

A Proposed Catastrophic Theory for the Geological Features of the Moon

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ABSTRACT

What appears to us on Earth as “The Man in the Moon” is actually a network of craters and large, dark remnants of ancient lava flows on the near side of the moon. The far side of the moon (the hemisphere facing away from viewers on Earth) has a completely different topography from the near side. Aside from “the Man in the Moon”, the near side is relatively smooth; but the far side is pock-marked with hundreds of craters of varying sizes and virtually no maria. Can the dramatic difference in topography between the two lunar hemispheres be explained? And can that explanation help us understand the origins of geological features of the moon, and other related phenomena in our solar system?

Secular theories attempting to explain the appearance and formation of such lunar features have proven insufficient, mathematically impossible, and/or patently absurd, and creationist theories often invoke extra biblical miracles, or fail to fully account for the purpose, or mechanisms related to the events they describe. This paper proposes a creationist/catastrophic alternative to explain the geological features of the moon and related phenomena.

INTRODUCTION

Anyone who has taken a good look at Earth's moon has seen "The Man in the Moon." That storied moniker has been applied to the fascinating picture we see when looking at the *near side* of the moon, (the hemisphere facing viewers from Earth). What appears to us on Earth as The Man in the Moon is actually a network of craters and large, dark remnants of ancient lava flows.

According to secular scientists, the moon has been in space for about 4.5 billion years catching comets, meteorites, and cosmic dust. And no matter how long the moon has been in existence, one would expect that in such a uniformitarian cosmology, we would see a relatively homogeneous distribution of impact craters all around the moon. But that is not what we see.

The network of craters and large dark spots were dubbed "maria" by early astronomers, who mistook them for lunar oceans. The craters are thought to have been formed by meteor impacts: "Impact craters are common on the inner planets and our moon, which implies that the earth probably was bombarded at some time in the past."¹ And the maria are thought to have been formed by cooling lava flows: "the volcanic overflow that formed the maria appear to have been preceded by impact basins."² Tycho is the near side's most prominent crater. It is located outside of the maria, and at 85 kilometers across, it is large enough to be seen with a good pair of binoculars. The famous craters Kepler, Copernicus and Aristarchus are almost as visible as Tycho, but are inside dark maria regions. The near side has most of the moon's volcanic features, including dome complexes, and giant, multi-ringed basins. The lava flows of the maria have smoothed over many craters, making the near side relatively smooth in comparison to the far side.

¹ (Oard 1994 Oard, M.J., Response to comments on the "Asteroid hypothesis for dinosaur extinction",

² (Faulkner 2014 Interpreting Craters in Terms of the Day Four Cratering Hypothesis)

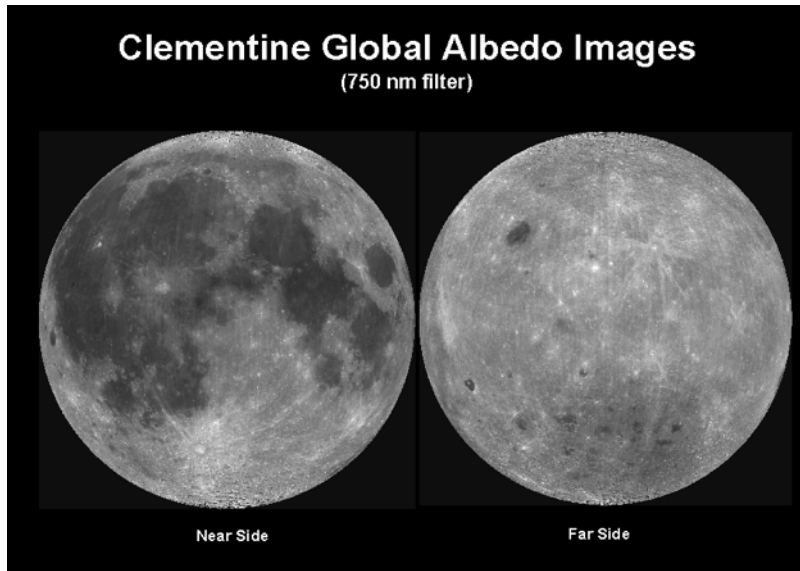


Figure 1

The far side has been called the “dark side of the moon,” but it’s not really dark since it faces the sun just as often as the near side. It is only “dark” in the sense that no one had seen it until 1959 when the Soviet spacecraft Luna 3 flew around the moon and took photographs. These pictures revealed a surface pock-marked with hundreds of craters of varying sizes, and only a few small maria. To the surprise of most astronomers, the far side “...almost completely lacks the large basaltic plains (maria) that are so prominent on the nearside.”³. [See Figure 1 for a visual comparison of the near and far sides of the moon]. The topographical differences between the sides have puzzled astronomers for decades. “Astronomers were stunned by the first images of the moon’s far side... The two hemispheres seemed like different worlds...”⁴ [See figure 2 for a photograph that accentuates the difference between the texture of the cratered surface on the near side and the far side].

³ (Cruz, M. 2012 Maria Cruz, “The Two Faces of the Moon,” *Science*, Vol. 338, 23 November 2012, pp. 1010–1011)

⁴ Berman 2003, Bob Berman, “Worlds Out of Balance,” *Discover*, Vol. 24, December 2003, p. 38.

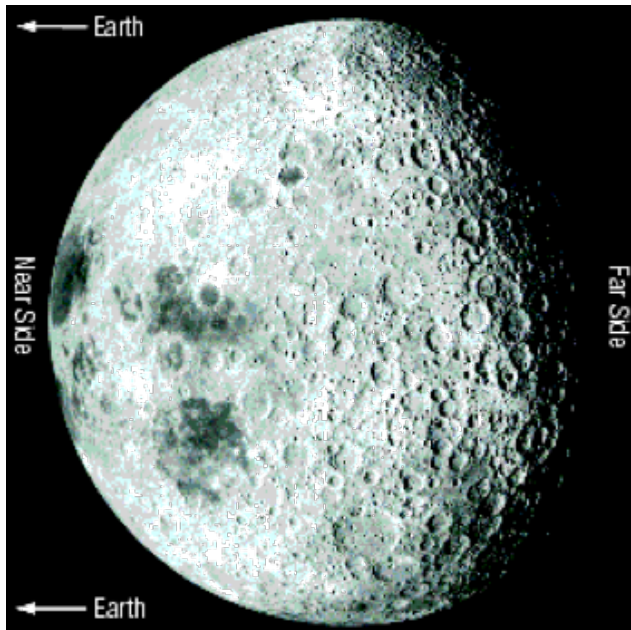


Figure 2

The fact that the moon has such apparent differences in topography between the near and far sides is something of a puzzle. We know that the moon rotates once on its axis in the time that it revolves around the Earth. With a relatively steady position in space, one would assume impacts on both sides of the moon would be relatively consistent over time. But there are significantly more, and larger impacts apparent on the near side as opposed to the far side. “I conclude from the distribution of true maria, except for the one and possibly two notable exceptions on the far side, that asteroids hit preferentially on one side of the moon—the side facing Earth.”⁵ Could the history of the moon, including the events surrounding formation of the craters and maria have played a part in this differential appearance between the near and far sides of the moon?

The maria and the large craters are not the only differences between the near side and the far side. The number of deep moonquakes (“Earthquakes” on the moon) is much greater on the near side, and they seem to be clustered around the central area.⁶ Is it possible that the moonquakes are directly related to the events that cause the dark maria and the huge craters? In this paper we will propose that all these differences between the near and far side were the result

⁵ Samec, 2008 On the origin of lunar maria JOURNAL OF CREATION 22(3) p. 101 2008

⁶ Nakamura, Y. 2005. Farside deep moonquakes and deep interior of the moon, Journal of Geophysical Research, Vol. 110, E01001

of catastrophic events documented in the Bible, and in accordance with the laws of physics, mathematics, and chemistry.

I. CURRENT THEORIES

A. Secular Theories

Big Bang cosmology is the current and fashionable theory among secularists to explain how our universe came into existence, or rather how our universe “evolved.” And there have been several associated theories proposed for the moon’s formation.

“Capture theory” became fashionable in the 1960s when British physicist Michael Woolfson reintroduced a theory initially proposed by astronomer Thomas Jefferson Jackson See half a century earlier.⁷ (Amusingly, See’s extreme arrogance caused his contemporaries to view him as incredulous and quickly dismissed his theory). Their theory dislodged George Darwin’s 19th century “Budding theory” which had been dealt a near fatal blow when the Apollo missions returned lunar material proving that the moon could not have “budded” from a rapidly spinning Earth. Woolfson posited that the moon was a foreign body that ambled past Earth and was “captured” by Earth’s gravitational sphere of influence. This theory gained currency with secular theorists because it seemed to answer Darwin’s problem of why the moon has a different composition than the Earth. But sadly, it could not explain the moon’s origin, and as time went on, the accumulation of simple mathematics related to gravitational influence implied that it was highly improbable, if not absurd, to assert that an object with as much mass as the moon could have passed by the Earth at just the right speed and distance to have been captured.

Then along came “Giant Impact theory”, which is currently championed as the finest and most scientifically sound theory of the moon’s origin in secular circles. Originally proposed in the 1970s by William Hartmaan and his colleague Donald Davis, this theory proposes that a stray planetoid collided with Earth and the debris that was produced from the collision coalesced into our moon.⁸ Per Robin Canup, an astrophysicist at the Southwest Research

⁷ Woolfson, 1964 <https://royalsocietypublishing.org/doi/pdf/10.1098/rspa.1964.0247>

⁸ Hartmann, 2014 <https://royalsocietypublishing.org/doi/10.1098/rsta.2013.0249>

Institute of Boulder, Colorado, many theorists at the time viewed the Giant Impact theory as "...ad hoc, probably unlikely and possibly ridiculous."⁹ It wasn't until 1984 at a lunar origin convention in Kona, Hawaii that Giant Impact, or "Big Whack" theory took hold (primarily due again to the increasingly untenable assertions of Capture theory). The fact that it seems to account for the angle of the moon's orbital plane, the geochemical differences between the Earth and the moon, and the similar isotope ratios found in lunar samples, makes the "Big Whack" the academic fashion as of late.

Unlike previous theories, the "Big Whack" was the first moon origin theory supported by computer models. Scientists have generated numerous computer models that allegedly show how the events took place. But keep in mind that computer modeling can be programmed to simulate virtually anything. Thus, we must view any model with caution, as they can present scenarios that are not *actually* possible. The introduction of a priori variables produces untrustworthy results at best, and dishonest at worst. Computer models should not be uncritically accepted as factual. Even if a model is programmed honestly, no computer model is 100% accurate and other evidence is necessary to back up modeling.

The "Big Whack" does not clarify why the two lunar hemispheres differ in topography. Secular scientists insert what they call the "Early and Late Heavy Bombardments" (EHB & LHB) for this lunar disfigurement, (and for other cratering evident in the solar system).¹⁰ "The early heavy bombardment is usually thought to have begun when the moon formed, allegedly about 4.6 Ga (giga-annum (10^9 years)) ago. If this were true, the oldest craters on the moon should date to nearly that age: to the time when the moon's surface allegedly became solid. The late heavy bombardment is dated at about 3.9–4.2 Ga. For the past 3.0–3.5 Ga, very few craters are thought to have formed on the moon or elsewhere in the solar system."¹¹ Claims regarding the source and volume of the EHB and LHB are tenuous at best, involving an almost mystical perturbation of planetary motion throughout the solar system. The

⁹ Canup, 1974 <https://www.pbs.org/wgbh/nova/tothemoon/origins2.html>

¹⁰ Walsh, K., Morbidelli, A., Raymond, S. et al. 2011. A low mass for Mars from Jupiter's early gas-driven migration. *Nature* Vol. 475, pp. 206–209. DOI: 10.1038/nature10201

¹¹ Faulkner 1999 <https://creation.com/a-biblically-based-cratering-theory>

source of those perturbations? “The most parsimonious solution to match constraints is a hybrid model with discrete early, post-accretion and later, planetary instability–driven populations of impactors.”¹² Or, as P.T. Barnum once famously said, “ladies and gentlemen, this way to the egress!”¹³

B. Creationist Theories

To properly answer the question of why the moon looks the way it does, it is important to start at the very beginning: Creation.

“And God made two great lights; the greater light to rule the day, and the lesser light to rule the night:” Gen 1:16

Genesis lays out Creation so plainly that even a child can understand that on the fourth day, God created the sun (to rule the day) and the moon (to rule the night). And though there isn’t a detailed description of God’s method of creation, or assembly of the heavenly bodies, we can conclude that it was orderly based on the scripture: “For He spoke, and it was done; He commanded, and it stood fast” – is the description of an orderly, rapid creation and assembly of the universe, including the bodies of our solar system.

And most creationists, while they oppose Big Bang cosmology, do believe that there was some major catastrophic event like the LHB that impacted the moon: while significant creation researchers like Michael J. Oard¹⁴, Wayne R. Spencer¹⁵ and Walter T. Brown¹⁶ hold to a flood related timing/origin for the impact event, Danny R. Faulkner¹⁷ posits that there were possibly two

¹² Bottke, 2017 <https://www.annualreviews.org/doi/abs/10.1146/annurev-earth-063016-020131>

¹³ Henry, J. Solar system formation by accretion has no observational evidence <https://creation.com/accretion-hypothesis>

¹⁴ Oard An impact Flood submodel—dealing with issues <https://creation.com/an-impact-flood-submodel>, *Journal of Creation* 26 (2):73–81, August 2012

¹⁵ Spencer, W. R. 2008. Our solar system: balancing biblical and scientific considerations, *The Proceedings of the International Conference of Creationism*, Vol. 6, pp. 293-306. Pittsburgh, PA: Creation Science Fellowship; Dallas, TX: Institute for Creation Research

¹⁶ Brown, 2008 Brown, W. T. *In the Beginning: Compelling Evidence for Creation and the Flood* 8th Edition, 2008. Phoenix, Arizona: Center for Scientific Creation

¹⁷ Faulkner 2014 *Interpreting Craters in Terms of the Day Four Cratering Hypothesis*

periods of impact bombardment in the solar system, one on Day Four of Creation, and a second event at the Fall or the Flood.

Being committed to a standard of allowing for *no extra-biblical miracles* and using only evidence from the Bible (or evidence demonstrable via the historical record or the scientific method), our goal is to present a clearer, and more convincing account of the geologic features of the moon. While the certainty of a bombardment and cratering event cannot reasonably be questioned, the “what” and “why” regarding the impactors either go inadequately answered or are miraculously explained away in the creationist theories we have reviewed.

Oard offers the possibility of supernatural protection of the Earth during the bombardment event. He says: “36,000 impact craters greater than 30 km in diameter were produced in Earth history. This estimate was based on the impacts on the moon transformed to the earth. And that “it was unlikely that these impacts could have occurred before the Flood or afterwards, but most likely occurred during the year of the Flood.” Yet he fails to adequately account for the source of the impactors. He says: “As creationists we do not invoke miracles lightly, but Scripture does say that God was intimately involved in the Flood.” And then: “One (challenge) is where the asteroids originated for the Flood. I believe that the secular astronomers mentioned above are correct that the asteroids (up to 800 km in diameter) for the LHB originated outside the solar system.” And: “Fitting impacts into a *very good* creation presents a problem if impacts occurred on Day Four. If the moon and other planetary bodies were bombarded on Day Four, the earth should also have been bombarded killing *nephesh* animals when there was no death before sin.”¹⁸

Spencer invokes the plausible idea that events related to the fall set in motion naturalistic events that triggered a later bombardment but does not adequately account for the source of the impactors. He says “We do not know how the impact bombardment at the Flood event took place. It could be possible that how the event took place makes factors other than surface area or gravity (when comparing crater population against that of the moon) important.”

¹⁸ Oard An impact Flood submodel—dealing with issues <https://creation.com/an-impact-flood-submodel>, Journal of Creation 26 (2):73–81, August 2012

And: “I agree with Oard that some source of objects outside the solar system that could somehow set off many impacts within the solar system may be reasonable.” *And:* “A large number of impacts during the Flood raises questions because there are many effects of so many impacts.” *And:* “...the evidence from the solar system suggests a large number of impacts occurred.” *And:* “Why would Mars have fewer large impact craters than the moon?” *And:* “I would welcome creationists exploring other possible solutions to these questions.” *And finally:* “There is a need for creationists to look into scenarios of solar system events that might explain the cratering evidence.”¹⁹.

Faulkner, in his paper “Interpreting Craters in terms of the Day Four Cratering Hypothesis” posits that the supernatural nature of the events of creation permitted God to assemble some heavenly bodies using measures that produced bombardment. He writes: “The purpose and means of the assembly of the planets had no component of judgment. That is, impacts are neutral, but they could be viewed as either destructive or constructive, depending upon the location, timing, and aftermath.”

Faulkner presents an outstanding explanation of entropy before the fall and illuminates the state of “very good” versus “perfect” during, and after the creation week. But we found no adequate account for how a chaotic bombardment scenario on Day Four fits with the orderly creation of the universe, or why this potentially “constructive” bombardment event, occurring throughout the solar system would supernaturally exempt Earth, or how everything remained “very good” through the Fall, (and perhaps through the beginning of the Flood) after said bombardment sent debris flying through the solar system. Finally, Faulkner does not provide for a resolution of what would have been a transient event leading to the Day Four bombardment, and how that resolution would have left the earth unaffected between Day Four and the Fall, (or perhaps even the flood), nor does he adequately elucidate the source of the 2nd “judgment” bombardment at the time of the flood. He does say that: “The cratering rate for the earth’s moon may have been different from other terrestrial planets, or the cratering rate for the terrestrial planets may have differed from that of the satellites of the

¹⁹ Spencer, W. R. 2014. <https://creation.com/impacts-and-noahs-flood>

Jovian planets. Additionally, the cratering rate may have not have been isotropic but instead have *depended upon direction*, (emphasis ours).²⁰

Brown has what we perceive as a ticking time bomb of supercritical water under pressure beneath the 60-mile thick crust of the earth on Day 6: “Tides in the subterranean water lifted and lowered the massive crust twice daily, stretching and compressing the pillars, thereby generating heat and raising the subterranean-water temperatures... . “The pressure in the 60-mile-deep subterranean chamber, simply due to the weight of the crust, was about 372,000 psi (25,550 bars)—far above the critical pressure. As the denser and thicker portions of the crust sagged in places and settled to the chamber floor, it lost potential energy which was gained as heat by the subterranean water. That water then became supercritical, exceeding 705°F and to a degree ionized”. As the temperature continued to increase, the pressure grew, the crust stretched and weakened, and the energy from tidal pumping increasingly ionized the water... .As the horizontally flowing liquid-gas mixture began to flow upward through the rupture, the pressure steadily dropped in each bundle of supercritical fluid. This released its electrical ionization energy, and some of each liquid droplet evaporated to become vapor. Within seconds, portions of the flow rose above the atmosphere where the pressure was almost zero. This 10,000-fold expansion was a weeks-long, focused explosion of indescribable magnitude “splitting” the atmosphere and accelerating much of the water, along with rock and dirt, into the vacuum of space.

As temperatures rose throughout the chamber before the flood, the water became supercritical, so it dissolved certain minerals, such as quartz, within the granite ceiling and floor. Heat, continually generated in the subterranean chamber by tidal pumping, raised the crust’s temperature, but only so much. *Eventually, heat escaping into the atmosphere (and ultimately into space) equaled the heat generated in the chamber*, so there were no further temperature increases—a situation called steady state. That state was reached without pressures or temperatures that would cause the crust to fail. Therefore, it was either man’s sinful actions (or inactions) or a direct act by God that later caused the crust or pillars to fail.

²⁰ Faulkner 2014 Interpreting Craters in Terms of the Day Four Cratering Hypothesis

Yes, these are only possibilities, but they bring us to the same starting point as the strictly scientific hydroplate theory. Regardless of how one reaches that point, everything that follows is within the scientific realm.”²¹

We cannot dispute the physics of the explosive power, and the heat transfer behavior of the supercritical vapor during Brown’s Hydroplate Theory rupture and explosive release from the Fountains of the Great Deep. After all, Dr. Brown received his degree in mechanical engineering from MIT while working specifically in the discipline of heat transfer. But the ability of the earth’s surface and atmosphere to dissipate the ever-increasing heat indefinitely is unconvincing. Since water would inevitably reach destructive supercritical temperatures from the beginning, we are left asking. “How could God call this inevitably catastrophic situation “very good?”

All the creationist positions discussed here are well researched (by men who love the Lord, and with the intellect and credentials to execute and present such research); all are expressed in forms that meet the rigorous demands of creation science research. But some of the “what” and the “why” questions remained unanswered for us.

II. A PROPOSED CATASTROPHIC THEORY

A. Rationale for a new theory

1. The young earth creationist view requires an immense amount of cratering throughout the solar system in a short time. A mechanism for such a bombardment should be clearly elucidated.
2. If we believe that the entire creation was “very good” before the Fall, then the deadly debris flying about in space that we assert struck the moon, and sometimes impacts the Earth causing injury and death today, does not easily fit the description. Errant bullets flying through space are not “very good.”

²¹ Brown, 2008 Brown, W. T. In the Beginning: Compelling Evidence for Creation and the Flood 8th Edition, 2008. Phoenix, Arizona: Center for Scientific Creation

Establishing that asteroids, meteors and comets had their origin *after the Fall* will help creationists better establish and defend our position.

3. The number and the intensity of moonquakes suggests a lunar bombardment in the recent past. Establishing the mechanism of that bombardment and its connection to moonquakes will better establish the creationist position.

4. Since Earth's gravity would tend to capture or deflect impactors headed for the moon from behind Earth's position in space, effectively exposing the earth, while shielding the moon from a sustained bombardment from that direction, the heavy bombardment observed on the near side strongly implies that the impactors came from the earth itself. And if such an event is adequately documented in scripture, it must be considered the most plausible explanation for many, if not all, the lunar impactors.

5. Current creationist theories fail to adequately document the source, the reason, the creative mechanism, or the resolution of the events surrounding the lunar bombardment.

6. A better theory that answers questions about the moon and lunar bombardment could be one more tool for getting the attention of sincere minded skeptics to help lead them to an understanding of creation, and ultimately, to faith in Jesus Christ.

B. Catastrophic Summary

We assert that at creation God separated waters below the crust of the Earth from the waters above it with the crust. The foundations of the crust rested upon the mantle via its pillars. The waters below the crust formed a contiguous chamber, interrupted regularly by the pillars in which the waters circulated via pressure differentials created by the tidal effects of the moon lifting and lowering the flexible crust. The heat and pressure that would naturally build were regularly relieved and balanced via a heat exchange mechanism designed into "the ground" (or the crust of the earth) far more efficient than that observed today. After the Fall of Man, when God cursed the ground, that curse altered either the position of, or the structure of the

crust so that it no longer facilitated the necessary heat exchange. Heat continuously rose beneath the crust resulting in increasing pressure. One day the heat and pressure caused a rupture in the crust that raced rapidly around the Earth, releasing a jet of water, along with materials eroded from the pillars and foundations of the Earth. A significant portion of Earth's mass was ejected, and a portion of that debris struck the moon and produced the features observed on the near side. Secondary and tertiary impacts related to the same catastrophic event produced the cratering on the far side.

III. DISCUSSION

We shall begin with an examination of the universal force that secular theorists (and even some creationists) rely upon to do the “heavy lifting” necessary to bear up theories that include allusions to, or explanations of the cratering and appearance of the moon: gravity.

A. Gravity, the mechanism of motion

It first must be established that as of the writing of this paper neither the force carrier nor the mechanism of action enabling the propagation of gravity have been identified. In other words, professors who may claim to teach our children about the formation of the universe, or the moon, or anything else, have yet to define either the force carrier or the means of propagation of the most fundamental force in nature; a force described quite elegantly by young Earth creationist Isaac Newton over 300 years ago.²²

The force of gravity pulls all of us toward Earth's center and hence toward its solid surface. This pull produces friction, a force affecting and slowing every move we make. Since we were children, we have assumed that everything behaves this way. In fact, no child could have taken his first steps without friction and the downward pull of gravity to give his feet purchase in the environment. Even liquids (like water) and gasses (like air) create a type of friction called “drag” because gravity also pulls liquids and gasses toward the Earth's surface.

²² Newton, I. 1687. *Philosophiæ Naturalis Principia Mathematica* Proposition LXX, Theorem XXX, Section XII, Book I [reprint, Amherst, New York: Prometheus Books, 1995] p. 154

In space, things are quite different. If you were orbiting Earth, its gravity would still act on you, but you would not feel it. You might think you were “floating” when, in fact, you would be falling. And in a perfectly circular orbit, your velocity would carry you away from Earth as fast as you fell.

As an example, in 1965 Gemini IV astronaut James McDivitt tried to catch up with an old piece of a Titan II rocket orbiting far ahead of him. He instinctively increased his craft's speed. However, the added speed moved his orbit higher and farther from Earth where gravity is weaker and orbital velocities are slower. Thus, he fell farther and farther behind his target. Had he temporarily slowed down, his orbit would have changed, lost altitude, sped up, and traveled a shorter route to his target. Only by slowing down could he catch up, taking something of a “short-cut.”

All particles attract each other gravitationally. The more massive and the closer the two particles are to each other, the greater their mutual attraction. To determine the gravitational pull of a large body, one must add the combined effects of all its components, even the smallest. Fortunately, the gravitational pull of a distant body behaves almost as if all its mass were concentrated at one point, its center of mass.

During the Apollo 13 mission, the astronauts traveling to the moon dumped waste material overboard. As the discarded material, traveling at nearly the same velocity as the spacecraft, moved slowly away, the spacecraft's gravity pulled the material back. To everyone's surprise, it orbited the spacecraft all the way to the moon. When the spacecraft was on Earth, Earth's gravity dominated things near the spacecraft. However, when the spacecraft was far from Earth, the spacecraft's gravity dominated things near it. The region around a spacecraft, or any other body in space, where gravity can hold an object in an orbit, is called that body's *sphere of influence (SoI)*.

An object's SoI expands enormously as it moves farther from massive bodies. If, for many days, rocks and droplets of muddy water were expelled from Earth in a hypersonic jet, the spheres of influence of the rocks and water would grow dramatically. The more the spheres of influence grew, the more mass they would capture, so the more they would grow, etc.

Hill's radius is the approximate radius of an objects sphere of influence. Using the following equation, we can calculate the size of the SoI of a rock that is moving away from the earth. Where a is the distance between the rock and the center of the earth, m is the mass of the rock, M is the mass of the earth, and r_h is Hill's radius.

$$r_h \approx a \left(\frac{m}{3M} \right)^{\frac{1}{3}}$$

If we have a rock that is 10m in radius with a density (ρ) of 3.3g/cm³ (3300 kg/m³), we find that the mass of the rock is as follows:

$$m = V \cdot \rho = \left(\frac{4}{3} \pi r^3 \right) \rho = \left(\frac{4}{3} \pi (10m)^3 \right) 3300kg/m^3 \approx 1.38 \times 10^7 kg$$

If the rock is 7400km from the earth surface, $a = 7400 + 6378 = 13,778km$. Solving for Hill's Equation:

$$r_h \approx 13,778 \left(\frac{1.38 \times 10^7}{3(5.97 \times 10^{24})} \right)^{\frac{1}{3}} \approx 0.0126km \text{ (or 12.6m)}$$

This shows that the Hill's Radius is only 2.6m bigger than the rock at this distance from Earth, but the volume of its SoI has doubled:

$$\frac{\frac{4}{3} \pi r_h}{\frac{4}{3} \pi r_{rock}} = \frac{\frac{4}{3} \pi (12.6m)^3}{\frac{4}{3} \pi (10. m)^3} = \left(\frac{12.6}{10.} \right)^3 = 2.0$$

As the rock moves further away from the earth, its SoI will continue to increase, allowing it to capture other smaller rocks and debris. This additional mass will enlarge the SoI further, and it will capture more debris, etc.

When numerous particles (rocks, dirt, ice, and water molecules, all moving away from Earth) interact and exchange momentum, their velocities become more similar. The effective sphere of influence of the combined mass increases, so those particles will increasingly tend to merge.

B. Escape Velocity & Capture

Every astronomical body has an “escape velocity.” That is, the slowest speed an object needs from a specified point to escape that body’s gravity and proceed. The escape velocity for an object at the surface of the Earth is 11.2 kilometers/second. For an object at the surface of the sun to escape the solar system, escape velocity is 617.2 kilometers/second. For something one astronomical unit (AU) from the sun to escape the solar system, escape velocity is 42.3 kilometers/second.²³

A droplet of water engulfed in a growing sphere of influence of a rock or another droplet with a similar velocity might be captured by it. A rare exception might occur if one body strikes the other with a delicate glancing blow. Another exception would be if a third particle passing by had just the right mass, speed, direction, and position so that its gravitational attraction could slow the droplet enough to cause capture. However, impacts and interfering third bodies are much more apt to cause scattering than capture.

A droplet entering a body’s fixed sphere of influence with even a small relative velocity would seldom be captured, because it would gain enough speed as it fell toward that body to escape from the sphere of influence at about the same speed it entered. Earth’s sphere of influence has a radius of about 966,000 km. A rock within this distance is influenced more by Earth’s gravity than the sun’s. A rock entering Earth’s sphere of influence at just a few feet per second would accelerate toward Earth and could reach a speed of about 11km/s, depending on how close it came to Earth. Assuming there was no collision, gravity would whip the rock partway around Earth so fast that it would exit Earth’s sphere of influence nearly as fast as it entered. It would then be influenced more by the sun’s gravitational sphere of influence and would enter a new orbit around the sun.

Exiting a sphere of influence is more difficult if that sphere contains a gas, such as an atmosphere or water vapor. The friction effect of any gas, especially a dense gas, slows an invading particle, perhaps enough to capture it. Atmospheres are often relied upon to slow and capture spacecraft. This technique, called aerobraking, generates heat. If the “spacecraft” is a liquid

²³ <https://www.studysmarter.us/explanations/physics/fields-in-physics/escape-velocity/>

droplet, capture is even easier, because evaporation makes the droplet smaller and the atmosphere denser.

And “capture” is the proper term. Those who say stars, planets, and moons formed through capture often use the misleading terms “accrete,” “condense,” and “gravitational collapse,” which imply a “pulling in.” These words sound scientific but reveal a misunderstanding of physics. While gravity would move two isolated particles in space toward each other if their relative velocities were initially zero, particles in space are not isolated and seldom travel with the same speed and direction. For a body to capture a particle, (a) the particle must be within the body’s sphere of influence, (b) the particle’s velocity relative to the body must never carry it outside the sphere of influence, and (c) the body’s gravitational grip on the particle must increase so later perturbations do not strip the orbiting particle away. Requirement (c) is most easily satisfied if the body has an atmosphere—a surrounding gas. If gasses are inside these spheres, capture becomes more likely, and the more particles captured, the larger the sphere of influence becomes.

C. Tidal effect

This brings us to the subject of tidal effect. A drop of water in an ocean tide feels a stronger gravitational pull from the sun than from the moon. This is because the sun’s mass (some 27 million times greater than that of the moon) more than makes up for the sun’s greater distance away from the water. But we know that ocean tides are caused primarily by the moon, not the sun, because the sun pulls the droplet *and* the center of the Earth toward itself almost equally, while the much closer moon pulls relatively more on either the droplet or the center of the Earth (whichever is nearer the moon). We best see this effect in tides because water droplets slip easily past each other.

Tidal effects act everywhere on everything: gasses, liquids, solids and even comets. When a comet passes near a large planet or the sun, that body’s gravity pulls the near side of the comet with a greater force than the far side. This differential in “pulls” stretches the comet and sometimes tears it apart. If a comet passes very near a large body, it can be pulled apart many times; that is, pieces of pieces of pieces of comets are torn apart as shown in Figure 3.

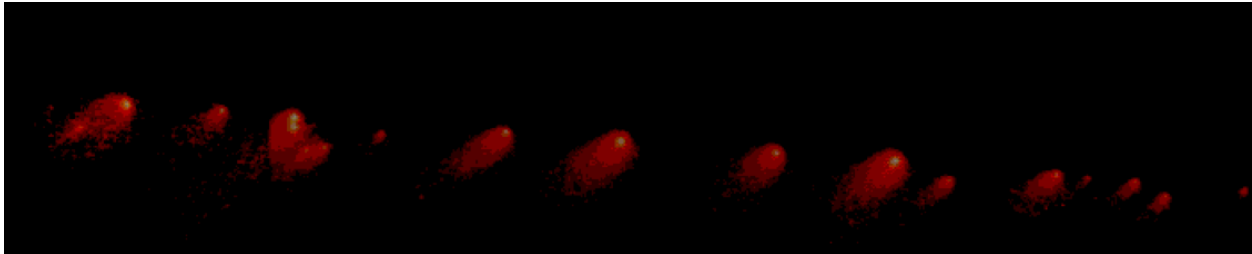


Figure 3

D. Meteors and asteroids and comets

In general, lighter particles (dirt, water droplets, and rocks) were launched with greater velocity than heavier objects. The heavier rocks merged to become asteroids, while smaller particles, primarily water, merged to become comets, which usually have larger orbits. Although no specific “line of demarcation” in characteristics separates asteroids and comets. In fact, some comets are also asteroids, and some asteroids are also comets. “Five of the numbered periodic comets are in fact also listed alternatively as numbered minor planets.”²⁴ “Since 2006, however, nine bodies orbiting within the main asteroid belt have been found with physical characteristics similar to comets.”²⁵ Much of the ejecta launched from the Earth on the day the Fountains of the Great Deep were broken up (Gen 7:11) was granite and water that reached escape velocity. Some water reached the cold upper atmosphere, froze, and fell back to Earth as hail, the water that did not escape or freeze fell as rain.

“...the same day were all the fountains of the great deep broken up, and the windows of heaven were opened. And the rain was upon the Earth forty days and forty nights.”

Gen 7:11-12

Most of the ejecta launched from Fountains of the Great Deep that reached escape velocity traveled into outer space, settling out by gravity into asteroids, meteors, comets, and trans-Neptunian objects, (The estimated mass

²⁴ Marsden, B. G. and Williams, G. V. 2008. Catalogue of Cometary Orbits, 17th edition, Cambridge, Massachusetts: Minor Planet Center, p. 6

²⁵ Mueller, K. and Yeston, J. 2012. “Impulsive Activity,” Science, Vol. 338, p. 1397.

of all asteroids excluding trans-Neptunian objects is 2.6×10^{24} grams)²⁶. Faulkner claims to have described problems of enough significance with Brown's assertion as to render Brown's assertions invalid.

In reviewing Faulkner's critique we were confused by Faulkner's immediate misunderstanding (or misrepresentation) of Brown's statement that: "*The volume of water on Earth is ten times greater than the volume of all land above sea level*". Faulkner responds: "*Taking the estimated mass of the earth's oceans and dividing by the earth's mass, we find that water makes up only 2.1×10^{-4} of the earth's mass.*"²⁷

There is a vast difference between the amount of land *above sea level* and the mass of *the entire earth*. Preceding his statement that water is less abundant than Brown implies, with Brown's estimate of water vs. amount of land above sea level and then following it with his own figure for land vs. mass of the entire earth, is misleading; although perhaps not intentionally so.

Faulkner's assertions regarding the heat problem created by The Fountains of the Great Deep launching debris through the atmosphere and into space states that "*The atmosphere is relatively stagnant, with the supersonic jets speed Bernuli's equation shows a large pressure differential that would drive air into the jet, pushing air into the jets producing enormous heat, preventing water and debris escaping the earth's gravity.*" Faulkner here reveals a misunderstanding of heat transfer, as a hot vapor cools exponentially as it expands (via The Joule/Thompson effect) according to the Clausius-Clapeyron Equation²⁸. The earth's atmosphere would provide a more than adequate heat sink even if the heat were not expressed in a directed stream as Brown describes.

Faulkner also raises concerns about the radiogenic heating that occurs within the Earth's interior. Brown argues that the heat generated from radioactive

²⁶ Brown, 2008 Brown, W. T. In the Beginning: Compelling Evidence for Creation and the Flood 8th Edition, 2008. Phoenix, Arizona: Center for Scientific Creation

²⁷ Faulkner, 2013 <https://www.creationresearch.org/an-analysis-of-astronomical-aspects-of-the-hydroplate-theory>

²⁸ Clausius, R. (1850). "Ueber die bewegende Kraft der Wärme und die Gesetze, welche sich daraus für die Wärmelehre selbst ableiten lassen" [On the motive power of heat and the laws which can be deduced therefrom regarding the theory of heat]. *Annalen der Physik* (in German). 155 (4): 500–524. Bibcode:1850AnP...155..500C. doi:10.1002/andp.18501550403. hdl:2027/uc1.\$b242250

decay is not as significant as commonly believed, and we propose that Brown's assertion that most of the radiogenic heat would have been dissipated during the initial catastrophic events through the release of water, ensuring that it didn't cause excessive temperatures, is more plausible based upon Brown's superior credentials and proven track record in the field of heat transfer science.

We propose that water droplets launched into space partially evaporated and quickly froze. Larger rocks had larger gravitational spheres of influence which grew as the rocks traveled away from Earth. The largest of these rocks became "seeds" around which ice particles, smaller rocks, and gas molecules collected gravitationally. Aerobraking caused by the gas, collapsed much of the mass around those "seed rocks", forming asteroids. One reason asteroids and comets are so similar is that they formed during the same geologic event from rocks, dust, and water launched by the Fountains of the Great Deep as Noah's flood began.

Each asteroid began as a swarm of particles (rocks, ice, and gas molecules) orbiting within a large sphere of influence. The swarm's volume was quite large so its spin was much slower than it would be once aerobraking collapsed the swarm into a single asteroid. The slow spin produced extreme temperature differences between the side facing the sun-facing and the side facing away. The "away" side would have been so cold that water molecules striking it would tend to stick as frost, adding "sphere of influence fuel" to the developing asteroid. When the swarm rotated 180°, that frost evaporated, adding pressure, and therefore thrust, to the sunny side. This radiometer pressure process (freezing followed by evaporating and thrusting) would have been repeated thousands of times, especially in larger swarms.

Because the volume of the swarm was large, the radiometer pressure acted over a large area and produced significant thrust. The swarm's relatively powerful thrust and low density caused the swarm to rapidly accelerate – much as a feather would in a steady breeze. Also, the sun's gravity 93,000,000 miles away at the position of the Earth, is 1,600 times weaker than Earth's gravity.

Consider two gravitational forces acting on a mass, m , at the Earth's surface. The first, F_E , is caused by the Earth's mass, M_E , acting, in effect, from the Earth's center – a distance D_E (4000 miles) away. The second gravitational force, F_S , is caused by the sun's mass, M_S , acting from a distance of D_S (93,000,000 miles). Letting G be the gravitational constant, these forces are:

$$F_E = \frac{G M_E m}{D_E^2} \quad \text{and} \quad F_S = \frac{G M_S m}{D_S^2}$$

The Sun is 332,900 times more massive than Earth. Dividing the left equation by the right gives:

$$\frac{F_E}{F_S} = \frac{M_E}{M_S} \times \left(\frac{D_E}{D_S}\right)^2 = \frac{1}{332,900} \times \left(\frac{93,000,000}{4000}\right)^2 = 1600$$

This means that a steady 1-pound force could lift and accelerate a rock away from the sun if the rock weighed 1,600 pounds on Earth and the rock were more than 93,000,000 miles above the Sun and far from Earth. Because there is virtually no resistance in outer space, pushing a swarm of rocks and debris farther from the sun was surprisingly easy.

With a transmission electron microscope, Japanese scientist Kazushige Tomeoka identified several major events in the life of one meteorite, which initially was part of a much larger parent body orbiting the sun. The parent body had many thin cracks through which mineral-rich water cycled. Extremely thin mineral layers were deposited on the walls of these cracks. These deposits, sometimes hundreds of layers thick, contained calcium, magnesium, carbonates, and other chemicals. Mild thermal metamorphism in this rock shows that temperatures increased before it experienced some final cracks and was blasted into space.²⁹

Representing the old Earth interpretation, Tomeoka asserts impacts on an asteroid cracked the rock that was to become this meteorite. Ice was deposited on the asteroid and impacts melted the ice, allowing liquid water to

²⁹ Tomeoka, K. 1990, "Phyllosilicate Veins in a CI Meteorite: Evidence for Aqueous Alteration on the Parent Body," *Nature*, Vol. 345, pp. 138–140

circulate through the cracks and deposit hundreds of layers of magnesium, calcium, and carbonate bearing minerals. A final impact then blasted rocks from this asteroid into space.

We propose that Earth was the parent body of meteors and asteroids, most of which are fragments of the Earth's pillars, (1 Sam 2:8, Job 9:6). In the centuries before the flood, tides in the subterranean water chambers compressed and stretched these pillars twice a day. This tidal pumping generated heat that was dissipated by a crustal structure that was altered after God cursed the ground in Genesis 3:17. Heating, cracking and forced circulation of water and minerals occurred at this time as the pillars and the crust of the Earth were undermined. Finally, the "breaking up" of the fountains produced the explosive event that launched Tomeoka's meteorite into space.

Smaller rocks and particles that achieved escape velocity became comets. Most comets travel on long, oval paths called ellipses bringing them near the sun and then swinging them around and into deep space. The point nearest the sun on an elliptical orbit is called its perihelion. At perihelion, a comet's speed is at its greatest. After a comet passes perihelion and begins moving away from the sun, its velocity steadily decreases until it reaches its farthest point from the sun, called its aphelion. (Similar to what happens when a ball thrown into the air slows until it reaches its highest point). Then, the comet begins falling back toward the sun, gaining speed until it again reaches perihelion.

Comets are also known to contain complex organic molecules, including trace amounts of the amino acid glycine, a building block of life on Earth.^{30 31} On November 12th, 2014, the European Space Agency's Rosetta spacecraft landed instruments on Comet 67P/Churyumov-Gerasimenko – a comet that is 72% to 74% empty space. This was the first successful landing of an

³⁰ Sandford S.A. 2006, et al., "Organics Captured from Comet 81P/Wild 2 by the Stardust Spacecraft," *Science*, Vol. 314, 15, pp. 1720–1724

³¹ Steigerwald, B. 2009. "NASA Researchers Make First Discovery of Life's Building Block's in Comet," NASA Goddard Space Flight Center. Retrieved December 29, 2022 from www.nasa.gov/mission_pages/stardust/news/stardust_amino_acid.html

observational instrument on a comet. Among the many discoveries were 16 organic compounds, shown in Table 1.³²

Name	Formula
Methane	CH ₄
Methanenitrile (hydrogen cyanide)	HCN
Carbon monoxide	CO
Methylamine	CH ₃ NH ₂
Ethanenitrile (acetonitrile)	CH ₃ CN
Isocyanic acid	HNCO
Ethanal (acetaldehyde)	CH ₃ CHO
Methanamide (formamide)	HCONH ₂
Ethylamine	C ₂ H ₅ NH ₂
Isocyanomethane (methyl isocyanate)	CH ₃ NCO
Propanone (acetone)	CH ₃ COCH ₃
Propanal (propionaldehyde)	C ₂ H ₅ CHO
Ethanamide (acetamide)	CH ₃ CONH ₂
2-Hydroxyethanal (glycolaldehyde)	CH ₂ OHCHO
1,2-Ethandiol (ethylene glycol)	CH ₂ (OH)CH ₂ (OH)
Glycine (an amino acid, obviously from life)	C ₂ H ₅ NO ₂

Table 1

Some might conclude that these organic compounds were precursors to life on Earth. But the more obvious alternative is that these compounds were fragments of organisms living on Earth that were destroyed in a cataclysm. If you saw a large pile of bricks and fragments of concrete mixed with steel rebar, aluminum frames, glass, cables, pipes, and fiberglass insulation, would you conclude that a building was evolving? Or that a building had been destroyed?

Finding so many complex organic compounds on such a small body in space was unprecedented. On rare occasions an organic compound (a molecule containing carbon atoms in rings, or long chains with such elements as hydrogen, oxygen, and nitrogen attached) might be found near a distant star. But comet 67P contained *sixteen* complex organic compounds! (See Table 1) These compounds that were found obviously came from life. We propose they came from the Earth.

³² Goesmann, F. et al., 2015 Organic compounds on comet 67P/Churyumov-Gerasimenko revealed by COSAC mass spectrometry, Science, Vol. 349, p. 497. DOI: 10.1126/science.aab0689

Today, a popular secular theory is that comets brought life to Earth. Instead, we propose that comets have traces of life *from* Earth. If A and B have a similar and unusual characteristic, or they correlate, one might assume that A caused B. But perhaps B caused A, or C caused both A and B. Perhaps no cause-and-effect link exists at all. Many misguided scientific efforts are rooted in this sort of logical fallacy; perceiving a relationship and, without other pertinent information, assuming a cause produced an effect.

E. Lunar cratering

Walled craters exist on the moon, (and Venus and Mercury for that matter). Think of the wall of the crater as a pile of sand, or clay. That pile would tend to spread downward evenly to form a sheet. It would no longer resemble a well-defined wall. And on the floor of the crater there should form a growing upward bulge, but the crater walls on the moon are well established, and crater floors observed show little expected bulge distortion. Meaning they cannot be over 4 billion years old³³.

Today, as the moon orbits the Earth, the same side of the moon always faces Earth. And there are notable differences in the near and far hemispheres. Almost all deep moonquakes are on the near side³⁴. The surface of the far side is rougher and has more craters, but the near side has most of the moon's volcanic features, lava flows, dome complexes, and giant, multi-ringed basins. Also, lava flows (darker regions) have smoothed over many craters on the near side.³⁵ "The far side, which we cannot see from Earth but has been imaged by satellites, almost completely lacks the large basaltic plains (maria) that are so prominent on the nearside."³⁶

Shadows in Figure 2 accentuate craters near the day-night boundary and minimize the appearance of craters on the near side. However, lava flows (which primarily occurred on the near side) make it smoother than the far side.

³³ Morton, G.R., Slusher, H.S. and Mandock, R.E. September 1982. "The Age of Lunar Craters," *Creation*

³⁴ Svoboda, E. 2006. *New Computers Uncover Old Quakes on the Moon*, *Discover*, Vol. 27, p. 38

³⁵ Berman 2003, Bob Berman, "Worlds Out of Balance," *Discover*, Vol. 24, December 2003, p. 38

³⁶ Cruz, M. 2012. *The two faces of the moon*, *Science*, Vol. 338, pp. 1010–1011

The Apollo missions gave us a great deal of valuable information, such as the composition of the lunar surface and seismic data. While scientists at the time were hopeful that the new data would clarify and confirm one of the various secular theories of the moon's formation, it did just the opposite. Astronomer William Hartmann stated: "...neither the Apollo astronauts, the Luna vehicles, nor all the king's horses and all the king's men could assemble enough data to explain the circumstances of the moon's birth."³⁷

Most will agree that lunar craters were formed primarily by impacts from asteroids, comets, etc. Hundreds of these craters were also formed volcanically (see Figure 4). Some of these crater basins pooled with lava and cooled to form dark, iron-rich basalt "spots" known as maria. Twenty of the 31 giant maria basins on the moon are found on the near side while only 11 sit on the far side. But why? Some have suggested that the near side of the moon has a thinner crust than the rest allowing for magma to easily seep up through the craters after an impact occurred. We will discuss these topics in detail later in the paper.

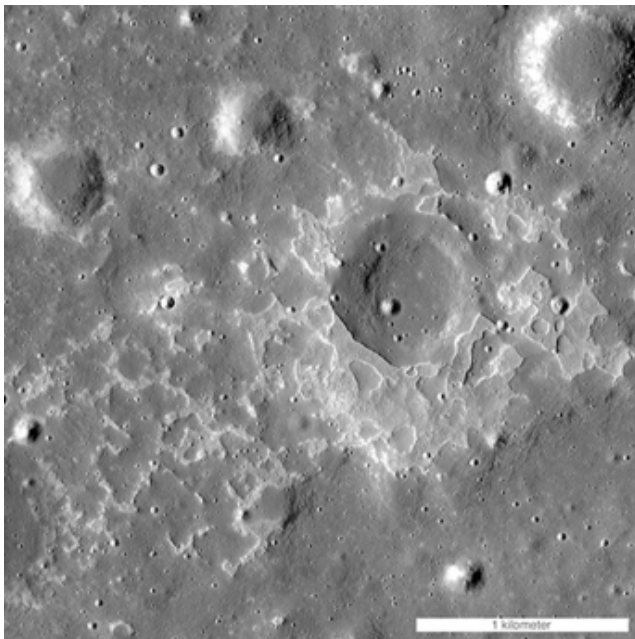


Figure 4

If comets and asteroids have been bombarding the moon at a steady rate, we should expect to see the moon evenly peppered with craters and maria,

³⁷ Hartmann, 1986 Origin of the Moon, p. VII, Lunar & Planetary Institute

especially if the moon is 4.5 billion years old. But again, this is not the case. From a distance, the near side appears to be smooth but with evidence of at least one large heavy bombardment, while far side looks as though it were blasted by something like a giant load of buckshot. The most logical explanation for such a dramatic contrast in hemispheres is a high-speed, large-item bombardment that attacked the moon primarily from one side, followed by a steady impact of smaller-item impacts on the other side.

Opposite sides of Mars and Mercury are also different. “A major surprise in the early days of lunar exploration was the discovery that the soft maria visible from Earth were far rarer on the moon’s far side, presumably because of some one-sided influence of the Earth. Now, refinements of Mariner 9 data show one hemisphere of Mars to be far rougher than the other, and Mariner 10 suggests the same asymmetry for Mercury. Data files grow, observes Bruce Murray of the California Institute of Technology, yet so does the mystery of hemispherical asymmetry. ‘We now know,’ he says, ‘a little less about the moon.’”³⁸

F. Lunar volcanism and Lava flows

Impactors on the moon produced the molten rock responsible for lava flows and volcanism observed today. If the impacts that produced volcanic features came rapidly from a single direction, one would expect such an asymmetry of hits. If the impacts occurred rapidly from all directions or slowly, (meaning longer than one 30-day orbital period for the moon), from a single direction, all sides would be equally hit. Large impacts would kick up millions of smaller rocks that would create secondary impacts and some rocks would escape the moon and possibly hit Earth. Today, both sides of the moon are saturated with smaller, secondary craters, as would be expected. Appearances indicate that large lunar impactors were launched rapidly from the direction of the Earth. That same launch/impact event would also account for geologic features of Mars and Mercury. There appears to have been a “bombardment event” that left its mark not only on the moon, most obviously, but indeed upon our solar system.

³⁸ Eberhart, J. 1974. “The Mystery of the Hemispheres,” Science News, Vol. 105, p. 241

Some have proposed that the moon's crust must be thinner on the near side, so lava can squirt out more easily on the near side than the far side. However, measurements of gravity,³⁹ heat flow, and seismic activity disprove that assertion. A relatively uniform ball of mass M and radius R has a moment of inertia about any diameter of $0.4000 MR^2$. The moon's polar moment of inertia is $(0.3935 \pm 0.0011) MR^2$ — almost the same.⁴⁰ This implies no significant differential between the near and far side crust. Of course, pressure and density must increase with depth. This accounts for the moon's moment of inertia being slightly less than that of a uniform ball. Little room is left over for a light crust. Five mass concentrations (mascons), account for the major discontinuities in density within the moon. Not only did large impacts form the giant basins, but their impact energy melted rock below, generated lava flows, and expanded the moon's radius by between 0.6 and 4.9 km.

The GRAIL satellites detected the cracks that brought lava to the surface — apparently rapidly and recently. “Application of gravity radiometry to observations by the Gravity Recovery and Interior Laboratory (GRAIL) mission results in the identification of a population of linear gravity anomalies with lengths of hundreds of kilometers. Inversion of the gravity anomalies indicates elongated positive-density anomalies that are interpreted to be ancient vertical tabular intrusions or dikes formed by magmatism in combination with extension of the lithosphereand an increase in the moon's radius by 0.6 to 4.9 kilometers early in lunar history.”⁴¹

The moon's liquid core was discovered in 2011.⁴² The core has not had time to cool and solidify. Large impacts would shift rock within the moon and produce deep frictional melting. The resulting magma would produce a liquid core and volcanic activity. Magma produced below the moon's crossover depth, would sink to the moon's center and form the moon's small liquid

³⁹ Wieczarek, M. A., et al., 2013. The Crust of the Moon as Seen by GRAIL, *Science*, Vol. 339, pp. 671–675

⁴⁰ Dickey, et al. 1994 J. O. Dickey et al., “Lunar Laser Ranging: A Continuing Legacy of the Apollo Program,” *Science*, Vol. 265, 22 July 1994, p. 487

⁴¹ Hanna Andrews, et al. 2013 Jeffrey C. Andrews-Hanna et al., “Ancient Igneous Intrusions and Early Expansion of the Moon Revealed by GRAIL Gravity Gradiometry,” *Science*, Vol. 339, 8 February 2013, p. 675

⁴² Weber, R. C. et al., 2011, “Seismic Detection of the Lunar Core,” *Science*, Vol. 331, pp. 309–312

core. Since the density of magma changes with depth below the surface of a planet or a moon, magma above the “crossover depth” is less dense than solid rock at the same depth and will try to rise through cracks. Below the crossover depth magma is more dense than solid rock and will sink toward the center.⁴³

Again, of the moon’s 31 giant basins, only 11 are on the far side.⁴⁴ Why should the near side have so many more giant impact features and almost all the maria? “In contrast, the far side [of the moon] almost completely lacks maria.”⁴⁵ The same is true of deep moonquakes.

Seismometers left on the moon during the Apollo missions recorded an astounding 12,500 seismic events. Moonquakes are now monitored using other methods, but the results continue to concur with earlier findings. “For unclear reasons, deep moonquakes seem largely confined to the side of the moon facing Earth.”⁴⁶ If large impactors came from Earth, most moonquakes should be on the near side. They are. In 1977, NASA turned the seismometers off. The moonquakes have now been reanalyzed using more powerful methods. The conclusion: even after making the most adverse assumptions, most deep moonquakes were on the near side of the moon and were clustered near the central portion of the near side.⁴⁷ If these impacts were recent, these moonquakes might still be occurring. They are!⁴⁸

G. Lunar orbit

Many ancient cultures worldwide had a 360-day year and a 30-day lunar month, (or “moonth”), (retrieved December 29, 2022 from <https://360dayyear.com/>). Presumably the word “month” was a carryover from pre-flood times. This would have given all humans on Earth, from creation to the flood, a marvelous calendar system. Regardless of where

⁴³ Urakawa, S. et al. 2006 “Anomalous Compression of Basaltic Magma,” Research Frontiers, pp. 113-114

⁴⁴ Short, 1975 Short, N.M. 1975. Planetary Geology Englewood Cliffs, New Jersey: Prentice-Hall, p. 87

⁴⁵ Spudis, P. D. 2003. “The New Moon,” Scientific American, Vol. 289, p. 89

⁴⁶ Svoboda, E. 2006. New Computers Uncover Old Quakes on the Moon, Discover, Vol. 27, p. 38

⁴⁷ Nakamura, Y. 2005. Farside deep moonquakes and deep interior of the moon, Journal of Geophysical Research, Vol. 110, E01001

⁴⁸ Watters, T. R. et al. 2019. Shallow seismic activity and young thrust faults on the Moon. Nature

people lived, they could easily and simply tell time without a mechanical clock.

But, if as we propose, just 1.22% of the debris launched from Earth by the Fountains of the Great Deep hit the moon, the lunar month would have changed from 30 days to its present 29.53-day lunar month, and the moon's circular orbit would have become the elliptical shape we see today, with an eccentricity of 0.0549.⁴⁹ Other key parameters for the moon's orbit would also change to what we now see.

H. Lunar Rocks and soil

Lunar rocks have relatively few volatile elements: water, nitrogen, hydrogen, chlorine, sulfur, and the noble gasses. However, lunar soil contains these elements – and plenty of water! Tiny beads of lunar basalt contain about 745 parts per million of water. As impacting comets and asteroids buried themselves deeply in what is now the moon's near side, the water-ice in those impactors mixed with the instantly created magma. Minutes or hours later, some of that magma erupted as a spray of droplets. Water molecules (and carbon, sulfur, chlorine, and fluorine) were diffusing out of the droplets as they solidified.⁵⁰

“Several studies have found concentrations of water much higher than expected in lunar materials.”⁵¹ The D/H ratio found in apatite grains brought back by the Apollo programs matches that of comets, not Earth.⁵²

“Concentrations of hydrogen, chlorine and Sulphur in the mineral apatite from 14053 [a lunar basalt rock brought back from the moon by the Apollo 14 astronauts] are indistinguishable from apatites in common terrestrial igneous rocks.”⁵³

⁴⁹ Brown, R. B. 2020. Did the Preflood Earth have 30-Day Lunar Months? retrieved December 29, 2022 from <https://apps.dtic.mil/sti/pdfs/AD1013404.pdf>

⁵⁰ Saal, A. E. et al., 2008. “Volatile Content of Lunar Volcanic Glasses and the Presence of Water in the Moon's Interior,” *Nature*, Vol. 454, pp. 192–194

⁵¹ Elliott, T. 2012 Galvanized Lunacy, *Nature*, Vol. 490, p. 346. DOI: 10.1038/490346a

⁵² Greenwood, J. P. et al., 2010. Water in Apollo Rock Samples and the D/H of Lunar Apatite, *Proceedings of the 41st Lunar and Planetary Science Conference, The Woodlands, Texas*. LPI Contribution No. 1533, p.2439

⁵³ Boyce, J.W. et al., 2010, Lunar apatite with terrestrial volatile abundances, *Nature*, Vol. 466. DOI: 10.1038/nature09274

The isotope ratios of these elements in lunar soil correspond not to the solar wind but to what is found on Earth, suggesting again that they came from Earth.⁵⁴ The rocks astronauts brought back from the moon also have identical oxygen and titanium isotopic ratios as those on Earth.⁵⁵ “... the 50Ti/ 47Ti ratio of the moon is identical to that of the Earth within about four parts per million” (Ibid.)

I. Lunar dust

As man prepared our mission to walk on the moon in the 1960s, questions about the thickness of the dust layer on the surface of the moon persisted. This was the result of old-Earth cosmology that alleged an age of the moon in the billions of years. This fueled an almost superstitious concern among the astronauts even after the Ranger and Surveyor missions had convinced many in the space program that the thickness of the lunar dust was not a concern. The astronaut who stepped off the lander onto the moon for the first time was indeed still concerned at the *moment of truth*.⁵⁶ But Neil Armstrong’s “one small step for a man” proved once and for all that the dust on the lunar regolith was only about an inch deep.

J. Water and ice

Throughout its orbit, the same side of the moon faces the Earth. Thus the moon rotates once on its axis each time it orbits Earth. That spin axis is nearly perpendicular to the line connecting the sun and moon. In 1998, a satellite orbiting the moon found two craters that show every indication that they contain large amounts of water/ice mixed with dirt. Surprisingly, the craters are on opposite sides of the moon; each 6° from a lunar pole.

Water exposed to direct sunlight on the moon will vaporize as 116° C steam. Those water molecules then bounce off the hot surface like ping pong balls,

⁵⁴ Ozima, M. et al., 2005, “Terrestrial Nitrogen and Noble Gasses in Lunar Soils,” *Nature*, Vol. 436, pp. 655–659, DOI: 10.1038/nature03929

⁵⁵ Zhang, J. et al., 25 March 2012. “The Proto-Earth as a Significant Source of Lunar Material,” *Nature Geoscience*, Vol. 5, p. 251. DOI: 10.1038/ngeo1429

⁵⁶ Armstrong, N. 1969. “Bob Hope and Neil Armstrong” retrieved December 29, 2022 from <https://youtu.be/qSKCaxx58Bg?t=469>

but with the moon's weak gravity and lack of atmosphere, each bounce covers several kilometers. Eventually, most of the water molecules will hit a cold spot, stick, and become frost. Today, the moon's primary water traps are the floors of its permanently shadowed polar craters. Those floors are colder than the average temperature on Pluto. But why is ice in craters that are shifted 6° from today's lunar poles, but not in craters at the poles? And why has ice remained in craters that periodically receive sunlight and are continually pounded by meteorites? The ice should have been sublimated over millions of years.⁵⁷

Let's look at two possible explanations; both are consistent with what would happen if a large mass were placed on or removed from the moon. In both cases, the moon's spin axis would remain fixed, but the moon would roll, so the maximum amount of mass is as far as possible from its spin axis. As the moon rolled, its north and south poles (points where the moon's fixed spin axis penetrates its rolling surface) would shift. Also, both theories explain the presence of radioactive gasses (radon) recently detected in craters on the leading (western) face of the moon's near side.⁵⁸

First, the creationist perspective: about five days after the flood began 1.22% of the water and rocks launched by the Fountains of the Great Deep began striking primarily the leading face on what is now the near side of the moon. Water and solid debris, following less direct routes, hit many other places around the moon. Much of the water that hit the moon became trapped within months on the cold floors of the early craters that formed at the lunar poles.

Some of the debris that hit the moon was radioactive. Within decades after the flood, larger rocky bodies – especially asteroids began impacting the moon. In 1968, the largest lunar impactors (mascons) were discovered on the moon. Notice that they lie near the moon's equator, suggesting that they were the unbalanced masses that rolled the moon and shifted its ice-filled craters.

Second, the secular “volcanic theory”: Over billions of years, comets and asteroids brought water to the moon. Eventually, most of that water became

⁵⁷ Garrick-Bethell, 2016 Signs of a Wandering Moon, Nature, Vol. 53, p. 456. DOI: 10.1038/531455a

⁵⁸ Lawson, et-al 2005, Recent outgassing from the lunar surface: The Lunar Prospector Alpha Particle Spectrometer <https://agupubs.onlinelibrary.wiley.com/doi/full/10.1029/2005JE002433>

concentrated in the bottoms of craters at the lunar poles. The radioactive gasses recently detected coming from two craters on the leading face of the near side of the moon suggest that volcanic activity expelled radioactive rocks from inside the moon. That would have shifted internal mass and altered the moon's balance, causing it to roll relative to its spin axis and shift the ice-filled craters that were initially located at the moon's north and south poles.⁵⁹

The volcanic theory raises several questions. How did radioactivity develop inside the moon? Why has ice, which periodically receives sunlight because it is no longer at the lunar poles, not sublimated into the vacuum of space? Was it because the moon's roll happened recently, such as, in the past 5,000 years? If ice built up over millions of years at the lunar poles, shouldn't there be a trail of ice-filled craters, not just the two that are about 200km from the poles? "Furthermore, one might expect ice paleopoles to have formed everywhere along this polar-wander path, raising the question of why they are found only at the locations observed in the current study."⁶⁰ Doesn't this imply a rapid roll? Because mascons (buried asteroids) are all near the lunar equator, did they cause the moon's roll? How could asteroids hit the near side of the moon? Doesn't Earth shield it? Our proposed theory answers these and other questions.

In 1998, billions of tons of water-ice mixed with the soil were found in deep craters near the moon's poles. As one writer visualized it "Comets raining from the sky left pockets of frozen water at the north and south poles of the moon," billions of tons more than previously believed, Los Alamos National Laboratory researchers have found.⁶¹

Later, thin traces of water were found at all lunar latitudes by three different spacecraft.⁶² Comets are a likely source, but this raises serious questions: ice should evaporate from the moon faster than comets currently deposit it, so

⁵⁹ Siegler, et al., 2016 Lunar true polar wander inferred from polar hydrogen, <https://www.nature.com/articles/nature17166>

⁶⁰ Garrick-Bethell, Early lunar magnetism p.456

⁶¹ Fleck, J., September 1998, "Comets Showered Ice on Moon," ABQ Journal of Science & Technology, p. C3

⁶² (Lucey, P. G. 23 October 2009, "A Lunar Waterworld," Science, Vol. 326, p. 531

why does so much ice remain?⁶³ Also, recently deposited ice has been discovered in permanently shadowed craters on Mercury, the closest planet to the sun⁶⁴. Ice that near the sun is even more difficult to explain [See Figure 5].

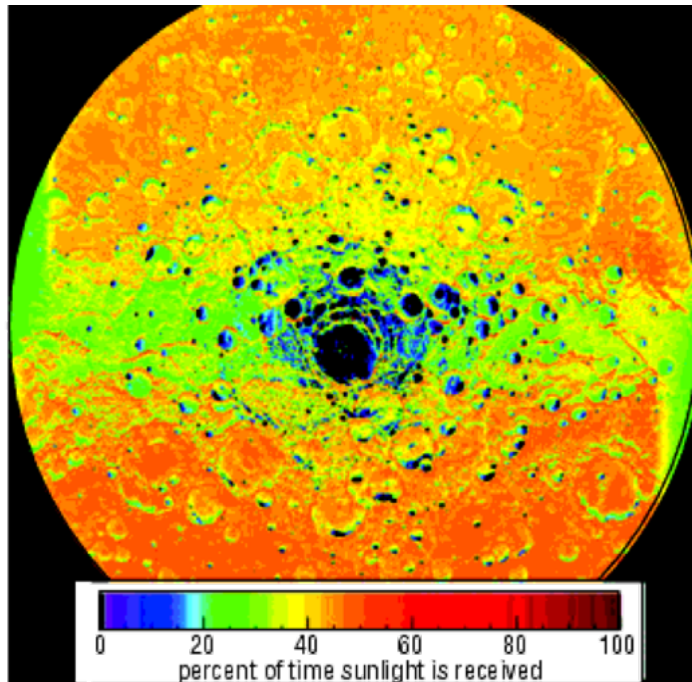


Figure 5

The idea that ice could have been on Mercury for millions of years is simply a non-starter. Meteoritic impacts would have scattered the ice into the sun's fiery glow or buried the ice with debris from those impacts. Nor could water have migrated into those craters from inside or on Mercury without becoming vapor (or dissociated H, O, and OH) that would quickly escape into space. Where did the water come from? Comets and asteroids, which contain vast amounts of water, are not hitting Mercury frequently today, but perhaps a rapid, violent bombardment of Mercury in the relatively recent past is the answer. Obviously, Mercury's water came from somewhere with considerable water. Could it have been Earth? Earth after all has been called "the water planet".

⁶³ Fluxes of Fast and Epithermal Neutrons from Lunar Prospector: Evidence for Water Ice at the Lunar Poles 1998

https://www.lpl.arizona.edu/~shane/PTYS_395_MOON/reading/feldman_et_al_science_1998.pdf

⁶⁴ (Chabot, N. L. et. al. 2014, "Images of Surface Volatiles in Mercury's Polar Craters Acquired by the MESSENGER Spacecraft," *Geology*, Vol. 42, pp. 1051–1054

K. Residual heat

Significant heat is flowing out of the moon from just below its surface, and yet the moon's interior is relatively cool. "...[The following is] a somewhat surprising outcome considering the size of the moon and the assumption that most of its heat energy had been lost. "...these unexpectedly high lunar [heat flow] values seem to indicate the moon's interior is much hotter than most thermal models had anticipated. If the temperature gradient in the lower regolith is extrapolated to great depths, the lunar interior would appear to be at least partly molten – a condition contradicted by other evidence."⁶⁵

In 2011, the moon was discovered to have a small liquid core.⁶⁶ "Actual values of heat flow determined on the moon at the Apollo 15 and 17 sites were two and three times higher than had been predicted."⁶⁷ Because the moon is not completely cold, we can assume it's much younger than the 4.6 billion years assumed by some. Is it possible that recent events have changed the moon's heat flow?

G. The scriptural record

Our theory proposes a mechanism by which the various solar system impactors, volcanism, and magma on the moon are explained. We propose that the ejecta launched by the Fountains of the Great Deep impacted the moon, and gave rise to the lunar features observed from Earth, lunar magma and volcanism, and to meteors, asteroids, and comets. All these phenomena can be traced to the same event chronicled in the Bible.

There existed before Noah's flood an enormous water reservoir under the Earth's crust, (that crust being one of the "firmaments" referred to in Genesis).

And God said, Let there be a firmament in the midst of the waters, and let it divide the waters from the waters. And God made the firmament and divided the waters which were under the firmament from the

⁶⁵ Short, 1975 Short, N.M. 1975. Planetary Geology Englewood Cliffs, New Jersey: Prentice-Hall, p. 87

⁶⁶ Weber, R. C. et al., 2011, "Seismic Detection of the Lunar Core," Science, Vol. 331, pp. 309–312

⁶⁷ Short, 1975 Short, N.M. 1975. Planetary Geology Englewood Cliffs, New Jersey: Prentice-Hall, p. 87

waters which were above the firmament: and it was so. And God called the firmament **Heaven**.” (Gen 1:6-8)

It is commonly believed that the “firmament” referred to in Genesis 1:6-6 is the sky, or the atmosphere. But we would point readers to the other instances of “firmament”, in this particular creation portion of scripture, and how the “firmament of heaven”, or “the heavens” is used to differentiate the atmosphere from this firmament. The firmament of Genesis 1:6-8 is the crust of the earth. The crust of Earth was called **Heaven** in Genesis, because the earth was originally a part of the heavenly Kingdom of God. And why would it not be? All was “very good”, and God enjoyed daily fellowship with Adam and Eve. But that was before sin and the curse.

The curse removed the earth from its privileged position in the Kingdom of God, and the earth’s physical form fell. We propose that the heavenly status of the earth prevented the development of any supercritical water before the Fall. Remember, the inevitable development of supercritical water “within 10 years of creation” as proposed in Walt Brown’s Hydroplate model is based upon Dr. Brown’s understanding of physics and heat transfer in the fallen universe of today. While a part of God’s heavenly kingdom, the earth was not governed by the physical laws as it would be after the fall (and is today). The nearly 100 meter thick crust that God called Heaven would behave as originally designed and allow for a heat exchange preventing the formation of supercritical water.

The scripture calls the reservoir of water below the crust “the deep” or “the great deep”:

“In the six hundredth year of Noah’s life, in the second month, the seventeenth day of the month, the same day were all the fountains of **the great deep** broken up...” (Gen 7:11)

“The waters made him great, **the deep** set him up on high with her rivers running round about his plants, and sent out her little rivers unto all the trees of the field.” (Ezk 31:4)

“The fountains also of **the deep** and the windows of heaven were stopped, and the rain from heaven was restrained;” (Gen 8:2)

The Earth’s crust, (some “below” the water of the seas, and all of it above the waters of the deep) rested upon the water, with its “foundations” anchored to the mantle by its “pillars”:

“Where wast thou when I laid the **foundations of the Earth?**” (Job 38:4)

“Whereupon are **the foundations thereof** fastened?” (Job 38:6)

“And the channels of the sea appeared, the **foundations of the world** were discovered, at the rebuking of the LORD...” (2 Sam 22:16)

“for the **pillars** of the Earth are the LORDS’s, and he hath set the world upon them” (1 Sam 2:8)

“Which shaketh the Earth out of her place, and the **pillars** thereof tremble.” (Job 9:6)

“The Earth and all the inhabitants thereof are dissolved: I bear up the **pillars** of it.” (Ps 75:3)

“... by the word of God the heavens were of old, and the Earth standing **out of the water and in the water**. Whereby the world that then was, being overflowed with water, perished:” (2 Peter 3:5-6)

The waters of the deep, interrupted at regular intervals by the pillars resting by the force of gravity on the mantle, were, like the land mass above, one contiguous entity, and largely decoupled the crust from the mantle, giving the spherical granite shell much more flexibility than it has today. It could flex from a sphere to an ellipsoid (and back again) during each tidal cycle, (See Figure 6).

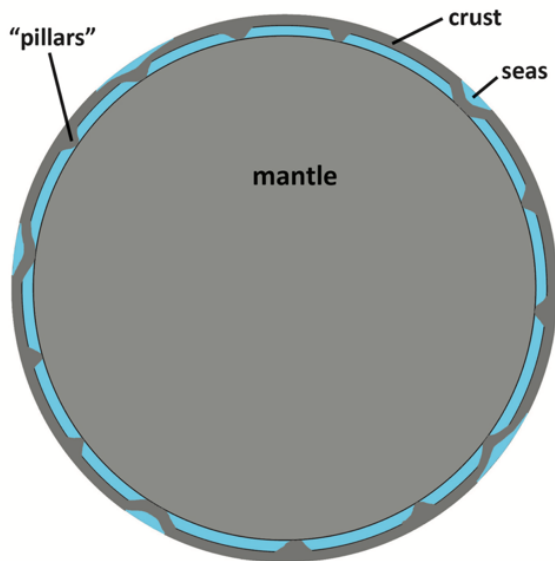


Figure 6

As the moon’s gravity lifted the crust at “12 o’clock” so to speak, the crust was pinched inward at “9” and “3 o’clock.” So water in the subterranean chambers was pumped by rising and falling pressure from low to high tide. The pillars between the crust and the mantle were also compressed and stretched twice a day by these subterranean tidal pressure differentials. The repeatedly compressed and hammered pillars would have produced enormous amounts of heat.

With a tidal effect circulating the water and shifting the foundations and pillars below, and an enormous amount of pressure and heat being generated, the water could eventually become *supercritical*, meaning super-hot – about 373°C.⁶⁸ which would have broken down the pillars, eroded the foundations, filled cracks with water and minerals, and undermined the stability of the crust.

But remember that at the beginning of the creation the crust of the earth was a part of God’s Heavenly Kingdom, and everything was “very good”. The heavenly function of God’s system of heat exchange dissipated the heat before it could achieve a supercritical state. This interaction is possibly referred to in the daily “mist” that rose up to water the earth.

⁶⁸ Galli, G. and Pan, D. 2 April 2013. “A Closer Look at Supercritical Water” PNAS, Vol. 110, No. 16

“...for the LORD God had not caused it to rain upon the Earth, and there was not a man to till the ground. But there went up a mist from the Earth, and watered the whole face of the ground.” (Gen 2:5-6)

The system was in perfect harmony. Even at the Fall, and for more than 1,500 years afterward, the Earth maintained a nearly perfect ecological balance.

But then, because God in His wisdom had created a system in which the waters created to sustain life could also be reserved for judgment, (in case of sin), at the Fall God cursed the ground for the sake of mankind.

“cursed is the ground for thy sake” (Gen 3:17)

The curse initiated the fall from Earth from Heaven and a decay of the heat exchange mechanism of the crust, which set in motion a series of geological events that would not only change the course of history but would change the face of the Earth, and even the moon to this day.

At this time in history, Earth and mankind were progressing rapidly toward utter destruction. But God in His wisdom, before he laid the foundations of the Earth, had established means and mechanisms (Eph 1:4, 1 Pet 1:20, Rev 13:8) by which He could redeem man if sin were to enter the world. And so, God could look at His creation on the sixth day, with its precisely balanced physical systems, undergirded by spiritual and physical contingencies that could overcome sin and death were they to become an issue, and He could call it all “very good.” After the curse excess heat began to build up in the deep and eventually the ecological balance reached a literal “boiling point” as the great deep persisted at super-critical temperature. This ecological imbalance (quite possibly exacerbated by the flora and trees growing out of control in the untended Garden of Eden) appears to have even caused a worldwide, pre-flood drought described in Ezekiel:

“Thus says the Lord GOD: ‘In the day when it went down to hell, I caused mourning. I covered the deep because of it. I restrained its rivers, and the great waters were held back. I caused Lebanon to mourn for it, and all the trees of the field wilted because of it. I made the nations shake at the sound of its fall, when I cast it down to hell

together with those who descend into the Pit; and all the trees of Eden, the choice and best of Lebanon, all that drink water, were comforted in the depths of the earth.” (Ezk 31:15-16 NKJV)

This is a poetic reference to events surrounding Noah’s flood and. The particular tree God chose to highlight as “restraining the waters” during the drought was the Tree of the Knowledge of Good and Evil, indicating that these events were related to the Fall of Man. The nations shook “at the sound of its fall”. And everyone who mourned the drought and wilted for lack of water was “comforted in the depths”. (Perhaps this reference to being “comforted in the depths” was God’s ironic way of saying to the wicked who were suffering through a worldwide drought, and no doubt mocking Noah as he preached the coming flood, “You want water? I’ll give you water!”).

As the temperature rose, the pressure built, and the super-critical water forced its way through the 60-mile-thick granite crust and cracks began to form as water was being pushed up through the foundations by the now globally supercritical water. Then, suddenly, one crack reached the surface, and in one day all the fountains of the great deep were broken up.

“In the six hundredth year of Noah's life, in the second month, the seventeenth day of the month, the same day were all the fountains of the great deep broken up, and the windows of heaven were opened.”
Gen 7:11

The fissure would have released forces of water pressure and heat on an almost incomprehensible scale. The crack would have then, according to the laws of the speed of sound in water versus granite, propagated in two directions, along the path of least resistance, around the globe only stopping as the water pressure decreased, or when it intersected itself, (which it did). This pattern can be observed in the failure of a flexible sphere stretched over fluid.⁶⁹ The remnants of the crustal breach that “broke open” the fountains of the great deep still exist as ridges, trenches and scars that run around the globe evident when viewing Google Earth.

⁶⁹ Free, G. and Gruchy, D. 7 June 2017. “Crushed by a Giant 6ft Water Balloon – The Slow Mo Guys 4K.” retrieved 29 December 2022 from <https://www.youtube.com/watch?v=fZI5oZ-1NdA>

As floodwaters escaped from the subterranean chambers, pillars were crushed, because they were forced to carry more of the weight of the overlying crust. Also, the nearly 60-mile-high walls of the rupture were unstable because rock is not strong enough to support a cliff more than 5 miles high. As lower portions of the walls crumbled, blocks – some a staggering 600 feet in diameter — were swept up and launched by the jetting fountains (see Fig. 7). Unsupported rock in the top 5 miles fragmented. The smaller the rock, the faster it accelerated, and the farther it went, just as a rapidly flowing stream carries smaller dirt particles faster and farther.

Larger rocks and boulders formed meteors, and asteroids and trans-Neptunian objects. Some of the larger of these, and larger groups of these were responsible for creating lunar cratering and maria. Smaller particles that did not impact other bodies coalesced to form comets.

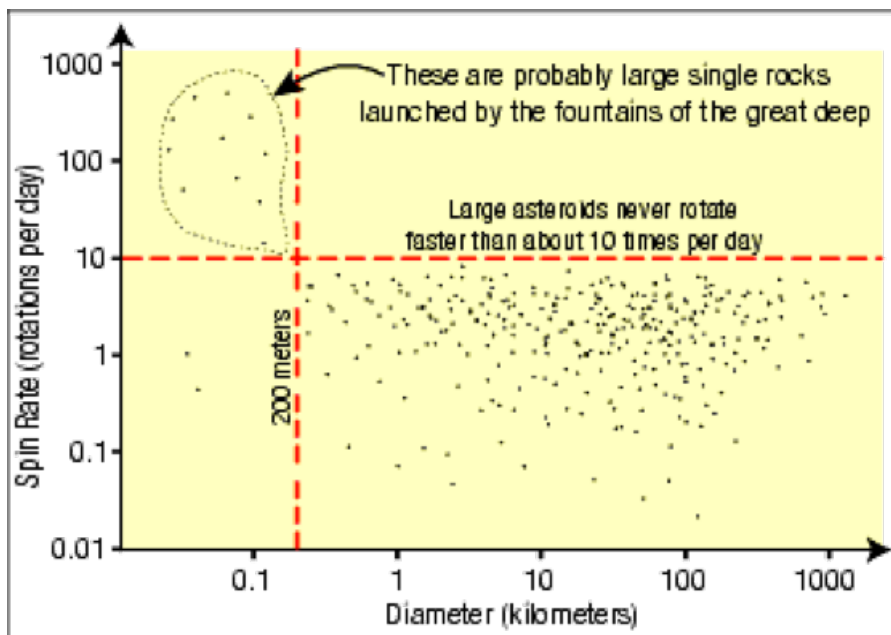


Figure 7

CONCLUSION

We propose that the geologic features of the moon can be explained by catastrophic events documented in the Bible. After the fall of man, the heat exchange and pressure relief achieved in the crust of the Earth was altered when God cursed the ground for man’s sake. This instigated the buildup of excess heat and pressure in the subterranean water chamber, creating a

“ticking time bomb” that finally exploded, in a single day, launching water and 3% of the Earth’s crust into space, with 1.22% of that mass striking the near side of the moon first, (and with the most insult), with secondary and tertiary impacts in the immediate aftermath, and since. Ejecta that did not fall back to Earth, or strike other bodies, was flung into space to form asteroids, comets and meteors. This Catastrophic theory best accounts for the observed geologic features of the moon.