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Front Cover: Dr. Russell Arndts (1935-2010), photo circa 2009 from his Facebook page. Dr. Arndts' obituary starts on page 33.

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EDITORIAL

Well, I had not planned on this, but here is another double issue. At least you get twice the number of pages, and those of you whose subscription ends with 132 receive an extra issue. And it does save on postage. Nevertheless, I would much prefer to produce four booklets a year than fewer. I am still working on the revision of *Geocentricity*, although at this point it is greatly enlarged with more things added than removed. I am slow of mind, not a fast thinker, so I need solitude to work on it. Everything has to be checked and triple checked, not to mention that geocentric science does not stand still. Many researchers, disappointed with relativity's failure to account for certain observations, are turning to the geocentric stance, but they are careful not to say so explicitly. Reading their papers, let alone evaluating them, is slow, tedious work.

We regret to announce the death of Russ Arndts. Russ died of complications with lupus on July 23. This issue is dedicated to his memory.

Dr. Sungenis and Geocentric Scriptures

The longest article in this issue is the first part of Bob Sungenis' excerpt from volume 2 of his *Galileo Was Wrong and the Church Was Right*. Bob has a Ph.D. in Theology and Religion and is a Roman Catholic, presenting the Roman Catholic view of the geocentric position. Bob is presently organizing a Catholic Geocentrism conference which will be held in South Bend, Indiana on 6 November this year. Martin Selbrede and I will be among the speakers. Those of you interested in attending, or wish more information, call Kari at 1-800-531-6393 or email caiomeo@aol.com. The venue is the Hilton Garden Inn near Notre Dame. Registration begins at 7:45 a.m. and the conference will run until 8:30 p.m. Admission is \$55 except for students and clergy who will be admitted for free.

Bob is a tireless supporter of the geocentric position and his first volume has more geocentric science in it than my 1992 book, *Geocentricity*. The science, we agree on; the geocentric scriptures we also agree on. We both profess faith in the inerrancy of Scripture, although he will say I take it too far whereas I think he doesn't take it far enough. For our Baptist and Protestant readers, he has used the Reformation-text numbering of the Psalms.

The article runs 58 pages so only the first part will be presented in this issue. It will probably take three issues to print the whole work.

Cosmology

In this issue we have several pieces relating to the structure of the universe. The first, “Is Gravity Real?” reports on the work of Erik Verlinde, who has derived Newton’s formula of gravity from entropy. He has interpreted this as meaning that there is only entropy and that there is no such thing as gravity.

The “Proof that Entropy Increases in Open Systems” article is one that I thought I had printed long ago but have not been able to locate. So I publish it here; if it is a repeat, then it bears repetition anyhow. It shows that the claim made by evolutionists, that in open systems entropy can be reversed to allow for evolution is wrong.

The firmament is a crucial part of the creation, being by far the largest and most massive medium that God created. Cosmologists believe that the Big Bang started when a tiny piece of the firmament “broke off” from the bulk of the firmament. Several “Panorama” reports deal with the firmament. We note here that people who advocate theistic evolution and the Big Bang actually invoke the firmament created on the second day as the raw material God used to begin his creation on the first day.

The firmament is the light-bearing medium of the universe. The light-bearing medium is now commonly said not to exist, however, but increasing number of physicists understand that the evidence shows there has to be a light-bearing medium. But the super-dense firmament is too “religious” for those physicists; they prefer a more æthereal medium, called the *luminiferous æther*. In “Chemosh as Æther,” we trace the source of the luminiferous æther to stem from the name of the Moabite god, Chemosh, translated into the Latin word, *æther*.

In the lead story of “Panorama,” we find that quasars do not show time dilation—a phenomenon predicted by relativity—in the periodic brightening and dimming of their light. Quasars are believed to be the brightest and most distant objects in the universe.

We also report on “Dark Flow,” a phenomenon that casts doubt on the cosmological principle—cornerstone of heliocentrism—that every place in the universe must look as if it is at the universe’s center.

Finally, evolutionary times are believed to be reliable because they depend on half-lives or radioactive material in rocks and fossils. For that to be so, the half-lives must be constant over time. We report on other phenomena that can significantly shorten half-lives, thus casting doubt on radiometric dates so crucial to evolution.

RUSSELL T. ARNDTS 1935-2010

Creationist and geocentrist, Russell T. Arndts, Ph.D., went home to be with the Lord Jesus on Friday afternoon, July 23, 2010. For years, Russ had suffered from lupus, an autoimmune disorder in which the body's immune system fights against one or more of the body's organs. In Russ' case, it was the lungs.

After a visit with doctors to discuss a planned heart operation to wean him from an oxygen tank, Russ quipped on May 10 that: "on the way out I met my heart doctor. He seemed willing to talk. He made it abundantly clear the lung doctor thinks I have a good chance of waking up where everyone ISN'T A GEOCENTRIC YOUNG EARTHER. While all of us will someday be where everyone is a geocentric young earther, I don't mind putting it off for a bit."

The heart surgery was performed in St. Cloud Hospital on May 25th and went smoothly. What followed, however, were a series of setbacks, surgeries, and recoveries, all documented by his wife, Betty, in a series of emails sent to people "in the loop." She said it best when she wrote: "After each surgery he worked at recovery then was hit with another complication. He was a wonderful patient and the nurses loved him." He died with his family gathered at his bedside. Russell is survived by wife, Betty, as well as daughters, sons-in-law, and grandchildren: Sharon (Richard) Hobbs and children Jordan and Kenna; Linda Brix and children, Rachel, Paul, and David (Anna); Beth (Steve) Prater and children Andrew, Joel, Isaac, and Renae.

Biographical Sketch

Russ was born on February 11, 1935 to Melvin and Geneva (née Thompson) Arndts in Chicago, Illinois. Theologically, he was raised a Baptist. Russ graduated from Bemidji High School in 1953 and from Bemidji State College in 1957. On 8 June of the same year, Russ married Betty J. Hurlbert in Bemidji, Minnesota. Russ earned a master's degree in chemistry from North Dakota State University in 1959. Later, Russ took earned a Ph.D. in chemistry from Louisiana State University, which was granted in 1968.

In 1960 Russ took a job as professor of chemistry at St. Cloud State University where he served for 35 years before his retirement in 1999. Between 1964 and 1968 Russ took a leave of absence to earn his Doctorate. Subsequently, he was promoted to Full Professor in 1970.

Upon his return from Louisiana State to St. Cloud in 1968, a number of students challenged him with the six-day creation account of Scripture and the evidence for it in science. Russ undertook the study origins, which ultimately led him to become a Creationist. He became active in the Creationist movement and became president of the Bible-Science Association (now known as “Creation Moments”). Russ served on the board of the Bible-Science Association until its dissociation from the late Walter Lang. After Walter’s ouster from the BSA, Russ served on the board of Creation Moments and is still listed (21 August) as such on their web site, a month after his death.

Russ as a Creationist

In the early 80’s, Dr. Arndts and fellow Creationist Bill Overn (who worked for Univac in the 1960s developing, among other things, fast memory devices and the first Mars lander) began investigating a theory that the elements produced by the decay of radioactive isotopes were not always the result of radioactive decay, but could have been present already in rocks when they formed. They went on to established a mixing model as an alternative to isochronal dating.¹ The result is so significant to Creationism that Arndts, Overn, and mathematician James Hanson were keynote speakers at the 1983 National Creation Conference held in the Twin Cities. After Dr. Arndts retired from teaching in 1999, he occupied himself with helping Christians understand the Creationist worldview.

Russell’s more recent writings had to do with the big bang, relativity, and the reasoning process used by evolutionists to sustain their superstition. The following quote gives an example of the latter:

Any conclusion reached by the use of data must have a sound reasoning system. Any data can be alleged to “prove” anything if we are willing to accept faulty reasoning. Evolutionary theory in general and specifically fossil reasoning is weak. Often creationists jump to the defense of a position when challenged needlessly.

Russ used the same tack when considering relativity, something which occupied him the last several years.

¹ Russ and Bill showed that neighboring crystals in lava could have radically different ages—hundreds of “millions” of years different. Arndts and Overn argued that ancient ages of rocks are illusions precipitated by the mixing of different isotopes in the source rocks. <http://www.tccsa.tc/articles/isochrons2.html>.

Russ and Geocentricity

It was his critical examination of Einstein's theories of relativity that led Russ eventually to adopt the geocentric model. Of course, it helped that the model is taught in Scripture. From relativity, Russ learned that today's acentric-heliocentric view has no observed scientific foundation. Russ summarized the results of his research in his book, *Geocentricity, Relativity, and the Big Bang* (see back cover for availability).

Russ participated in the Third International Conference on Absolutes, which was held in Houston from 16 through 18 June 2007. He presented a paper entitled, "Einstein's Procedural Definitions and the Hafele and Keating experiment." In his paper Russ used the same logical approach that he earlier brought to bear against the evolutionists. Unfortunately, Russ did not provide the committee with a copy of the paper so it was never posted in the Conference Proceedings.

It took Dr. Arndts quite a while to accept Geocentricity as a Bible doctrine, but once he did, he took to it as a duck takes to water. In an email dated April 27 of this year, he wrote: "It occurs to me that whenever geocentricity is rejected, an infinite universe is proposed with no center and no edges. Of course, with Einstein's relativity the same effect can be achieved with a finite universe." That is quite insightful and entirely correct.

Other Activities

Politically, Russ was a conservative and was active in supporting conservative causes. All these activities went into his mentorship of students of all ages, especially those interested in theological and philosophical issues, not to forget his mentoring his grandchildren.

At the time of his death, Russ was an active member of his church and a committed believer who lived out his faith in Jesus Christ.

PROOF THAT ENTROPY INCREASES IN OPEN SYSTEMS

Based on a letter from Physicist Harold Armstrong

Abstract

Creationists often challenge evolutionists with the entropy argument. When invoking the argument, creationists claim that evolution violates the second law of thermodynamic. Evolutionists typically counter by arguing that the second law does not apply to open systems, that energy imposed from outside an open system can bring order, that is, can decrease the entropy within the open system. In this paper we will prove that the evolutionists are wrong. Entropy does not decrease in open systems.

The Problem

Originally, entropy was defined in terms of heat, specifically as:

$$dS = \frac{dQ}{T}$$

where dS is the change in entropy, dQ is the change in heat, and T is temperature. We can express this definition of entropy in terms of energy, E , instead of heat by noting that

$$dE = kdT$$

(where k is Boltzmann's constant and dT is a change in temperature). Expressing this as a differential, we trivially obtain:

$$\partial E = k\partial T$$

Since

$$k\partial T = \partial Q$$

we can say that $\partial E = \partial Q$, that is, that ∂E and ∂Q are interchangeable.

So it is that by adding energy into an open system from the outside, we add heat to the open system and we cannot help but increase the entropy (or disorder) in the system. In short, adding energy ($dE > 0$) means heat is added ($dQ > 0$) and so, by the definition of entropy (first equation above), since both numerator and denominator are positive, the change in entropy is also positive ($dS > 0$) and so the entropy increases.

This means that adding energy into an open system to rearrange its components (e.g., building DNA molecules) does not increase the order (decrease the entropy) but always, increases the entropy (disorder). We conclude then that adding energy to a house from the outside, say by means of a tornado, increases the entropy (disorder) of the room.

What of crystals and other related phenomena held up as examples of local entropy reversal in support of evolution? When the flaws in the crystals are taken into account, the entropy of the crystal is actually higher than the entropy the atoms had when in solution. Likewise, cleaning a room may appear to bring order to the room and so decrease its entropy, but by the time you factor in the heat and energy you released into the room during the cleaning process, you find that you have significantly increased the entropy of the room than was removed by the reordering of the dust and furnishings of the room.

Entropy Today: Murphy's Law

Speaking of entropy, we've all seen copies of Murphy's Law and its corollaries. Usually Murphy's Law is stated as "If anything can go wrong, it will go wrong," but true to Murphy's Law, the statement was not made by Murphy. Who was Murphy and whence his law?

Edward Aloysius Murphy was a U. S. Air Force Captain working on the rocket sled project back in 1949. One day he noted that a technician was installing accelerometers backward on a rocket sled. As a result, Captain Murphy's law was born as: "If there's more than one way to do a job and one of those ways will end in disaster, then someone will do it that way." Later the rocket sled driver, then-Major John Paul Stapp, framed Murphy's Law into its current, stronger wording, "If anything can go wrong, it will." So you see, Murphy *was* an optimist!

IS GRAVITY REAL?

Gerardus D. Bouw

Abstract

Recently, the existence of gravity has been challenged. So far its replacement is little more than a rough draft of a new theory. In this paper we examine the history and nature of the challenge and discover that without gravity, Newton's theory of gravity retakes the forefront as a description of reality, taking back the ground it lost to Einstein's theory of gravitation. At the end of the paper, we examine how it relates to Scripture, Geocentricity, and my time sheet theory published in the *Biblical Astronomer* in 2007.



Figure 1: *Erik Verlinde*

Introduction

The new role that entropy and information play in quantum mechanics and gravity sets the scene for a dramatic unification of ideas in physics. On the surface, these new ideas appear to be at odds with Scripture, but when we realize that God is omnipresent in time as well as space, the concept of information takes on a new significance, in essence becoming a synonym for omniscience.

Verlinde's Proposal

One of the hottest new ideas in physics is that gravity is an emergent phenomenon instead of a primary law of physics. Saying gravity

is *emergent* means that gravity *emerges from* other phenomena instead of *causing* other phenomena such as a tossed ball falling to earth. The proposed view is that gravity somehow arises from the complex interaction of simpler things.

Early in 2010, Dr. Erik Peter Verlinde of the University of Amsterdam put forward an idea which has taken the world of physics by storm.¹ Reversing the logic of 300 years of science, Verlinde argues that gravity is a consequence of the laws of thermodynamics, which describe the behavior of heat and gases; he argues that gravity is merely a manifestation of entropy in the universe.

Now entropy relates heat to temperature and is the foundation of the second law of thermodynamics. In its basic form, the second law says that you cannot make an ice cube colder by placing it on a red-hot block of iron. The heat remaining in the ice cube will not be added to the heat in the block of iron. The second law of thermodynamics says that in ALL processes, the entropy of the universe must increase. Over the last 15 decades the concept of entropy has been broadened from heat to statistics, disorder, and information theory. Murphy's laws are statements of entropy. Theologically, the second law says that entropy dictates that it is impossible to reach heaven and gain eternal life by your own works.

Verlinde's idea is based on the second law of thermodynamics: that entropy always increases over time. It suggests that differences in entropy between parts of the universe generate a force that redistributes matter in a way that maximizes entropy. This is the force we call gravity.

"For me gravity doesn't exist," said Verlinde. Not that he can't fall down, but Verlinde is one of a number of physicists who say that physicists and astronomers have been looking at gravity the wrong way and that there is something more basic from which gravity "emerges." Looking at gravity from this angle, they say, could shed light on some of the vexing cosmic issues of the day, like the dark energy, a kind of anti-gravity that seems to be speeding up the expansion of the universe, or the dark matter that is supposedly needed to hold galaxies together.

Verlinde is not an obvious candidate to go off the deep end. He and his brother Herman, a Princeton professor, are celebrated twins known more for their mastery of the mathematics of hard-core string theory than for philosophic fights. Born in Woudenberg, in the Netherlands, in 1962, the brothers got early inspiration from a pair of 1970s Dutch television shows about particle physics and black holes. "I was completely captured," Verlinde recalled. He and his brother obtained

¹ Verlinde, Erik, 2010. "On the Origin of Gravity and the Laws of Newton," arXiv:1001.0785v1, 6 January.

Ph.D.s from the University of Utrecht in 1988 and then went to Princeton: Erik to the Institute for Advanced Study and Herman to the University. After bouncing back and forth across the ocean, they got tenure at Princeton. They married and divorced sisters. Erik left Princeton for Amsterdam to be near his children.

What is exciting about Verlinde's approach is that it dramatically simplifies the theoretical scaffolding that supports modern physics. And while it has its limitations—for example, it generates Newton's laws of gravity rather than Einstein's—it has some advantages also, such as the ability to account for the magnitude of dark energy with which conventional theories of gravity struggle.

But perhaps the most powerful idea to emerge from Verlinde's approach is that gravity is essentially a phenomenon of information. This idea gets a useful boost from Jae-Weon Lee and a couple of colleagues at Jungwon University in South Korea.² They explored the idea of quantum information to derive a theory of gravity and they did it by taking a slightly different tack to Verlinde.

At the heart of their idea is the tricky question of what happens to information when it enters a black hole. Physicists have puzzled over this for decades with little consensus. But one thing they agree on is Landauer's principle: that erasing a bit of quantum information always increases the entropy of the universe by a certain small amount and requires a specific amount of energy. Jae-Weon and colleagues assume that this erasure process must occur at the black hole horizon. And if so, space and time must organize themselves in a way that maximizes entropy at these horizons. In other words, entropy generates a gravity-like force.

That's intriguing for several reasons. First, Jae-Weon and Co. assume the existence of space-time and its geometry and simply ask what form it must take if information is being erased at horizons in this way. The erasure also relates gravity to quantum information for the first time. Over recent years, many results in quantum mechanics have pointed to the increasingly important role that information appears to play in the universe.

Some physicists are convinced that the properties of information do not come from the behavior of information carriers such as photons and electrons, but the other way round. They think that information itself is the ghostly bedrock on which our universe is built. Gravity has always been a fly in this ointment. But the growing realization that information plays a fundamental role here too could open the way to

² Lee, Jae-Weon, Hyeong-Chan Kim, & Jungjai Lee, 2010. "Gravity from Quantum Information," arXiv:1001.5445v2, 21 March.

the kind of unification between the quantum mechanics and relativity that physicists have dreamed of.

The knowledgeable reader may wonder why a string theorist is interested in Newton's equations. After all Newton was overturned a century ago by Einstein, who explained gravity as wrinkles in the geometry of space-time and who, some theorists think, could in turn be overturned by string theorists.

Over the last 30 years gravity has been "undressed," in Verlinde's words, as a fundamental force. This disrobing began in the 1970s with the discovery by Jacob Bekenstein of the Hebrew University of Jerusalem and Stephen Hawking of Cambridge University, among others, of a mysterious connection between black holes and thermodynamics, which culminated in Hawking's discovery in 1974 that when quantum effects are taken into account, black holes will glow and eventually explode.

In a provocative calculation in 1995, Ted Jacobson, a theorist from the University of Maryland, showed that given a few of these holographic ideas, Einstein's equations of general relativity are just another way of stating the laws of thermodynamics.

Hawking's glowing, exploding black holes (exploding, at least, in theory—none has ever been observed) lit up a new strangeness of nature. Black holes are holograms, like the 3-D images you see on credit cards. All the information about what has been lost inside them is encoded on their surfaces. Physicists have been wondering ever since how this "holographic principle," which some physicists imagine that we are all mere shadows on a distant wall, applies to the universe and where it came from.³

The thing that is new in Verlinde's paper is the idea that differences in entropy can be the driving mechanism behind gravity, that gravity is, as Verlinde puts it an "entropic force."

So far a rather lengthy report. Now for some commentary.

According to 't Hoofd's paper, the combination of quantum mechanics and gravity requires the three-dimensional world to be an image of data that can be stored on a two-dimensional projection much like a holographic image.⁴ Three years ago, we discovered that if we consider the universe to be four dimensional, with time as the fourth dimension, that the two-dimensional projection plane would have imaginary axes, that is to say, each axis involves i , which is the square

³ For your editor's view of the holographic universe see the three-part article entitled "Vistas in Time," 2007. *Biblical Astronomer*, 17(121):71, 77; (122):93.

⁴ 't Hoofd, Gerard, 1993. "Dimensional Reduction in Quantum Gravity," Utrecht Preprint THU-93/26, gr-qc/9310006.

root of negative one, $\sqrt{-1}$.⁵ In the series of papers we published at the time, we discovered a mapping in which the past is deposited as a series of sheets which we called “time sheets.” Verlinde’s paper starts with these sheets but he calls them *screens* for he pictures the firmament as consisting of a crystalline lattice in which the Planck particles are at the intersections of the crystalline edges. These corners are the locations where the Planck particles touch one another in Figure 2.

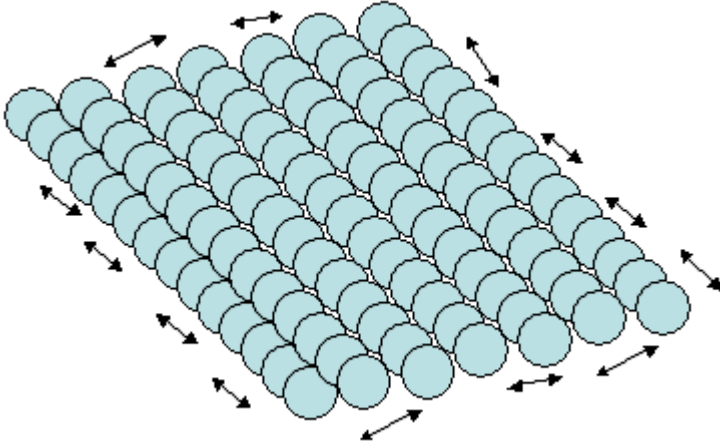


Figure 2: *Two sheets of Planck particles that make up the Firmament.*

Verlinde assumes that the rows of balls (a.k.a. strings) will curl and twist about one another the same way that DNA, polymers (certain types of plastic), and hair curls with the weather. At the risk of oversimplifying this, the curling force puts a stress on the chain and the stress he identifies as gravity.

A force may be assumed due to entropy if it acts in the direction of increasing entropy and is proportional to temperature. From this statement you may conclude that you need temperature to have a force in the first place. The derivation is not really all that difficult but I will let it lie for now. It involves assuming that each sphere in Figure 2 has two states, 0 and 1. Then spread the screen over the surface of a sphere and the sphere will “emerge” as equivalent to some mass in the part of space surrounded by the screen. It works.

In a sense, Verlinde’s model is similar to the time-sheet model. In the time-sheet model we looked at the information that is stored sheet-upon-sheet in the past. Verlinde, on the other hand, looks at the sheet as it is released from the future, emerging into the present.

⁵ Cf. footnote 3. The 4-D case is called “Topological Geometrodynamics” by cosmologists.

Lastly, why is information so important a concept at this fundamental level of cosmology? Theologically speaking, we each decide what we will and will not do. The Bible says we have free will, which leaves it for us to decide what we will do from second to second of time. Once we have done it, it cannot be undone; it is recorded in the past. We can repent and maybe restore or repair what was done, but the act is still recorded in the past; we cannot erase it.

Now some will object that the future is predetermined and many may even invoke God's foreknowledge of events as evidence. But foreknowledge is not the same as predestination. Foreknowledge is a property of omnipresence. God is not only omnipresent in space, but also in time. So he knows ahead of time what we will do, but also gives us warnings to change direction. Just because he knows whether or not we will heed him has nothing to do with predestination. The only people predestinated in Scripture are believers on the Lord Jesus Christ; they are predestinated from the moment of their confession to be conformed to the image of Christ. The Bible says nothing about anyone being predestinated to hell.

So, is gravity real? If it's not real then Verlinde's model says that the universe conspires to make it look real. What's the difference?

QUOTABLE QUOTE

The density of the nebular distribution increase outwards, symmetrically in all directions, leaving the observer in a unique position. Such a favoured position, of course, is intolerable.... Therefore, in order to restore homogeneity, and to escape the horror of a unique position, the departures from uniformity, which are introduced by the recession factors, must be compensated by ... spatial curvature. There seems to be no other escape.

—*Edwin Hubble*, commenting on his discovery of the redshift in *The Observational Approach to Cosmology*, pp. 58-59.

A government big enough to give you everything you want is strong enough to take everything you have.

—Thomas Jefferson

CHEMOSH AS ÆTHER

*The thing that hath been, it is that which shall be;
and that which is done is that which shall be done:
and there is no new thing under the sun.¹*

The following article was suggested by David Lifschultz, who over the years has authored several articles published in *The Biblical Astronomer*. The most recent one, “The Bible and the New Physics” which appeared in the Spring 2009 issue, precipitated the exchange that led to this article.

The name, Chemosh, occurs eight times in Scripture.² The first time is in Numbers 21:29 where Chemosh is associated with the Moabites:

Woe to thee, Moab! thou art undone, O people of Chemosh: he hath given his sons that escaped, and his daughters, into captivity unto Sihon king of the Amorites.

The implication of the verse is that Chemosh has given his worshippers, the Moabites, into the hand of their enemy, Sihon. That conquest took place not long before Israel approached Moab from the wilderness en route to the Promised Land, at which time the king of the Moabites, Balak, hired Balaam to curse Israel (Numbers 22-24).

In I Kings 11:33 Chemosh is called “the god of the Moabites” and earlier, in verse seven of the same chapter, Chemosh is called “the abomination of Moab.” The latter sentiment is echoed in II Kings 23:13.

There is a bit of controversy over the meaning of the name, Chemosh. Strong, in his *Strong's Exhaustive Concordance*, says that the name Chemosh derives “from an unused root meaning to be swift, active, agile, penetrating.” The implication is that Chemosh is a god of virility. The association probably arises from Israel’s joining himself unto Baal-peor (Numbers 25), but there the context is not Chemosh but “the gods” of Moab, meaning that the worship was not restricted to Chemosh. In particular the god in context is Baal-peor, the lord of Peor, but the lord of Peor is not necessarily the same as Chemosh, the god of the Moabites. Still many commentators do equate Baal-peor

¹ Ecclesiastes 1:9.

² Numbers 21:29; Judges 11:24; I Kings 11:7, 33; II Kings 23:13; Jeremiah 48:7, 13, 46.

with Chemosh and it is entirely possible that lasciviousness played a role in both gods' worship programs.

Unfortunately, more often than not these days, Hebrew or Semitic origins for words are dismissed where once they were considered the starting place for tracing word origins since the confounding of the languages at the Tower of Babel. Strong's meaning of Chemosh is no exception, for the "swift, active, agile, and penetrating" meaning comes from the Arabic, not from any Semitic language even though Israel, Moab, Amon, and Edom are all Semites. Note that all of the meanings listed by Strong are adjectives and a verb. But Chemosh is neither adjective nor verb in Hebrew; it is a noun.

From Chemosh the Greeks derived Comus, the god of lascivious feasting and reveling. Comus' parties were so lascivious and so noisy that it was necessary to have an apologist for his parties. In Latin, that apologist was called a *comissor* or *comessor*. The term survives to this day. In the Communist parties around the world, the apologist is called the *commissar*. In English, he is a *commissioner*.

The Hebrew root of the word Chemosh is *cama* for heat or light and *yesh* for substance. It follows that, in Semitic languages, Chemosh denotes the hot substance of the heavens. The god of Moab is the substance of the heavens which substance is conceived as hot light.

That Hebrew meaning was translated into Greek as *aizo* meaning hot into Latin where it became *aether* for warm, generative air. The Hebrew then may denote the warm solar light or aether considered as the "Animal Mundi or soul of the World, the Principle of heat, life, activity, and vigor to all nature."

David Lifschultz comments on this, saying:

The concept of the luminiferous æther came from the Pagan concept of their God Chemosh. And this æther, as Virgil writes, was everywhere although that is logically impossible. I have the quote from Virgil's *Aeneid* below:

Know first, that Heaven and earth's compacted frame,
 And flowing waters, and the starry flame,
 And both the radiant lights, one common soul
 Inspires, and feeds, and animates the whole,
 This active mind infused through all the space,
 Unites and mingles with the mighty mass.
 Hence men and beasts the breath of life obtain,
 And birds of the air and monsters of the main.
 The æthereal vigor is in all the same,
 And every soul is filled with equal flame.

The idea of a god without a shape, as Æther, is transmitted to us from the Greeks though it dates back to Moab in the shapeless God of Chemosh, and thus is transmitted to us from the Bible (Numbers 21:29).

Today there is a renewed interest in the æther as shortfalls and problems with relativity as a theory arise. It's not so much that relativity is wrong as it is that relativity can go only so far before it falls flat on its face. Thus the Apeiron Press, now apparently defunct, published about a score of books that in one way or another demonstrated the need for an æther model as necessary to explain how the earth can appear to stand still while everyone *knows* that it moves through space. Today, as was true in the nineteenth century, the searched-for æther is required to be rarified, yea even ethereal. But an ethereal æther requires that the æther can be dragged with the earth only so far up in space. Eventually the vacuum of space will not allow the æther to be dragged any further. But as far as we know, the rare æther is dragged by the earth out to some 10 billion miles.

The only physical model of an æther that makes any sense today is a variant of the plenum æther. Such an æther is not ethereal in the least. It is tremendously dense. For all practical purposes it can be said to be infinitely dense. Such an æther can account for the observations that relativity cannot account for.

As far as Chemosh-æther is concerned, it's just one more piece of evidence that there really are very few new things, even in science. The theory of evolution is as ancient as Babylon. Heliocentrism goes back at least as far as the third century B.C. Before that, Geocentrism was unopposed. Socialism also dates back to Babylon; it didn't work then just as it doesn't work now. The more I learn of the past, the more I realize that, with all the explosion of knowledge experienced in the past 200 years, we have come up with few new ideas and even among those, many are extensions on ancient ideas. It turns out that such is a property of Humanism, for Humanism is a backwards-looking religion, always pining for the ancient ways of paganism, free love, free sex, socialism, communalism (a.k.a. Communism) and human sacrifice. To that you can add heliocentrism.

Lastly, the firmament acting as a super-dense æther is consistent with both Scripture (firmament) and science; not so the hot-air æther of Chemosh, the Greeks, and the Romans. The worship of Chemosh elevated fire to deity in the Western pagan mind. From it came the theory of a hot æther to which today's physicists, confronted by the overwhelming evidence of Geocentricity, turn to keep the earth moving.

SCRIPTURAL PASSAGES TEACHING GEOCENTRISM Part 1

Robert A. Sungenis, Ph.D.¹

Joshua 10:10-14

¹⁰And the Lord threw them into a panic before Israel, who slew them with a great slaughter at Gibeon, and chased them by the way of the ascent of Bethhoron, and smote them as far as Azekah and Makkedah.

¹¹And as they fled before Israel, while they were going down the ascent of Bethhoron, the Lord threw down great stones from heaven upon them as far as Azekah, and they died; there were more who died because of the hailstones than the men of Israel killed with the sword.

¹²Then spoke Joshua to the Lord in the day when the Lord gave the Amorites over to the men of Israel; and he said in the sight of Israel, "Sun, stand thou still at Gibeon, and thou Moon in the valley of Ajjalon."

¹³And the sun stood still, and the moon stayed, until the nation took vengeance on their enemies. Is this not written in the Book of Jashar? The sun stayed in the midst of heaven, and did not hasten to go down for about a whole day.

¹⁴There has been no day like it before or since, when the Lord hearkened to the voice of a man; for the Lord fought for Israel.

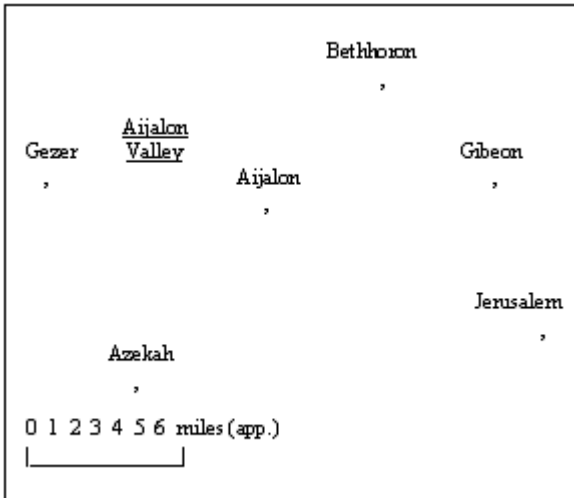
One of the more important features of this passage is the involvement of the Lord in both being the cause of the celestial and atmospheric events, as well as the disposition and eventual slaughter of Israel's enemies, in this case, the Amorites. The Lord does three things: (a) he puts the enemies into a panic (vr. 10); (b) he throws down great hailstones (vr. 11); (c) he causes the sun and moon to stand still (vrs. 12-14). As such, divine intervention predominates the passage and thus

¹ Excerpted from the book: *Galileo Was Wrong: The Church Was Right, Volume II, The Historical Case for Geocentrism*. Second edition, published February 2008, ISBN: 9780-9779640-9-3. For purchase, contact CAI Publishing, Inc. at caiomeo@aol.com

we must begin the analysis from the fact that we are in the realm of miraculous events far removed from natural occurrences. Once divine intervention is accepted as an integral part of the passage, subsequently it is only a matter of deciding how God accomplished the three miracles.

“Panic” and “hailstones” are not unusual occurrences in themselves, nevertheless, if the Lord is the cause we would expect them to be of severe and enduring effect so as to accomplish the purpose at hand, that is, killing the enemies of Israel. For hailstones to form instantaneously and be large enough to kill, a deliberately calculated divine intrusion had to be accomplished. In Scripture, hail appears to be a common device for divine judgment.² Putting opposing armies into a “panic” also seems to be a favorite divine assault.³

Apart from the divine intrusion described in the passage, the only other significant feature is that the sun and moon are stopped in their movements through the sky. Since by the passage’s own admission there has been no other time in history where such an event has occurred (vr. 14), it makes the event highly unusual even in the realm of miraculous events.



² Ex 9:10; Ps 18:12; 78:47-48; 105:32; Is 28:2, 17; 30:30; Ez 13:11-13; Ws 5:22; Es 46:6. In the Qumran text 4QJosa the reading is “stones,” whereas the Masoretic text reads “great stones” [גְּדֵלוֹתַי] and the LXX has “stones of hail” [λίθοις τῆς χαλάζης].

³ Ex 14:24; 23:27; Jg 4:15; 8:12; 1Sm 5:9-11; 7:10; Ps 48:5; Is 31:9; Jr:51:32; Zc 12:4, 13. See also Jb 38:22-23.

Another distinguishing feature is the detail that is provided regarding the locations of the events. Such detail lends credibility not only to the story itself but also to its accuracy. Five distinct places are mentioned (Aijalon, Azekah, Bethhoron, Gibeon, Makkedah). Historically, Bethhoron was 5 miles WNW of Gibeon, and Azekah was 15 miles SW of Bethhoron. The Aijalon Valley, over which the moon ceased its motion, was between Aijalon and Gezer, the two cities being about 7-8 miles apart. Gibeon was about 11 miles east of Aijalon, and about 15 miles due east from the center of the Aijalon Valley. Gilgal, from which Joshua traveled all night to come to Gibeon, is about 17 miles east of Gibeon. Beyond Gezer directly west about 15 miles is the Mediterranean Sea.

According to the account in Js 10:6-12, it was apparently at Gibeon that Joshua was standing when he made his request to God to stop the sun. The sun was most likely directly overhead, probably near noontime position. This fits the description in Js 10:13 that “the sun stayed in the *midst* of heaven.”⁴ Joshua also sees the moon, but it is to the west of the sun. Perhaps Joshua made the request to God at midday because after fighting the Amorites from the early morning, he could see by the early afternoon he was not going to have enough time to finish the battle by sundown, especially since he was fighting five different armies. Joshua 10:5 states:

Then the five kings of the Amorites, the king of Jerusalem, the king of Hebron, the king of Jarmuth, the king of Lachish, and the king of Eglon, gathered their forces, and went up with all their armies and encamped against Gibeon, and made war against it.

As he makes the request and sees it answered, Joshua determines that the moon has stopped over the Aijalon Valley. This valley begins about 15 miles due west of Gibeon and extends westward another 15 miles through Gezer until the shore of the Mediterranean. Joshua is in Gibeon which is located in the Judean mountain range. If at Gibeon Joshua is elevated about 500 feet, he will be able to see westward about 30 miles before the Earth’s curvature limits his line of vision.⁵ In order to be above the Aijalon Valley in Joshua’s line of vision, the moon would be just about 10-30 degrees above the horizon. In fact, the higher Joshua’s elevation at Gibeon, the lower in the sky the moon must be in

⁴ “midst” is from the Hebrew מִצְּרֵי (chatsy), meaning “middle” or “half” (Ex 24:6; Js 1:12; 8:33; 12:2).

⁵ If he is elevated 100 feet, he would be able to see only 13 miles. At 250 feet, 21 miles. See <http://www.boatsafe.com/tools/horizon.htm>.

order to be above the Ajalon Valley. If Joshua is seeing the moon about 30 or so degrees above the horizon, then the moon is about 60 degrees from the sun, and the sun is at the 90 degree mark, “in the midst of the sky.” At this angle, the moon would not be in full phase, but between the 3rd quarter and full phase, but closer to the former. In the 3rd quarter, the moon is in the middle sky as the sun rises, and it sets in the west when the sun reaches the middle sky. Hence, since Joshua can still see the moon while the sun is in the middle of the sky, the moon’s phase must be just prior to the 3rd quarter. All in all, the account corroborates with astronomical facts concerning the occupation of the sun and moon in the midday sky.

Additionally, the passage’s veracity is also demonstrated in that it fulfills the required testimony of the Hebrew legal code, *i.e.*, “two or three witnesses.”⁶ Among these witness are “The Book of Jashar” and the Hebrew Bible. The Book of Jashar is cited because it will serve to stem any doubts about the account’s authenticity, since the passage itself admits that the stopping of the sun and moon is one of the most fantastic events ever to occur in the history of mankind. To at least affirm that a second party recorded such an occurrence, anyone familiar at that time with the Book of Jasher could consult the text to authenticate the testimony of the Hebrew Bible. Whether the Book of Jasher exists today is still in debate,⁷ but the fact remains that the Hebrew

⁶ Dt 17:6; 19:15; Mt 18:16; 2Co 13:1.

⁷ Some orthodox Jews assert that the *Book of Jasher* appears in two ancient rabbinical works and an anonymous Jewish work of the 12th century A.D. The actual title of the book is סֵפֶר הַיָּשָׁר (sefer hayashar) translated more correctly as “Book of the Righteous.” The Hebrew article הַ is never put before a proper name, thus “Jasher” is probably a misnomer in today’s Bibles. The citation often given for the account in Joshua 10:12-14 is: Yashar 88:63-65, which reads: ⁶³“And when they were smiting, the day was declining toward evening, and Joshua said in the sight of all the people, Sun, stand thou still upon Gibeon, and thou moon in the valley of Ajalon, until the nation shall have revenged itself upon its enemies. ⁶⁴“And the Lord hearkened to the voice of Joshua, and the sun stood still in the midst of the heavens, and it stood still six and thirty moments, and the moon also stood still and hastened not to go down a whole day. ⁶⁵“And there was no day like that, before it or after it, that the Lord hearkened to the voice of a man, for the Lord fought for Israel” (taken from a 1613 A.D. book, J. H. Parry and Co. Salt Lake City, 1887). Another source, *The Book of Jasher* (New York, M. M. Noah and A. S. Gould, 1840, p. 260), says that the word “moments” is from the Hebrew “עֲתֵיִם”, literally times; what portion of time, I cannot understand by this term, never used in scripture to express any division of time, so I have translated it ‘moments,’” as cited in *The Long Day of Joshua*, Donald Patten, Ronald Hatch and Loren Steinhauer, Pacific Meridian Pub., WA, 1973, p. 183). Nh 9:28 & Jb 24:1 use עֲתֵיִם (“times”) from the feminine noun עֵת. (See also <http://www.kivits.com/Jashar1.htm>). One source, Timothy Archer, claims that “Sefer haYashar” was found in the Qumram excavations, although only the account found in 2Sm 1:18, not Joshua 10:10-14. Please see the website at: (<http://www.strangehorizons.com/2003/20030317/jashar.shtml>).

writer puts his testimony of the miraculous event on the line, as it were, allowing it to be checked and verified by any independent party who sought an affirming witness. The *Book of Jashar* is itself authenticated since it is cited in other books of the Hebrew Bible, and thus the veracity of the reference to Jashar in the book of Joshua is affirmed.⁸ (There are other such books that are not included in the canonical corpus of the Hebrew Old Testament, such as the book of Gad the Seer – 1Ch 29:29).

To round out a possible “third witness” to the event, the Hebrew Bible reiterates the account of the cessation of celestial movement in Habakkuk 3:11: “The sun and moon stood still in their habitation at the light of thine arrows as they sped, at the flash of thy glittering spear.” Habakkuk reflects the detail of the Joshua passage in that it mentions both the sun and the moon ceasing their movements. The book of Habakkuk was written in the 7th century B.C. while Joshua was written in the 11th century, thus showing how the tradition survived intact over at least four centuries. Additionally, the event is also recorded in Ecclesiasticus (Sirach) 46:4: “Was not the sun held back by his hand? And did not one day become as long as two?” This Old Testament book was written just prior to the Maccabean revolt, circa 160 B.C., which takes the testimony of Joshua’s Long Day transpire at least through a millennium.

Exegetical Details of Joshua 10:10-14

Similar to a few other accounts in the Old Testament, celestial bodies are incorporated into accounts of war in one form or another. The closest to Joshua is Judges 5:20: “From heaven fought the stars, from their courses they fought against Sisera.” From the metaphorical wording embedded in the passages, some scholars have concluded that Js 10:10-14 is merely a fictional account of a typical battle in the annals of Israeli history. In their view, the account is merely an embellished story that attributes a decisive victory to the Hebrew God but in reality it was a normally fought battle that lasted at least two days. These scholarly conclusions, of course, discount any divine intrusion taking place in the narrative, which is their academic goal when interpreting such miracle-laden passages. The difficulty for these scholars, however, is that the miraculous intrusion is woven so inextricably within the details of the passage that it is impossible to separate them without destroying the history of the narrative itself. After the “Quest for the Historical Jesus” was undertaken by liberal scholars in the last few centuries, theological academia became quite aware of the fact that arbitrarily separating the miraculous from the historical results in destroying both. This has been

⁸ 2Sm 1:18, although in this account the demise of Israel is recorded.

the Achilles heel of most of liberal and modernistic scholarship when examining passages such as Joshua 10:10-14.

There are other interpreters who, although recognizing the validity of miracles, seek to minimize the possibility that such events occurred in Joshua 10, usually out of fear of criticism from modern academia. In such cases, appeal is often made to the Hebrew word דָּמָם (*damam*) that appears in reference to the sun: “And the sun *stood still*.” Since *damam* also means “silent,”⁹ these interpreters posit that Joshua is not saying the sun was moving and then stopped; rather, “silent” is merely a poetic way of describing Israel’s victory over the Amorites using celestial metaphors, as if the sun was hush with amazement.

But escape from the literal application is not so easy. Although in many cases “silent” is the preferred translation of *damam*, in actuality, *damam* is chosen because it always ceases the action of the entity in view. For example, if a person is talking, *damam* is used to denote that he has ceased talking, and therefore he is “silent” (e.g., Ps 31:17: “let the wicked be put to shame, let them *be silent* in Sheol”). If an object is moving, *damam* is used to denote that it has stopped its motion (e.g., 1Sm 14:9: “Wait until we come to you, then we will *stand still* in our place, and we will not go up to them”). Whatever the normal activity of the entity in view, *damam* is employed when that activity comes to an end. Hence, if the salient feature of the sun is its movement in the sky so that it can give light upon the land (which function will eventually terminate if the sun moves beyond the immediate locale), *damam* would be the proper word to use if the sun’s movement ceased.

Although after Joshua *damam* is not used again in the Hebrew Bible in connection with a heavenly body, it is used with other objects whose chief function is movement. In Jr 47:6, for example, *damam* is used to represent the cessation of a sword’s activity: “Ah, sword of the Lord! How long till you are quiet? Put yourself into your scabbard, rest and *be still*!” We know that the salient feature of the sun in Joshua 10:13 is its movement across the sky to give light (as opposed to its heat), for the simple fact that it is coupled with the movement of the moon: “And the sun stood still, and the moon stayed.” Hence, the use of *damam* in the case of the sun can only apply to a cessation of its movement, otherwise, it could not be compared to the moon. Moreover, although in the moon’s cessation of movement the word chosen is

⁹ דָּמָם (*damam*) appears 30 times in the Old Testament (RSV), and is understood in the following ways: “silent” (Lv 10:3; Jb 29:21; 31:34; Ps 4:4; 30:12; 31:17; 62:5; 131:2; Jr 47:6; 48:2; Lm 2:10; Ez 24:17; Am 5:13); “cut off” (1Sm 2:9); “stand still” (1Sm 14:9) “still” (Ex 15:16; Jb 30:27; 37:7; Is 23:2; Jr 8:14); “ceasing” (Ps 35:15); “devastated” (Jr 25:37); “destroyed” (Jr 49:26; 51:6); “rest” (Lm 2:18).

עמד (*amad*),¹⁰ in the latter part of Js 10:13 *amad* appears again to describe the sun's cessation of movement: "The sun stayed (*amad*) in the midst of heaven." Thus, the sun's cessation of movement is reinforced by two similar yet distinct Hebrew words, *damam* and *amad*.

Additionally, two different Hebrew tenses are employed. After Joshua's use in vr. 12 of *damam* in the Qal imperative commanding the sun and moon to "stand still," in vr. 13 the narrator puts *damam* in the Qal imperfect tense to denote that the sun did, indeed, heed the command. Normally, the imperfect tense is a future tense, but because it is introduced here with a *waw*-consecutive it acts like a past tense, thus vr. 13's translation, "stood still." Also in vr. 13, the narrator then changes verbs and tenses to describe the moon's cessation of movement, using *amad* in the perfect tense, which is the Hebrew past tense. Lastly, in vr. 14, the *Book of Jasher* is cited and now *amad* is applied to the sun in the Qal imperfect *waw*-consecutive. The upshot of all these grammatical nuances is that these Hebrew verbs and their alternating tenses show conclusively that the account is interwoven as a cause-effect sequence of events that actually took place as recorded. Poetry is never put in such a format.

Once divine intrusion is accepted as the basis for the account, another issue for consideration is whether the sun itself was stopped (which necessitates that it was previously in motion) or the Earth was stopped in rotation (which necessitates that the sun was not in motion). The most significant piece of evidence in favor of the former interpretation is that even modern heliocentric science (which holds that the Earth rotates on an axis and revolves around the sun), agrees that the moon moves in space. It revolves around the Earth every 28 days or so. That being the case, if behind the actual meaning of Joshua 10:10-14 were the possibility that the Earth was in rotation and thus the passage is attempting to give a phenomenal or 'as it appears' account of the events occurring on that historic day, it would be rather self-defeating for the author to include the cessation of the moon's movement, since both the ancient and modern observer agree that since the moon revolves around the Earth it must be stopped from doing so if it is to be legitimately considered ceasing its movement. Consequently, since in the normal course of events the moon is in constant motion, yet on this particular day its movement ceased, we are forced to conclude that the cause for the moon's cessation of movement was not the Earth that

¹⁰ עמד (*amad*) appears 78 times in the Old Testament. Its preponderant meaning is translated by such words as: "stay," "wait," "remain," "abide," "establish," etc., the most common being "stop" or "stay" (e.g., Gn 19:17; Ex 9:28; Lv 13:23; Dt 10:10; 1Sm 20:38; 30:9; 2Sm 17:17; 2Kg 4:6; 13:18; 15:20; Jr 4:6; Hs 13:13).

stopped spinning but a force that acted upon both the moon and the sun to stop them from continuing their normal revolution around the Earth. So conspicuous is the moon in this account that the reader may assume that the writer deliberately added the moon so as to forestall interpretations of the passage that might seek to eliminate its literal interpretation. The reason is plain: in the heliocentric system, the Earth rotates, and whereas if the Earth stopped rotating it would make it appear as if the sun stood still, the moon would still revolve around the Earth and appear to be continuing to move while the sun remained still, and thus Joshua's request could not be fulfilled by ceasing the Earth's rotation.¹¹ Once again, since in the geocentric system both the sun and the moon revolve around the Earth, then both the sun and the moon would need to cease their movement simultaneously to satisfy Joshua's request. As noted previously, the heliocentric system, with its claim of a cessation of the Earth's rotation, cannot satisfy Joshua's request, for from Joshua's perspective on the ground the moon would simply move too far in one day to fulfill the specification in the text that it remained over the valley of Aijalon, which at most stretches for only 15 miles until it hits the Mediterranean Sea.

Historical Evidences for Joshua's Long Day

Several works have sought to corroborate the biblical account of Joshua's long day with other historical accounts in various parts of the world. One source makes the following points:

In the ancient Chinese writings there is a legend of a long day. The Incas of Peru and the Aztecs of Mexico have a like record, and there is a Babylonian and a Persian legend of a day that was miraculously extended. Another section of China contributes an account of the day that was miraculously prolonged, in the reign of Emperor Yeo. Herodotus recounts that the priests of Egypt showed him their temple

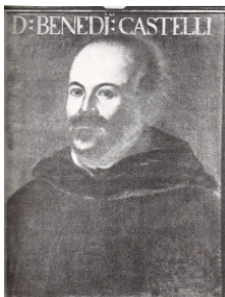
¹¹ The distance from the Earth to the moon is 250,000 miles. Using 2 π r for the circumference of the moon's orbit, the total is 1,570,000 miles the moon travels in 28 days. In one day it travels 56,071 miles, which distance would take it way beyond the valley of Aijalon. In fact, since the Joshua account says that both the sun and the moon could be seen in the sky, this means that the sun and moon were at right angles to one another with the moon being near the extremity of the horizon. That being the case, there is a slim margin of space the moon could occupy in order to remain in the sky if its movement had not been arrested. An extra distance of 56,000 miles would take it beyond the horizon and out of sight.

records, and that there he read a strange account of a day that was twice the natural length.¹²

Another account is similar:

In the Mexican Annals of Cuauhtitlan (the history of the empire of Culhuacan and Mexico, written in Nahuatl-Indian in the sixteenth century) it is related that during a cosmic catastrophe that occurred in the remote past, the night did not end for a long time....Sahagun, the Spanish savant who came to America a generation after Columbus and gathered the traditions of the aborigines, wrote that at the time of one cosmic catastrophe the sun rose only a little way over the horizon and remained there without moving; the moon also stood still.¹³

Galileo's Interpretation of Joshua 10: The Letter to Castelli



On December 21, 1613, three years after Galileo had published his formal advocacy of heliocentrism in his book *Siderius nuncius*, he was busy defending his theory in various private letters. One of the more extensive defenses appears in his letter to his personal friend, **Benedetto Castelli**. In the letter, Galileo gives two answers to Joshua 10:10-14. In the first he claims that it is not necessary or always correct to interpret Scripture in a literal sense. In the second, Galileo claims that even if one were to interpret the passage literally, it is impossible to explain from the geocentric position. Thus he attempts to explain it from the heliocentric model, which we will analyze here. Galileo writes:

(1)...I come now to a consideration of the particular passage from Joshua which occasioned three comments to the Grand Duchess. And I will seize upon the third, which was pre-

¹² Harry Rimmer, *The Harmony of Science and Scripture*, Eerdmans Publishing Co., 1944, pp. 269-270.

¹³ Immanuel Velikovsky, *Worlds in Collision*, New York, Macmillan Company, 1950, pp. 45-46. See also *Joshua's Long Day and the Dial of Ahaz*, C. A. L. Totten, Destiny Publishers, MA, 1890, p. 25. The most extensive treatment of the historical coincidences is Gerardus Bouw's, *Geocentricity*, pp. 60-80, which documents incidents occurring during the same time period in Africa, China, North America, Central and South Americas.

sented as mine, as indeed it truly is. But I will add for you some further considerations which I do not believe have been put in writing previously.¹⁴

(2) Let it be granted and conceded to an adversary for now that the sacred text should be taken in its exact literal meaning; namely, that God was asked by Joshua to make the sun stand still and to prolong the day so that he could obtain the victory. And I also ask my adversary to observe the same rule that I observe, that is, that he not bind me but free himself in regard to altering or changing the meaning of the words. I say, then, that this passage most clearly shows the falsity and impossibility of the Aristotelian and Ptolemaic world system, and is also very well accommodated to the Copernican system.

(3) First I ask my adversary if he knows by what motions the sun is moved. If he knows, he must reply that the sun has two motions; namely, an annual motion towards the east and a daily motion towards the west.

(4) Next ask him whether both of these motions, which are different and contrary to each other, belong to the sun and are both proper to it. He must reply “no,” for the only proper and special motion of the sun is its annual motion. The other motion is not proper to it, but belongs to the highest heaven, that is, the first sphere, which in its rotation carries along the sun and the other planets and the stellar sphere and which is ordained to give a revolution* around the earth in twenty-four hours by means of a motion, as I have said, which is contrary to the sun’s natural and proper motion.

(5) I come then to the third question, and I ask him which of these two motions of the sun causes day and night; namely, its own proper and real motion, or the motion of the first sphere. He must reply that day and night are caused by the motion of the first sphere, and that the proper motion of the

¹⁴ Original Italian: “In confermazione di che, vengo adesso a considerare il luogo particolare di Giesuè [Joshua], per il quale ell’ apportò ad alcuni tre dichiarazioni; e piglio la 3^a, ch’ ella produsse come mia, sì come veramente è, m’v’ aggiungo alcune condizioni di più, quale non credo haverle detto altra volta” (Favaro, *Galileo E L’Inquisizione*, p. 42). For the rest of Galileo’s letter to Castelli we will use the English translation.

sun does not produce day and night but rather the various seasons and the year itself.

(6) Now if the day depends not on the motion of the sun but on the motion of the first sphere, who does not see that, in order to lengthen the day, one needs to make the first sphere stop, and not the sun? Thus if someone understands these first elements of astronomy, does he not also recognize that if God had stopped the motion of the sun, then instead of lengthening the day, he would have shortened it and made it briefer? For since the motion of the sun is contrary to the daily revolution*, then to the degree that the sun moves towards the east, to the same degree it will be slowed down in its motion towards the west. And if the motion of the sun is decreased or annulled, it will move to the west in a proportionally shorter time. This is observable if one looks at the moon, whose daily revolution* is slower than that of the sun in proportion to its own proper motion being faster than that of the sun. Therefore it is absolutely impossible in the system of Ptolemy and Aristotle to stop the motion of the sun and thereby to lengthen the day, as the Scripture states to have happened. Hence either one must say that the motions are not arranged as Ptolemy said, or one must alter the meaning of the words, and say that, when the Scripture says that God stopped the sun, he really wished to say that he stopped the first sphere. But in order to accommodate himself to the capacity of those who are hardly able to understand the rising and setting of the sun, he said the contrary of what he ought to have said as he spoke to humans steeped in the senses.

(7) Let me add that it is not credible that God would have stopped the sun without paying attention to the other spheres. For without any reason he would have changed all the laws, relations, and dispositions of the other stars in respect to the sun, and would have greatly disturbed the whole course of nature. But it is credible that he stopped the whole system of celestial spheres which, after an intervening period of rest, he returned consistently to their functions without any confusion or alteration.

(8) But since we have already agreed not to alter the meaning of the words of the text, we must have recourse to an-

other arrangement of the parts of the world, and then see if it agrees with the bare meaning of the words, taken straightforwardly and without hesitation, as to what actually happened.

(9) Now I have discovered and have proven with necessity that the globe of the sun rotates on itself, making one full rotation* in about one lunar month, in exactly the same way that all the other celestial rotations occur. Moreover it is quite probable and reasonable that the sun, as the instrument and highest minister of nature, as if it were the heart of the world, gives not only light, as it clearly does, but also motion to all the planets which revolve around it. Therefore, if in agreement with the position of Copernicus we attribute the daily rotation primarily to the earth, then who does not see that, in order to stop the whole system without any alteration in the remaining mutual relation of the planets but only to prolong the space and time of the daylight, it is sufficient to make the sun stop, exactly as the literal meaning of the sacred text says? Behold then that in this second way it is possible to lengthen the day on earth by stopping the sun, without introducing any confusion among the parts of the world and without altering the words of Scripture.

(10) I have written much more than my indisposition allows. So I will end, offering my services and kissing your hands, petitioning Our Lord for a good holiday and every happiness. Florence, 21 December 1613.¹⁵

There are several problems with Galileo's arguments. First, Galileo enters the challenge by saying: "the sacred text should be taken in its *exact literal meaning*; namely, that God was asked by Joshua to make the sun stand still." But his interpretation: "if in agreement with the position of Copernicus we attribute the daily rotation primarily to the earth," is not an "exact literal meaning," since Joshua 10:10-14 does not mention the Earth, much less its ceasing of an alleged rotation. The original Italian does not leave much room for Galileo. It states: "...che le parole" ("that the words") "de testo sacro" ("of the sacred text") "s'habbino a prendere nell' senso appunto" ("should be taken in the

¹⁵ Translated by Richard Blackwell in *Galileo, Bellarmine and the Bible*, pp. 199-201. Blackwell's use of "rotation" and "revolution" have been corrected when necessary and are noted by an asterisk.

sense exactly”) “che elle suonano” (“that they play out”).¹⁶ The only latitude for Galileo is the Italian word *suonano*. It is the third person, plural, present, indicative of the verb *suonare*, which means to play, make music, or chime, ring, beat, sound or seem. If Galileo intended *suonano* as a metaphor for music, he gave himself some leeway regarding what he meant by “the exact sense” of Joshua’s text, since he could have meant that whatever interpretation sounds the best is the most proper, that is, the interpretation that best fits the biblical data is what was intended by Joshua. This leeway would allow Galileo to suggest a rotation of the Earth as the proper interpretation since, in his mind, it best “plays out” or “rings true” the available data. But that which best “plays out” the data is in Galileo’s case determined by the subjective judgment of the interpreter and is not dependent strictly on a literal rendering of the words. If the literal words say “the sun stopped,” then the literal interpretation must incorporate the fact that the sun was moving and suddenly came to a stop. There can be no other literal sense to the words. It is only when one arbitrarily adds the possibility of the ‘language of appearance’ that it would be possible to claim that the Earth stopped rotating. But using phenomenal language is neither literal language or literal interpretation, it is figurative on both counts. This distinction is true regardless how literal one makes the figures, that is, it is true in spite of Galileo’s attempt to use a literal rotation of the Earth to attempt to answer the figurative stoppage of the sun.

Ironically, Galileo reiterated his commitment to the literal meaning of Joshua 10 in paragraph #8 in which he says: “But since we have already agreed not to alter the meaning of the words of the text.” The original Italian is: “Ma perchè siamo già convenuti, non dover alterare il senso litterale del testo.” A more literal translation of the second half of the sentence is: “not to alter the literal sense of the text.” Normally, the “literal sense” is understood to refer to what the words literally say. There is no “meaning” other than the literal data, no matter how absurd it may sound or impossible to accomplish. If, for example, one said: “I jumped to the moon,” the only literal sense is that the person squatted down and sprang up with enough force to land him on the moon. Although in this case the literal sense is certainly impossible to accomplish, still, the sentence can only refer to one action, jumping to the moon. Similarly, “stopping the sun,” in the literal sense, can only mean stopping the sun from moving in space. Hence, it seems as though Galileo has limited his options in paragraph #8 and thus he has not followed the rules of his own challenge.

Secondly, Galileo complains that the Ptolemaic or Aristotelian models would have an impossible task of accomplishing the stoppage

¹⁶ Favaro, *Galileo E L’Inquisizione*, p. 42, my translation.

of the sun because the sun has two movements in the sky, one in which the sun itself actually moves and one in which the sphere housing the sun moves. In the latter, the sun only appears to move, according to Galileo. The former is the annual west-to-east movement of the sun as it makes its 360 degree trek through the zodiac, while the latter is the daily east-to-west movement we see in sunrise and sunset. He writes in paragraph #6:

For since the motion of the sun is contrary to the daily revolution,* then to the degree that the sun moves towards the east, to the same degree it will be slowed down in its motion towards the west. And if the motion of the sun is decreased or annulled, it will move to the west in a proportionally shorter time.

Galileo claims that, if one is going to interpret Joshua 10 literally, ceasing the sun's movement can only refer to what he deems as the *actual* movement of the sun, the west-to-east movement that it makes against the revolving universal sphere. His argument is that if the "actual" movement of the sun is stopped, it does not lengthen the day, it actually makes it shorter, since: (a) the motion of the universal sphere which carries the sun in its daily revolution has not been stopped and therefore the sun will move at its normal 24-hour pace around the Earth, and (b) the ceasing of the sun's west-to-east movement through the zodiac will make the sun move a little faster in the east-to-west direction, thus defeating Joshua's whole purpose for calling upon God.

Galileo's argument is clever, but it is wrong on all counts. First, the conundrum Galileo manufactures for the geocentric model is accomplished by an arbitrary mixing of the miraculous and the natural. On the one hand, Galileo admits to the miraculous nature of stopping the west-to-east movement of the sun because for him it answers the literal interpretation of Joshua's request. On the other hand, for the sun's east-to-west movement Galileo suddenly wishes to limit the possibilities to the natural realm, thus allowing himself to claim that there would be a contradiction in the geocentric explanation of Joshua 10. Thus in paragraph #7 he writes:

Let me add that it is not credible that God would have stopped the sun without paying attention to the other spheres. For without any reason he would have changed all the laws, relations, and dispositions of the other stars in respect to the sun, and would have greatly disturbed the whole course of nature.

But as Galileo was warned by Pope Urban VIII in 1633, and as even the converted Galileo himself realized in 1641 when he renounced the heliocentric system,¹⁷ God's omnipotence has no limits. There are innumerable ways God can accomplish the task at hand if and when the normal laws which govern the universe are set aside to make room for God's divine ingenuity.

Second, Galileo conveniently ignores the fact that, if the sphere moves then the sun moves, and if the sphere stops then the sun stops. In contrast to a fixed earth, there is movement and cessation of movement for both the sphere and the sun. For example, as the axle in a wheel rotates 360 degrees at the same time as the rim of the wheel, both the axle and the rim move in relation to the fixed vehicle to which they are housed. In addition, the fact that the moon also ceases its motion and hangs over the valley of Aijalon for close to 48 hours lends credence to the idea that both the sun and the moon are housed in the same sphere. In other words, to stop both the sun and the moon simultaneously, only the sphere in which they are contained needs to be stopped. Hence it is literally true that both the sun and the moon could be stopped, and thus Joshua's request is literally fulfilled. Galileo's attempt to apply the distinction between the sun's proper and improper motion to the literal interpretation of Joshua 10 is obviously erroneous.

Galileo had another argument to counter the traditional interpretation of Joshua 10. In his *Letter to the Grand Duchess Christina* of July 1615, he states:

But if I am not mistaken, something of which we are to take no small account is that by the aid of this Copernican system we have the literal, open, and easy sense of another statement that we read in this same miracle, that the sun stood still *in the midst of the heavens*. Grave theologians raise a question about this passage, for it seems very likely that when Joshua requested the lengthening of the day, the sun was near setting and not at the meridian. If the sun had been at the meridian, it seems improbable that it was necessary to pray for a lengthened day in order to pursue victory in battle, the miracle having occurred around the summer solstice when the days are longest, and the space of seven hours remaining before nightfall being sufficient. Thus grave divines have actually held that the sun was near setting, and indeed the words themselves seem to say so: *Sun, stand thou still, stand thou still*. For if it had been near the meridian, either it

¹⁷ See Volume I, Chapter 1 of *Galileo Was Wrong: The Church Was Right*.

would have been needless to request a miracle, or it would have been sufficient merely to have prayed for some retardation. Cajetan is of this opinion, to which Magellan [Cosme Magalhaens] subscribes, confirming it with the remark that Joshua had already done too many things that day before commanding the sun to stand still for him to have done them in half a day. Hence they are forced to interpret the words *in the midst of the heavens* a little knottily, saying that this means no more than that the sun stood still while it was in our hemisphere; that is, above our horizon. But unless I am mistaken we may avoid this and all other knots if, in agreement with the Copernican system, we place the sun in the “midst”—that is, in the center—of the celestial orbs and planetary rotations, as it is most necessary to do. Then take any hour of the day, either noon, or any hour as close to evening as you please, and the day would be lengthened and all the celestial revolutions stopped by the sun’s standing still *in the midst of the heavens*; that is, in the center, where it resides. This sense is much better accommodated to the words, quite apart from what has already been said; for if the desired statement was that the sun was stopped at midday, the proper expression would have been that it “stood still at noonday,” or “in the meridian circle,” and not “in the midst of the heavens.” For the true and only “midst” of a spherical body such as the sky is its center.¹⁸

Again, Galileo’s interpretation is illogical. If the sun were already in the “midst of heaven” by the mere physical fact that it occupies the center of the solar system, then there would be no reason for Joshua to associate the “midst of heaven” with the cessation of movement. Joshua 10:13 says: “And the sun stood still, and the moon stayed....The sun stayed in the midst of heaven, and did not hasten to go down for about a whole day.” Stating that the sun was “stayed in the midst of heaven” but with no relation to a cessation of its movement would be superfluous since, in the Copernican system, the sun already occupied the center of the heavens and has never ceased doing so. Moreover, Galileo ignores the impact of the moon on the interpretation of the passage. By using the moon as a reference marker, the passage is defining movement and cessation of movement. That is, a celestial body is in motion before Joshua’s command and ceases said motion after his command. If motion and direction toward the horizon is defined and accomplished

¹⁸ Translated by Stillman Drake in *Discoveries and Opinions of Galileo*, pp 213-214.

for the moon, it must also be the same for the sun, otherwise the passage is inconsistent and incongruous. Since in this case the moon must precede the sun in their mutual heading toward the horizon, the moon must stop at some place before it hits the horizon, which means the sun must be some distance further back. The only scientific possibility for that location is in the middle of the day sky or before the midday sky.

Additionally, Galileo is led to his peculiar interpretation because he cannot fathom why Joshua would ask for the sun to cease its travel across the sky at noon time if he could expect at least another half day of sun light to accomplish his task. But although Joshua's request may seem odd from a chronological perspective, it is quite appropriate from a logistical perspective. As we noted earlier, Joshua has no small task on his hands. Five armies surrounded him on this particular day. If after defeating the first army Joshua calculated how long it took to accomplish, he could then calculate how long it would take to defeat the other four armies. Apparently, by midday Joshua had calculated that the job could not be done in the remaining six to nine hours of light available to him. Even at four hours per army (which is a modest estimate considering that battles between two armies, both ancient and modern, might extend into days or weeks rather than hours), the total time of Joshua's battles would extend beyond twenty hours. An extra day would give Joshua another twenty-four hours in addition to the six or nine he had remaining on the first leg of the battles, making a total of thirty to thirty-three hours of battle time to be divided up among five armies, amounting to between six or seven hours per army, which is not an exorbitant amount by any militaristic standards. If we add in the fact that noonday light is much brighter than sunset light and therefore much easier for Joshua to spot the enemy as opposed to having the enemy hiding in dark hues and shadows, it is all the more conducive for him to stop the sun at midday. Also, the heat of the noonday sun would allow no reprieve for the tired and exhausted bodies of an enemy pursued by divine hailstones, whereas the coolness of a setting sun would give them much needed comfort.

Ecclesiasticus (Sirach) 46:3-5

³Who before him ever stood so firm? For he waged the wars of the Lord.

⁴Was not the sun held back by his hand? And did not one day become as long as two?

⁵He called upon the Most High, the Mighty One, when enemies pressed him on every side.

Here we have another witness to the events which occurred twelve hundred years earlier in the days of Joshua. It confirms that the sun was the moving object that needed to be stopped so that Joshua could complete his task. It confirms that the potential threat comprised a host of surrounding armies who were seeking to trap the Israelites. (Js 10:5 indicates that five kings, each with their separate army, sought to destroy Israel). Sirach puts the information into a series of rhetorical questions, which is his way of indicating that these events are established historical facts that only a fool would deny.

Habakkuk 3:11

¹¹The sun and moon stood still in their habitation at the light of thine arrows as they sped, at the flash of thy glittering spear.

The outstanding grammatical feature in this passage is the consistent use of Hebrew singulars, even though there are two celestial bodies in view. First, the lack of a conjunctive between “sun” and “moon” acts as a singular; second, the verb “stood still” (which uses the same word עמד (*amad*) utilized in Js 10:12-13) is in the singular; third, “habitation” is also in the singular. The purpose of the singulars is to treat the occurrence as one celestial phenomenon, perhaps because both the sun and moon ceased their motion as the universe at large stopped revolving altogether.

The recapping of the events of Joshua’s time are contextually significant here because it serves to remind the prophet Habakkuk of God’s mighty deeds of the past so that Habakkuk can have confidence that God will do the same in the present dire situation at hand. The book of Habakkuk is only three chapters long, but the drama is very intense. The outline is as follows:

- Hk 1:1-1-4: Habakkuk’s first question to God: Why do the evil Israelites go unpunished?
- Hk 1:5-1:11: God’s answer to Habakkuk: I will use the evil Babylonians to punish them.
- Hk 1:12-2:1: Habakkuk’s second question: Why are you using an evil nation to judge Israel?
- Hk 2:2-2:20: God’s answer: I will also judge the Babylonians after I use them to judge Israel.
- Hk 3:1-19: Habakkuk remembers all of God’s mighty deeds and judgments of the past and has his faith restored.

It is within the last pericope that Habakkuk recounts a number of God's previous mighty deeds, among them being the destruction of Cushan and Midian (Ex 15:14-16) as well as the plagues upon Egypt and Canaan (Ex 7:19-20; Js 3:16). These are historical events that serve to authenticate God's actions and confirm his promises to Habakkuk that He will bring the same vengeance upon Israel's present oppressor, Babylon. Hence, because the miraculous celestial event of Joshua's day is called upon as a testimony to God's faithfulness, the event is authenticated as a real historical occurrence, otherwise the very attribute of divine faithfulness that Habakkuk is seeking to exonerate would be built on false testimony.

2 Kings 20:9-12

⁹And Isaiah said, "This is the sign to you from the Lord, that the Lord will do the thing that he has promised: shall the shadow go forward ten steps, or go back ten steps?"

¹⁰And Hezekiah answered, "It is an easy thing for the shadow to lengthen ten steps; rather let the shadow go back ten steps."

¹¹And Isaiah the prophet cried to the Lord; and he brought the shadow back ten steps, by which the sun had declined on the dial of Ahaz.

¹²At that time Merodachbaladan the son of Baladan, king of Babylon, sent envoys with letters and a present to Hezekiah; for he heard that Hezekiah had been sick.

2 Chronicles 32:31

³¹And so in the matter of the envoys of the princes of Babylon, who had been sent to him to inquire about the sign that had been done in the land, God left him to himself, in order to try him and to know all that was in his heart.

³²Now the rest of the acts of Hezekiah, and his good deeds, behold, they are written in the vision of Isaiah the prophet the son of Amoz, in the Book of the Kings of Judah and Israel.

Isaiah 38:7-8

⁷"This is the sign to you from the Lord, that the Lord will do this thing that he has promised:

⁸Behold, I will make the shadow cast by the declining sun on the dial of Ahaz turn back ten steps." So the sun turned back on the dial the ten steps by which it had declined.

Together these three passages (2Kg 20:9-12; 2Ch 32:31; Is 38:7-8) are important because they specify the same occurrence and treat it as a miraculous event. Not only was the event known in Israel, but the king of Babylon had also heard and thus sent envoys to make an inquiry of the "sign." Similar to the account in Joshua in which two or three witnesses are included in order to authenticate the event as a real occurrence, so here we have the authors of Kings, Chronicles and Isaiah all testifying to the same miraculous event, with a foreign king as an internal witness to the three narratives.

The passages are also significant because they demonstrate that, of the two possible means to turn back the time which was displayed on the sundial of Hezekiah, it is the sun that is turned back in its course, not the Earth which is retarded in rotation. Indeed, Scripture knows nothing about a rotating Earth in order for it to be considered an option in a matter of celestial adjustment. If the Earth were rotating, there would be little reason for the narrator not to mention that it had been retarded by ten steps, since such a rotational reversal would have been just as stupendous as turning back the sun in its course. In fact, considering the disturbances and vibrations a sudden reversal of the Earth's rotation would have caused, it would have been more miraculous to mask such terrestrial effects than it would be for a curtailing of the sun's movement.

PANORAMA

On Time Dilation in Quasar Light Curves¹

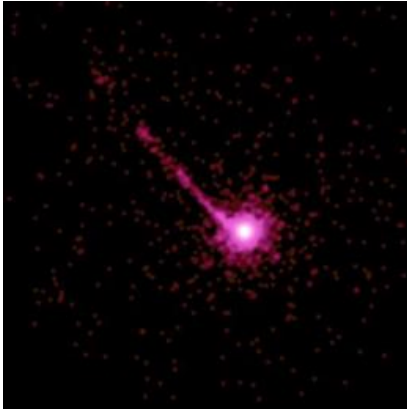


Figure 1: This X-ray image shows the quasar PKS 1127-145, a very intense source of both X-rays and light. It appears to be located about ten billion light years from earth. If so, its X-ray jet extends at least a million light years (ten times the diameter of the Milky Way) from the quasar. (Courtesy: NASA.)

The phenomenon of time dilation is one of the foundational cornerstones of the theories of relativity. In order to keep the speed of light constant everywhere, relativity shrinks objects in the direction they are moving and shortens time the faster objects go. That way, the ratio of length divided by time, which is speed (miles per hour or km/hour, for instance), is forced to remain constant. If time dilation does not exist, then the consequences are “unthinkable” for science, for that means that the usual explanation of the Michelson-Morley experiment’s failure to find evidence of the earth’s speed about the sun is an invalid explanation, implying geocentricity.

One of time dilation’s implications is that, because distant parts of the universe are moving away from us at speeds approaching the speed of light, time should appear to pass slower and events there should appear to occur more slowly than similar events located closer to us.

The abstract of Hawkins’ (not to be confused with the famous Stephen Hawkins of wheelchair fame) reads:

In this paper we set out to measure time dilation in quasar light curves. In order to detect the effects of time dilation, sets of light curves from two monitoring programmes are used to construct Fourier power spectra covering time-scales from 50 d to 28 yr. Data from high- and low-redshift samples are compared to look for the changes expected from time dilation. The main result of

¹ Hawkins, M. R. S., 2010. “On the Time Dilation of Quasar Light Curves,” *Monthly Notices of the Royal Astronomical Society*, **405**(3):1940.

the paper is that quasar light curves do not show the effects of time dilation. Several explanations are discussed, including the possibility that time dilation effects are exactly offset by an increase in time-scale of variation associated with black hole growth, or that the variations are caused by microlensing in which case time dilation would not be expected.

Translation: The power emitted by each of almost 900 quasars was observed for some length of time. The length of time any particular quasar was observed ranged anywhere from 50 days up to 28 years. The data thus recorded were divided into two classes: a class of low-redshift quasars whose distances averaged about 6 billion light years from earth, and a high-redshift sample averaging around 10 billion light years. The resulting periodicities found in each sample were compared to see if their periods were of the same length. Because of time dilation, it was expected that the 10-billion light-year group of quasars should average longer periods than the 6-billion light-year group. The expected time dilation was not observed. The rest of the paper deals with possible explanations that can rescue relativity's time dilation. These include:

- That the growth rate of the black holes exactly cancels the time dilation. (Theory has it that a quasar grows by sucking matter from its surroundings into the black hole at the core of the quasar.)
- That what was measured was not the true periodicity of the quasars but was instead a twinkling induced by tiny, undetectable black holes in somewhat the same way that stars appear to twinkle because of airflows in the atmosphere. The black hole effect is called "microlensing."
- That the more distant quasars, which allegedly formed shortly after the start of the Big Bang, are gravitationally damaged in such a way that the damage cancels out the predicted time dilation.

Then there are the unthinkable possibilities, not mentioned by Hawkins, some of which are far more likely than the microlensing by tiny black holes left over from the supposed Big Bang:

- One is the possibility that the universe is not expanding and that the Big Bang theory is wrong.
- Another possibility is that quasars may not be located at the distances indicated by their redshifts. Halton Arp's anomalous

redshifts have never yet been refuted, although there is no shortage of deniers of that claim.

- This may be another example of a phenomenon that has yet to receive much exposure and which I call “The Conspiracy Theory.” The Conspiracy Theory says that physics conspires to make it look as if the earth is at rest in the universe by hiding the motion of the earth through the firmament while showing only the relative rotation of earth and firmament. When it comes to “clocks,” such as pulsars (rapidly-rotating compacted stars) and, in this case, the time dilation effect of quasars, the clocks all “conspire” to arrive at earth as if the earth is not moving in orbit around the sun.²

As to the last point above, the periods of quasars are longer than the periods of pulsars, but the “Conspiracy” is relativistic in nature, which means that every relativistic phenomenon will conspire to show the earth at rest at the (bary-)center of the universe.

Lord willing, we shall have an article devoted to the Conspiracy Theory in the not-too-distant future.

German Physicists Trash Global Warming “Theory”

For any non-scientist interested in the climate debate, there is nothing better than a ready primer to guide you through the complexities of atmospheric physics—the “hardest” science of climatology. Here we outline the essential points made by Dr. Gerhard Gerlich, a respected German physicist, that counter the bogus theory of Anthropogenic Global Warming (AGW).³

Before going further, it’s worth bearing in mind that no climatologist ever completed any university course in climatology—that’s how new this branch of science really is. Like any new science, the fall-back position of a cornered AGW proponent is the dreaded “appeal to authority” where the flustered debater, out of his or her depth, will say, “Well, professor so-and-so says it’s true—so it must be true.” Don’t fall for that proxy tree-ring counter’s gambit any longer. Here is the finest shredding of junk science you will ever read.

In a recently revised and re-published paper, Dr. Gerlich debunks AGW and shows that the IPCC “consensus” atmospheric physics

² For a technical introduction to the “Conspiracy Theory,” see Ronald R. Hatch, 2004. “Those Scandalous Clocks,” *GPS Solutions*, **8**:67.

³ Gerlich, Gerhard, & Ralf D. Tscheuschner, 2009. “Falsification of the Atmospheric CO₂ Greenhouse Effects Within the Frame of Physics,” arXiv:0707.1161v4 [physics.aoph] 4 Mar.

model tying CO₂ to global warming is not only unverifiable, but actually violates basic laws of physics, i.e., the first and second laws of thermodynamics.⁴ The latest version of this momentous scientific paper appears in the March 2009 edition of the *International Journal of Modern Physics B*, vol. 23(3):275-364.

The central claims of Dr. Gerlich and his colleague, Dr. Ralf Tscheuschner, include, but are not limited to:

- 1) The mechanism of warming in an actual greenhouse is different than the mechanism of warming in the atmosphere, therefore it is not a “greenhouse” effect and should be called something else.
- 2) The climate models that predict catastrophic global warming also result in a net heat flow from atmospheric greenhouse gasses to the warmer ground, which is in violation of the second law of thermodynamics.

Essentially, any machine which transfers heat from a low temperature reservoir to a high temperature reservoir without external work applied cannot exist (the first law of thermodynamics can also be phrased as “Heat cannot flow uphill”). If it did it would be a “perpetual motion machine,” a concept generally confined to the realm of pure science fiction.

Gerlich’s and Tscheuschner’s independent theoretical study is detailed in a lengthy, mathematically complex (144 equations, 13 data tables, and 32 figures or graphs), and well-sourced (205 references) paper. The German physicists prove that even if CO₂ concentrations double (a prospect even global warming advocates admit is decades away), the thermal conductivity of air would not change more than 0.03%. They show that the classic concept of the glass greenhouse wholly fails to replicate the physics of earth’s climate. They also prove that a greenhouse operates as a “closed” system while the earth works as an “open” system and the term “atmospheric greenhouse effect” does not occur in any fundamental work involving thermodynamics, physical kinetics, or radiation theory. All through their paper, the German scientists show how greenhouse gas theory relies on guesses as to which scientific properties contribute to the “greenhouse effect,” let alone how much each property contributes, if it contributes at all. There is such a myriad and unquantifiable array of factors that is beyond even the abilities of the most powerful of modern supercomputers to handle them. The paper’s abstract states it neatly:

⁴ The first law of thermodynamics says that energy (or matter) can neither be created nor destroyed. The second law of thermodynamics says that no matter what happens in a system, the total entropy of the universe can only increase.

The atmospheric greenhouse effect, an idea that many authors trace back to the traditional works of Fourier (1824), Tyndall (1861), and Arrhenius (1896), and which is still supported in global climatology, essentially describes a fictitious mechanism, in which a planetary atmosphere acts as a heat pump driven by an environment that is radiatively interacting with but radiatively equilibrated to the atmospheric system. According to the second law of thermodynamics such a planetary machine can never exist.

Nevertheless, in almost all texts of global climatology and in widespread secondary literature it is taken for granted that such a mechanism is real and stands on a firm scientific foundation. In this paper the popular conjecture is analyzed and the underlying physical principles are clarified. By showing that:

1. there are no common physical laws between the warming phenomenon in glass houses and the fictitious atmospheric greenhouse effects,
2. there are no calculations that can determine an average surface temperature of earth or any planet,
3. the frequently-mentioned difference of 33 °C is a meaningless number calculated wrongly,
4. the formulas of cavity radiation [black body radiation] are used inappropriately,
5. the assumption of a radiative balance is unphysical,
6. thermal conductivity and friction must not be set to zero,

the atmospheric greenhouse conjecture is falsified.

The article, which spans 115 pages in the electronic format, thoroughly debunks the theory of man-made warming and shows that there is no mechanism whereby carbon dioxide in the cooler upper atmosphere can exert any thermal “forcing” effect on the warmer surface below. To do so would violate both first and second laws of thermodynamics. Unlike in a greenhouse, there is no glass roof on the earth to trap the excess heat, preventing its escape upward into space. Thus we conclude that the commonsense axioms are preserved: namely, that the deeper the ocean, the colder the water; and that heat rises, it does not fall.

Thunder Storms Generate Gamma Rays

High-energy bursts of gamma rays typically occur far out in space, perhaps near black holes or other high-energy cosmic phenom-

ena. So imagine scientists' surprise in the mid-1990s when they found these powerful gamma ray flashes happening right here on earth, in the skies overhead.

They're called Terrestrial Gamma-ray Flashes, or TGFs, and very little is known about them. They seem to have a connection with lightning, but TGFs themselves are something entirely different.

"In fact," says Doug Rowland of NASA's Goddard Space Flight Center, "before the 1990s nobody knew they even existed. And yet they're the most potent natural particle accelerators on earth." Individual particles in a TGF acquire a huge amount of energy, sometimes in excess of 20 mega-electron volts (MeV). In contrast, the colorful auroras that light up the skies at high latitudes are powered by particles with less than one thousandth as much energy.

At this time, there are more questions about TGFs than answers. What causes these high-energy flashes? Do they help trigger lightning—or does lightning trigger them? Could they be responsible for some of the high-energy particles in the Van Allen radiation belts which can damage satellites?

Most of what's known about TGFs to date has been learned from missions meant to observe gamma rays coming from deep space, such as NASA's Compton Gamma Ray Observatory which discovered TGFs in 1994. As it stared out into space, Compton caught fleeting glimpses of gamma rays out of the corner of its eye, so to speak. The powerful flashes were coming from earth's atmosphere.

Subsequent data from Compton and other space telescopes have provided a tantalizingly incomplete picture of how TGFs occur. In the skies above a thunderstorm, powerful electric fields generated by the storm stretch upward for many miles into the upper atmosphere. These electric fields accelerate free electrons, whisking them to speeds approaching the speed of light. When these ultra-high-speed electrons collide with molecules in the air, the collisions release high-energy gamma rays as well as more electrons, setting up a cascade of collisions and perhaps more TGFs.

To the eye, a TGF probably wouldn't look like much. Unlike lightning, most of a TGF's energy is released as invisible gamma rays, not visible light. TGFs don't produce colorful bursts of light like sprites and other lightning-related phenomena. Nevertheless, these unseen eruptions could help explain why brilliant lightning strikes occur.

A longstanding mystery about lightning is how a strike gets started. Scientists know that the turbulence inside a thundercloud separates electric charges, building up enormous voltages. But the voltage needed to ionize air and generate a spark is about 10 times greater than the voltage typically found inside storm clouds.

“We know how the clouds charge up,” Rowland says, “we just don’t know how they discharge. That is the mystery.” TGFs could provide that spark. By generating a quick burst of electron flow, TGFs might help lightning strikes get started, Rowland suggests. “Perhaps this phenomenon is why we have lightning,” he says.

If so, there ought to be many more TGFs each day than currently known. Observations by Compton and other space telescopes indicate that there may be fewer than 100 TGFs worldwide each day. Lightning strikes millions of times per day worldwide. That’s quite a gap. Still, satellites such as Compton are pointed away from the earth, to study deep space. They are not designed to observe gamma rays from earth, so estimates based on their counts are likely to be low.

The Bible does weigh in on the matter. While challenging Job’s understanding of creation, God says this to him:

Who hath divided a watercourse for the overflowing of waters, or a way for the lightning of thunder? (Job 38:35)

So far we have a rudimentary understanding of the way for lightning to follow. It wasn’t recognized until the 1970s that lightning followed a path or way which has to be there first before the lightning bolt can form. The current mystery is how that “way” forms in the first place. The cosmic-ray generator that causes the Terrestrial Gamma-ray Flashes may give us a clue as to what happens at the boundary between the firmament where the stars are (Genesis 1:16) and the open firmament where the birds are (Genesis 1:20). Presumably, the windows of heaven are located at that boundary (Genesis 7:11). TGFs may deepen our understanding of the “way for the lightning.”

Introducing...Dark Flow

As if dark energy and dark matter are not enough to fill the cosmic void, we now have something new: Dark Flow. The following report appeared in early 2009 in *New Scientist*, written by Amanda Geffer and entitled “Dark Flow: Proof of Another Universe?” It is dated 23 January 2009 and appeared in issue 2692. No page number is given in the web posting. The source article⁵ describes a sizeable chunk of the universe that violates the Copernican principle that the earth should not look as if it is in a central position of the universe. That principle has been restated as the “The Cosmological Principle,”

⁵ Kashlinsky, A., F. Atrio-Baradela, D. Kocevski, & H. Ebling, 2008. “A Measurement of Large-scale Peculiar Velocities of Clusters of Galaxies: Results and Cosmological Implications,” arXiv:astro-ph/0809.3734 (also cf 0809.3733).

that at sufficiently large scales, the universe should look the same regardless of which direction we look. Both the Copernican and Cosmological principles were invented to counter the mountain of evidence that the earth is at the center of the universe. In essence, the principle says that all points in the universe should look as if they are in the center of the universe. That way, earth is not in a special place. So, in the first instance, the article deals with a phenomenon that supports geocentricity.

The article contains some moderately technical material, but it is designed to be readable to most people with a nodding acquaintance with basic, popular astronomy. When the article says that an idea or hypothesis is a claim, you should take that at face value. A claim is not proof. Also, a claim is not necessarily the best explanation possible. Finally, note that dark matter is not necessary to explain any “mysterious” properties of the universe if the universe is a geocentric universe. Since *New Scientist* is a British publication, the English spelling will be preserved in the text, which is quoted from this point forward until the section labeled “My Comments.”

For most of us the universe is unimaginably vast. But not for cosmologists. They feel decidedly hemmed in. No matter how big they build their telescopes, they can only see so far before hitting a wall. Approximately 45 billion light years away lies the cosmic horizon, the ultimate barrier because light beyond it has not had time to reach us.

So here we are, stuck inside our patch of universe, wondering what lies beyond and resigned to that fact we may never know. The best we can hope for, through some combination of luck and vigilance, is to spot a crack in the structure of things, a possible window to that hidden place beyond the edge of the universe. Now Sasha Kashlinsky believes he has stumbled upon such a window.

Kashlinsky, a senior staff scientist at NASA’s Goddard Space Flight Center in Greenbelt, Maryland, has been studying how rebellious clusters of galaxies move against the backdrop of expanding space. He and colleagues have clocked galaxy clusters racing at up to 1000 kilometres per second - far faster than our best understanding of cosmology allows. Stranger still, every cluster seems to be rushing toward a small patch of sky between the constellations of Centaurus and Vela.

Kashlinsky and his team claim that their observation represents the first clues to what lies beyond the cosmic horizon. Finding out could tell us how the universe looked immediately after the big bang or if our universe is one of many. Others aren’t so sure. One rival interpretation is that it is nothing to do with alien universes but the result of

a flaw in one of the cornerstones of cosmology, the idea that the universe should look the same in all directions. That is, if the observations withstand close scrutiny.

All the same, colleagues are sitting up and taking notice. “This discovery adds to our pile of puzzles about cosmology,” says Laura Mersini-Houghton of the University of North Carolina, Chapel Hill. Heaped in that pile is 95 per cent of the universe’s contents, including the invisible dark matter that appears to hold the galaxies together, and the mysterious dark energy that is accelerating the universe’s expansion. Accordingly, Kashlinsky named this new puzzle the “dark flow.”

Kashlinsky measures how fast galaxy clusters up to 5 billion light years away are travelling by looking for signs of their motion in the cosmic microwave background (CMB), the heat left over from the big bang. Photons in the CMB generally stream uninterrupted through billions of light years of interstellar space, but when they pass through a galaxy cluster they encounter hot ionised gas in the spaces between the galaxies. Photons scattered by this gas show up as a tiny distortion in the temperature of the CMB, and if the cluster happens to be moving, the distortion will also register a Doppler shift.

In any individual cluster, this shift is far too small to detect, which is why no one had ever bothered looking for it. However, Kashlinsky realised if he combined measurements from a large enough number of clusters, the signal would be amplified to a measurable level.

Kashlinsky and his team collected a catalogue of close to 800 clusters, using telescopes that captured the X-rays emitted by the ionised gas within them. They then looked at the CMB at those locations, using images snapped by NASA’s WMAP [the Wilkinson Microwave Anisotropy Probe’s temperature mapping] satellite. What they found shocked them. Galaxy clusters are expected to wander randomly through their particular region of space, because matter is distributed in uneven clumps, creating local gravitational fields that tug on them. Over large scales, however, matter is assumed to be spread evenly, so on these scales the clusters should coast along with space as it expands. What’s more, everything in the standard model of cosmology suggests that the universe should look pretty much the same in all directions.

Out of bounds

So what is behind the dark flow? It can’t be caused by dark matter, Kashlinsky says, because all the dark matter in the universe wouldn’t produce enough gravity. It can’t be dark energy, either, because dark energy is spread evenly throughout space. That, leaves only

one possible explanation, he concludes: something lurking beyond the cosmic horizon is to blame.

Before the findings were published in October [2009] in *The Astrophysical Journal Letters* (vol 686, p L49), Kashlinsky knew how heretical his idea would seem. “We sat on this for over a year checking everything,” he says. “It’s not what we expected or even wanted to find, so we were sceptical for a long time. But ultimately it’s what’s in the data.”

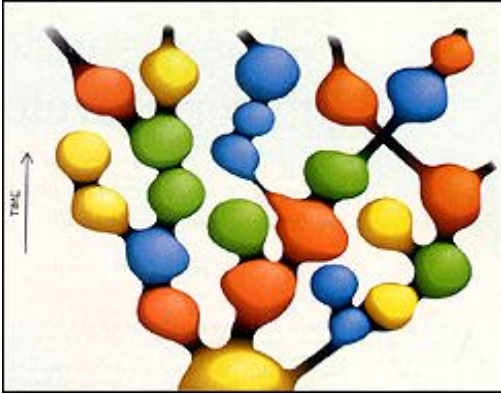


Figure 2: *A Multiverse.* Kashlinsky proposes that, if we were in the bottom red universe at left, the effect he has discovered is due to the yellow universe at the bottom.
(Figure added by your editor.)

No one knows exactly what might lurk over the horizon or indeed how large the cosmos is (see “Just how big is the universe?”) But Kashlinsky suspects it is a remnant of the chaotic state that existed just a fraction of a second after the beginning of time, before a phenomenon known as inflation took hold.

It is generally thought that our universe began as a tiny patch in some pre-existing space-time forming a bubble which then underwent a burst of exponential expansion. This period of inflation stretched and smoothed our universe, leaving an even distribution of matter and energy. Outside this bubble, far beyond our cosmic horizon, things might look very different. Without inflation’s ironing skills, space-time could be highly irregular: smooth in one neighbourhood and with massive structures or giant black holes in another. “It could be as bizarre as one can imagine, or something rather dull,” says Kashlinsky. Either way, he suggests that something outside our bubble is tugging on our galaxy clusters, causing the dark flow.

Other, more radical, explanations for dark flow have also been floated. It is possible - even likely, some say - that ours wasn’t the only bubble to inflate out of primordial space-time. In this “eternal inflation” scenario, bubbles pop up all over the place, each defining its own universe within a larger multiverse.

Many cosmologists are happy to relegate those other universes to that dusty corner of theory where unobservable by-products are stored. Mersini-Houghton is not one of them. She argues that the dark flow is caused by other universes exerting a gravitational pull on galaxy clusters in our universe. She and her colleagues calculated how other universes, scattered at random around our bubble, would alter the gravity within it (www.arxiv.org/abs/0810.5388). “When we estimated how much force is exerted on the clusters in our universe, I was surprised that the number matched amazingly well with what Kashlinsky has observed,” she says. “I firmly believe that this is the effect of something outside of our universe.”

Others believe dark flow could be a sign that our bubble universe crashed into another bubble just after the big bang. In eternal inflation each bubble universe can pop into existence with its own unique set of particles and forces of nature, so collisions between bubbles can have dramatic consequences. If two universes with the same physics collide, they will generate a burst of energy, then merge. However, if two very different universes collide, a cosmic battle ensues. At the site of the crash, a wall of energy called a domain wall will form, holding the two incompatible worlds apart. The bubble with lower energy then expands, sending the domain wall sweeping through its rival, obliterating everything in its path.

The dark flow could be a sign that our bubble universe crashed into another soon after the big bang

If our universe underwent such a collision, any lingering evidence of the cosmic wreckage should appear in the part of the sky facing the impact site. The collision’s impact should distort space, and that would in turn affect how light rays, including the CMB, travel through it and how large-scale structures, including galaxies and clusters, evolve. Looking out across the sky today, we would expect to see the universe exhibiting strange properties in the direction of the collision.

The collision might have imprinted a special direction onto the CMB, says physicist Anthony Aguirre of the University of California, Santa Cruz. “As you move away from the special direction, the temperature [of the CMB] would change.” Physicists are now combing the data looking for the hallmarks of such a shift. Whenever there are weird things happening on a large scale within the galaxy, the remnants of a collision are a candidate for explaining it, Aguirre says.

A completely different take on dark flow comes from Luciano Pietronero of La Sapienza University in Rome, Italy and Francesco Sylos Labini of the Enrico Fermi Center in Rome, Italy. They say the

standard cosmological model is wrong, and that a different model might explain the motion of galaxy clusters that Kashlinsky found. “This is just another element pointing toward the fact that the standard picture of galaxy formation is not correctly describing what is going on in the real universe,” Pietronero says.

Predictions of the motion of galaxy clusters based on the conventional model assume matter is evenly distributed throughout space on very large scales. Pietronero and Sylos Labini claim analysis of the distributions of galaxies and galaxy clusters throughout the sky shows that this is not true, and that at large scales matter is like a fractal.⁶ If that is the case, the gravitational field throughout the universe would also be irregular and could lead to the effects Kashlinsky observed. New results from the Sloan Digital Sky Survey, which has already mapped about a million galaxies, will help give Pietronero and Sylos Labini a more precise picture of the spread of matter, which they hope will confirm their ideas. “I think we will have interesting news very soon,” says Sylos Labini.

A fractal universe would, however, raise big problems of its own. For one thing, a fractal distribution of matter is incompatible with cosmic inflation, so theorists would be left to figure out how it arose in the first place (*New Scientist*, 10 March 2007, p 30).

Probing the multiverse

Physicist Douglas Scott of the University of British Columbia in Vancouver, Canada, is also sceptical that dark flow is evidence of anything outside our observable universe. “There is no reason at all to expect it to come from structures beyond the horizon,” he says. Scott notes that so far dark flow has only been observed out to distances that are only a few per cent of the total distance to the horizon. “If the effect is real,” he says, “then the likely explanation would be some very large-scale structure, but still within the horizon.” Such a structure, though, would still present a major challenge to cosmology’s standard model.

The most important thing now is to confirm that dark flow is real and that it continues all the way out to the cosmic horizon. Two other teams have made measurements consistent with Kashlinsky’s results, but only on scales less than 200 million light years—just a short step compared to the distance out to the horizon.

⁶ Ed. note: a fractal is a fractional dimension. We are used to thinking in terms of one dimension or two dimensions, or three, but there are situations in which something might have 3.739 dimensions. This is counter intuitive but work is progressing in the realm of fractals. Most people only see fractals as colorful, pretty, repeating designs.

To confirm their finding, Kashlinsky's team will be analysing more recent WMAP data and working with researchers at the University of Hawaii on data from an all-sky X-ray catalogue. The tiny Doppler effect that Kashlinsky uses to measure the clusters' velocities is only observable in bulk, which means the more galaxy clusters he can look at the better. "If confirmed, this will be an exciting way of probing the ultimate structure of the universe and perhaps even the multiverse," Kashlinsky says. "But you have to check and recheck."

"If this thing is confirmed and it is real, it will be incredibly important," says Aguirre, "on the same order of discovery as the realisation that those little smudges on the sky are other galaxies. The most important thing it would tell us is that the standard picture is broken in some way. And the most exciting thing it could tell us is that there are other universes." If it does, space and time will open up to reveal a reality that is so much bigger than we know. When that happens, those claustrophobia-stricken cosmologists will finally be able to breathe easy.

Just how big is the universe?

It is 13.7 billion years since the big bang, so light now reaching us cannot have started its journey longer ago than that. Yet the most distant object we could conceivably see today lies further away than 13.7 billion light years. That's because throughout the life of the universe, space has been expanding. Taking this into account, cosmologists calculate that the edge of our observable universe is now approximately 45 billion light years away.

Beyond that, who knows? The inflation theory of cosmology predicts that the universe grew from a bubble. Just how big that bubble has now become depends on how long inflation lasted. If it continued for a very long time—in this context "very long" is still only a fraction of a second—then the edge of our universe might lie far beyond the 45-billion-light-year limit of our vision. That could also rule out the possibility of observing the influence of other universes on our own. As physicist Matthew Kleban of New York University puts it: "It's totally possible that we live in a multiverse and we'll never know because there's been so much inflation."

My Comments

Of course, I don't believe that the universe is billions of years old. Furthermore, in a geocentric universe the entire gravitational field of the universe is tied to the earth. In that case, there is no need to postulate multiverses, also called parallel universes. As I've pointed out in

the past, parallel universes, that is multiverses as now appears to be the new moniker for the many-universes models, are the rage because their equations are easily solved. The single-universe model is extremely difficult to solve. The difficulty lies in selecting what reference point should be at its “center.” Clearly, that center is well-defined in the geocentric universe. The universe can be only 6,000 years old and still look as if it is tens of billions of years old if we select the correct expansion rate.

The first inflationary-universe model came from the old Soviet Union and aged the universe to its present size and properties in about 100,000 years. That was circulated verbally in the West circa 1972 and is rarely mentioned except indirectly. It took about a decade for cosmologists to find the proper expansion rate to age the universe to its present state in 10-20 billion years. Cosmologists could have gone the opposite direction in time and found the expansion rate and its “when” to bring it to its present state in 6 days.

As for the material from which the universe was formed, Scripture tells us that material precipitated from the power of God.⁷ Since Creation starts out with intelligence, namely the infinite intelligence of God, the created universe can have as many God-like properties as God would desire it to have. It could be intelligent, in the sense of awareness of its surroundings (e.g., gravity, electromagnetic fields, all the way to human intelligence).

In contrast, modern inflation models start with the firmament, that is, on the second day of creation. There the Lord told us that the firmament was to separate the waters above from those below. In essence, this placed the waters above at the boundary between the second heaven (outer space or firmament) and the third heaven where the throne of God is located. Whereas the firmament may well have been stretched out since Scripture says something to that effect, it may well have undergone an inflationary event; but since modern inflationary models start with an already-created firmament, they cannot apply to the inflation of the firmament.

If there were inflation of the material in the universe on the fourth day of creation, it would correspond to the type of inflation we hear of from today’s secular scientists. This leaves open the question, “If Kashlinsky is correct, is the anomalous speed due to an irregularity in the firmament, or is it due to something in the third heaven?” We cannot answer that question until we are certain of the observations and compute what irregularity in the firmament would induce such an ef-

⁷ Romans 1:20 For the invisible things of him from the creation of the world are clearly seen, being understood by the things that are made, even his eternal power and Godhead; so that they are without excuse.

fect. Kashlinsky's observation, if confirmed, cannot damage the Bible's account of creation for the simple reason that the foundation of Kashlinsky's model for the origin of the universe is founded on the firmament and does not allow us to ask the question, "Who created the firmament?"

Is God Hiding the God Particle?

One of the great unsolved mysteries in physics is mass. What is mass? A related question is, What is inertia? Inertia is the force you feel when a vehicle accelerates, goes around a bend, and decelerates. These are puzzling concepts, but there is one theory that proposes the existence of a particle that imparts mass to other particles. That particle, or set of particles,⁸ is formally called a "Higgs boson" and has been nicknamed "The God Particle." A boson is any of a class of particles, such as the photon, pion, or alpha particle (a helium nucleus without electrons), that have zero or integral spin and allow any number of identical particles to occupy the same quantum state.

Of all the equipment searching for evidence of the Higgs boson, the most famous is the Large Hadron Collider (LHC) operated by the European group, CERN. Hadron refers to any particle that is made up of quarks; quarks are a family of sub-particles.⁹ The LHC lies in a tunnel 17 miles (27 km) in circumference, and as much as 574 ft (175m) beneath the Franco-Swiss border near Geneva, Switzerland. It is the largest particle collider in the world and has had its problems getting up and running. But things seem to be running smoothly these last few months.

But while the problems with the Large Hadron Collider were being solved, a tongue-in-cheek rumor was circulating among its researchers that the Collider was actively hiding the God particle. It makes for interesting reading, but remember, this is tongue-in-cheek; it is not *real* physics but is allowable in the realm of Einsteinian relativity. The story unfolded in October 2009.¹⁰

Explosions, scientists arrested for alleged terrorism, mysterious breakdowns—recently CERN's Large Hadron Collider (LHC) has begun to look like the world's most ill fated experiment. Is it really

⁸ In June 2010, it was discovered that instead of one particle, there might be a family of particles that produce mass.

⁹ The number of smaller particles making larger particles seems endless. Rather than believing in a smallest particle from which all other particles are made, I believe rather that there is a finite set of rules on how particles can be created.

¹⁰ Leake, Jonathan, 2009. "A Particle God Doesn't Want Us to Discover: Large Hadron Collider woes from the Future." *The Sunday Times*, October 18, *Times Online*.

nothing more than bad luck or is there something weirder at work? Such speculation generally belongs to the lunatic fringe, but serious scientists have begun to suggest that the frequency of CERN's accidents and problems is far more than a coincidence.

The LHC, they suggest, may be sabotaging itself from the future—twisting time to generate a series of scientific setbacks that will prevent the machine fulfilling its destiny. At first sight, this theory fits comfortably into the crackpot tradition linking the start-up of the LHC with terrible disasters. The best known is that the £3 billion particle accelerator might trigger a black hole capable of swallowing the Earth when it gets going. Scientists enjoy laughing at this one.

This time, however, their ridicule has been rather muted—because the time travel idea has come from two distinguished physicists who have backed it with rigorous mathematics. What Holger Bech Nielsen, of the Niels Bohr Institute in Copenhagen, and Masao Ninomiya of the Yukawa Institute for Theoretical Physics in Kyoto, are suggesting is that the Higgs boson, the particle that physicists hope to produce with the collider, might be “abhorrent to nature.”

What does that mean? According to Nielsen, it means that the creation of the boson at some point in the future would then ripple backwards through time to put a stop to whatever it was that had created it in the first place. This, says Nielsen, could explain why the LHC has been hit by mishaps ranging from an explosion during construction to a second big bang that followed its start-up. Whether the arrest of a leading physicist for alleged links with Al-Qaeda also counts is uncertain.

Nielsen's idea has been likened to that of a man traveling back through time and killing his own grandfather before he has any children. “Our theory suggests that any machine trying to make the Higgs shall have bad luck,” he said. “It is based on mathematics, but you could explain it by saying that God rather hates Higgs particles and attempts to avoid them.”

His warnings come at a sensitive time for CERN, which is about to make its second attempt to fire up the LHC. The idea is to accelerate protons to almost the speed of light around the machine's 17-mile underground circular racetrack and then smash them together. In theory the machine will create tiny replicas of the primordial “big bang” fireball thought to have marked the creation of the universe. But if Nielsen and Ninomiya are right, this latest build-up will inevitably get nowhere, as will those that come after—until eventually CERN abandons the idea altogether.

This is, of course, far from being the first science scare linked to the LHC. Over the years it has been the target of protests, wild specu-

lation and court injunctions. Fiction writers have naturally seized on the subject. In *Angels and Demons*, Dan Brown sets out a diabolical plot in which the Vatican City is threatened with annihilation from a bomb based on antimatter stolen from CERN. *Blasphemy*, a novel from Douglas Preston, the bestselling science-fiction author, draws on similar themes, with a story about a mad physicist who wants to use a particle accelerator to communicate with God. The physicist may be American and the machine located in America, rather than Switzerland, but the links are clear.

Even Five, the TV channel, has got in on the act by screening *FlashForward*, an American series based on Robert Sawyer's novel of the same name in which the start-up of the LHC causes the earth's population to black out for two minutes when they experience visions of their personal futures 21 years hence. This gives them a chance to change that future.

Scientists normally hate to see their ideas perverted and twisted by the ignorant, but in recent years many physicists have learnt to welcome the way the LHC has become a part of popular culture. CERN even encourages filmmakers to use the machine as a backdrop for their productions, often without charging them.

Nielsen presents them with a dilemma. Should they treat his suggestions as fact or fiction? Most would like to dismiss him, but his status means they have to offer some kind of science-based rebuttal. James Gillies, a trained physicist who heads CERN's communications department, said Nielsen's idea was an interesting theory "but we know it doesn't happen in reality." He explained that if Nielsen's predictions were correct then whatever was stopping the LHC would also be stopping high-energy rays hitting the atmosphere. Since scientists can directly detect many such rays, "Nielsen must be wrong," said Gillies. He and others also believe that although such ideas have an element of fun, they risk distracting attention from the far more amazing ideas that the LHC will tackle once it gets going.

The Higgs boson, for example, is thought to give all other matter its mass, without which gravity could not work. If the LHC found the Higgs, it would open the door to solving all kinds of other mysteries about the origins and nature of matter. Another line of research aims to detect dark matter, which is thought to comprise about a quarter of the universe's mass, but made out of a kind of particle that has so far proven impossible to detect.

However, perhaps the weirdest of all CERN's aspirations for the LHC is to investigate extra dimensions of space. This idea, known as string theory, suggests there are many more dimensions to space than the four we can perceive. At present these other dimensions are hid-

den, but smashing protons together in the LHC could produce gravitational anomalies, effectively tiny black holes, that would reveal their existence. Some physicists suggest that when billions of pounds have been spent on the kit to probe such ideas, there is little need to invent new ones about time travel and self-sabotage.

History shows, however, it is unwise to dismiss too quickly ideas that are initially seen as science fiction. Peter Smith, a science historian and author of *Doomsday Men*, which looks at the links between science and popular culture, points out that what started as science fiction has often become the inspiration for big discoveries. “Even the original idea of the ‘atomic bomb’ actually came not from scientists but from H. G. Wells in his 1914 novel *The World Set Free*,” he said.

“A scientist named Leo Szilard read it in 1932 and it gave him the inspiration to work out how to start the nuclear chain reaction needed to build a bomb. So the atom bomb has some of its origins in literature, as well as research.”

Some of CERN’s leading researchers also take Nielsen at least a little seriously. Brian Cox, professor of particle physics at Manchester University, said: “His ideas are theoretically valid. What he is doing is playing around at the edge of our knowledge, which is a good thing.

“He is pointing out that we don’t yet have a quantum theory of gravity, so we haven’t yet proved rigorously that sending information into the past isn’t possible.

“However, if time travelers do break into the LHC control room and pull the plug out of the wall, then I’ll refer you to my article supporting Nielsen’s theory that I wrote in 2025.”

This weekend, as the interest in his theories continued to grow, Nielsen was sounding more cautious. “We are seriously proposing the idea, but it is an ambitious theory, that’s all,” he said. “We already know it is not very likely to be true. If the LHC actually succeeds in discovering the Higgs boson, I guess we will have to think again.”

POINTS TO PONDER

There is a general Biblical principle that “justice, justice shalt thou pursue” which means that you cannot achieve a noble end by use of an immoral device like Bolshevism—a form of a bubonic plague of thought—to achieve justice, as though that were possible from such haters of all humanity as Trotsky.

—D. K. Lifschultz

CREDO

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We believe that the creation was completed in six twenty-four hour days and that the world is not older than about six thousand years. We maintain that the Bible teaches us of an earth that neither rotates daily nor revolves yearly about the sun; that it is at rest with respect to the throne of him who called it into existence; and that hence it is absolutely at rest in the universe.

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To the law and to the testimony: if they speak not according to this word, it is because there is no light in them.

– Isaiah 8:20

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