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**SPRING 2008**



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**Front Cover:** Bottle Green Moldavite tektite backlit by reflected sunlight. Photograph by John T. Unruh. See "Tektites" article in this issue.

# THE BIBLICAL ASTRONOMER

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## EDITORIAL

In the current issue we present one of the papers presented at the Third International Conference on Absolutes held in Houston last year. Amateur astronomer J. Timothy Unruh presents the results of his long interest in tektites. Mr. Unruh wrote a similar article for the *B.A.* in 1992. He makes a good case for the hypothesis that tektites originate from the moon.

The primary focus of the Readers' Forum in this issue is geocentricity. Many of the websites advertise that they provide open forums for debate, but they actually exist to promote the owner's beliefs and faith. A prime example is the much-decorated "Bad Astronomer" website. If, however, a creationist or geocentrist starts humiliating the evolutionist or heliocentrist argument, the moderator bans him. One geocentric advocate has been banned more than thirty times from the site. Each time he takes a new identity and starts the debate over again. The main letter in this issue's "Forum" is the type of letter that gets its author banned from the "Bad Astronomer" website.

The third article is about the speed of waves through the firmament and is taken from the appendix of the main article in issue 99 of *The Biblical Astronomer*. The derivations and calculations were reexamined and the results are presented for different types of waves. It is no surprise that transverse waves (such as ocean waves and light waves) move at the speed of light. Temperature is a measure describing the energy of molecules and atoms colliding with one another, thus bouncing around at a wide range of speeds. The average speed is computed and falls between the speed of light and 1.75 times the speed of light, depending on the number of degrees of freedom in the firmament. A degree of freedom is synonymous with being able to move in one dimension, thus three degrees of freedom means free to move in up to three dimensions. Finally, the speed of a particular kind of compression wave, formally known as a longitudinal wave, is determined to be much faster than the speed of light, capable of traversing the universe in a hundred-billionth of a second.

### **Another Conference?**

At the end of last year's conference the feeling was, "Let's do this again real soon." Late last year there was some talk about having another, smaller conference in the greater Cleveland area; however, the time was too short. So we would like to try for summer of 2009.

The main problem with the Cleveland venue is that it is forty miles from the airport and five miles from the nearest lodging other

than a campground which is about two miles away. What this means is that participants will have to arrange their own transportation to, during, and from the conference. We are open to another venue if anyone would care to assume the responsibility of organizing it. If anyone is so inclined, please advise the editor via mail or email (see inside front cover).

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## Geocentricity Limerick

Dr. Thomas M. Strouse

The Father made the sun go up and down,  
 And the heavens and stars go around and around,  
     With earth in her fixed place,  
     He sent Christ's saving grace,  
 So His glory throughout creation should be known.

\*\*\*\*\*

In the book, *The Theory of Electrons, 1915*, after introducing the theory of "electrons" (he invented them) Lorentz came to his item 7, in which he said:

"Indeed, one of the most important of our fundamental assumptions must be that the ether not only occupies all space between molecules, atoms or electrons, but that it pervades all these particles. We shall add the hypothesis that, though the particles may move, the ether always remains at rest. We can reconcile ourselves with this, at first sight, somewhat startling idea, by thinking of the particles of matter as of some local modification in the state of the ether. These modifications may of course very well travel onward while the volume-elements of the medium in which they exist remain at rest."

If we slightly modify Lorentz's hypothesis that his universally stationary material ether is completely "incompressible" and allow that it is very slightly compressible (wherefore it will conduct wave systems at a finite rather than infinite velocity), his theory is logically tenable.

# TEKTITES

## MYSTERIOUS GLASSY PEBBLES

**J. Timothy Unruh**

*My interest in tektites began in childhood, before the advent of the space age. As a boy, already interested in astronomy, I first became fascinated by them when I heard say of “mysterious little green rocks from the Moon.” Since that time I have collected and studied these intriguing little glassy pebbles and have written and lectured innumerable times about them to equally fascinated audiences.*



Splashform Tektites from Indochina (author's collection)

### **Introduction and Background**

Tektites are small pieces of natural glassy-like material found in specific areas of the world. With some exceptions tektites resemble terrestrial obsidian. The name tektite is derived from the Greek word “tektos,” which means *molten* or *melted*, a term selected because of unmistakable evidence that these glassy particles were shaped while in plastic condition. Their origin is one of the great mysteries of modern

science, but it is certain they made at least one passage through Earth's atmosphere. Tektites have been known since ancient times, and in every region where they have been found, they have been collected because of their distinct difference from the surface materials in which they are found. In some cases primitive people made artifacts from tektites. The uniqueness of tektites also led to the early suspicion that they were extraterrestrial. Because of their evidence of an extraterrestrial origin, discussions of tektites are usually included as a separate chapter in most books about meteorites.

Even though tektites have been closely associated with stony and metallic meteorites, these "glassy meteorites" differ in some important respects. Their form, composition, surface markings, and distribution indicate they came from a source different from that of typical meteorites, and it is evident they encountered the Earth's atmosphere at speeds somewhat less than that of most meteorites. Unlike meteorites which continuously enter the Earth's atmosphere, a tektite fall has never been observed. The study or science of tektites, being a relatively recent development has, as yet, no well-known formal designation by name. Geo-tektites and astro-ceramics have been suggested, although a third, *tektitics*, is the term preferred by this writer.

The truly puzzling nature of these enigmatic objects is evidenced by the many theories that have been proposed to explain their origin. Early suggestions have included terrestrial lava bombs, glass worked by ancient artificers, gizzard stones of ancient birds or fossilized excreta, concretions in limestone, atmospheric or terrestrial dust fused by lightning (fulgurites), and, of course, glass meteorites. However, it has been only within the last 150 years or so that tektites have come under serious scientific scrutiny. Tektites have been subjected to nearly every conceivable kind of analysis and a considerable amount of data has been accumulated about them, but only a rough idea of the process of their formation has emerged. Discussions between scientists of differing opinions often continue to a spirited degree. Almost all the literature that has been published about tektites has been written with the assumption of uniformity with its great ages of Earth history.

### **Some Important Facts We Know about Tektites**

There are a number of well-established and significant facts about tektites that have been gathered over the years. Hence, any finally-accepted hypothesis on their origin must be harmonized with all of these facts.

Tektites are found in about a dozen specific areas of the world called strewn fields. The more significant of these strewn fields in-

cludes Southeast Asia (Indo-China), Philippine Islands, Australia, Moldavia in Czechoslovakia, Libya in Africa, and areas within North America, including regions in Georgia and Texas. Respectively, specimens from these areas are called Indochinites, Philippinites, Australites, Moldavites, Libyan Desert Glass, Georgiaites, and Bedlasites from the area of Bedias, Texas.

Tektites range in size from tiny particles smaller than a grain of sand called micro-tektites, through intermediate sizes of curious shapes weighing up to several hundred grams, to, in rare cases, blocks the size of a football. A typical tektite found in a strewn field might be about the size of a fingertip or a small walnut. Tektites appear to be the same size as they were when they were created. In other words, they do not appear to be pieces broken from larger formations, and they seem to have rapidly cooled after being in a molten state for a short period of time, perhaps on the order of minutes.

The shape of tektites is one of their most outstanding characteristics and is indicative of a once semi-fluid state. Their surface markings are strongly suggestive of a high velocity flight through the atmosphere where they were ablated and sculptured aerodynamically. At the same time, their structures strongly evidence that their forms have been attained while spinning freely. Many of the intermediate-sized tektites are shaped like spheres, eggs, dumbbells, bowling pins, teardrops, bars, disks, lenses, buttons, and other nondescript forms. The kinetically-formed shapes of the Indochinites are called "splash form," a term originated by the late Virgil E. Barnes, director of tektite research at the University of Texas.

Overall, tektites occur in five distinct forms: 1. aerodynamic forms most noticeable in the small lenses and flanged button australites, 2. kinetically-shaped splash form Indochinites which are the most commonly-known type, 3. large homogenous moderately-rough glassy nondescript specimens without the characteristic splash form shapes, 4. the occasionally-larger rough and gritty layered Muong Nongs, and 5. the tiny micro-tektites which appear like glassy spheroids under a microscope.

Tektites are geographically specific. In other words, they are found in widespread groups limited to certain areas of the world, in the aforementioned strewn fields. Each group seems to have arrived as a separate fall with no individuals having fallen between or apart from such events. Along with this, tektites are geologically non-conforming, in that they occur as detached pieces bearing no physical relationship to the particular terrain in which they are found. They are distributed as if from somewhere else, namely from the sky. Furthermore, they are superficially deposited very high if not at the top of the geologic column,

and never deep, which seems to indicate an arrival after most if not all the formative geological processes of the terrain in which they are found. In other words, tektites likely arrived shortly after the great Earth-changing convulsions of Noah's Flood.

Tektites exhibit a unique surface sculpturing which is often characterized by the presence of grooves, notches, bubbly-like pits, radial gouges, and alternating parallel straight or swirled glassy bands or wrinkles sometimes called flow lines, and smooth or "bald" areas. Internally they are swirly and slightly bubbly. Evidence strongly suggests that the surface sculpturing of tektites is the result of aerodynamic ablation during their rapid hot fall through the atmosphere. That their surface sculpturing was completed before they reached the ground seems confirmed by a few specimens which show what appears to be stretched breaks which must have occurred during flight while the piece was still in plastic condition. The lack of surface sculpturing at the break is indicative that the sculpturing was complete before the break occurred and before the tektite reached the ground.

When they are cleaned of soil residue, tektites are in such good condition that they usually appear fresh and unweathered, or in other words, new. This lack of solution etching is a strong indication that tektites have not been subjected to terrestrial weathering, even in situ, for more than a few thousand years. It is certain that tektites were cooled and hard by the time they reached the ground because none have been found with embedded material from their impact on the soil as would be the case with soft molten particles. A few sources have referred to ancient archaeological sites where tektite chips, which exhibited fresh breaks, were found as products of tool making. That these breaks were fresh is also consistent with the fact that the primitives lived only a few thousand years ago, not millions.

When the ages of tektites is considered in the context of radiometric dating methods, those specimens of a given strewn field appear to all have the same age. The same dating methods also seem to indicate age variations between the various strewn fields. However all strewn fields appear to be geologically recent.

Most tektites appear very much like dull black opaque glass, similar in appearance to obsidian. However, when they are broken or cut into thin slices and held up to a strong light source, they show an amber color and are translucent. In this respect Indochinites and Philippinites both show similar effects. Tektites from Moldavia in Czechoslovakia however are about the color of green bottle glass. Those from the Libyan desert in Africa appear yellowish. Moldavites and Libyanites both are relatively transparent when cut or faceted. Others appear smoky gray, light or dark green, olive or various hues of brown, some virtually

colorless. Like the Indochinites and Philippinites, American tektites appear dark as a whole piece. However, the American pieces show a more or less translucent greenish-brown color in thin slices.

Tektites are relatively hard, being between 6-7 on Moh's scale of hardness, which makes them harder than artificial glass. Tektites are also relatively dense having a specific gravity of 2.4. Being a natural glass like obsidian, tektite glass appears to have formed initially by rapid cooling and has no crystal structure in the general sense of the term, hence cleavage is absent and fracture is conchoidal. Their refractive index is close to 1.5.

A distinguishing material characteristic of tektite glass is its unique chemical nature as revealed by geochemical analysis. Tektites are very high in silica content. They are a silicate glass containing anywhere between 58% to 85% silicon dioxide with some specimens of Libyan desert glass containing 98%  $\text{SiO}_2$ , which make them almost pure silica. The typical tektite contains about 70% silica, 11-15% aluminum oxide, small amounts of the oxides of iron, magnesium, calcium, potassium, sodium, titanium, manganese, and traces of other elements. There is practically the same chemical composition among all types of tektites, however, scientists are able to distinguish tektite specimens from different regions. The gas trapped in tektites is about as dense as that found in the Earth's atmosphere at an altitude of 30 miles, indicating their formation in a near vacuum.

Perhaps the most outstanding attribute of tektites is their exceedingly low water content. They are drier than terrestrial rocks by a factor of at least 100 or more. This difference has been demonstrated in the laboratory by taking two pieces of rock, both black and glassy: one a piece of obsidian and the other a tektite and subjecting the two to a hot blowtorch flame. The relatively soggy obsidian will bubble and froth as the water trapped inside is forced out, while the arid tektite will merely change into a molten lump.

The non-crystalline tektite glass is very pure and homogenous and if it was manufactured artificially, it would represent a very high grade of glass. It is a type of glass which cannot be produced quickly but requires very specific conditions in order to form. The only natural glasses that meet these criteria are terrestrial obsidian and tektites. A crude glass can be easily produced from sand by lightning, an artillery shell, a nuclear explosion, or cosmic impact. In this process there is a quick rise in temperature, a melting of the sand, and then a refreezing with the rapid drop in temperature. This does not allow for the production of glass of the quality that we see in tektites. This crude type of glass is referred to as shock or impact glass and is the kind of glass which is found at various impact sites around the world.

Another peculiarity of tektites is the fact that no tektite-strewn fields have been found further than 50 degrees latitude north or south of the equator. This represents another great anomaly about tektites, however this circumstance seems to suggest that tektites arrived as a shoal of particles from a source located at a relatively short cosmic distance. Otherwise, had these particles arrived from a much greater distance from Earth, they would have had more time to disperse so that they should be distributed uniformly over the Earth, like meteorites.

Although tektites are often associated with meteorites, an important difference between meteorites and tektites is the evidence that tektites never spent much time in space. An indication that a meteorite has been in space for any length of time is the presence of cosmic ray tracks in the meteorite specimen. When cosmic rays penetrate through a piece of material, they leave microscopic tracks. The number of cosmic ray tracks etched into the meteorite is taken as an indicator of how long the meteorite has been in space. However, no cosmic ray tracks are found in tektites. From this fact scientists conclude that tektites could not have existed in space for more than a few thousand years, neither could they have come from beyond the Earth-Moon system.

### **Tektite Theories of Origins**

Of all the ideas that have been entertained in the past 150 years about the origins of tektites, four theories have prevailed and which have been given the most serious consideration by modern science. These theories are 1. terrestrial volcanism, 2. lunar impact, 3. terrestrial impact, and 4. lunar volcanism. These theories are described respectively in the following paragraphs.

Early on it was proposed that tektites had their origin in explosive terrestrial volcanic eruptions and that they are a type of volcanic bomb. However, tektites are found in regions where there is no volcanism. No volcanic regions are known to produce glass of the tektite type. Furthermore, a volcanic blast does not produce the velocity necessary to loft a pebble above the atmosphere let alone create the aerodynamic effects observed on tektites. Beyond that, air resistance would become an inhibiting effect. Besides, no volcano has ever been observed to expel projectiles to the velocity of incandescence as of a meteor.

Later on, in the 1940s Harvey H. Nininger, considered by many as the father of American meteoritics, proposed that tektites are the product of material blasted off the Moon as a result of gigantic meteorite impacts there. To an observer with only a modest portable telescope, it can be seen that the Moon is virtually covered with circular impact fea-

tures, some of these clearly showing extensive deposits of debris conspicuously radiating out from the point of impact. In several cases these radiants can be seen extending more than half-way across the face of the Moon. These are most visible during full Moon. Because of the violent impact of a large meteorite on the Moon and the subsequent explosion, it is evident that some of these streams of lunite could have escaped the Moon entirely, and possibly in a direction which brings their material into the Earth's influence. When this material finally reached the Earth the individual pieces would have been sculptured by their passage through the atmosphere and deposited on the ground in the form of the strewn fields which we observe today.

In the 1960s this possibility was explored by a number of researchers, and in great detail, by leading astronomer and geophysicist John A. O'Keefe and aerodynamic engineer Dean R. Chapman, both NASA scientists who were involved with the Apollo program. Probably no one else in the world had accumulated so varied a collection of tektites nor has ever studied these strange objects so thoroughly and scientifically as these two men who concluded that tektites were from the Moon.

When tektites were not immediately found on the Moon by the Apollo astronauts, the lunar impact theory was abandoned by most scientists and the terrestrial impact theory became popular. However, this was not as the result of any evidence from new discoveries but by popular acclaim. Perhaps future missions to the Moon will be more discriminating in selecting locations for the search of tektites, or tektite material on the Moon. Little known is the fact that when the 843 pounds of lunar material retrieved by the astronauts were carefully examined, they contained pieces of glass which could not be distinguished from tektite material.

Nininger's early lunar impact theory for tektites has the advantage of being dynamically feasible, especially when it is considered that since the Apollo program a number of meteorites have been identified as having a lunar origin. Given that scientists have collected meteorites from Mars, it should be all the more likely by orders of magnitude that meteorites from the Moon have been collected on the Earth as well. Hence, if there are mechanisms and forces within our planetary system which have produced these results, then it should come as no surprise that the tektites found on the soils of the Earth should have come from the Moon.

Hence, this third idea, the terrestrial impact theory, states that a gigantic meteorite impacted the Earth causing an explosion and excavation of terrestrial material which was heated and launched upward through the atmosphere after which it passed back downward through

the atmosphere as tektites, coming to rest in their arrangement as a strewn field. No other theory of terrestrial origin has been so seriously put forward.

Today most scientists involved in the study of tektite origins believe that this is how tektites were formed. However there are some serious questions about this theory that have not been answered.

One question which must be asked in respect to the launching of molten globules upward from a terrestrial meteorite blast is, how would the soft molten globules of tektite material survive the force and velocity of the upward thrust without being blown apart into fine droplets by the acceleration and air resistance during their flight up from the lower atmosphere? Suggestions such as a local vacuum in the atmosphere caused by the explosion which allowed the tektites to pass upward unimpeded are met with serious circumstantial problems.

It is evident that the flanged button Australites were initially cold glassy spheres. Carefully-conducted air jet experiments which exactly duplicated the formation of the flanged buttons leave no doubt that these objects were formed during a downward flight through the atmosphere, and at an entry velocity of approximately 6.5 miles per second. All of this suggests an extraterrestrial origin.

Another question which must be asked is, if tektites formed when a gigantic meteorite or a comet struck the Earth where are craters or remains of craters caused by these collisions in the areas where tektites are found? No consistent correlation between the locations of known terrestrial impact structures and the location of tektite fields has been realized. Almost all terrestrial impact features exhibit no associated tektite strewn fields. Furthermore, the great ages usually assigned to these features by conventional dating methods are conspicuously inconsistent with the evident recent deposition of the tektites. Unlike the Moon where meteorite impacts in the thousands appear to be the principal force forming the landscape, there are only about 200 known impact structures and astroblemes on the Earth. However, most of these are deeply covered in sediment or lie deep under the ocean, another sign that tektites arrived on the Earth after Noah's Flood. The best-preserved impact features we see today are all relatively small, like Barringer Crater in Arizona, Chubb Crater in Northern Quebec, or Wolf Creek Crater in Western Australia. We do not see any very large impact features miles across that are fresh and well preserved, another indication that most of the terrestrial impacting siege occurred during the Flood epoch, the smaller well-preserved craters having resulted from late-comer, post-Flood meteorite impacts.

The difficulty of launching material out from the Earth is shared with the terrestrial volcanic theory in that atmospheric retardation of

hyper-velocities is tremendous especially in the dense lower atmosphere and consequently restricts the flight range of small objects.

One of the most important discussions that must take place in regard to tektite origins has to do with the quality of the tektite glass itself. Tektites are essentially bubble free and very homogenous. In commercial glass making, fining is the process whereby homogenized glass is produced. To fine glass requires careful heating in a crucible at the right temperature for an extended period of time according to a formula called Stoke's Law. This is necessary in order to allow the bubbles to rise and clear out and for the glass to become homogenized, that is, internally consistent throughout. It is a process that is reminiscent of the homogenization of cows' milk. When we consider the homogenization of glass, such a glass product is found in only three known situations: 1. artificial glass, 2. obsidian from a terrestrial volcano, and, 3. in tektites.

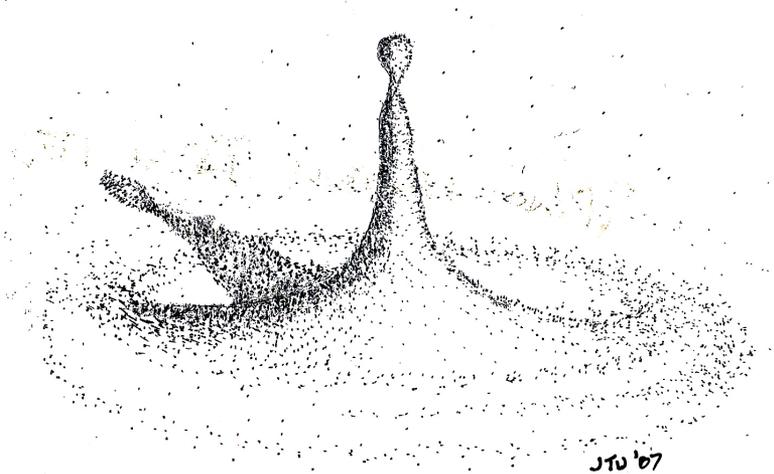
Glass is formed in two ways, by a fining process as just described and by impact or shock. When sand, for instance, is subjected to an intense thermal shock, it forms a crude glass. As mentioned previously, this can occur as a result of a direct lightning strike, the explosion of an artillery shell, or a meteorite impact. During any of these events the temperature rises very quickly, melts the sand, then the temperature drops almost as quickly allowing whatever material that was melted in those few moments to freeze. Because this sequence occurs so briefly it does not allow any "fining" or homogenization to occur. The resultant product is not a glass which is chemically pure and consistent throughout but a product known as shock or impact glass which is a crude glass, materially contaminated by other surface material. Hence, it is impossible to produce fined glass like tektites naturally under these circumstances. In other words the sequence, as we understand it, of a giant meteorite impact on the Earth cannot produce tektite glass.

It is evident therefore that the fining of tektite glass had to have occurred somehow outside of the Earth. Furthermore, no known natural process on Earth can produce material as dry as tektite glass. The Earth is simply much too wet, and all terrestrial rocks are reflective of this hard fact. Finally, there is the limiting factor of the absence of cosmic ray tracks in tektites. Thus from these important facts it must be concluded that the nearest and only physical location where tektite glass could have formed is the Moon.

A fourth theory, referred to as the lunar volcanism theory, states that tektites are the products of explosive volcanic eruptions on the Moon. This theory has been considered by some as the most workable and viable model to date given all the known facts about tektites them-

selves. However, this theory is believed by only a small minority of the scientists studying the tektite problem today.

The lunar volcanism theory would provide an explanation for why the surface rocks on the Moon examined so far are, for the most part, different in composition from tektites. Terrestrial obsidian is formed under the surface of the Earth and is brought to the surface by volcanoes. Tektites may be dry lunar obsidian that, as the result of lunar volcanic eruptions, comes from deep within the Moon where the  $\text{SiO}_2$  content is much higher. This deep location would also explain the absence of cosmic ray tracks in tektites. Under these circumstances the only conceivable mechanism for excavating this material would be a very large-scale volcanic explosion. However, a credible explanation on how a lunar volcano could expel material at such a force and velocity as to escape the Moon entirely without first disintegrating and scattering the body of the volcano itself widely over the lunar surface has not been forthcoming.



Liquid Drip Spike  
(Illustration by Joseph T. Unruh)

Of interest is the fact that an observer with even a modest portable telescope can see spread, splash, and rebound impact features on the Moon, all betraying differences in the manner of which lunar material reacted to incoming projectiles in its excavation and launching as ejecta. Experiments conducted by this author involving the dropping or thrusting of objects into a mass of water, sand, or mud, show that the size, shape, mass, angle, and velocity of the falling body or projectile all contribute to a diversity of impact ejection results. The shape of the

projectile seems to be particularly important in the nature of the splash result. While the dropping of a glass or steel marble into a swimming pool from waist height produced practically no splash whatsoever, an irregular stone of the same size produced a more significant and complex splash result. Occasionally the spherical objects produced a splash with a symmetrical rebound spire or spike. A recent article in *Nature* described an experiment involving the dropping of a heavy ball into aerated sand that produced a tall sharp spiked jet of grains immediately after being engulfed in the sand. Undoubtedly the shape of the object has something to do with the rebound spike effect. Particularly interesting is the fact that a small somewhat irregularly-shaped heavy iron object produced a splash rebound which traveled at a speed noticeably greater than the speed of the falling object initially dropped into the water, and at the same time the rebound liquid reached a considerably greater height than the height from which the metallic object was dropped into the water. This seems to be confirmed by others, including Ronald A. Oriti who in 1967 wrote that: "...experimental evidence indicates that it is possible to eject fragments with speeds exceeding that of the impacting missile. There can be no doubt that the Earth must be receiving matter from the Moon. It may be that some of this matter is so similar in appearance to terrestrial rocks that it has gone unnoticed."

Perhaps such experimental results will prove helpful in developing a working model on tektite origins when it is considered that a splash is merely a collision of particles under various conditions of surface tension and viscosity. We must remember that a large-scale meteorite impact on the Moon acting along with the fluid behavior of the lunar surface material under this circumstance should be seen as hardly different than any ordinary impact splash in water, sand, or mud on Earth, but simply on a much larger scale. If tektite glass is in fact lunar obsidian, this material must have been deeply excavated and launched to Earth by large cosmic impacts under a highly unusual and specific set of circumstances. This possibility is consistent with the observed rarity and restricted geography of tektite fields on Earth.

Thus we might suggest the possibility that under the right circumstances the concentrated force of impact of a very large heavy incoming projectile—an irregular yet roughly spherical metallic asteroid—could have discriminately launched material from deep under the lunar surface expelling it out as a plume of material that escapes the Moon's relatively weak gravity and sending it off toward an Earthbound trajectory. Furthermore, through some kind of ecliptic restricted gravitationally influenced effect, this shoal of particles might have followed a route close to the plane of the ecliptic in its relatively short drift to

Earth. Such a scenario would allow for its observed deposit in the lower latitudes. This scenario is similar to Nininger's original model with the primary distinction being in the nature of the lunar impact itself.

## Conclusion

The evidence we have about tektites—that they formed as a result of a gigantic explosive impact, that their formation occurred in a near vacuum in a place where there is very little water, that they have not been exposed long to cosmic rays, that they underwent a very rapid hot flight down through the atmosphere, that they are geographically-specific, and that they are composed of highly-fined glass—seems to reinforce the conclusion of only one physical place of origin, namely the Moon. Since the Moon seems to be so overwhelmingly-implicated as the origin of tektites, it seems incumbent upon us to look for the mechanism which would launch and deliver this material to the Earth in the form of which we find it today. Furthermore, given the unanswered questions still residing with the four previously-reviewed theories, it is this writer's suggestion that perhaps a fifth, *the lunar impact rebound spike ejecta theory*, as implicated in the liquid drop experiments previously described, deserves further investigation and study as a viable explanation for the presence of tektites on Earth.

In spite of the great deal of research that has been brought to bear on the nature and origin of tektites, we must plead ignorance in our full understanding of these most enigmatic objects until that day when one of our theories is finally vindicated. Thus, it has been said by not only a few of our fellow scientists seeking to divine the true identity of these unique objects that tektites represent one of the most frustrating, illogical, and impossible objects on Earth.

Given the Earth's immobility and preferred place in the cosmos, and given that we reckon our everyday life in terms of Euclidean geometry, i.e., in terms of "breadth, and length, and depth, and height" (Ephesians 3:18), it should come as no surprise that we should occasionally find odd relics in the soils of the earth sent "down" from on high. There are a number of references in the Bible to stars falling to the Earth (Revelation 6:13), stones cast down from heaven (Joshua 10:11), fire and brimstone (Luke 17:29), all of which would indicate a fixed Earth Central as the recipient of heavenly meteoritic material. If the stars should fall to the Earth and make their mark from a distance so great, so then should tektites also from a distance much less.

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## READERS' FORUM

### From a Concerned Citizen

Dear Sir, I really think you need to go back and read the bible, because you do not have a full understanding of who GOD really is . He is the alpha and omega,

He is no just some science thing you are trying to disprove.You are believing in a dangerous cult adopted science theory,along with astrology which is from satan himself, I will pray for you that GOD gives you an understanding of how wrong you are in your thinking and understanding of how this earth was formed and continues to rotate on its axis, just by the grace of GOD.

Thank You Bill N,

[All above *sic* except for spurious carriage returns that have been removed to save space—*Ed.*]

### Response:

You did not read the material, did you? I hate astrology and have shown from historical evidence that the model advocated by astrologers is not the geocentric model but the heliocentric one you learned in school and now defend. What evidence do I have? Simply that all mosaic floors of synagogues in the Mid-east have the zodiacal constellations surrounding the sun god Apollo, not the earth. Ditto all occult representations of the sky; the sun is always in the center, not the earth.

### From the Bad Astronomer Web Site

The following note is by Martin Selbrede, posted on the Bad Astronomer Forum (under a pseudonym) rebutting Phil Plait the atheistic moderator, founder, and owner of the “Bad Astronomer” website. Martin’s response is brilliant and extremely well written. Martin G. Selbrede wrote:

The Forum Moderator writes: “As always, besides all the obfuscation, this boils down to the same thing Prince has posted many times before. I have also posted a rebuttal many times, but have never heard back from Prince, Dunash or any other geocentrists on how I am wrong. So, for the nth time, I will post it here: Geocentrism, as advocated by creationists or other religiously fundamental people, is cer-

tainly wrong. How, you may ask? What is going on is that you can do a change of reference frame to a geocentric one, and by relativity the math must still work out. I readily admit that. I do not understand all the math involved, but I will take it for granted that it works out, and that physically, geocentrism is just as valid as, say, heliocentrism.

“But note the words ‘just as valid.’ Also, by relativity, it cannot be any more valid; geocentrism is just another change of frame (although to a non-inertial one). What geocentrists are saying is that geocentrism is the one, true frame. Creationists must say that because that is what is says in the bible (sic). Now pay attention here, because this is the important bit: to say geocentrism isn’t wrong, you have to accept the premise that any frame of reference is just as valid as any other. But to claim that geocentrism is correct, you have to ignore that very same premise. Geocentrism as the One True Way is therefore self-contradictory (sic). It doesn’t work.”



**Figure 1:** the Bad Astronomer, Phil Plait. (Courtesy, Ensceptico, [Wikimedia Project](#).)

The Moderator correctly notes that within the relativity paradigm, geocentricity and heliocentricity are both physically valid models. I’ve been using plenty of qualifications lately (phrases such as “albeit non-exclusively”) to denote this fact of relativity. The general covariance

of the field equations requires that all attacks on geocentricity from a physical point of view be regarded as specious. But the ire raised is selectively applied—Occam’s Razor has NO bearing on those covariant tensors, and if it did, they wouldn’t be covariant anymore. The barycentric argument has no bearing on covariance for the same reason. The superluminal velocity objection to geocentricity is slain on Einstein’s field equations. Yet most of this heliocentrically-driven attack on geocentricity is passed over, and anyone asserting that the Earth unequivocally revolves around the Sun is left uncorrected. Their provincialism is acceptable, despite its conflict with relativity theory. A geocentrist dares to point out that these kinds of criticisms have no physical meaning, citing Einstein (correctly!) to that effect, and he’s ostracized.

Let it be noted for the nth time on the part of geocentrists that our citation of relativity is specific and narrowly focused onto this one axiom: no refutation of the geocentric model, on any physical grounds, can be mounted once one accepts relativity as accurately depicting the physical state of affairs in the universe. Geocentrists do NOT deny that the same could be true of a heliocentric model, or a lunocentric, or jovocentric model. Equal physical validity under relativity accords geocentricity a place at the table, and every critic of it who mounts attacks upon it from a physics perspective is intrinsically crippled in his efforts, unless he elects to jettison Einstein. Then, perhaps, he can attempt to make a case against geocentricity.

I firmly believe that the Moderator makes a gratuitous leap in his concluding syllogism, primarily by incorporating a suppressed premise in his logic. The suppressed premise is that geocentrists are all proponents of relativity theory. And the gratuitous leap is affirming that geocentricity is only salvaged by recourse to relativity, which therefore makes it a non-unique, non-exclusive, albeit legitimate physical description of the physical situation. What, precisely, would the Moderator believe are the implications if relativity is incorrect? Since when is geocentricity harmed by relativity being in error? It appears to geocentrists that relativity being overthrown would lead, not to the outright rejection of geocentricity and re-enthronement of heliocentricity, but quite the opposite.

For example, the Michelson-Morley experiment is explained by relativity by urging that the velocity of the Earth through aether (if one existed) is masked by isotropic light speeds. If relativity is decommissioned as a viable explanation, the *prima facie* explanation for this experimental result, which is even now a plausible option, becomes nearly compelling: namely, that the M-M apparatus correctly measured the velocity of the earth around the sun, which velocity is zero. (This is why geocentrists have strongly criticized aether entrainment theories that attempt to salvage heliocentricity in non-relativistic thinking. Entrainment is taught because the Earth's motion is presupposed, but each entrainment model is fatally flawed by internal inconsistencies, starting with the disproportion between the allegedly undetectable annual motion and the readily detectable diurnal rotation. Yes, you can say that relativity explains this, but this paragraph is all about what would happen if relativity is debilitated as an explanation.)

I'm aware of no geocentrist who, in the context of relativity theory, derides the equal validity of heliocentricity and geocentricity. But I've read a lot of posts here from geocentricity's critics who are quite clear that they are NOT equal, and that heliocentricity is true while

geocentricity is false. They are, rarely, corrected by anyone from their own camp.

In formal debate, one of the most telling strategies is to mount an internal critique of the opposing system. In so doing, you adopt, *ex hypothesi*, your opponent's position and plumb its implications. This, and only this, is what geocentrists do when pointing out that relativity theory bars geocentricity's critics from mounting any attack upon it from the field of physics. We do not urge that relativity teaches geocentricity to be right and heliocentricity to be wrong. We do not misrepresent relativity and its implications. We understand what relativity teaches and its bearing upon the question in hand. We believe Sir Fred Hoyle struck the correct balance on the matter when he said the trial of Galileo, if held today, would have to be ruled as a draw. Geocentrists make no more of this, as far as relativity is concerned, than is justifiable.

But neither do we leave the matter there. As Franco Selleri's 1998 journal title suggests, there are "Open Questions in Relativistic Physics." And so much of the discussion (the Moderator perceives it as "obfuscation") is centered, not on relativistic explanations, but beyond that paradigm. If geocentricity is to be evaluated, it should be evaluated on its own grounds, not on alien grounds foisted upon it to create straw men opponents. If geocentrists believe geocentricity is what the Moderator calls "The One True Way," this would obviously not follow from relativity, but from a classical reconstruction of physics. Because this fact goes unappreciated, most of the points geocentrists make (about the impedance of free space, the Planck Density, aether entrainment) are routinely transplanted into a relativistic context by critics. And then we get slammed as if we were using relativity improperly to defend geocentricity as the only legitimate cosmology.

Therefore, the debate has always been prosecuted using a double-edged sword: the internal critique of the opposing system (using the prevailing relativistic paradigm) to disarm all challenges to the geocentric model's validity on physical grounds, and then a positive exposition of geocentricity without reference to relativity, which can be conducted to a compelling conclusion. The former strategy only gets geocentrists so far, but it's a lot farther than most critics are willing to admit (physical equality!). The latter strategy takes geocentricity the rest of the way. This would be easier for many to see if they could be more open-minded on the issue of relativity's actual validity. Yes, there are websites that regard all questioning of Einstein to be forms of psychosis, and some dissident physicists have enunciated positions that later came back to haunt them. What does it say, however, when we choose to psychoanalyze another for his viewpoint, rather than evaluate his

view fully on the merits (as a precondition to rejecting or accepting it)? The dissident (crackpot?) is apparently too open-minded, while his opponent may well be too close-minded. This mindset is evidenced by JS Princeton's earlier comments that there is "no motivation" to perform any experiment that might possibly support the geocentric position. This is, and always has been, a serious informal logical fallacy known as "cavalier dismissal." Yes, you stand the risk of standing toe-to-toe with an actual crackpot in unproductive, endless debate. Maybe that's reason enough to perform the experiment—to put a matter to rest. Since geocentrists propose experiments to falsify their view (which stands in the best tradition of the scientific enterprise), I think they're being constructive about this debate.

I find the charge of "obfuscation" curious. There was a high-level discussion in progress, on some relatively obscure (in my view, under-reported) facets of physics that have a major bearing on matters physical. Such discussions are necessarily laden with the appropriate terminology (jargon: the short-hand vocabulary used by specialists in a field). What, specifically, was being cloaked by me in these discussions? Surely not an illicit use of relativity, since much of my discussion involved aspects of a classical reconstruction of physics. Frankly, my opponents' appeals to Occam's Razor was far more an obfuscation (and rejection of their own relativistic paradigm) than anything I said. And, for the record, most people misquote Occam's Razor anyway. The edict not to multiply hypotheses is often thought to mean, "The simplest explanation is the best." In actual fact, it's "The simplest explanation that accounts for all the facts is the best." I'm simply bringing to bear additional facts not accounted for by geocentricity's opponents. Occam's Razor is thereby vitiated in its application, but geocentricity's opponents don't readjust their bearings before using it. This facile use of a misapplied principle is far more disingenuous than any assertion I've recently made in these discussions.

I trust this sets the record straight. But I've been surprised here before.

### **Skeptical Questions**

Below are a series of questions by a skeptic named Bill and answers by your editor.

**Bill:** Do you believe that humans have accurately sent spacecraft to investigate the planets and other objects within our solar system?

**BA:** Yes.

**Bill:** If so, are there mathematical calculations that assume geocentricity which can more precisely direct our spacecraft to rendezvous with other planets, moons, asteroids and comets within our solar system?

**BA:** No, but see below for why. To track these craft from earth, it is easiest to use the geocentric coordinate system. To change the trajectory of a spacecraft in the gravitational field of the sun, it is easiest to use the heliocentric coordinate system.

**Bill:** If you claim that, even though such mathematical calculations have not yet been worked out, this still does not rule out the possibility that such calculations may be possible, my response is that it does not seem rational to believe in something simply because it has not been ruled out. Rational beliefs are those that have been ruled in by the evidence, regardless of whether alternative beliefs have been ruled out. Even if a geocentric universe cannot fully be ruled out, it is not rational to believe in such a universe unless there is sufficient evidence to rule it in.

**BA:** True, assuming your premise that the geocentric “calculations have not yet been worked out.” However, your assumption is false. The equations derived from a geocentric universe have been worked out and they are identical to those derived from an acentric universe. Thus I can then reverse your argument and say that since the geocentric model has been around longer than the heliocentric, which, in turn, has been around longer than the modern acentric model, we should return to it. I can claim more: that it was the disproof of the heliocentric model that led to the modern acentric model which, in turn, postulates that every point in the universe looks as if it is located at the center of the universe. After all, the evidence that allegedly overturned the geocentric model has itself now been overturned.

I agree that a rival model should show itself superior to a current one before being accepted, but that has often been violated in the history of science. To men, theories are like women. Men prefer beauty but in reality, beauty is often deceptive and vain. Being beautiful does not make a woman true. Likewise, the most beautiful of several rival theories does not make it true. Thus heliocentrism and relativity won their respective days because they were deemed “beautiful,” but they are not true in any absolute sense. So, though your argument is valid, it lacks soundness.

**Bill:** If heliocentric orbital mechanics works well to get spacecraft to their destination, then it seems reasonable to believe, at least tentatively, that the heliocentric model is correct. Until a geocentric orbital mechanics works better for accurate space travel, should we not accept the model with the most explanatory value?

**BA:** The geocentric explanation gives the same formulae as the acentric ones but it has a better explanation. For instance, the centrifugal and Coriolis “effects” are considered fictitious forces in modern theory. In the geocentric theory they are caused by real, gravitational forces. The geocentric model explains the Euler effect, and even some quantum mechanical effects are derived from the geocentric assumption, a connection that the acentric model has yet to find.

The acentric model cannot explain why the Creator of the universe would tell us that the sun moves around the earth if the reverse is true. This latter may not be acceptable to you but surveys show that even in the USA some 35-45% of the population still believes that the sun goes around the earth. I am a geocentrist because that is what my God, Jesus, teaches. Since he is the way, the truth, and the life, it is incumbent upon me to conform my view of nature to his truth, which is his written word. It is my pleasure to be able to do that in the realm of astrophysics in particular. I am not held responsible for whether or not anyone believes me, but I am responsible for what I do with the Truth (Christ), that is, whether I teach, suppress, or crucify him anew.

### **Humphreys' White Hole Cosmology**

Hello Dr. Bouw, I was wondering what you thought about Humphreys' White Hole Cosmology. I was wondering what creationist model you subscribe to explain distant starlight, thank you.

In Christ, R. T.

Dear R. T., Dr. Humphreys' model is a halfway house between the modern relativistic belief and geocentricity.

Here's the problem with it. True, according to relativity the gravitational tension about the earth would allow billions of years to pass on the outskirts of the universe while 6,000 years would pass on earth, but about five years before Dr. Humphreys published his theory, an Israeli physicist noted the opposite; that according to relativity, the outskirts of the universe would only experience 6,000 years while the earth experienced billions of years.

Thus, according to relativity, both Humphreys' white hole model and the Israeli's black hole model are correct. So you see the problem: according to the black hole model, billions of years have passed on earth while in the third heaven's (God's) view only 6,000 years have passed. According to Humphreys' white hole model, 6,000 years have passed on earth while billions of years have passed in God's view.

This gives us four options:

1. 6,000 years elapsed in earth, 12 billion years for God.
2. 12 billion years elapsed in earth, 6,000 for God.
3. 12 billion years elapsed in earth, 12 billion years for God.
4. 6,000 years elapsed in earth, 6,000 years for God.

Humphreys has chosen option 1; the Israeli physicist chose option 2; modern physics chooses option 3; and geocentrists opt for number 4. We are dealing with absolute space when we speak of the firmament, the heaven where the sun, moon, stars and the earth are located. Relativity does not apply to absolute space, which eliminates options one and two. So, the only sound options are three and four.

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### **Alexander von Humboldt on Geocentricity**

The visitor was friendly received by Alexander von Humboldt<sup>1</sup> [1769-1859], and when he laid before him his doubts about the Copernican System, got for answer the memorable words: “I have known, too, for a long time, that we have no arguments for the Copernican system, but I shall never dare to be the first to attack it. Don’t rush into the wasps’ nest. You will but bring yourself to scorn of the thoughtless multitude. If once a famous astronomer arises against the present conception, I will communicate, too, my observations; but to come forth as the first against opinions which the world has grown fond of—I don’t feel the courage.”

### **Cause for Concern!**

A Washington, DC airport ticket agent offers some examples of why our country is in trouble!

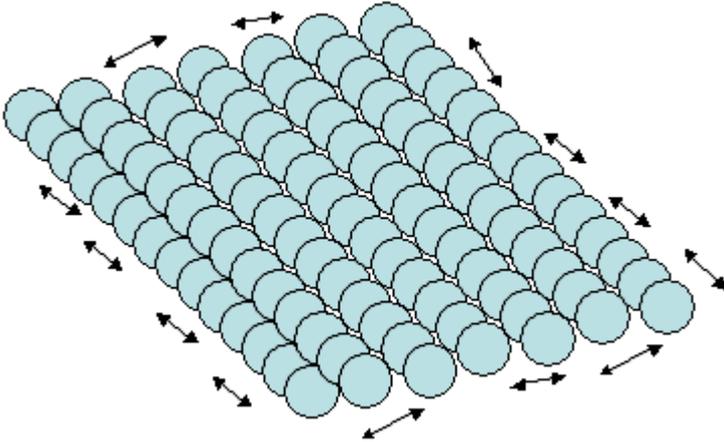
1. I had a New Hampshire Congresswoman ask for an aisle seat so that her hair wouldn’t get messed up by being near the window.
2. I got a call from a candidate’s staffer, who wanted to go to Capetown. I started to explain the length of the flight and the passport information, then she interrupted me with, “I’m not trying to make you look stupid, but Capetown is in Massachusetts.” Without trying to make her look stupid, I calmly explained, “Cape Cod is in Massachusetts, Capetown is in Africa.” Her response, ... click.

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<sup>1</sup> Von Humboldt was a German naturalist and writer. His expedition to South America, Cuba, and Mexico (1799-1804) advanced the science of ecology.

## THE SPEEDS OF WAVES IN THE FIRMAMENT<sup>1</sup>

We report here on recent work on the properties of the firmament. This work has to do with the characteristic speeds in the firmament. The speed of “sound,” that is, any disturbance through the firmament, can be considered analogous to that of normal matter. Here we implicitly assume that such analogy is valid, and we assume that, as absolute space, the firmament behaves as a perfect fluid.



**Figure 1:** Two layers of Planck particles making up the firmament showing the kinds of motions that can exist for the particles. The motions make up the various waves that can exist and propagate through the firmament.

### Transverse Wave Speed

In a transverse wave, the particle displacement is perpendicular to the direction of propagation. Light is an example of a transverse wave, so are the waves we can make with a rope tied to a doorknob. We generally picture transverse waves as bouncing up and down. Figure 2 shows a transverse wave propagated left to right through a stack of layers in the firmament. Imagine taking the sheet in Figure 1 and shaking it up and down like a blanket.

The formula for the speed of the transverse wave,  $v_t$  is:

$$v_t = \sqrt{T/\mu}$$

<sup>1</sup> This article is an updated version of an appendix first published in the *B.A.* by Gerardus D. Bouw, 2002. “Earthquakes, Snowfalls, and Geocentricity,” *12*(99):5.

where  $\mu$  is the mass per unit length. For a rope waved up and down with the end tied to a doorknob, the mass per unit length may be one ounce per foot of rope. For the firmament, the Planck particle mass is  $2.2 \cdot 10^{-5}$  gram and its diameter is  $1.6 \cdot 10^{-33}$  cm. Stringing the particles side-by-side for a centimeter gives  $\mu = 1.347 \cdot 10^{28}$  gm/cm (about  $1/250^{\text{th}}$  the mass of the moon). Taking the tension to be the gravitational attraction between neighboring Planck particles, the gravitational tension becomes:

$$T = G\mu^2 = 1.211 \cdot 10^{49}$$

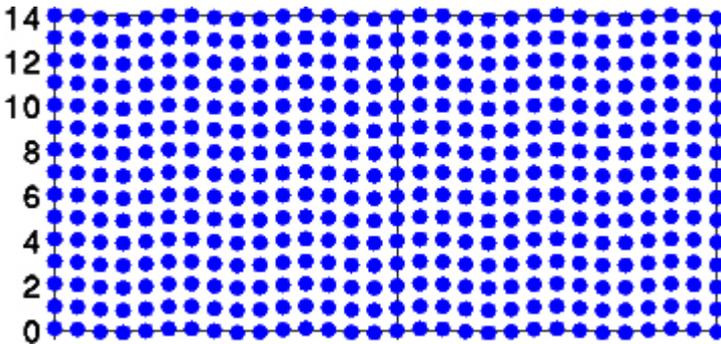
which means that

$$v_t = (G\mu).$$

Substituting in the Planck values for  $T$  and  $\mu$  gives

$$v_t = 2.998 \cdot 10^{10} \text{ cm/sec}$$

which is the speed of light. We conclude that the transverse-wave speed of a disturbance in the firmament is the observed speed of light viz.  $2.99792458 \cdot 10^{10}$  cm/sec.



**Figure 2:** Transverse Wave in the Firmament

### Thermal Speed

A second transmission speed can be derived from the temperature of a medium. This speed is also sometimes called “quantum speed.” It is the average speed of a particle in the firmament caused by the heat of the firmament, which has a temperature of  $T = 1.42 \cdot 10^{32}$  kelvins.<sup>2</sup> The formula that gives the quantum speed  $v_q$  is related to Boltzmann’s constant  $k$ , and the Planck particle mass  $m$ , and is derived by equating the kinetic energy of a particle to its thermal energy as:

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<sup>2</sup> At these immense values, one can just as well read Fahrenheit for Kelvin.

$$v_q = (3kTm^{-1}).$$

Crunching the numbers gives a value for  $v_q$  of  $5.21 \cdot 10^{10}$  cm/sec. This is 78% higher than the speed of light. However, the coefficient 3 under the radical assumes that each particle has three degrees of freedom, which is to say that the particle can freely move in any of the three directions: up-down, left-right, and forward-backwards. If there is only one degree of freedom, then the quantum speed becomes  $3.008 \cdot 10^{10}$  cm/sec which is roughly the speed of light. Since light follows the path of least resistance, one-degree of freedom tentatively seems to be the appropriate model.

So far we have defined two speeds in the firmament, both with a speed equal to the speed of light. The question arises, Are they related? The answer is, No. For a transverse wave, the particles are moving coherently, as a group. In the thermal case, the particles are bouncing all over the place, in all directions for the greater-than-light speed value and oscillating back and forth against each other in the one-degree of freedom case.

### Longitudinal (Pressure) Wave Speed

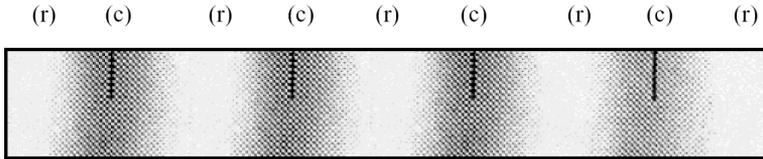
The third speed is the most interesting because it measures the speed of a pressure wave (a compression wave, also known as a longitudinal wave) through the firmament. To derive it we need to measure the compressibility of the firmament. What is needed is a property called the “bulk modulus” ( $B_m$ ) of the firmament. The speed ( $v_b$ ) can then be derived by relating it to the density  $\rho$  by the relationship:

$$v_b = (B_m/\rho)^{1/2}. \quad (1)$$

The bulk modulus relates pressure and volume via the expression:

$$B_m = \frac{(P - P_0) V_0}{V_0 - V}.$$

Here  $P$  and  $V$  are the compressed pressure and volume while  $P_0$  and  $V_0$  are the original pressure and volume respectively.



**Figure 3:** a longitudinal wave moving from left to right. The particles do not ride with the wave; they move back and forth, compressing at the regions marked (c) and rarifying in regions (r). Regions (c) and (r) also move to the right, but individual particles move to the right for half a wavelength and then move to the left for the other half. This is the case for any pressure wave, whether the spoken word or the shock wave of an explosion.

Normally, we picture the firmament as non-compressible, but we assume that a difference exists between the uncompressed volume we call space and the compressed firmament. Essentially, we look at the problem of compressing the universe to the density of the firmament. In that case,  $P_0$  is zero, there being very little pressure in the vacuum of space, and  $P$  is of the order of at least  $10^{49}$  dynes, the pressure between two adjacent grains of the firmament. The initial volume,  $V_0$ , is the volume of the universe which is roughly  $10^{85}$   $\text{cm}^3$ . The final volume is the volume of the starting ball of firmament constituting the Big Bang, that is, of the order of  $10^{39}$   $\text{cm}^3$ . The starting density we assume to be the critical density of the universe which is of the order of  $10^{-29}$   $\text{gm}/\text{cm}^3$ . We are now able to arrive at a crude estimate of the rate at which a compression wave can travel through the heaven we call outer space.

When the numbers are used in equation (1), we find that the speed of longitudinal wave is roughly  $3 \cdot 10^{39}$   $\text{cm}/\text{sec}$  ( $10^{29}$  times the speed of light). At that speed, the signal crosses the universe in roughly  $10^{-11}$  second or one-hundred billionth of a second. The actual speed is likely much higher since the pressure inside the compressed ball is likely to be greater than the pressure between two Planck particles in contact with one another. After all, we did ignore the contributions of the two neighboring particles beyond the ones touching. We can come up with an upper limit by assuming that the maximum pressure is  $10^{49}$  times the number of particles in the primordial fireball, that is,  $10^{59}$ . This gives a speed of roughly  $10^{68}$   $\text{cm}/\text{sec}$ , crossing the universe in about  $10^{-40}$  second. It may well be that it will take a Planck time ( $10^{-44}$  sec) if all the numbers were better known, but that is just a conjecture for now. In an earlier analysis based on stellar structure theory, a speed of sound through the firmament was estimated to be  $10^{107}$   $\text{cm}/\text{sec}$ .

## Conclusion

We examined three types of disturbances in the firmament and examined the characteristic speed associated with each. Two of the disturbances involved waves (transverse and longitudinal) and the third is the counterpart of thermal motion that can be manifest Brownian motion, though we do not examine that particular property in this paper.

The first waveform we looked at was that of transverse waves. We discovered that these waves traveled through the firmament at exactly the speed of light. From this we can conclude that electromagnetic energy is transmitted through the firmament at the speed of light and that the firmament is, itself, the medium transmitting the wave energy through space.

We next looked at thermal motion. The surface temperature of the firmament is extremely hot, but we do not feel its heat because it is immediately absorbed by a neighboring Planck particle. That is the case whether one particle hits another or whether the energy of the particle is transmitted as a wave. We found the thermal speed of the Planck particles to be of the order of the speed of light, possibly somewhat higher, depending on the degrees of freedom in the firmament.

Lastly, we looked at longitudinal wave transmission, the phenomenon we commonly use to explain sound waves. We discovered that the transmission speed for such a wave is  $10^{29}$  times the speed of light. At that speed a disturbance at the geometrical center of the universe will reach the edge in a hundred-billionth of a second. We suggest that this may be the speed of gravity.

Finally, what makes us able to find these properties without invoking the General Theory of Relativity is that the firmament is indistinguishable from a plenum (an infinitely dense medium) to the created universe. As such, the firmament is the absolute space for which Sir Isaac Newton sought. As absolute, relativity does not apply to it. The firmament is the standard to which all motion in the universe is to be referenced.

# PANORAMA

## A Part of the Cosmos Too Empty

When drawing a map of the radio sky, L. Rudnick and colleagues at the University of Minnesota discovered an unexpected cold spot in the Cosmic Microwave Background (CMB). The cold spot suggests the presence in the constellation Eridanus (the river of stars running south from the constellation of Orion) of a huge volume devoid of matter—an empty bubble a billion light years across. Not only is ordinary matter missing, but also the mysterious stuff called “dark matter.” The giant void, however, does contain “dark energy.”

The physics of this cold spot in the CMB involves two factors:

1. Matter, if present, would interact with the CMB and raise its temperature a bit and
2. The presence of dark energy has the opposite effect. According to what is suspected about dark energy, it would siphon a bit of energy from the CMB photons, thus cooling them and creating a cool spot.

The spatial extent of the phenomenon is not necessarily anomalous. However, the suspected void in Eridanus is so large that the best-accepted theory of cosmic evolution cannot account for it.

## The Solar System Is Too Full<sup>1</sup>

The distances in the solar system are great. Although meteor and asteroid “storms” abound in the movies, no spacecraft has ever accidentally run into an asteroid or been crippled by a meteor. It even takes most of a year to reach one of the nearest planets. How can such an expanse of empty space be called “too full”?

In previous issues we have talked about the stability of the solar system, particularly the role the earth<sup>2</sup> and Mars<sup>3</sup> play in stabilizing the planetary orbits. In each case, gravity is in play. It turns out that gravity decides when a system is too full.

Anyone who has read up on the relationship between Saturn’s rings and satellites has a sense of how gravity regulates material in a gravitational system. The moons shepherd rings, keeping the particles making up the ring system confined to a specific band associated with the shepherding moon’s orbital period. We also find resonances among

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<sup>1</sup> Soter, Steven, 2007. “Are Planetary Systems Filled to Capacity?” *American Scientist*, 95:414.

<sup>2</sup> Panorama, 1999, “Stabilizing Earth,” 9(89):26.

<sup>3</sup> Panorama, 1993. “The Moon and the Seasons,” 3(65):21.

the planets, not just in their orbital periods but also in their rotation. The moon, for instance, always keeps the same face pointed to earth. Likewise, when Venus is closest to earth, it, too, presents the same face to the earth.

Computer analysis of the solar system, where planetary orbits are worked backwards or forwards in time, reveals that the solar system is metastable, meaning that it can easily be disrupted. One more object can disrupt the entire system.

A digital computer computes an orbit by breaking it down into short, straight lines that link together to trace the orbit. An orbit of short, straight lines is not the same as a real, smoothly-curving orbit. As a result, inaccuracies enter the model with each short line and with each computation determining that line (rounding and truncation errors, especially in computations involving irrational numbers such as  $\pi$ ). Thus a computer's usefulness is limited to a relatively small time span. Its conclusions may be valid for at most a few million years, and that may be optimistic.

Of all the planets in the solar system, and recall that in geocentricity the earth is not a planet, Mercury is most unstable. Mercury has a small but finite probability, based on changes in the eccentricity of its orbit and on gravitational resonances<sup>4</sup> of colliding with Venus.<sup>5</sup> If that collision happens, the solar system would probably become chaotic. Stability could only be reestablished by the ejection of a planet.

Once again we see that delicate balance that modern science calls the "Anthropic Principle," which reveals that the universe was made for man. The solar system is in a delicate balance. The distance of the earth from the sun has to be maintained within less than a handful of percents, or all higher-order life on earth will die. If, as your editor believes, the earth is located at the barycenter of the universe, it cannot be ejected from the solar system because the entire power of the universe would hold it in place; but a small planet such as Mercury, the smallest of the planets, is most likely of all the planets to be ejected if the stability of the solar system is to be maintained. The heavens were created for man says the Scripture, and all of impartial science attests to that.

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<sup>4</sup> One expects Mercury to have resonances with Venus, the sun, and earth. The resonance with earth was mentioned in the author's book, *Geocentricity*.

<sup>5</sup> The spiritual implication of such a collision is the confrontation between Jesus as the true bright and morning star (Revelation 22:16) and Satan's counterfeit morning star, (Mercury or Hermes, the messenger of the gods as in "hermeneutics") overtly found in the NIV in Isaiah 14:12. For more on the matter, see Bouw, G. D., 2001. "The Morning Stars," *B.A.* 11(97):69. By the way, the reading, "Day Star," found in margin notes and modern versions' text of Isaiah 14:12, also attributes a title of Christ (II Peter 1:19) to Lucifer or Satan. In that case, the day star refers to the sun (Psalm 19:1-6).

## CREDO

The Biblical Astronomer was founded in 1971 as the Tychonian Society. It is based on the premise that the only absolutely trustworthy information about the origin and purpose of all that exists and happens is given by God, our Creator and Redeemer, in his infallible, preserved word, the Holy Bible commonly called the King James Bible. Any scientific endeavor which does not accept this revelation from on high without any reservations, literary, philosophical or whatever, we reject as already condemned in its unfounded first assumptions.

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.

We affirm that no man is righteous and so all are in need of salvation, which is the free gift of God, given by the grace of God, and not to be obtained through any merit or works of our own. We affirm that salvation is available only through faith in the shed blood and finished work of our risen LORD and saviour, Jesus Christ.

Lastly, the reason why we deem a return to a geocentric astronomy a first apologetic necessity is that its rejection at the beginning of our Modern Age constitutes one very important, if not the most important, cause of the historical development of Bible criticism, now resulting in an increasingly anti-Christian world in which atheistic existentialism preaches a life that is really meaningless.

**If you agree with the above, please consider becoming a member. Membership dues are \$20 per year. Members receive a 15% discount on all items offered for sale by the *Biblical Astronomer*.**

*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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