DID A WATER CANOPY SURROUND EARTH AND CONTRIBUTE TO THE FLOOD?

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Isaac Vail (1840–1912) first proposed the canopy theory in 1874.[1] He believed a canopy formed millions of years ago as the earth evolved from a molten state. Vail supported his case primarily by ancient mythology, which in his opinion included Genesis 1:6–8a that states:

Then God said, "Let there be an expanse in the midst of the waters, and let it separate waters from waters." And God made the expanse, and separated the waters which were below the expanse from the waters which were above the expanse; and it was so. And God called the expanse heaven.

Notice that these verses do not explicitly say a canopy surrounded the earth.

Vail's canopy was a vapor cylinder surrounding the earth but open at the poles. Since then, many people have recognized problems with Vail's canopy and proposed variations. These usually involved a thin, spherical shell of water—as either a liquid, gas (a vapor), or solid (ice particles or an ice shell). As we will see, each variation has serious biblical and scientific problems. In fact, canopy theories "do not hold water." Consequently, canopy theories have delayed our understanding of Genesis 1:6–8a, the structure of the preflood earth, the flood, and earth's geological features. But first, what are the standard arguments for a canopy?

Arguments for a Canopy—and Brief Responses

The Source of the Flood Water. "Today, earth's atmosphere holds, on average, only one inch worth of liquid water. Therefore, the Genesis flood raises two common questions: Where did so much flood water come from, and where did it go? A canopy partially answers the first question."

Response: No canopy theory claims to provide all the water for a global flood. Nor does any canopy theory explain where the water went after the flood. Somehow transporting this water back into outer space or suddenly forming deep ocean basins after the flood is hard to imagine or explain. However, the phrase "the fountains of the great deep" (Genesis 7:11) implies that the flood water came from subterranean sources. To learn where the water went after the flood, see pages 102–131.

Many have rejected the Genesis flood account because they could not imagine where the flood water, which covered all mountains, went. Canopy theories have contributed to this

difficulty.

Drop in Longevity. “Radiation from outer space may cause people to age. If so, a preflood canopy might have shielded people from this aging process. Perhaps this is why life spans before the flood were about 900 years.”

Response: If radiation from space reduced life spans, we would expect an immediate drop in longevities after the flood. Life spans did drop, but for 12 generations after the flood, human longevity remained much higher than today. [See page 317.] Even Noah lived 349 years after the flood. Some argue that perhaps radiation damage accumulated genetically over many generations. Few, if any, canopy proponents have proposed specifically what type of harmful radiation it was, how it reduced longevity so much without causing massive deformities and genetic diseases, why longevity leveled off at about 70 years rather than continuing to deteriorate, or how to test the proposed mechanism.

Most proposals for this drop in longevity are testable, but seldom tested. One test, which might have shown that cosmic or solar radiation reduce longevity, failed. Mice were raised in deep caves, shielded from both types of radiation. Neither those mice nor their offspring lived longer than other mice.[2] Furthermore, if radiation from outer space accelerated aging, then living at a lower elevation, where one is protected by a thicker blanket of atmosphere, should increase longevity. No such effect is known.[3]

Joseph Dillow’s book, The Waters Above, is probably the most complete, accurate, and up-to-date defense of any canopy theory. After explaining other problems with the “longevity claim,” Dillow concludes, “So it appears that canopy theorists have been in error when they appealed to the shielding effect of the canopy as a direct explanation for antediluvian longevity.”[4] Dillow also states, “We readily admit that Genesis does not teach the existence of a pre-Flood vapor canopy.”[5] [emphasis in original]

A Uniformly Warm Climate. “A canopy may have given the earth a uniformly warm climate. This might explain why fossils of temperate animals and plants (such as dinosaurs and large trees) are found in Antarctica and on islands inside the Arctic Circle.”

Response: After the flood, mountains were suddenly pushed up. This shifted the poles and brought temperate regions to today’s polar regions. [For details see page 118 and Endnote 53 on page 128.] Also, during the global flood, some plants and animals may have floated to today’s polar latitudes where they were later fossilized.

Even if a canopy produced a warm polar climate, it would not satisfy another requirement for lush vegetation— sunlight in the winter. Polar nights are six-months long, and when the Sun does shine, it is always low in the sky. How could large trees and dinosaurs (requiring long food chains) survive, let alone thrive, during the long polar night?

Despite much speculation, no one knows what temperatures would exist under a canopy. Today, even experts disagree on the extent to which carbon dioxide currently warms the earth. Think how much more difficult it is to determine the warming, thousands of years ago,

under a canopy of unknown thickness, reflectivity, content, and height above the earth.

Venus. “We see canopies on other planets, such as Venus.”

Response: Some planets have atmospheres, but none has a canopy. An atmosphere has contact with its planet, but a canopy is a distinct shell above the planet’s atmosphere. Venus is shrouded by a thick, opaque atmosphere, consisting primarily of carbon dioxide (96.5%), nitrogen (3.5%), and traces of other gases. Venus does not have a layer of water, or any other relatively heavy substance, above its atmosphere.

Genesis 7:11–12. “Genesis 1:6–8a seems to speak of a water canopy that contributed to the flood. After all, Genesis 7:11–12 states that ‘... the floodgates of the sky were opened. And the rain fell ...’ A lot of rain fell from somewhere.”

Response: If this were true, similar biblical interpretations should predate Vail’s in 1874. Where are they? Quite often it is hard to see alternatives once we have learned “the accepted explanation.”

Actually, Genesis 7:11–12 says that “all the fountains of the great deep burst open, and the floodgates of the sky were opened. And the rain fell ...” Later, Genesis 8:2 states “the fountains of the deep and the floodgates of the sky were closed, and the rain from the sky was restrained.” These events were perhaps in cause-and-effect order.[6] That is, the fountains of the great deep caused extreme, torrential rain. Once the fountains stopped, this violent rain ended. Then milder, more normal, rain fell. In other words, “the rain from the sky was restrained.”

The transliteration of the Hebrew word usually used for normal rain is matar. Violent rain is geshem (used only in Genesis 7:11 and 8:2). It is sometimes accompanied by high winds and huge hailstones that can destroy mortared walls (Ezekiel 13:11–13). The hydroplate theory (pages 102–131) explains this sequence in more detailed, physical terms. We have failed to appreciate the explosiveness, magnitude, and power of “the fountains of the great deep.”

Scientific Arguments Opposing a Canopy

The Pressure Problem. A canopy holding only 40 feet of liquid water, or its equivalent weight of vapor (steam) or ice, would double the earth’s atmospheric pressure—making oxygen and nitrogen toxic to many animals, including humans.[7] This is why most vapor canopy theories limit the thickness of water in their canopy to less than 40 feet.

For a vapor canopy holding this amount of water, the high pressure at its base would require that its temperature exceed a scorching 220°F. Otherwise, the vapor would condense into a liquid. A vapor canopy, whose base had that temperature, would radiate large amounts of heat to the earth’s solid surface. People, plants, and animals would absorb so much heat from all directions above that life might not survive.[8] Those who believe a canopy would produce a globally mild climate have overlooked this detail.

Maintaining a canopy's 220°F temperature at night, or worse yet, at the poles during the coolest season, adds a further difficulty. Yes, there were seasons before the flood. [See Genesis 1:14.][9]

The Heat Problem. All canopy theories[10] have another major heat problem. The larger the canopy, the greater the heat problem.

A Vapor Canopy. Each gram of water vapor (steam) that condenses to a liquid releases about 539 calories of heat. If 6.22 x 10^{21} grams of water fell from a vapor canopy, enough to form a layer of water only 40 feet thick around the world, the temperature of the water and atmosphere would, as a first approximation, rise 810°F (or

$$\frac{539\frac{\text{cal}}{\text{gm}} \times 6.22\times10^{21}\,\text{gm}}{\left(5.1\times10^{21}\,\text{gm}\times0.242\frac{\text{cal}}{\text{gm}\,^\circ\text{C}}\right)+\left(6.22\times10^{21}\,\text{gm}\times1.0\frac{\text{cal}}{\text{gm}\,^\circ\text{C}}\right)} = 450^\circ\text{C} = 810^\circ\text{F}$$

450°C).

where 5.1 x 10^{21} grams is the mass of the atmosphere, and 0.242 and 1.0 are the calories needed to raise one gram of air and one gram of liquid water (respectively) 1°C. Unbearable temperatures remain even after we expand this analysis to include every scientifically conceivable way to remove this heat.[11] Also, 40 feet of rain would not produce a global flood.

A Liquid or Ice Canopy. For liquid or ice particles to remain in space above the earth's atmosphere, they must be in orbit. For anything to orbit the earth, its velocity must exceed 17,000 miles per hour (760,000 cm/sec). (As stated earlier, a layer of water only 40 feet thick contains 6.22 x 10^{21} grams of water.) Just as a spacecraft generates great heat as it reenters the atmosphere, orbiting liquid or ice particles release vast amounts of heat as they fall from orbit. That heat energy equals the kinetic energy of the particles in orbit, which

is $\frac{1}{2}\times6.22\times10^{21}\left(760{,}000\right)^2\times2.39\times10^{-8} = 4.29\times10^{25}\,\text{cal}$

where 2.39 x 10^{-8} converts the units to calories. This heat would raise the atmosphere's

$$\frac{4.29\times10^{25}\ \text{cal}}{\left(5.1\times10^{21}\ \text{gm}\times0.242\frac{\text{cal}}{\text{gm}^\circ\text{C}}\right)+\left(6.22\times10^{21}\ \text{gm}\times1.0\frac{\text{cal}}{\text{gm}^\circ\text{C}}\right)}$$

$$= 5{,}700^\circ\text{C} = 10{,}000^\circ\text{F}$$

temperature

Even if a canopy began with the coldest ice possible (absolute zero) or if some heat were transferred elsewhere, insufferable heat would remain.[12]

A similar problem exists if this ice were part of a spinning shell surrounding the earth. A rapidly-spinning shell, providing enough centrifugal force to balance the gravitational force as much as possible, would still have too much kinetic energy. Once the shell collapsed, that energy would become scalding heat, enough to "roast" all life on earth.

The Light Problem. A canopy having only 40 feet of water—in any form—would reflect, refract, absorb, or scatter most light trying to pass through it.

Starlight. People living under a 40-foot-thick canopy could see stars only if they were directly overhead, so their light would have the shortest path through a canopy. Before the flood, people presumably could see stars, because stars were created for a purpose: "for signs, and for seasons, for days and years " (Genesis 1:14). Stars would achieve their purpose only if enough stars could be seen to identify seasonal variations. Therefore, one needs to see large star patterns, such as constellations—not just a few stars directly overhead. By looking through a "keyhole" into the night sky, it is questionable whether one could have seen, recalled, and distinguished seasonally shifting star patterns through the filter of a 40-foot-thick canopy, even on a moonless night.

Sunlight. A canopy would also reflect and absorb considerable sunlight. How then could many tropical plants, which require much sunlight today, have survived for centuries under a preflood canopy?

The Nucleation Problem. To form raindrops, microscopic particles, called "condensation nuclei," must be present to initiate condensation. However, falling rain sweeps away these nuclei and cleans the atmosphere. This reduces further condensation. Rain from a vapor canopy would actually "choke off" rain production.

Some claim volcanic eruptions, beginning suddenly at the time of the flood, continuously ejected condensation nuclei into the upper atmosphere. Never explained is why volcanic eruptions suddenly began globally, then quickly and continuously distributed nuclei throughout the atmosphere for up to 40 days. Volcanic eruptions, rather than contributing to the flood, require special conditions that seem to be a consequence of the flood. [For an explanation, see pages 106 and 117.]

The nucleation and heat problems limit the rain formed by condensation to that of a local flood. It seems more likely that "geshem rain" was produced by the powerful jetting of the "fountains of the great deep" which caused torrential rain for *"40 days and 40 nights."*[13]

The Greenhouse Problem. While sunlight can pass through glass into a greenhouse, heat in a greenhouse has more difficulty radiating back out through the glass. This greenhouse effect traps heat inside the greenhouse, raising its temperature. All canopy theories have a greenhouse problem.

Also, as temperatures under a canopy rose, more water would evaporate from the earth's surface, especially its oceans. More water vapor in the air means a greater greenhouse effect, a warmer atmosphere, and even more evaporation. This cycle would feed on itself, producing what is called "a runaway greenhouse effect." For example, Venus' atmosphere has experienced a runaway greenhouse effect. Venus is about 700°F hotter than one would expect based on its distance from the Sun. The greenhouse effect increases Earth's temperature by about 60°F.

During the last thirty years, the Institute for Creation Research (ICR) has been the best-known advocate of a vapor canopy. In 1998, ICR wrote that a strong greenhouse effect would exist under a vapor canopy, raising "surface temperatures as high as 400°F." However, if many variables were chosen in the most favorable manner for a vapor canopy, "the water content of a canopy could be as much as [no more than] *three feet of liquid water without the surface temperature reaching temperatures which would destroy life on the earth."*[14] So if many variables are favorably selected, the greenhouse effect, alone, limits a canopy to a thickness of only 3 feet.

The Support Problem. What supported the canopy?

A Vapor or Liquid Canopy. A vapor canopy would rapidly mix with the atmosphere, just as steam above a kitchen stove quickly mixes with air. Once the vapor contacted the earth's surface, it would condense. A liquid canopy would quickly evaporate and then diffuse through the atmosphere. Neither type of canopy could have survived for the many centuries before the flood.

An Ice Canopy. A pure ice canopy would vaporize into the vacuum of space, just as dry ice vaporizes at atmospheric temperature and pressure. Furthermore, ice is structurally weak. An ice shell could not withstand tidal stresses or meteoritic, cometary, or asteroidal impacts. A spinning ice shell could not withstand the powerful centrifugal forces at its equator and the crushing gravitational forces along its spin axis.

The Ultraviolet Problem. Ozone in the earth's upper atmosphere blocks the Sun's destructive ultraviolet light, but a canopy surrounding the atmosphere would be exposed to ultraviolet light. Therefore, water in the canopy would dissociate into hydrogen and oxygen, effectively destroying that canopy.

Final Thoughts. Could there have been a canopy? Perhaps, in one of two ways. First, one

could minimize most of these scientific problems by assuming the canopy was thin, maybe inches thick. The thinner the canopy, the less severe most problems become. (Notice, the support and ultraviolet problems remain.) But what function would the canopy perform, and what hard, scientific evidence—not speculation—is there for claiming that a thin canopy could perform that function? Certainly, a thin canopy would not contribute to a global flood—the reason most people accepted the canopy in the first place.

Second, one could also dismiss each of these scientific problems by saying that God performed a miracle. That may be true. Certainly, He can; He has; and He sometimes does. However, miracles should not be proposed to "prop up" a scientific theory. (Some evolutionists mistakenly believe this is how creation science works.) As one sees more and more "miracles" required by canopy theories, their plausibility decreases, and the need for an alternate explanation increases.

An Alternate Interpretation

Let us now consider another interpretation of Genesis 1:6–8a and related verses.

The phrase "expanse of the heavens," used four times in Genesis 1:14–20, means sky, atmosphere, outer space, or heaven— whichever is implied by the context. In Genesis 1:6–7, the term "expanse" (without "of the heavens" added) was the earth's crust. Surface waters (oceans, seas, lakes, and rivers) were above this crust, and subterranean waters were below. The subterranean waters burst forth, producing the "fountains of the great deep" and the global flood.

[Pages 293–295 and 300–302 contain other support for this interpretation.] Psalm 136:5–9, a song of thanks to God, deserves a special comment. It describes three sequential events: (1) the heavens are made, (2) the earth is spread out above the waters, and (3) the Sun, Moon, and stars were made. This sequence is similar to the creation events of Day 1, Day 2, and Day 4. If the proposed interpretation is correct, then Psalm 136:5–9 precisely parallels the creation events of Days 1, 2, and 4.

Several ancient extrabiblical writings also state that the earth's crust, when first created, divided liquid waters above from liquid waters below.[15]

If this picture of the newly created earth is correct, then it seems worthy of inclusion in the brief creation chapter of Genesis 1. However, if "the waters above" refers to a canopy containing less than one-half of 1% of the earth's water, then why would one creation day and almost 10% of the creation chapter be devoted to it?

A Study of Some Key Hebrew Words

To understand Genesis 1:6–8a better, we will study the key words in bold below.

Then God said, "Let there be an expanse in the midst of the waters, and let it separate waters

from waters." And God made the expanse, and separated the waters which were below the expanse from the waters which were above the expanse; and it was so. And God called the expanse heaven.

Waters (mayim). This word means a liquid water, not a vapor or solid.[16] Had the water in Genesis 1:6-8 been a vapor, cloud, mist, or ice, other Hebrew words would have been more appropriate. For example, ancient Hebrew had six words for "cloud."

II Peter 3:5–6 also implies that this is liquid water. Peter used the same Greek word (ὕδωρ) to describe both the liquid water that flooded the earth and the water out of which the earth formed, an obvious reference to Genesis 1:6-7. Liquid water was both above and below the expanse, which contradicts the vapor or ice canopy ideas but is consistent with the "expanse = crust" interpretation.

Separate (badal). This word implies a sharp division. Furthermore, the generally untranslated preposition "ben," associated with "badal," means "between." It suggests an ordering (water, expanse, water) with no overlapping or gaps. Interfaces are also implied on each side of the expanse.[17] These meanings oppose a vapor, liquid, or ice particle canopy lying above the atmosphere, because atmospheric gases would mix with the canopy.

In the Midst of (tavek). This word means between, within, among, inside, etc. Sometimes it means "to bisect" or "in the center of." Regarding Genesis 1:6–7, the respected Jewish commentator Cassuto stated, "It is true that in the Pentateuch, too, reference is made to the division of the primeval world-ocean into two halves, situated one above the other, ..."[18] [See also Genesis 15:10.] Rabbi Solomon Yitzchaki, in his famous eleventh century Rashi Commentary, stated that the expanse was "in the exact center of the waters."[19] As we have seen, canopy theories place less than one-half of 1% of the earth's water above the expanse and the rest below. (This is necessary to reduce the problems associated with heat, light, and pressure mentioned earlier.) Would it not seem strange to say that your scalp is "in the midst of" your body? According to the hydroplate theory, the crust of the preflood earth divided more equally the earth's liquid waters.

Heaven (shamayim). "Heaven" had a variety of meanings in ancient Hebrew, as it does in modern languages. Moses used shamayim to describe outer space (Genesis 26:4), the atmosphere (Genesis 27:28), where God dwells (Deuteronomy 26:15), where angels dwell (Genesis 28:12), and the source of blessings (Genesis 49:25). Other examples could be given. The context in which shamayim is used is important to understanding its specific meaning.

Expanse or Firmament (raqia). The key Hebrew word in Genesis 1:6–8a is raqia (רָקִיעַ). It is translated "firmament" in the King James translation and "expanse" in most Hebrew dictionaries and modern translations. While its original meaning is uncertain, its root, raqa (רָקַע), means to spread out, beat out, or hammer as one would a malleable metal. It can also mean "plate." This may explain why the Greek Septuagint translated raqia

16 out of 17 times with the Greek word stereoma (στερέωμα), which means "a firm or solid structure." The Latin Vulgate (A.D. 382) used the Latin term "firmamentum," which also denotes solidness and firmness. So the King James translators in A.D. 1611 coined the word "firmament." Today, "firmament" is usually used poetically to mean sky, atmosphere, or heavens. In *modern* Hebrew, raqia means sky or heavens. However, originally it probably meant something solid or firm that was spread out.

Finally, if raqia were related to a canopy, it seems strange that other Hebrew words, often translated as "canopy," were not used in Genesis: sukkah (Ps 18:11 and II Sam 22:12), chuppah (Is 4:5), and shaphrur (Jer 43:10).

Questions Raised by Genesis 1: 8a

Why then, does Genesis 1:8a state, "And God called the expanse heaven"? Perhaps "heaven" (thought of today as atmosphere or outer space) is always the proper translation for raqia, and the Septuagint and Vulgate translators incorrectly associated solidness with it. However, the similarities of raqia (רָקִיעַ) with baqia (בָּקִיעַ) and raqa (רָקַע) argue against this. [See page 312.] If raqia always means "heaven," five questions, or apparent textual contradictions, arise.

Question 1: Why was it necessary to follow the word raqia with the phrase "of the heavens" in Genesis 1:14, 15, 17, and 20? That would be redundant.

Question 2: If raqia implies a canopy, why wasn't one of the three Hebrew words that clearly means "canopy" used?

Question 3: Genesis 1:8a defines heaven after the word "heavens" was first used in Genesis 1:1. Normally a word's meaning is understood from the context of its first usage. Furthermore, Genesis 1:1 says the heavens were created on the first day.[20] However, if raqia always means "heaven," then Genesis 1:8a says heaven was created on the second day.

Question 4: Genesis 1:9 states, "Let the waters below the heavens be gathered into one place, and let the dry land appear." Obviously, these are earth's surface waters. If "heaven" and "raqia" are identical, as canopy theorists believe, why did Genesis 1:9 not read, "Let the waters below be gathered into one place"? That would have been sufficient, clear, and consistent with the phrasing of Genesis 1:7. It would also make clear that the raqia is above—not below—the surface waters. Instead, the text reads, "Let the waters below the heavens be gathered into one place." The words "the heavens" had to be added to specify that surface waters were gathered into one place. To refer to "the waters below" (without "of the heavens" added) would point to subterranean waters.

Question 5: If raqia means "heaven," was liquid water placed above "heaven," as Genesis 1:7 states? Because the Sun, Moon, and stars were placed in the raqia (of the heavens) and

liquid water was placed above the raqia, were all heavenly bodies inside the canopy?[21]

Genesis 1:8a, as typically translated and understood, seems inconsistent with many verses. Either we do not understand the true meaning of raqia and shamayim, or something is mistranslated or inserted.

For centuries, Bible scholars have noted some of these contradictions and have proposed other translations or meanings. Four will be briefly described; two involve textual details, one is theological, and one is historical.

Robert Hooke (1635–1703), one of the greatest scientists of all time,[22] gave a lecture before the famous Royal Society of London. There he proposed that Genesis 1:8a should read: "Also, God called the heaven the firmament" rather than the normal "And God called the firmament heaven." Hooke said there were two firmaments. The first, described in Genesis 1:6, was a solid expanse in the midst of the liquid waters that covered the earth. It was a spherical shell that divided equally, above and below, the earth's liquid waters. The second firmament was the heavens (sky, atmosphere, or outer space). According to Hooke, whenever raqia was followed by "of the heavens," as in the next four uses of raqia (Genesis 1:14, 15, 17, and 20), the second firmament is implied.[23]

What Does "Raqia" Mean?

The Hebrew word raqia is usually translated "expanse" or "firmament." When it is immediately followed by "of the heavens" it means atmosphere, sky, outer space, or heaven. However, what does raqia standing alone mean? The Hebrew words most similar to raqia (רָקִיעַ) are raqa (רָקַע) (its root), baqia (בָּקִיעַ), and baqa (בָּקַע). Each describes a deformed solid.

In 1890, James Strong catalogued all usages of every word in the Old and New Testaments. He counted the frequency of each Hebrew and Greek word's specific English translation. For example, the Hebrew word baqa, the 1234th word in Strong's Hebrew dictionary, is translated in the New American Standard Bible as "breached" three times, "split" seven times, etc. By studying all usages and contexts of a word and similar words, a difficult-to-translate word can be better understood.

The King James translators translated raqia as firmament, because they thought it involved something firm. However, its specific meaning when Genesis was written is unknown. Raqia is obviously important, because the second creation day centered around it, just as the third day dealt with plants, and the fourth day with heavenly bodies. What was the raqia? Certainly, raqia is one of the most mysterious and important words in the Bible.

By carefully studying English meanings of raqa, baqa, and baqia in Table 21, one can see that atmosphere, sky, outer space, and heaven do not relate to what we might guess raqia means. Instead, we get a picture of a breakable solid being pressed out. How can a solid be breakable but malleable or moldable? Answer: extreme compression.

Few realize that all rock 5 miles or more below the earth's surface is "pressed out." Imagine a perfectly vertical column of a typical rock 5 miles high. If the rock were "somewhat confined," as explained in the next paragraph, the pressure at the column's base would be so great that it would slowly flow—like tar. Stacking more rock on top would cause even more flow at the bottom. If the column were 10 miles high, all the rock in the bottom half would try to flow. The rock at the bottom would be squeezed like a tall stick of butter trying to support a 10-ton truck.

If our column were pressed in from all sides by similar columns, the flow in the central column could go nowhere. The central column would have lateral support. Furthermore, if all columns were given lateral support by other columns, we would have the situation that actually exists in the top 10 miles of the earth's crust. At depths of 5 miles or greater, the rock wants to flow but can't, because the forces on all particles are balanced in all directions. So below 5 miles, the rock is sealed like highly compressed putty. Cracks could not normally open up immediately above the subterranean water chamber, which I estimate was almost 10 miles below the earth's surface. [See pages 102–131.]

This 10-mile-thick crust above the subterranean chamber would be a potentially breakable, pressed out solid—a raqia. How could it break? A crack could not begin in the sealed, extremely compressed lower half. However, if a vertical crack formed at the earth's surface, steadily increasing pressure in the subterranean water would cause the crack to grow downward. Once the crack penetrated halfway down, it would then become unstable and, in a few seconds, rip catastrophically to the bottom of the crust. What would follow is the subject of Part II of this book, pages 100–255.

Table 21. All Biblical Meanings of Words Related to Raqia

		PREFIX	
		baq	**raq**
SUFFIX	a	***baqa*** (Strong's #1234): breached (3), break forth (1), break into (1), break open (1), break out (3), break through (1), breaks forth (1), broke through (2), broken into (2), breaks open (1), broken up (1), burst (2), burst open (1), cleave (1), dashed to pieces (1), divide (2), divided (3), hatch (2), hews (1), invaded (1), make a breach (1), rip up (1), ripped open (2), ripped up (1), shook (1), split (7), split open (1), splits (1), tear (1), tore (2), torn (2)	***raqa*** (Strong's #7554): beaten (1), hammered out (2), plates (1), spread out (3), spreading out (1), stamp (1), stamped (2) For usage and context see: Ex 39:3; Num 16:39; II Sam 22:43; Job 37:18; Ps 136:6; Is 40:19, 42:5, 44:24; Jer 10:9; and Ez 6:11,

			25:6.
	ia	***baqia*** (Strong's #1233): breaches (1), fragments (1) For usage and context see: Is 22:9 and Amos 6:11.	raqia (when not followed by "of the heavens "): Traditional Interpretation: atmosphere, outer space, sky, heaven Proposed Interpretation: a pressed out solid, such as the earth's crust

Hooke's proposal would answer questions 1–5 and harmoniously unite all related Bible verses and key Hebrew words. However, the most natural rendering of the Hebrew in Genesis 1:8a, as presently understood, does not support Hooke's proposal. Because the oldest manuscript containing Genesis 1:8a dates back only about 1075 years (Aleppo Codex, copied by Aaron ben Asher in A.D. 930), finding an even older manuscript might clarify this matter.

As a second possibility, the word in Genesis 1:8a normally translated "heaven" (shamayim) may not have originally meant heaven. Prior to about A.D. 700, the written Hebrew language contained only consonants. Vowel points were then inserted in written Hebrew to standardize its pronunciation. For example, the meaning of

n th bgnng Gd crtd th hvns nd th rth

may be clear, but the phrase is difficult to pronounce (and, therefore, to remember). If other vowels had been inserted long ago in "hvn," the original word might have a different meaning today.

Rabbi Yitzchaki (mentioned above) explained in his eleventh century Rashi Commentary that with different vowel points the original Hebrew word we now think of as meaning "heaven" in Genesis 1:8a, would mean "there are waters," "fire and water," or "it carries waters." Each meaning could relate to the earth's preflood crust.

While in Jerusalem on 28 June 1990, I tried to resolve this confusion in a two-hour meeting with Michael Kline, Dean of Hebrew Union University. My question was, "What did raqia and shamayim mean when Moses wrote Genesis?" To my surprise, he suggested Rabbi Yitzchaki's three alternate translations, which I had previously studied. After all, shamayim in Genesis 1:8a is a compound of sha + mayim, and while a distinct original meaning for sha is uncertain, mayim does mean liquid water. After I briefly explained the hydroplate theory, Dean Kline said that raqia (as opposed to "raqia of the heavens") might well have been the earth's crust, below which was liquid water.

A third possibility was proposed to me in independent letters by two pastors.[24] Before

Adam's fall, the earth was a paradise; in a sense, it was "heaven on earth." Therefore, God "called" the firmament (earth's crust) heaven. Each pastor provided different biblical reasons for his view, but both maintain that our difficulty in understanding Genesis 1:8a results largely from our inability to imagine the original paradise. If man had not fallen, no one would have difficulty with the fact that God called the earth, "heaven."

Douglas E. Cox provides a fourth, but radical, explanation for Genesis 1:8a.[25] In a detailed historical study, Cox claims that the raqia was the earth's crust. When the Septuagint was written, Greeks ruled the Middle East, including Israel. Hebrew beliefs clashed with Greek religion and cosmology. In Greek thought, their chief god, Zeus, was the solid dome that held up all stars. By equating "raqia" with "heaven" in Genesis 1:8a, Hebrew religion and cosmology fell more in line with Greek beliefs. The tyrannical Greek ruler, Antiochus IV (referred to by Christ in Mt 24:15), claimed to be Zeus, desecrated the temple in Jerusalem, appointed two high priests, killed anyone possessing Hebrew Scriptures, and destroyed Scriptures he did find.[26] Genesis 1:8a, in later copies of the Masoretic, conformed with the Septuagint. Cox believes the prophecy of Daniel 8 was fulfilled by the Greeks altering Genesis 1:8. While Cox may be wrong about raqia, he correctly demonstrates that the ancient Hebrews were falsely blamed for the pagan Greek idea that a solid dome (canopy) surrounded the earth.

Let's say the strongest possible case was made against each of these four proposals. In that worst case situation, two problematic interpretations, shown in Table 22, would remain.

Table 22. Two Interpretations

Interpretation	Translation	Problems
Traditional	expanse = atmosphere, outer space, heaven, etc.	Questions 1–5 Seven Scientific Issues Key Hebrew Words
Proposed	expanse of the heavens = space, etc. expanse [only] = earth's crust	Understanding Genesis 1:8a

Mythology and Canopies

Vail's case for a canopy rested largely on the mythology of the Greeks, Romans, Egyptians, and other ancient cultures. He argued that a real canopy, millions of years ago, produced these myths. Vail wrote,

I have been told again and again that the canopy idea is weak because it is founded on mythology. I can only protest that it is not founded on mythology, on the contrary mythology is largely founded on the canopy, fossilized in human thot [thought]. The canopy as a watery heaven close to the earth existed for untold millions of years before a myth ever

germinated.[27]

We can all agree with Vail that ancient mythology and today's canopy theories are linked. But which came first: myth or canopy? If the best canopy theory cannot overcome the scientific problems mentioned earlier, then a canopy did not produce or precede the ancient myths. Myths probably produced canopy theories.

Conclusion

Arguments for canopy theories do not stand up when examined closely. These theories also contain many biblical and scientific problems, such as those associated with pressure, heat, sunlight, support, condensation nuclei, the greenhouse effect, and ultraviolet light. Even leading canopy advocates privately acknowledge these problems. Also, canopy theories do not even begin to explain the flood's global destruction and geological activity. [Page 102 lists 24 examples.]

Canopy theories have misled many, delaying understanding of the flood, geology, and therefore, earth's true age. The flood water came from below, not above. Failure to understand this has caused many to doubt the historical accuracy of the flood account, and, therefore, the Bible itself. Without the flood to explain the fossils buried in the earth's sedimentary layers, the theory of organic evolution fills the vacuum—an explanation that also removes or minimizes need for the Creator.

References and Notes

1 . Isaac Newton Vail published many pamphlets on his canopy theory, starting with Waters Above the Firmament in 1874. Other titles included: The Misread Record (also published under the title The Deluge and Its Cause), Eden's Flaming Sword, Ring of Truth, The Heavens and Earth of Prehistoric Man, Canopy Skies of Ancient Man, A Glance at Comparative Mythology, Annular World Evolution, and others. Most of these titles have been republished by Donald L. Cyr, Waters above the Firmament (Santa Barbara, California: Stonehenge Viewpoint, 1988). In 1902, Vail also published a 400-page book titled The Earth's Annular System. However, it was John C. Whitcomb Jr. and Henry M. Morris who popularized the canopy theory in The Genesis Flood (Philadelphia, Pennsylvania: Presbyterian and Reformed Publishing Company, 1961).

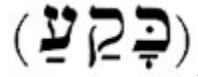
2 . Joseph C. Dillow, The Waters Above (Chicago: Moody Press, 1981), p. 170.

3 . Vail claimed that after the canopy collapsed, the earth was no longer shielded from the Sun's radiation, so life spans decreased. If so, someone, even after the time of Abraham, should have noticed that people living indoors or farther from the equator lived longer.

4 . Dillow, p. 170.

u “It is commonly held that the pre-flood vapor canopy shielded the earth from cosmic radiation and also reduced surface ozone levels. These effects supposedly contributed to the longevity of the antediluvian patriarchs. However, radiation studies and research in molecular biology seems to rule this out. Even if the earth were 100 percent shielded from radiation and if ozone levels in the pre-flood world were zero, no appreciable improvement would have resulted.” Joseph C. Dillow, “The Canopy and Ancient Longevity,” Creation Research Society Quarterly, Vol. 15, June 1978, p. 27.

5 . Dillow, The Waters Above, p. 222.

6 . This also occurs in Proverbs 3:19–20: “The Lord by wisdom founded the earth; by understanding He established the heavens. By His knowledge the deeps were broken up, and the skies dripped with dew.” The same Hebrew word, baqa  , is used for “broken up” and “burst open” in Proverbs 3:20 and Genesis 7:11. Baqa describes a violent and complete splitting, sometimes of the earth’s crust (Numbers 16:31, Micah 1:4, Zechariah 14:4). Isaiah 34:15 and 59:5 use baqa to describe the breaking of an egg shell by internal pressure as a baby bird exits. This aptly describes events of the hydroplate theory—the globe encircling rupture (splitting) of the earth’s crust by internal pressure just before water erupted.

7 . Doubling atmospheric pressure doubles the blood’s oxygen content. Doubling the blood’s oxygen content, by any means, can produce a disease, called retrolental fibroplasia, in unborn or premature children. An opaque membrane forms behind the lens of the eye, resulting in blindness. This also occurs in mice and other species.

Increased ambient pressure also results in excess carbon dioxide in the blood. Oxygen and nitrogen toxicities increase significantly. The problem is aggravated at high work levels and for the elderly and ill. [Personal communication with Daniel J. O’Rourke, M.D., 11 December 1994.]

8 . The Sun’s surface radiates at an effective temperature of 10,000°F, but occupies only a 10,000th of the sky’s area. A 220°F canopy, while not as hot, would radiate from the entire sky. Taking only these factors into consideration, a vapor canopy by itself would provide 60% as much heat as the Sun. Other complex factors might remove some of this heat.

9 . Genesis 1:14 says the heavenly bodies were created “... for seasons, and for days and years.” Therefore, the earth’s axis was tipped relative to the earth’s orbital plane, because only by being tipped can seasonal shifts in star patterns and temperature variations occur.

10 . Not addressed are canopy theories that provide no scientific details or data to support speculative claims.

11 . For example, two other ways to remove this heat might be to radiate it into

outer space or to conduct it into the earth. Both processes are slow, removing relatively little heat in the short time available.

12 . Some have proposed that a huge, icy comet struck earth, causing a global flood and an ice age. Those proposals ignore this same heat problem. Actually, such a comet would have more kinetic energy than an ice or water canopy of equal mass. Therefore, the temperature increase would be greater.

13 . After 40 days and 40 nights, the "geshem rain" stopped (Genesis 7:12). However, the flood water rose until the 150th day, when it covered all preflood mountains (Genesis 7:19–24). After 40 days, the layer of water rising on earth blanketed and suppressed the jetting of the fountains of the great deep. Nevertheless, high-pressure subterranean water continued to gush out and add to the rising flood waters until the 150th day. On that day, the fountains were closed (Genesis 8:2) by the hydroplates settling onto the floor of the subterranean water chamber, pinching shut the outward-flowing water. [See pages 102–131 for the scientific details supporting this explanation.]

14 . "Numerical Climate Modeling at ICR," Acts & Facts, April 1998, p. 2.

15 . Ancient extrabiblical writings, although not having the authority of biblical passages, also support the idea that earth was created with water under the crust.

The First Book of Adam and Eve, states in verse 70:15 that "God ... established the earth upon the waters." The Secrets of Enoch, another apocryphal book, also known as II Enoch, says in verse 47:5, "The Lord ... fixed the earth upon the waters." [Rutherford H. Platt Jr., editor, The Forgotten Books of Eden (U.S.A.: Alpha House, 1927), pp. 50, 98.]

II Esdras, which was part of most Christians' Old Testaments until the Reformation, retells the same creation story found in Genesis 1. However, in II Esdras 6:41–42 the second and third days are described differently by Ezra.

> On the second day you created the angel of the firmament, and commanded him to make a dividing barrier *between the waters, one part withdrawing upwards and the other remaining below. On the third day you ordered the waters to collect in a seventh part of the earth; the other six parts you made into dry land, ...* [emphasis added]

In other words, the earth's waters immediately after the creation were divided into two parts, perhaps equal parts. One part was below a barrier, and the other part was above. The earth's seas covered only 1/7th of the earth's surface. Therefore, the volume of surface water was probably much less than the volume of today's surface water which covers 70% of the earth. So, considerable water would have been on the other side of the barrier—much more than any canopy could have held. However, subterranean chambers could have held that amount.

Most definitive is the word "barrier." It hardly seems to describe the

atmosphere, sky, heaven, or outer space. It aptly describes the earth's crust that vertically divided the earth's liquid water. II Esdras 16:58 reinforces this: "He has shut up the sea in the midst of the waters, and by His command He has hung the earth upon the water."

A final, but intriguing, extrabiblical writing, The Book of the Cave of Treasures, is explained on page 301.

16 . Stanley V. Udd, "The Canopy and Genesis 1:6–8," Creation Research Society Quarterly, Vol. 12, September 1975, pp. 90–93.

u Dillow, p. 58.

17 . Udd, p. 91.

18 . Umberto Cassuto, A Commentary on the Book of Genesis, From Adam to Noah, translated by Israel Abrahams (Jerusalem: Magnes, The Hebrew University, 1961), p. 32.

19 . M. Rosenbaum and A. Silberman, Rashi Commentary on the Pentateuch, Vol. 1 (Jerusalem: Silberman Family, 1930), p. 4.

20 . Genesis 1:1 describes the first acts of creation on Day 1, and is not, as some have proposed, a topic sentence summarizing the entire creation week. The Hebrew conjunction—translated "and"—joining verses 1 and 2, shows a sequential action. (Similar connections—"and" and "then"—join all verses in chapter 1, tightly linking them all in time.) Obviously, the creation of time ("In the beginning") and space ("the heavens") must proceed the creation of things such as earth, waters, and light.

21 . A few people claim that raqia is the universe, and the waters above the expanse (raqia) surround the universe. This places all the heavenly bodies in the expanse of the heavens, which agrees with Genesis 1:14–17. [This was first proposed by Harold L. Armstrong, "The Expanding Universe and Creation," Repossess the Land (Minneapolis, Minnesota: Bible Science Association, 1979), pp. 22–27. More recently, D. Russell Humphreys adopted this interpretation in his book Starlight and Time (Colorado Springs, Colorado: Master Books, 1994), pp. 34–36, 58–77.]

Surrounding the universe with water assumes the universe is finite, when its size may be infinite, or it may have an even more exotic geometry. Let us assume the edge of the universe is only 10 billion light-years away, and absolutely nothing is outside it, even empty space. Surrounding the universe with as much water as the earth contains (1.43×10^{24} grams), as just one example, would spread one gram over every 3×10^{22} square miles—or place adjacent water molecules one mile apart!

Pure water in the near vacuum of space would clearly be water vapor, not the liquid water the Bible describes above the expanse. What purpose would that water fulfill? Certainly, it would have played no role in the flood and could

not be detected today. Why then mention it in the brief first chapter of Genesis?

22 . Hooke's scientific achievements rank near those of the greatest scientist of all time—his contemporary, competitor, and countryman, Isaac Newton. Some of Newton's discoveries (such as important aspects of the Law of Gravitation) were announced years earlier by Hooke. Hooke is best known for "Hooke's law" and his pioneering work in the field of elasticity. He discovered plant cells, many microorganisms, and Jupiter's spot. He made several important geological observations, first argued that comets are periodic, built the first Gregorian telescope, and invented the spring driven clock, the universal joint, and the sextant.

23 . Ellen Tan Drake, Restless Genius: Robert Hooke and His Earthly Thoughts (New York: Oxford University Press, 1996), pp. 300–309.

24 . Pastor Diego Rodriguez first suggested this in a letter on 10 January 2005. Pastor Bob Enyart's independent proposal was sent on 23 February 2005.

25 . Douglas E. Cox, "Report on the Firmament," 25 August 2001, www.sentex.net/~tcc/firma1.html.

26 . The gory details of the life of Antiochus IV are found in I and II Maccabees.

27 . Isaac Newton Vail, The Misread Record (Seattle, Washington: The Simplex Publishing Company, 1921), pp. 36, 37.