*) made it grow tall, making its rivers flow around the place of its planting, sending forth its streams to all the trees of the field.

In addition, there are passages of scripture, such as Isa 40.22, Job 26.10, Pro 8.27, which suggest the earth is a circular disk on the surface of the deep. Only a two-dimensional disk could be considered separate as it appeared from the gathered waters.

It was noted that some English versions try to make the Hebrew text in Genesis 1 and elsewhere agree with a modern cosmological understanding in the way the Hebrew is translated. However, in each instance I showed that when the Hebrew text is examined directly it depicts a cosmic geography as the ancients understood.

In the last two sections I presented arguments that Gen 1.11 describes the creation of wild and domesticated plants with a focus on fruit trees and that Gen 1.24 describes the creation of wild and domesticated animals. Arguments were presented that *bāhēmâ* in Gen 1.24–25 refers to domesticated animals. These are both examples of de novo creation. Both domesticated plants and animals existed in the world of the ancient Hebrews, so in order for the creation to be complete these must have been created in the beginning. But we now know that domesticated plants and animals came about by human intervention in the reproduction cycle of these plants and animals. This occurred as part of the Neolithic agricultural revolution which began about 10000 BCE. During this time, people switched from being nomadic hunter-gatherers to being settled agriculturalists. This was the beginning of human civilisation.

Augustine knew that the creation story narrated in Genesis 1 did not square with how ancient Greek science viewed the world. In *The Literal Meaning of Genesis* he argues that Genesis 1 is written to suit the understanding of the people at that time. In order to communicate in a way that all

people could understand, the creation story was told in a simpler, allegorical fashion. For this reason, Augustine thought it was foolish for Christians to interpret Genesis 1 literally. I have shown that if Genesis 1 is taken literally the cosmos created is structured according to ancient Near Eastern common belief. This is completely different to how we understand the cosmos to be structured today. God accommodated the Genesis 1 creation account to where the ancient Hebrews were at in their understanding of the universe.

In the end, it is not possible that the creation of the physical universe as described in Gen 1.1–2.3 could apply to our modern understanding. I have shown that the cosmos created in Gen 1.1–2.3 conforms to how ANE peoples believed the heavens and the earth to be. Both OT and NT scriptures confirm this. This understanding was based on pre-scientific observations unaided by sophisticated mathematical knowledge and scientific instruments. However, our modern scientific understanding of the universe has developed over a period of some 2,500 years going back to the observations and theorising of the ancient Greeks. This historical development is charted in Table 3. Also, our current understanding is not fixed. It continues to change as new observations and measurements are made and new conclusions are drawn from these. Therefore, since our view of the cosmos changes continuously, it is not possible for one understanding of the cosmos held at a particular time to apply to all of time. Gen 1.1–2.3 is a view of the cosmos held by a particular people—the ancient Hebrews, at a particular time—the time of Moses. As such, Gen 1.1–2.3 cannot be understood to be a literal account of how God created the heavens and the earth.

Table 3: Historical Steps Towards a Modern Understanding of the Universe and Its Origins†

	Geometry arose independently in a number of early cultures as a practical way for dealing with lengths, areas, and volumes. Geometry began to see elements of formal mathematical science emerging in the West as early as the 6th century BCE. By the 3rd century BCE, geometry was put into an axiomatic form by Euclid, whose treatment, <i>Euclid's Elements</i> , set a standard for many centuries to follow.
ca. 530 BCE	Pythagoras of Samos (ca. 570–ca. 495 BCE) believed the earth was in motion and had knowledge of the periodic numerical relations of the planets, moon, and sun. The celestial spheres of the planets were thought to produce a harmony called the music of the spheres.
ca. 350 BCE	In about 350 BCE, the Greek philosopher Aristotle (384–322 BCE) observed that the curved umbral shadow of the earth on the moon during a lunar eclipse was a proof that the earth was in fact spherical. Up until this time the common belief in ancient times was that the earth was a flat disk floating on the waters of the abyss. Aristotle taught that rotating spheres carried the moon, sun, planets, and stars around a stationary earth. The earth was unique because of its central position and its material composition. After returning from a trip to Egypt, Aristotle noted that “there are stars seen in Egypt and [...] Cyprus which are not seen in the northerly regions.” This phenomenon can only be explained with a round surface, and Aristotle continued and claimed that the sphere of the earth is “of no great size, for otherwise the effect of so slight a change of place would not be quickly apparent.” (De caelo, 298a2–10) The further you go from the equator, the further the “known” constellations go towards the horizon, and are replaced by different stars. This would not have happened if the earth was flat.
ca. 270 BCE	Aristarchus of Samos (300–210 BCE), a Greek astronomer and mathematician, is considered to be the first person to propose a scientific heliocentric model of the solar system, placing the sun, not the earth, at the centre of the known universe. He accurately deduced the other planets in correct order from the sun.
ca. 230 BCE	If you push a stick in the [sticky] ground, it will produce a shadow. The shadow moves as time passes (which is the principle for ancient Shadow Clocks). If the earth had been flat, then two sticks in different locations would produce the same shadow. But they do not. This is because the earth is round, and not flat. Eratosthenes (276–194 BCE) used this principle to calculate the circumference of the earth quite accurately.
200 CE	In 200 CE Ptolemy (ca. 90–ca. 168 CE) proposed an earth centred universe, with the sun and planets revolving around the earth. Perfect motion should be in circles, so the stars and planets, being heavenly objects, moved in circles. However, to account for the complicated motion of the planets, which appear to periodically loop back upon themselves (exhibit retrograde

- motion), epicycles had to be introduced so that the planets moved in circles upon circles about the fixed earth.
- 1054 In 1054 Chinese astronomers observed a supernova (modern designation SN 1054), later correlated to the Crab Nebula. It is part of the Perseus Arm of the Milky Way galaxy and is about 6,500 light-years away from earth.
- 1543 In 1543 CE Nicolaus Copernicus (1473–1543) published *De revolutionibus orbium coelestium* (*On the Revolutions of the Heavenly Spheres*) his seminal work on heliocentric theory. This placed the sun at the centre of the universe, motionless, with the earth and the other planets rotating around it in circular paths modified by epicycles and at uniform speeds. This replaced Ptolemy’s geocentric model of the universe which had reigned for over 1,000 years.
- 1572, 1577 Tycho Brahe’s (1546–1601) studies of the nova of 1572 and the comet of 1577 were the first major challenges to the idea that the Aristotelean celestial spheres or orbs existed as solid, incorruptible, material objects.
- 1584 In 1584, Giordano Bruno (1548–1600) proposed a cosmology without any firmament: an infinite universe in which the stars are actually suns with their own planetary systems.
- 1609, 1619 In 1609 Johannes Kepler (1571–1630) published his first two laws of planetary motion, having found them by analysing the astronomical observations of Tycho Brahe. Kepler’s third law was published in 1619. Kepler’s laws are:
1. The orbit of every planet is an ellipse with the sun at one of the two foci.
 2. A line joining a planet and the sun sweeps out equal areas during equal intervals of time.
 3. The square of the orbital period of a planet is proportional to the cube of the semi-major axis of its orbit.
- 1609, 1610 In 1609 and 1610 Galileo Galilei (1564–1642) used a telescope to make astronomical observations that refuted the principles of Aristotelian Cosmology which maintained that all heavenly bodies should circle the earth. Specifically, Galileo observed that four moons of Jupiter were orbiting around the planet. He described them as small planets orbiting a larger planet. He observed that Venus exhibited a full set of phases similar to that of the moon. This observation also showed that the planets (Jupiter, Neptune, and Venus) are all spherical, and all orbit the sun. He also deduced that the moon was not a translucent and perfect sphere as Aristotle claimed.
- 1676 In 1676 Ole Christensen Rømer (1644–1710) made the first quantitative measurements of the speed of light.
- 1687 In 1687 Sir Isaac Newton (1642–1727) published *Philosophiæ Naturalis Principia Mathematica* (“the Principia”) which contained his laws of motion and his law of universal gravitation. This work laid the foundation for classical mechanics. Newton’s laws of motion describe the relationship between a body and the forces acting upon it, and its motion in response to said forces:
1. First law: When viewed in an inertial reference frame, an object either is at rest or moves at a constant velocity, unless acted upon by an external force.
 2. Second law: The sum of the forces on an object is equal to the total mass of that object multiplied by the acceleration of the object. In more technical terms, the acceleration of a body is directly proportional to, and in the same direction as, the net force acting on the body, and inversely proportional to its mass. Thus, $F = ma$, where F is the net force acting on the object, m is the mass of the object and a is the acceleration of the object. Force and acceleration are both vectors (as denoted by the bold type). This means that they have both a magnitude (size) and a direction relative to some reference frame.
 3. Third law: When one body exerts a force on a second body, the second body simultaneously exerts a force equal in magnitude and opposite in direction to that of the first body.

Newton's law of universal gravitation states that any two bodies in the universe attract each other with a force that is directly proportional to the product of their masses and inversely proportional to the square of the distance between them:

$$F = G \frac{m_1 m_2}{r^2}$$

where:

- F is the force between the masses,
- G is the gravitational constant,
- m_1 is the first mass,
- m_2 is the second mass, and
- r is the distance between the centres of the masses.

- 1727 The aberration of light (also referred to as astronomical aberration or stellar aberration) is an astronomical phenomenon which produces an apparent motion of celestial objects about their locations dependent on the velocity of the observer. Aberration causes objects to appear to be angled or tilted towards the direction of motion of the observer compared to when the observer is stationary. The change in angle is typically very small, on the order of v/c where c is the speed of light and v the velocity of the observer. In the case of "stellar" or "annual" aberration, the apparent position of a star to an observer on earth varies periodically over the course of a year as the earth's velocity changes as it revolves around the sun, by a maximum angle of approximately 20 arcseconds in right ascension or declination.
- Aberration is historically significant because of its role in the development of the theories of light, electromagnetism and, ultimately, the theory of special relativity. It was first observed in the late 1600s by astronomers searching for stellar parallax in order to confirm the heliocentric model of the solar system. However, it was not understood at the time to be a different phenomenon. In 1727, James Bradley provided a classical explanation for it in terms of the finite speed of light relative to the motion of the earth in its orbit around the sun, which he used to make one of the earliest measurements of the speed of light. However, Bradley's theory was incompatible with 19th century theories of light, and aberration became a major motivation for the aether drag theories of Augustin Fresnel (in 1818) and G. G. Stokes (in 1845), and for Hendrick Lorentz's aether theory of electromagnetism in 1892. The aberration of light, together with Lorentz's elaboration of Maxwell's electrodynamics, the moving magnet and conductor problem, the negative aether drift experiments, as well as the Fizeau experiment, led Albert Einstein to develop the theory of special relativity in 1905, which provided a conclusive explanation for the aberration phenomenon.
- 1771 In 1771 Charles Messier (1730–1817) published a catalogue of 110 astronomical objects (*Messier Objects*) now known to include galaxies, star clusters, and nebulae. The purpose of the catalogue was to help astronomical observers, in particular comet hunters such as himself, distinguish between permanent and transient visually diffuse objects in the sky.
- 1781 In 1781 William Herschel (1738–1822) announced the discovery of Uranus, expanding the known boundaries of the solar system for the first time in modern history.
- 1838 Friedrich Bessel (1784–1846) was the first to successfully measure stellar parallax. Parallax is the apparent displacement of an object because of a change in the observer's point of view. Astronomers use parallax to measure distances to nearby stars. In 1838 Bessel announced that 61 Cygni had a parallax of 0.314 arcseconds, which, given the diameter of the earth's orbit around the sun, indicated that the star is 10.3 light-years away.
- 1842 In 1842 Christian Doppler (1803–1853) postulated his principle (later coined the Doppler effect) that the observed frequency of a wave depends on the relative speed of the source and the observer, and he tried to use this concept for explaining the colour of binary stars.
- 1846 From the slight perturbations observed in the orbit of Uranus John Couch Adams (1819–1892) and Urbain Jean Joseph Le Verrier (1811–1877) mathematically predicted there was another planet beyond Uranus. They calculated where the planet effecting Uranus's orbit should be, then asked an astronomer to check. In 1846 Neptune was discovered by Johann Gottfried Galle (1812–1910) and Heinrich Louis d'Arrest (1822–1875), almost exactly where it was predicted to be.
- 1851 In 1851 J.-B.-L. Foucault devised a method for demonstrating that the earth rotates on its axis. This was a large pendulum free to swing in any direction. As it swings back and forth, the earth rotates beneath it, so its perpendicular plane of swing rotates in relation to the earth's surface. So, relative to earth, the plane of oscillation of a pendulum at the North Pole undergoes a full clockwise rotation during one day; a pendulum at the South Pole rotates counter-clockwise.

- When a Foucault pendulum is suspended at the equator, the plane of oscillation remains fixed relative to earth.
- 1871 John William Strutt, 3rd Baron Rayleigh, (1842–1919) discovered the phenomenon now called Rayleigh scattering, explaining why the sky is blue, and predicted the existence of the surface waves now known as Rayleigh waves. Rayleigh's textbook, *The Theory of Sound*, is still referred to by acoustic engineers today.
- 1873 With the publication of *A Dynamical Theory of the Electromagnetic Field* in 1865, James Clerk Maxwell (1831–1879) demonstrated that electric and magnetic fields travel through space as waves moving at the speed of light (299,792,458 m/s). Maxwell proposed that light is in fact undulations in the same medium that is the cause of electric and magnetic phenomena. The unification of light and electrical phenomena led to the prediction of the existence of radio waves. Maxwell's fully developed theory of electromagnetism, in the modern form of four partial differential equations, first appeared in his textbook, *A Treatise on Electricity and Magnetism* in 1873.
- 1887 The Michelson–Morley experiment was performed in 1887 by Albert Michelson (1852–1931) and Edward Morley (1838–1923). It attempted to detect the relative motion of matter through the stationary luminiferous aether (“aether wind”). The negative results are generally considered to be the first strong evidence against the then prevalent aether theory, and initiated a line of research that eventually led to special relativity, in which the stationary aether concept has no role.
- 1905 The special theory of relativity was proposed in 1905 by Albert Einstein (1879–1955) in the paper “On the Electrodynamics of Moving Bodies”. It is based on two postulates: (1) that the laws of physics are invariant (i.e., identical) in all inertial systems (non-accelerating frames of reference); and (2) that the speed of light in a vacuum is the same for all observers, regardless of the motion of the light source. Special relativity implies a wide range of consequences, which have been experimentally verified, including length contraction, time dilation, relativistic mass, mass–energy equivalence, a universal speed limit, and relativity of simultaneity. It is the accepted physical theory regarding the relationship between space and time.
- 1916 General relativity, or the general theory of relativity, is the geometric theory of gravitation published by Albert Einstein in 1916 and the current description of gravitation in modern physics. General relativity generalises special relativity and Newton's law of universal gravitation, providing a unified description of gravity as a geometric property of space and time, or space-time. In particular, the curvature of space-time is directly related to the energy and momentum of whatever matter and radiation are present. The relation is specified by the Einstein field equations, a system of partial differential equations. Some predictions of general relativity differ significantly from those of classical physics, especially concerning the passage of time, the geometry of space, the motion of bodies in free fall, and the propagation of light. Examples of such differences include gravitational time dilation, gravitational lensing, the gravitational redshift of light, and the gravitational time delay. The predictions of general relativity have been confirmed in all observations and experiments to date.
- 1915 The solution by Karl Schwarzschild (1873–1916) in 1915 of Einstein's field equations of general relativity led to the well-known Schwarzschild radius, which is the size of the event horizon of a non-rotating black hole.
- 1920 Sir Arthur Eddington (1882–1944) investigated the interior of stars through theory, and developed the first true understanding of stellar processes. His models of stellar nucleosynthesis were eventually accepted as a powerful tool for investigating stellar processes, particularly in issues of stellar evolution.
- 1924 Edwin Hubble (1889–1953) established that there was more to the universe than the Milky Way galaxy. Hubble identified Cepheid variables (a kind of star) in several spiral nebulae, including the Andromeda Nebula and Triangulum. His observations, made in 1922–1923, proved conclusively that these nebulae were much too distant to be part of the Milky Way and were, in fact, entire galaxies outside our own.
- 1927 Georges Lemaître (1894–1966) was the first person to propose the theory of the expansion of the universe, widely misattributed to Edwin Hubble. He was also the first to derive what is now known as Hubble's law and made the first estimation of what is now called the Hubble constant, which he published in 1927, two years before Hubble's article. Lemaître also proposed what became known as the Big Bang theory of the origin of the universe, which he called his “hypothesis of the primeval atom”.

- 1929 Hubble's law is the name for the observation in physical cosmology that: (1) objects observed in deep space (extragalactic space, ~ 10 megaparsecs or more) are found to have a Doppler shift interpretable as relative velocity away from the earth; and (2) that this Doppler-shift-measured velocity, of various galaxies receding from the earth, is approximately proportional to their distance from the earth for galaxies up to a few hundred megaparsecs away. This is normally interpreted as a direct, physical observation of the expansion of the spatial volume of the observable universe.
- 1933 In 1950 Fritz Zwicky (1898–1974) theorised on the existence of dark matter after he observed that there was 400 times the mass in the Coma cluster of galaxies than there “should” have been or that he had expected there to be. He coined the term “dark matter” to describe this invisible mass.
- 1950 Then in 1950 Vera Rubin found that bodies orbiting around the outskirts of galaxies travelled at approximately the same speed as the bodies orbiting near the centre of a galaxy. This provided more evidence for the existence of dark matter. It is now estimated that 95 percent of the measured mass of galaxy clusters is dark (invisible to any direct observation).
- 1960–1962 Quasars were first discovered in the early 1960s. They are extremely luminous and were first identified as being high redshift sources of electromagnetic energy, including radio waves and visible light, that were point-like, similar to stars, rather than extended sources similar to galaxies. Because some quasars are at great distances from the earth and the finite speed of light they have enabled astrophysicists to more accurately measure the immense size of the universe.
- 1964 An expanding universe implies that all the matter and energy in the universe came from a highly condensed singularity. This is the Big Bang model of the universe. According to this model, the universe expanded from an extremely dense and hot state and continues to expand today. The discovery of the cosmic microwave background radiation (CMBR) by Arno Penzias and Robert Wilson in 1964 was a major confirmation of the Big Bang theory of how the universe began.
- 1967 A pulsar is a highly magnetised, rotating neutron star that emits a beam of electromagnetic radiation. The first pulsar was observed by Jocelyn Bell Burnell and Antony Hewish in 1967. A pulsar is the only place where the behaviour of matter at nuclear density can be observed (though not directly) and millisecond pulsars have allowed a test of general relativity in conditions of an intense gravitational field.
- 1992, 1995 An exoplanet, or extrasolar planet, is a planet outside the solar system. The first published discovery of an exoplanet to receive subsequent confirmation was made in 1988 by the Canadian astronomers Bruce Campbell, G. A. H. Walker, and Stephenson Yang. But this planet's existence was not confirmed until 2003 using improved techniques. Since then more than a thousand such planets have been discovered (1054 planets in 800 planetary systems including 175 multiple planetary systems as of 12 December 2013). It is estimated there are at least 100 billion planets in the Milky Way, with at least one planet on average per star.
- 1998 The accelerating universe is the observation that the universe appears to be expanding at an increasing rate. In 1998, observations of type Ia supernovae suggested that the expansion of the universe has been accelerating since around redshift of $z \sim 0.5$. After the initial discovery in 1998, these observations were corroborated by several independent sources: the cosmic microwave background radiation and large scale structure, apparent size of baryon acoustic oscillations, age of the universe, as well as improved measurements of supernovae and X-ray properties of galaxy clusters.
- 2003 From 2003 models attempting to explain the accelerating expansion of the universe include some form of dark energy, dark fluid or phantom energy. This notion has become part of the Standard Model of Cosmology as of 2003–2013, since it is the simplest model in good agreement with a variety of recent observations.
- 2012 The discovery of the Higgs boson announced at CERN on 4 July 2012 confirms the existence of the Higgs field, which is pivotal to the Standard Model and other theories within particle physics. The discovery of a Higgs boson should allow physicists to finally validate the last untested area of the Standard Model's approach to fundamental particles and forces, guide other theories and discoveries in particle physics, and potentially lead to developments in “new” physics.

- 2014 Researchers announced they had found the residual marker for “inflation” —the idea that the cosmos experienced an exponential growth spurt in its first trillionth, of a trillionth of a trillionth of a second. The gravitational waves found put a distinctive twist pattern in the polarisation of the CMBR as predicted by inflation theory. The measurements were taken using the BICEP2 instrument at the South Pole Telescope facility.

† The information in this table is taken mainly from <http://en.wikipedia.org/>. It is common knowledge available to all.

Abbreviations

ACC	accusative case
Amp	Amplified Bible (1995)
ANE	ancient Near Eastern
ASV	American Standard Version (1901)
BBE	Bible in Basic English (1965)
BCE	before common/Christian era
BDB	Brown, Driver & Briggs
CE	common/Christian era
CEB	Common English Bible (2011)
CEV	Contemporary English Version (1995)
COBUILD	Collins COBUILD English Language Dictionary (1987)
EEB	EasyEnglish Bible Modern English (2001)
ESV	English Standard Version (2007, 2008)
EVD	English Version for the Deaf (2003)
Fenton	Holy Bible in Modern English (1903) by Ferrar Fenton
GW	God’s Word for the Nations (1995)
ISV	International Standard Version (1996-2012)
Jubilee	Jubilee Bible (2000)
KJV	King James Version (1611)
Knox	Monsignor Ronald Knox Translation (1950)
LB	Living Bible (1971) by Kenneth Taylor
LXX	Septuagint Greek Old Testament
MT	Masoretic text
Message	The Message (2002) by Eugene H. Peterson
Moffatt	James Moffatt Bible (1924)
NAB	New American Bible (1970)
NASV	New American Standard Version (1970)
NCV	New Century Version (1993)
NEB	New English Bible (1970)
NET	New English Translation (1996)
NIDOTTE	New international dictionary of theology and exegesis
NIV	New International Version (1978)
NIRV	New International Reader’s Version Bible (1996)
NJB	New Jerusalem Bible (1994)
NKJV	New King James Version (1982)

NLT	New Living Translation (1996, revised 2004)
NIRV	New International Reader's Version Bible (1996)
NRSV	New Revised Standard Version (1989)
NT	New Testament
OT	Old Testament
REB	Revised English Bible (1989)
Rotherham	Rotherham's Emphasised Bible (1902)
RSV	Revised Standard Version (1971)
Schocken	Schocken Bible (1995) by Everett Fox
Tanakh	Tanakh Translation of Jewish Bible (2004)
TEV	Today's English Version (1976)
TNIV	Today's New International Version (2005)
Webster	The Webster Bible (1833)
YLT	Young's Literal Translation (1887) by Robert Young

Hebrew Transcription

The BART transcription for Hebrew consonants is given in Table 4 and for Hebrew vowels in Table 5.

Table 4: BART Transcription of Hebrew Consonants

<u>Hebrew Character</u>	<u>Name</u>		<u>Pronunciation</u>
א	'Aleph	('au.lef)	' glottal stop (silent word final)
ב	Bêyth	(beiθ)	b as in bell (hard)
ב			b as in over (soft)
ג	Gîymel	('yi.mel)	g as in gate (hard)
ג			g̃ as baḡ (soft)
ד	Dâleth	('dau.leθ)	d as in door (hard)
ד			d as in other (soft)
ה	Hê'	(hei)	h as in heave
ו	Vâv	(vauv)	w as in well
ז	Zayin	('zah.yin)	z as in zeal
ח	Chêyth	(xeiθ)	ḥ as in loch (guttural)
ט	Têyth	(teiθ)	ṭ as in tip
י	Yôwd	(joud)	y as in yellow
כ, final ך	Kaph	(kaf)	k as in king (hard)
כ			k̄ as in Bach (soft)
ל	Lâmed	('lau.med)	l as in liner
מ, final ם	Mêm	(meim)	m as in mail
נ, final ן	Nûwn	(nun)	n as in noose
ס	Çâmek	('sau.mek)	s as in sell

ע	‘Ayin	(‘ah.yin)	‘ raspy sound in back of throat
פ, final ף	Pê’	(pei)	p as in pet (hard)
פ	Phê’	(fei)	p̄ as in awful (soft)
צ, final ץ	Tsâdêy	(tsau. ‘dei)	ʃ as in cats
ק	Qôwph	(kouf)	q guttural ‘k’
ר	Rêysh	(reiʃ)	r as in rain
ש	Sîyn	(sin)	ś as in sell (hard)
שׁ	Shîyn	(ʃin)	š as in shell (soft)
ת	Tâv	(tauv)	t as in tart (hard)
תׁ	Thâv	(θauv)	t as in myth (soft)

Table 5: BART Transcription of Hebrew Vowels

<u>Hebrew Character</u>	<u>Name</u>	<u>Pronunciation</u>
(ַ)	Qâmêts	â as in <u>all</u>
(ֶ)	Pattach	a as in <u>man</u>
(ֵ)	Shêvâ’-Pattach	ă as in <u>cat</u> (shortened)
(ִ)	Tsêrêy	ê as in <u>they</u>
(ֻ)	Çegôwl	ē as in <u>their</u>
(ֹ)	Shêvâ’- Çegôwl	e as in <u>men</u>
(ֺ)	Shêvâ’- Çegôwl	ě as in <u>met</u> (shortened)
(ֻ)	Shêvâ’	° obscure, as in <u>average</u>
(ִ)	Chiyriq	silent, as in <u>made</u>
(ֵ)	Chôwlem	î as in <u>machine</u>
(ֶ)	Short Qâmêts	i as in <u>suppliant</u>
(ֹ)	Chôwlem	ô as in <u>no</u>
(ֺ)	Short Qâmêts	o as in <u>nor</u>
(ֻ)	Shêvâ’- Qâmêts	ō as in <u>not</u> (shortened)
(ֹ)	Shûwrêq	û as in <u>cruel</u>
(ֺ)	Qîbbûts	u as in <u>full</u>

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