

Thoughts on the *rāqîa'* and a Possible Explanation for the Cosmic Microwave Background

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Abstract

I propose that Genesis 1:1 represents an example of introductory encapsulation, providing a summary of all the events of the Creation Week. The creative acts described in the account of Day Two (Genesis 1:6–8) thus refer to the astronomical heaven. This establishes a foundation for building a biblical model of astronomy. This approach also makes three bold statements about the universe. As an added benefit, it may provide a simple explanation for the CMB (cosmic microwave background).

Keywords: CMB, expanse, firmament, heaven, introductory encapsulation, *rāqîa'*, *šāmayim*

Introduction

The first occurrence of the word “heaven” in the Bible is found in Genesis 1:1, which records that “In the beginning, God created the heavens (שָׁמַיִם, *šāmayim*) and the earth (אֶרֶץ, *’ereṣ*).” In Hebrew, *šāmayim* is properly a plural noun, despite having the appearance of a dual form.¹ While the Hebrew word *šāmayim* is translated as a plural in Genesis 1:1 in versions such as the ESV (quoted here), the NASB, and the NIV, some versions, such as the KJV, translate *šāmayim* as a singular. Whether *šāmayim* is rendered as a singular noun (“heaven”) or a plural (“heavens”) is generally a matter of the translator’s preference. While *šāmayim* appears 421 times in 395 verses of the Old Testament, it is the subject of a sentence only rarely, as in Psalms 19:1 [19:2 MT] and 50:6 (cf. Judges 5:4). The Hebrew word *šāmayim* refers to things above us. As such, it can have three possible referents. For convenience, we can call these the three heavens, though this terminology does not appear in the Old Testament. The first heaven is the near distance above us. Today we would call this the atmosphere, though the atmosphere was not a concept that ancient people, including the Hebrews, would recognize. Clouds, birds, and precipitation are phenomena associated with this first heaven. For instance, Psalm 104:12 refers to the birds of heaven and Isaiah 55:10 speaks of rain and snow coming down from heaven. The second heaven is the astronomical realm, what we today would call space. The Old Testament describes stars as being in heaven, in Genesis 22:17, for example. The third heaven is the abode of God. Psalm 115:3 states that

our God is in heaven. The only place in the Bible where this distinction and enumeration of the heavens is alluded to is in the New Testament, 2 Corinthians 12:2–4, where the Apostle Paul briefly described his experience in the “third heaven.”

Since the distinction and enumeration of the heavens is not clearly taught in Scripture, one must exercise caution in making these distinctions in biblical texts. The distinction is merely a phenomenological one. It is clear that things in the first heaven are nearby, because we readily can see motion in them, such as the motion of birds and clouds. Furthermore, there is an obvious parallax effect—one’s location directly determines what one observes. A bird, cloud, or rain experienced locally will not necessarily be experienced by observers elsewhere. On the other hand, a change in location on the earth’s surface will not dramatically alter what we see in the second heaven, unless that change in location is great. Today we clearly see the distinction as being due to objects either being in the earth’s atmosphere or beyond it, in space. However, the ancient Hebrews would not have grasped this distinction in this sense, because our concept of the atmosphere and space beyond is modern. Therefore, the distinction between the first and second heavens sometimes is blurred in the Old Testament, and they are merged into one in some contexts.

The second occurrence of the Hebrew word *šāmayim* is in the Day Two account (Genesis 1:6–8). On Day Two, God made the expanse (*rāqîa'*). Genesis 1:8 further states that God called the expanse heaven (*šāmayim*). Thus, we are in the curious position

¹ The plural may be used in Hebrew not only to express a number of individuals or separate objects, but also may be used to denote them collectively. As such, the plural may be used to express a combination of various external constituent parts (referred to by Gesenius as “plurals of local extension”). Regarding the plural ending, both of the abundantly common nouns שָׁמַיִם and מַיִם (“water”) have the appearance of a dual form. However, in both cases the original plural ending *-im* has been reduced to *-im* under the influence of the stress. See Koehler and Baumgartner (2001, s.v. מַיִם); Gesenius (2006, §88d); and Joüon and Muraoka (2006, §91f).

of God creating the heavens (or heaven) twice, in Genesis 1:1 and again in Genesis 1:6–8. There are several ways to resolve this issue, and the path that we take will have direct implications in developing a proper biblical model of cosmology. Important in this discussion is the *rāqîa'*, the thing that God made on Day Two and then called *šamayim*.

The Hebrew word *rāqîa'*, translated as “firmament” in the KJV, appears 17 times in the Old Testament, with over half of those occurrences (nine times) in Genesis 1. Given its prominence in the narrative of the Creation Week, the *rāqîa'* is of inestimable value in developing a biblical cosmology. Since the word so rarely occurs outside of the creation account, discerning its meaning can pose a challenge to the reader. Recent creationists have developed several different understandings of what the *rāqîa'* is. For instance, Morris (1970, 59; 1976, 58–59) popularized the idea that the *rāqîa'* is the earth’s atmosphere. However, Morris (1970, 111–112) did allow that the *rāqîa'* in other passages might refer to astronomical heaven, or more properly, space itself. Johnson (1987) went further in identifying the *rāqîa'* with space in *all* contexts. Humphreys (1994) more fully developed the idea that the *rāqîa'* refers to interstellar space and presented arguments against identifying the *rāqîa'* as the atmosphere. In developing his cosmology, Hartnett (2007, 94) diminished the extent of the *rāqîa'* a bit from that of Humphreys by positing that the *rāqîa'* extended to the outer regions of the solar system. Very different from everyone else is Brown’s (2008, 362–370) contention that the *rāqîa'* is the earth’s surface. Obviously, all of these positions cannot be correct.

Different views of the *rāqîa'* lead to different conclusions about the earth, its atmosphere, and the universe, though it is not always clear if the views lead to the conclusions or if the conclusions require the views. For instance, the view that the *rāqîa'* is the atmosphere frequently leads to the conclusion that the pre-Flood earth was surrounded by some sort of water canopy. Indeed, the *rāqîa'* being the atmosphere was an integral part of Morris’ Flood model (Whitcomb and Morris 1961, 77, 287), in that the collapse of the water canopy was posited as one of the two sources of the Flood waters mentioned in Genesis 7:11 (the “windows of heaven”). Through the considerable influence of Morris, the canopy model was widely popular among recent creationists four decades ago, but the canopy model largely has been abandoned by recent creationists now (Hodge 2009). If the water canopy model is no longer viable, should we not reevaluate Morris’ interpretation of the *rāqîa'*?

Several creation scientists have reconsidered the *rāqîa'*. The *rāqîa'* being interstellar space is necessary for Humphreys’ white hole cosmology. Hartnett attempted to explain the abundant water in the solar system by his identification of the *rāqîa'* with the space of the solar system. Separating the waters above and below by the earth’s surface is an integral part of Brown’s hydroplate model with the *rāqîa'* being the primordial surface of the earth. Given the wide diversity of beliefs about the *rāqîa'* and the stakes involved in developing a biblical cosmology, a review of the possible meanings of *rāqîa'* is in order. Unfortunately, many of the teachings on the *rāqîa'* in the creation literature appear to have been developed after little interaction with the Hebrew scholarship.

Various translations of *rāqîa'* have originated and compounded the problem. The Septuagint translators chose to render *rāqîa'* as *stereoma*. In ancient Greek cosmology, the *stereoma* was the hard, transparent sphere on which stars were affixed. As the *stereoma* spun, it carried the sun, moon, and stars across the sky. Of course, today we recognize that it is the earth’s rotation that causes this motion. In most ancient Greek cosmologies there were other nested circles or spheres concentric within the *stereoma* that carried the sun, moon, and five naked-eye planets, producing motions of those objects with respect to the background stars. The identification of the *rāqîa'* as the *stereoma* probably was an attempt by the Septuagint translators to conform Scripture to the dominant cosmology of the day (Yunker and Davidson 2011, 129; cf. Kaiser 2013, 78). The Septuagint translation was done in Alexandria, a center of Greek thought, and so the Greek influence was strong. The same appeal to conform to current thinking exists today, for many authors interpret Genesis 1 in terms of the big bang model, the dominant cosmological theory of our day. In the Vulgate, Jerome chose the Latin word *firmamentum* to translate *rāqîa'*.² As one easily may surmise, we get the English word “firm” from the root for this word, and so Jerome’s choice here again went with the idea from the Septuagint of the *rāqîa'* being a hard substance. Many English translators, such as those of the KJV, went along with Jerome by simply transliterating the Latin word as “firmament.” Thus, the idea that *rāqîa'* denotes something hard persists among some creationists today.

Given the reality of the way the *rāqîa'* has been translated, medieval Christian and rabbinical scholars’ opinions on the subject may be suspect. At the very least they were products of the times in which they lived. Furthermore, they, like earlier translators, may have felt compelled to conform to the cosmology of their times. Truly ancient (pre-

² Though Jerome could read Hebrew, it seems (at least in some cases) that he deferred to the Septuagint when attempting to translate more obscure words (and *rāqîa'* certainly classifies as such, with only 17 occurrences in the Old Testament).

Greek influence) Hebrew sources outside of the Old Testament are exceptionally rare and do not make mention of the word *rāqîa'*. Furthermore, the sparse use of the word *rāqîa'* elsewhere in the Old Testament is of little help.

The Meaning of Genesis 1:1

Whitcomb and Morris (1961, 219) taught that Genesis 1:1 indicated that the creation of the earth and the space of the universe were the first creative acts of Day One. Given the stature that these two gentlemen have among creationists, it is not surprising that this has been the dominant view of recent creationists throughout the past half century. However, outside of the creation literature, this view of Genesis 1:1 is decidedly less dominant. Recently, Camp (2015) noted that Hebrew and Old Testament scholars (including conservative ones who believe in recent six-day creation) believe that Genesis 1:1 contains an example of *introductory encapsulation*, a term introduced by Boyd (2014a, 453–455). Boyd defined introductory encapsulation as “A verb representing an eventuality that subsumes a series of eventualities, which elaborate on the whole” (Boyd 2014b, 768). The introductory encapsulation is followed by the elaboration, the elaboration defined as “The coherence relation in which eventualities depicted by a group of verbs take place in the same time interval as that of the eventuality represented by the verb that precedes the group” (Boyd 2014b, 764). Boyd offered several examples:

Carl had a great morning [an introductory encapsulation]. His wife made the family bacon and eggs. There was little traffic driving into the office. His secretary had a pot of coffee waiting for him. His cranky first client cancelled his appointment.

Notice that the introductory encapsulation is followed by four sentences of elaboration, explaining in more detail why and how Carl had a great morning. Or consider this example (Boyd et al. 2014, 58):

Harry took his family on a great day trip. He drove them up the coast, explored a state park with them, treated them to a nice seafood dinner, and drove them back home tired but happy.

Here the introductory encapsulation is followed by elaboration of a single sentence with four clauses. There are numerous examples of introductory encapsulation and elaboration found in the book of Genesis. Boyd (2014b, 768) defined introductory encapsulation and gave this example:

In Genesis 37:5–7, “Joseph dreamed a dream and told it to his brothers and they hated him even more,” is an introductory encapsulation, which is followed by the elaboration: “He said to them, ‘Please listen to this dream I have dreamed,’” after which he regales them with the content of the dream.

Notice that the introductory encapsulation of Genesis 37:5 is complete, though it lacks details. Verse 7 gives the details of the dream, and verse 8 records Joseph’s brothers’ response and explains why their hatred of Joseph grew. Without this additional information, we would not know the reason for the brothers’ increased hatred for Joseph.

I propose that in similar manner, Genesis 1:1 functions as an example of introductory encapsulation, followed by elaboration given in Genesis 1:2–2:3. There are at least three reasons for this. First, the phrase “heaven and earth” in Genesis 1:1 is a merism. A merism is a figure of speech in which two or more words are combined to express the entirety of something. For instance, the expression “lock, stock, and barrel” refers to complete possession of something. The phrase comes from the three basic parts of a rifle: the stock, which holds the other parts and provides something secure for the user to hold onto the rifle, the barrel, through which the projectiles are shot, and the lock (now often called the receiver), which is the mechanism that fires the projectiles. A rifle easily can be disassembled into these three parts, and it is incomplete without all three of these parts.

A merism often contains two contrasting words to convey entirety. An example would be to search high and low for something. It is implied that the search was done at the highest and lowest places, with the implication that everything in between is included. This is the sort of merism that “heavens and earth” seems to be in Genesis 1:1. Even in English today we use this merism, as in “I moved heaven and earth, but I still could not succeed.” That expression is used to describe a situation in which every possible approach was tried. Ancient Hebrew lacks a word for “universe.” Hence, the only manner to refer to the entirety of physical existence in Hebrew is the use of the merism “heaven and earth.”

Second, Genesis 1:1 together with Genesis 2:1–3 would appear to function as an inclusio. An inclusio is a literary device of bracketing a text with similar material at the beginning and ending of the text. The similar words act as a frame or bookends that tie the text together. There are numerous examples of inclusios in the Hebrew Old Testament. However, many people reading English translations of the Bible often miss inclusios. There are at several reasons for this. One is that sometimes they are lost in translation. A second reason is that an inclusio is not a common concept in English writing. Third, chapter breaks often intervene between the beginning and end of an inclusio. This is the situation of the likely inclusio that runs between Genesis 1:1 and Genesis 2:1–3. A good example of inclusio that survives translation well is Psalm 118, where the first and last verses read identically.

Returning to the creation account, we see an *inclusio* which involves the introduction of specific words and phases in Genesis 1:1—**בָּרָא** (“created”), **אֱלֹהִים** (“God”) and **וְאֵת הַשָּׁמַיִם וְאֵת הָאָרֶץ** (“the heavens and the earth”)—and their repetition in reverse order in Genesis 2:1–3 (**וְהָאָרֶץ** in 2:1; **אֱלֹהִים**, initially, in 2:2; and **בָּרָא** in 2:3). This *inclusio* effectively brackets the contents of the creation narrative (cf. Mathews 1996, 114).

Third, and perhaps most significantly, the grammatical relationship between Genesis 1:1 and 1:2 suggests that Genesis 1:1 contains an instance of introductory encapsulation. Cassuto (1961, 20) notes on Genesis 1:2 that the Hebrew construction **וְהָאָרֶץ וְהַיָּמִים** (“Now the earth was formless and void”) plainly shows that verse 2 begins a new subject. “It follows, therefore, that the first verse is an *independent sentence* that constitutes a *formal introduction*” (emphasis added).³ Young (1999, 11) concurs with Cassuto’s observations, noting there are similarly constructed narratives in the Old Testament that feature summary statements followed by detailed accounts (cf. 1 Kings 18:30ff.). Young phrases his point rather uniquely, saying, “Verse one is a narrative complete in itself.”⁴ As such, Genesis 1:2 does not necessarily follow sequentially what is stated in verse 1 (note the *qatal* verb in 1:2); rather, it is a descriptive statement that represents the state of the world near the beginning of the creative process that is summarized in verse 1. As such, Genesis 1:1 functions to summarize the account of creation to follow, and Genesis 1:2–31 elaborates upon the details of God’s creative activity.

However, verse 1 is immediately followed by verse 2, which describes the initial condition of the earth. Therefore, while verse 1 serves as an introductory encapsulation, it also describes the creation of the earth at the beginning of Day One. In a similar manner, the creation of the heavens is described, or elaborated, in the Day Two account (Genesis 2:6–8).

Since the creation literature has been dominated by Morris’ viewpoint that Genesis 1:1 records the creation of astronomical space on Day One, the

approach that Genesis 1:1 represents an example of introductory encapsulation and that God created space on Day Two is sure to encounter resistance from recent creationists. There are at least two reasons for this. Genesis 1:1 is foundational to creation, so when one has been accustomed to viewing Genesis 1:1 in a particular manner, it is difficult to conceive of other possibilities. However, this is insufficient reason to oppose the introductory encapsulation theory. It is striking that much scholarship among Christians (who are non-scientists) embrace this concept (see, for example, Currid 1991, 31; Eichrodt 1967, 104; Hamilton 1990, 103, n. 2; Harrison 1975, 1022; Jewett 1991, 457; Keil and Delitzsch 2006, 29; Kelly 1997, 45, 79; Mathews 1996, 129; Ross 1988, 106; Sarna 1989, 5; Skinner 1910, 14; Von Rad 1972, 48; Wenham 1987, 15; Westermann 1984, 101; Young 1964, 9).

The second reason for resistance to Genesis 1:1 being an instance of introductory encapsulation is the fear that it may lead to belief in billions of years. However, this is precluded by a straightforward reading of Exodus 20:8–11, which states that all of God’s creative actions occurred on six normal days. Also, as Camp (2015) has clearly demonstrated, one cannot divorce the introductory statement of Genesis 1:1 from the remainder of the creation account. Thus, one cannot insert billions of years into the first verse or two of Genesis, because the first verse or two do not stand alone. Rather, verse one acts as a summary and introduction, and the details follow. In each of the three examples of introductory encapsulation and elaboration repeated above, two hypothetically from today and the third from Genesis 37:5–7, no one would suggest that considerable time intervened with or after the introductory encapsulation before the details were related. Instead, everyone readily acknowledges that the events of the introductory encapsulation and the elaboration must be contemporaneous. To suggest that introductory encapsulation permits for the insertion of great time is to misunderstand introductory encapsulation and elaboration.

³ Cassuto (1961, 21) further notes on verse 2 that “Whenever the subject comes before the predicate, as here, the intention of the Bible is to give emphasis to the subject and to tell us something new about it; see, for instance, in 1: *Now the serpent was cunning*, etc. (the serpent had not previously been mentioned by name, but was merely implied in the general term beast of the field—ii 19, 20). But in most cases, including our own, the subject has already been mentioned earlier, and the verse comes to focus the reader’s attention on it; e.g. iv 1, 18 (four times); vii 16, 19; x 8, 9, 13, 15, 24, 26; xi 12, 14; xiii 17, 18; xx 4, xxi 1; xxii 23; etc., etc. It is though Scripture said: ‘As for this subject, I have to tell you that this is what happened, or what he did, or what befel [*sic*] him’. Here, too, the meaning is: ‘As for the earth alluded to in the first verse, I must tell you that at the beginning of its creation, it was without form or life,’ etc. In *v*. 1 the heavens come first, because in referring to the two parts of the universe together, the more important part must be given precedence; but when the Bible proceeds to describe the work of creation in detail, the earth, which was created first, is mentioned first, whereas the heavens are dealt with in the second paragraph.” This shows the biblical author’s special focus on the earth.

⁴ Concerning the example given from 1 Kings 18:30ff., Young (1999, 11) observes that “Verse 30b is the general statement of repairing the altar. The detailed account begins in verse 31. The first verb in the detailed account is **תָּקַן** (verse 31). Grammatically, this verb does not follow **תָּקַן** of verse 30. The order is not, ‘First, Elijah repaired the altar, and then he took twelve stones.’ Verse 30b is a narrative unit, complete in itself; verses 31ff. constitute another narrative unit, the first verb of which is **תָּקַן**.”

If Genesis 1:1 is an example of introductory encapsulation, then it presents a possible problem. Someone might object that while the heavens are explicitly detailed as being made on Day Two, there is no explicit statement, apart from Genesis 1:1, of the creation of the earth. Therefore, when did God create the earth? The word “earth” (*’ereṣ*) does not appear after Genesis 1:1–2 until Genesis 1:9 (Day Three) when God made the dry land to appear and He called it “earth.” With this equation of earth with the dry land on Day Three, what was the earth of Day One in Genesis 1:1–2? Verse two says that the earth was unfilled and unformed, that darkness was on the face of the deep, and that the Spirit of God was moving over the waters. The deep refers to very deep waters of the sea. The description of the Spirit of God moving over the waters reinforces this. Hence, the earth created at the beginning of Day One was a watery mass. How deep was this water? Humphreys (1994) would have the entire mass be composed of water. However, many creation geologists believe that the rocky mass of the earth was within the water but unexposed until Day Three (for example, Austin et al. 1994; Baumgardner 2000). When we ask when God made the earth, it probably is more proper to ask when God created the material out of which God made the earth, that is, when did God create the primordial matter that would become the earth as we know it now. To answer that, we need to realize that there is no reason why Genesis 1:1 is *merely* a merism. Genesis 1:2 describes the unfinished state of the earth (the deep/waters) at the beginning. Since the structure of introductory encapsulation and elaboration does not permit the insertion of additional time, great or small, nor does it permit actions outside of its structure, the initial creation of primordial matter is implied in conjunction with the initial creative acts of Day One (Faulkner 2013). Again, viewing Genesis 1:1 as an example of introductory encapsulation does not permit the addition of billions of years or the creation of things prior to Day One.

What Did God Make on Day Two?

The realization that the mention of the heavens in Genesis 1:1 does not necessarily refer to the creation of what we now call space at the beginning of Day One frees one up to view the Day Two account differently. Genesis 1:6 declares God’s determination to call the *rāqîa'* into existence to separate the waters from the waters. This is immediately followed by Genesis 1:7, which states that God made the *rāqîa'* to separate the waters above the *rāqîa'* from the waters below the *rāqîa'*. Finally, in Genesis 1:8, God called the *rāqîa'* “heaven” (*šamayim*), and the Day Two narrative closes. The Hebrew word *šamayim* refers to

things above us, which could include the atmosphere (first heaven) and what we today would call space (the second heaven). There is no reason why both of these could not be included here. The Hebrew Old Testament does not make as sharp of a distinction of distance between these two heavens as we might today. However, we can assume that the original readers would have had some distinction based upon observations of objects that appear in heaven. For example, birds, clouds, and precipitation clearly are in the first heaven as they appear quite near the earth, while the sun, moon, and stars (including planets) are in the second heaven.

As an example, consider meteors, which appear about 100km high in our atmosphere. Being within the upper reaches of the earth’s atmosphere, today we would properly consider them to be atmospheric effects, albeit of an astronomical origin. However, the ancient Hebrews would have considered meteors to be stars based upon their appearance (even today meteors commonly are referred to as shooting stars or falling stars). Hence, the ancients would have considered meteors to be in the second heaven. Artificial satellites did not exist in the ancient world, but within the context of Old Testament language, how would we classify them? They appear as bright stars that move across the sky. From the standpoint of ancient people, including the Hebrews, artificial satellites would be stars. However, they orbit only slightly higher than meteors appear in the atmosphere. The distance between low-earth orbit satellites and the atmosphere is orders of magnitude less than the distance between these satellites and the closest astronomical body, the moon. Hence, with regards to distance, even today one could make the case that artificial satellites ought not to be included with astronomical bodies, and so ought not to be in the second heaven.

The point is that the distinction between the first and second heaven is not as clear as some might think, particularly when one views that ancient distinction from a twenty-first century perspective. If one were to opine that either only the first heaven or only the second heaven was made on Day Two, then it is not clear where the line of demarcation between the two would have been. However, if both entities were made on Day Two, then this is a moot point.

The word *šamayim* appears only seven times in Genesis 1. The first three appearances are in Genesis 1:1, 8, and 9. The first verse is part of the encapsulatory introduction. Verse 8 is God’s equation of the *rāqîa'* with the *šamayim*. Verse 9 involves God’s command for the waters under the heavens to be gathered into one place and that dry land appear. Since this immediately follows God’s equation of the *rāqîa'* and the *šamayim* and the conclusion of Day

Two, it ought to be abundantly clear that the *rāqîa'* ought to be equated with *šamayim* in verse 9. The four times that *šamayim* is used in the remainder of Genesis 1, it always appears in construct with the word *rāqîa'*, as it is translated “firmament of heaven” in the KJV. Three of these uses are in the context of the Day Four account (verses 14, 15, and 17), with the fourth appearance in the Day Five account (verse 20). The implication seems to be, lest there be any confusion, that this entity mentioned is the same thing that God made on Day Two. Within the context of the Day Four narrative, this “firmament of heaven” is where God placed the luminaries—the sun, moon, and stars. In the Day Five account, the birds are said to fly “across [or upon] the expanse of the heavens”. The construction in Genesis 1:20 is different from the other appearances of the phrase firmament of heaven, and it is difficult to translate. There is a distinction from where the stars are, suggesting that the birds merely fly across the interface of the firmament of heaven. These considerations and others suggest that the *rāqîa'* is closest to what we would call the sky. In this respect the atmosphere, and especially the lower portions of the atmosphere, may be the near surface of the *rāqîa'*.

Besides being based upon this reading of the Genesis 1 creation account, this understanding of the *rāqîa'* nicely incorporates the Old Testament verses that speak of the heavens being stretched or spread out—as in Job 9:8; Psalm 104:2; Isaiah 40:22, 42:5, 44:24, 45:12, 48:13, 51:13; Jeremiah 10:12, 51:15; and Zechariah 12:1. Besides these 11 verses, there are a few other verses that might qualify for inclusion, but they are not so clearly worded, so they were omitted from the list above. One of those verses worthy of note is Job 37:18, which says that God has spread out the sky. This is translated sky rather than heaven here, because the noun *šḥāqîm* is used rather than *šamayim*. However, these two Hebrew words have enough similarity in meaning that they could be used interchangeably. Interestingly, the Hebrew verb in Job 37:18 that is translated spread is *rāqa'*, the verb from which the noun *rāqîa'* comes. The verb in each of the 11 verses listed above is *nāḥ*, meaning to stretch, or to spread out. However, it also can mean to bend. This verb appears in 2 Samuel 22:10; Psalm 18:9; and Psalm 144:5, which says that God bent, or bowed, the heavens, so these verses say much the same thing and could be included as well, though they read differently in English.

Admittedly, the Hebrew verbs used to describe the spreading or stretching of the heavens do not appear in the Day Two account. The verb in Genesis 1:7 is *ʿasah*, which means “to do, make, or perform,” and is commonly used in the creation account in reference to God’s creative action. However, the word *rāqîa'* derives

from the word *rāqa'*, a verb meaning “to beat, to stamp out.” This is the sort of action that one might do with a malleable metal, such as gold. Through mechanical means, craftsmen can beat, stamp, or otherwise spread gold into very thin sheets, often for the purpose of inlaying objects. In recent years, it has become common to view the stretching of the heavens as referring to the expansion of the universe. However, as universal expansion was not discovered by Edwin Hubble until 1929, this would not have been how the text would have been understood prior to the twentieth century. Certainly, those who wrote about the stretching of the heavens or those who first read or heard it must have had some understanding of what this meant. In each case where the stretching of the heavens is mentioned in the Old Testament, the context is within the sovereignty and omnipotence of God based upon His role as Creator. Therefore, one ought to look into the creation account for the meaning of these passages. Since Genesis 1:8 equates *šamayim* with *rāqîa'*, and we know from the verb from which *rāqîa'* comes means to beat or spread out, the best fit for understanding the stretching of the heavens is with what God did on Day Two. The “stretching” out of the heavens thus refers to a past event, not an ongoing phenomenon.

Hebrew verbs do not innately possess tense as English verbs do, so properly translating them occasionally can be tricky. However, in a number of the 11 verses that mention the stretching of the heavens, the action is associated with creation, which is finished (Genesis 2:2). For instance, consider Isaiah 42:5. The verse begins,

Thus says God, the LORD, who created the heavens and stretched them out....

Notice the parallelism between “created the heavens” and “stretched them out.” Since creation of the heavens is a past event, the parallel makes no sense if the stretching out is ongoing. Similar parallel structure tying the stretching of the heavens to the (past) creation process exist in Isaiah 44:24, 45:12, 48:13; Jeremiah 10:12, 51:15; and Zechariah 12:1. It is difficult to reconcile the ongoing expansion of the universe with verses describing the stretching of the heavens at the time of creation.

Especially noteworthy is another example of parallelism found in Psalm 19:1. This verse has tremendous bearing on a correct, biblical understanding of the *rāqîa'*. The verse reads (ESV),

The heavens declare the glory of God,
And the sky above proclaims his handiwork.

Here the Hebrew word *rāqîa'* is rendered “sky.” This verse says the same thing two different ways. However, the parallelism works only if the two subjects, *šamayim* and *rāqîa'* are equivalent on a conceptual level (i.e., they refer essentially to the same thing). These two entities are exactly equated

in Genesis 1:8, so they are the same. Therefore, if the *rāqīa'* made on Day Two is the earth's atmosphere, then the subject of Psalm 19:1 is the earth's atmosphere. No one believes this to be the case, for Psalm 19:1 is universally accepted as referring to the celestial heavens. While Psalm 19 does not specifically mention stars, it does mention the sun in verse 4, and the sun is further discussed in verses 5 and 6. Clearly, God made the sun on Day Four and placed it in the firmament, or expanse, of heaven. This is not the earth's atmosphere.

Where Are the Waters Above Today?

God made the *rāqīa'* to separate the waters above it from the waters below it. If the *rāqīa'* can best be identified principally as what we call space today, then there are three startling conclusions. First, assuming that the waters above are a finite distance away, then the universe is bound, or has an edge. While this possibility is permitted within the physics of space and time as we now understand it, this position is decidedly unpopular among cosmologists. If the universe is unbound, then the universe either can be finite or infinite in size. If finite, then the universe has curvature so that space closes back on itself so that there is no boundary. Outside of the creation literature, very little work has been done on cosmological models that are bound.

Second, since the *rāqīa'* was spread out from the waters below the *rāqīa'*, and the earth formed out of those waters, unless this spreading was asymmetrical, then the earth must be at, or at least near, the center of the universe. Other creationists have reached a similar conclusion (Hartnett 2005; Humphreys 2002), albeit by different means. Among non-biblical cosmologies, this is to be resisted more strenuously than a bound universe. The reason is that this runs counter to the Copernican principle, which asserts that the earth is in no particularly significant location. Most cosmologies today deny that the universe has a center, opting for either an infinite universe or an unbound finite universe. In either case, the universe has no center. There is no way at this time observationally to determine if either of these views is correct. Even if the universe had a center, the probability of the earth being near that center in the vast universe is vanishingly small. Hence if it turned out that the universe had a center and the earth were near it, that highly improbable location would imply design and a Creator.

Third, the Bible implies that the boundary of the universe is accompanied by water. Unlike what the canopy model proposes, the waters above the *rāqīa'* did not condense at the time of the Flood, and so still ought to be beyond the *rāqīa'*. This is borne out by Psalm 148:4, which speaks of waters above the heavens still

being there. We do not know who wrote Psalm 148 or when they wrote it, but it almost certainly was long after the Flood. That is to say, in the post-Flood world, the universe is surrounded by water.

What form might this water at the edge of the universe be in? Some might wish to have this water in a solid or gaseous form, as opposed to liquid. However, the Hebrew word for water, *māyim*, is used only for liquid water. If ice were intended, the word would be *qerah*. If gaseous water were meant, we might expect to see *nāsi'*, or perhaps *hebel*. Therefore, the water above the *rāqīa'* on Day Two must have been liquid. Furthermore, Psalm 148:4 suggests that at least at the time that Psalm 148 was written the water above still was in a liquid form. Some might object that the conditions in space are such that liquid water could not remain in that state, but instead must have condensed into ice or evaporated into gas. However, we know nothing of the physical conditions at the edge of the universe. Indeed, the edge of the universe is a difficult concept to grasp physically. It may be that God has imposed conditions at the edge of the universe so that the water there remains as a liquid. Or perhaps not. While I prefer liquid water at the edge of the universe, I shall now consider the implications of water at the edge of the universe, not only as a liquid, but also as a gas or solid.

All baryonic matter (such as water) must radiate, if it has any temperature. We have never observed, nor can we conceive of matter, with absolutely no temperature, so the assumption that the water at the edge of the universe has temperature seems warranted. Solids, liquids, and gases at high pressure radiate a blackbody spectrum that is a function of temperature. A question arises as to whether the water at the edge of the universe is optically thick. I will assume here that it is, thus ensuring a relatively clean blackbody curve. If the water at the edge of the universe is a gas at low pressure, it will produce an emission spectrum, which will be a function of its temperature. At any rate, the spectrum of a low pressure gas will be dramatically different from the spectrum of the other possibilities. As a back of envelope calculation, assume that the temperature of the water is 300K, close to room temperature. This water must lie beyond the most distant galaxies or other objects in the universe. Observationally, we know that there is a direct relationship between distance and redshift (the Hubble relation). Therefore, the spectrum of the water must be redshifted by a factor greater than the largest observed redshift. Currently, the record for greatest redshift is 8.6 for the galaxy UDFy-38135539 (Lehnert et al. 2010). This record redshift likely will fall to an even higher redshift, so assume $z=10$ for the water. This would result in a blackbody spectrum of 30K.

What do we observe? The universe appears to be bathed in a radiation field called the cosmic microwave background (CMB). The currently measured temperature of the CMB is 2.725K. Since 1965, the CMB has been interpreted as the best evidence for the big bang model. Presumably, the CMB emanates from a time about 400,000 years after the big bang when the universe was sufficiently hot and dense enough to be opaque. According to the big bang model, once the universe had expanded and cooled sufficiently, the universe became transparent, and matter and photons decoupled for the first time, thus permitting the light from the opaque gas at the time of decoupling to reach us. After traveling over billions of light years, the blackbody spectrum of the opaque gas has been redshifted by a factor of about a thousand, thus cooling the blackbody curve of the gas from about 3000K to about 3K.

One problem for recent creationists who reject the big bang model is the lack of explanation for the CMB (Faulkner 2014). However, if water truly is at the edge of the universe as Genesis 1:6–8 suggests, then we ought to expect that the universe is surrounded by water, which ought to radiate. Assuming cosmological redshift, regardless of its cause, the radiation from this water ought to be a cool blackbody, which is what we observe. It was possible that between 1929, when Edwin Hubble discovered the expansion of the universe, and 1965 someone could have predicted the CMB, if they had taken Genesis 1:6–8 seriously. Here I arbitrarily picked values for the temperature and redshift for the water. The qualitative match with the CMB is approximately that of big bang model predictions prior to the discovery of the CMB. At this time I have no model expectations of exact temperature of the water or its redshift, but it is easy to pick pairs of their values that would result in a match with the CMB. In time, it may be possible to estimate both temperature and z based upon a detailed model of the *rāqîa'*.

Is it possible to make predictions that might be testable? Yes, depending on the state and conditions of the water, there ought to be spectral features in the CMB. For instance, there may be absorption lines of water at longer wavelengths, a portion of the CMB spectrum where little attention is paid. There could be spectral features from vibrational modes, normally in the infrared, but redshift would alter that. It may be possible to predict spectral features that can be tested against the CMB spectrum, but a more detailed model of the initial temperature of the water and its redshift would be required.

Conclusion

I have proposed here that Genesis 1:1 contains an example of introductory encapsulation and that Genesis 1:6–8 ought to be understood primarily

in terms of the creation of what we now call space (or sky). Some recent creationists may object on the grounds that Genesis 1:1 as an introductory encapsulation is a retreat, or that some people with a belief in billions of years also believe this. However, many of those who believe in billions of years also believe in the cardinal doctrines of Christianity, such as the Deity, virgin birth, and bodily resurrection of the Lord Jesus Christ. By that reasoning, we ought to reject these, because some people who believe in billions of years also believe these cardinal doctrines. As for fear of changing one's mind about such a matter, we ought not to develop our theology or our creation model motivated by fear. To the contrary, our commitment must be to the integrity of Scripture and to what the Bible actually says.

How one interprets Genesis 1:1 directly affects how one interprets Genesis 1:6–8. If one gets Genesis 1:6–8 wrong, it will have little, if any, impact on a biblical model of geology. If one gets Genesis 1:6–8 wrong, it will have little, if any, impact on a biblical model of biology. However, if one gets Genesis 1:6–8 wrong, then there is little hope of developing a successful biblical model of astronomy. I ask those who may be quick to criticize the proposal presented here carefully to consider the consequences to astronomy. An exciting possibility is that this proposal may provide a potential explanation for the CMB. Recently, Humphreys (2014) has produced a model that may offer an explanation for the CMB. At this point, we ought not to rule out any possibilities.

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