VOLUME 17 NUMBER 122

THE BIBLICAL ASTRONOMER

FALL 2007

RENEWED ITEMS

(Continued from the back cover)

The following two items have not been available for some time and are now available again.

Vital Questions by Philip Stott. (Second edition) Tackles just how flimsy the evidence is for such well-established ideas as the Big Bang, Relativity, and evolution. 155 pages. $20

Where in the Universe Are We? by Philip Stott. **DVD video**. We sold this same video in VHS format some years back, but now reissued in DVD format. $25

Problems in Astronomy by Philip Stott. VHS video $15

Foreign orders, please read pricing policies
on the back cover of this issue.

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Front Cover: The quarter moon looks deathly quiet in this photo, but the area at the terminator, the line between day and night at left, is a line of turmoil. Find out why in this issue's "Panorama" on page 107.

THE
BIBLICAL ASTRONOMER

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EDITORIAL

Time Sheets

With this issue we conclude the three-part article about time. This issue's article is the one that was presented at the Third International Conference on Absolutes in July. Although highly technical, even for *The Biblical Astronomer*, the article attempts to tackle one of the most difficult problems in cosmology. Current models of space and time have two possible types of solutions. The first type is the easiest to solve; that is, that the events that happen by chance split the universe into a set of parallel universes. That is the most popular model because it ignores the existence of God and is mathematically the simplest. The other, much more difficult solution is a single universe solution, where chance events have unique outcomes and the universe does not split into parallel universes. This is the solution approached in this paper, one that allows for God and yet also allows for chance, as per Ecclesiastes 9:11 which says,

> I returned, and saw under the sun, that the race *is* not to the swift, nor the battle to the strong, neither yet bread to the wise, nor yet riches to men of understanding, nor yet favour to men of skill; but time and chance happeneth to them all.

This unique solution presupposes that all events are recorded as they come to pass. That the act of recording a chance event "decides" the outcome of that chance event has long been known to quantum mechanics, and it is that principle which leads to the unique universe solution. Of necessity, some of the article is speculative, but insofar as the author knows, it violates no principle of physics and most importantly, of all, it violates no scripture. It does take certain scriptures literally that hitherto have been assumed figurative or puzzling. For instance, "they that depart from me shall be written in the earth" (Jeremiah17:13b) states that those that depart from the Lord will be recorded in the earth. The unique solution brings a literal sense to what is easily dismissed as figurative language.

One thing promised in the first article was not delivered in this, the third article, and that is a detailed exposition of the Energy-time Uncertainty Principle. It is the foundation upon which the physics of the current article is built, but only those aspects necessary for the present article are mentioned and used.

I must also reiterate something about technical articles to the non-technical reader. It is not necessary to understand or to follow the equations presented. Their presentation is for the 5% of our readers

who can follow the derivations. The text after each equation will state in English what the equation says in the language of mathematics. It does help to have taken high school physics and an introductory astronomy course, but it is not necessary. Thus the equations can be skipped without loss of understanding.

The Star of Bethlehem

On a lighter, far less technical level, we have the first of two articles on the Star of Bethlehem. The paper in this issue presents the "what" of the star. It presents the signs in heaven that preceded the birth of our Lord Jesus Christ and examines the nature of the star. As in past articles, we cannot shake the conclusion that the star the wise men saw in the east, which is the same star that led them to Bethlehem, was the angel of the Lord. Yet the stars were given for signs and for seasons (Genesis 1:14), so we cannot dismiss the celestial pageantry heralding the Lord's birth either, even though none of the participants in that pageantry is itself the Star of Bethlehem. The paper also examines the effect that the pageantry had on the peoples of Rome, Persia, and Judea.

The second paper, which D.V., we will print in the next issue of the *Astronomer*, will deal with the "when" of the star, the birth of Christ. It will do so by working forward and backwards in time from Scriptural and historical records. Again, we will take Scripture as our final authority.

Eating Toxic Waste

From time to time we have dealt with pollution and responsible ways of responding to environmentalists' woes. In this issue's "Panorama," we present extremophiles, living creatures that live under extreme conditions and remove certain dangerous elements from the environment by depositing them in a non-toxic form.

"Panorama" also presents another problem that NASA has to solve before we can colonize the moon. This problem is another dusty one. We have all seen the moon's terminator, the dividing line between night and day. What we do not see is a stream of dust that flows along the terminator from pole to pole. Electronic and sensitive mechanical devices caught in that stream of dust will soon be clogged and rendered useless. The earth is a special place, a safe haven for man. So far, we have not seen any other place, anywhere in creation, that will accommodate man without some serious protective gear, not even our oceans nor in the crust of the earth.

VISTAS IN TIME III: TIME SHEETS

Gerardus D. Bouw, Ph.D.
Presented under the title "In Process of Time"
at the Third International Conference on Absolutes,
The Woodlands, Texas
16-18 July 2007

Review

This is the third and final paper on time. In the first paper we examined time with the language of mathematics. We started the paper with a look at what happens to matter as the fundamental units (length, mass, time, etc.) changed over time. For that we assumed conservation of energy and ran into a peculiar form of the Energy Uncertainty Principle (EUP). We ended that paper by introducing the usual form of the Energy Uncertainty Principle, and we presented the usual rationale for this most mysterious of the uncertainty principles.

In the second paper we looked at time from the so-called natural languages, in our case the English language. We focused on the concept of attention span as it relates to memory and intelligence. We closed that article with a reference to sheets, each as thick as an attention span. At the time we did not pursue that concept.

In this, the third paper, we shall connect the Energy Uncertainty Principle and derive from it the sheets referred to in the second article. This paper presents a view of time sheets that has a superficial similarity to the sheets of Topological Geometrodynamics theory; but it is not quite the same. The main difference between the two theories is that we present a single, real solution while TGD presents a set of possible solutions, each of which shows up as a "parallel universe."

Introduction

Have you ever wondered about certain statements in Scripture that defy the imagination: concepts such as the firmament of Genesis 1? In it God placed the sun, moon, and stars, implying that the firmament is immense. The humanist, who thinks he is the measure of all things, cannot fathom such immensity, especially not if there is water beyond that firmament. Leaning on his own understanding, he concludes that God really didn't mean what he wrote in Genesis 1 and so, to appease the churched, concocts the notion that the firmament is the atmosphere and that there must have been some sort of water canopy above the atmosphere, even though such a canopy is impossible. That failing, he

invents the more scholarly-appearing fable that the firmament is an expanse, without saying an expanse of what, and totally ignores the waters above it. Fiction is ever more popular than fact, so when physics discovered the firmament in the early 1930s, the "recognized" scholars still hold onto the myth that the firmament is an expanse, or that it is the atmosphere, or even the crust of the earth. We now know that the firmament is a super-dense medium that pervades all of space and dictates the laws of physics, if not all nature.

In this paper we consider a family of mysterious references: two that obviously relate to time, and two that appear totally unrelated to time. The phrases are these:

- In process of time (Genesis 4:3, etc.)
- Time and chance (Ecclesiastes 9:11)
- Written in the earth (Jeremiah 17:13)
- The books were opened (Revelation 20:12).

Now some will dismiss chance as unreasonable, as abrogating the power of God, as though God has no right or power to abrogate anything he wants (such as the exacting of vengeance for our sins, for instance). Others dismiss these verses as poetic, not literally true, as if poetic phraseology gives God and man a justification for lying. Still others, having succumbed to the 160-year old myths that only the original autographs were inspired, that no translation can be inspired, and that God did not care enough about his words to protect them from the ravages of man and time. Such trivialization of the scriptures runs contrary to everything this author has ever experienced about the scriptures (AV).

In Process of Time

The phrase, "in process of time," occurs four times in Scripture. The first occurrence is found in Genesis 4:3

> And in process of time it came to pass, that Cain brought of the fruit of the ground an offering unto the LORD.

The remaining four are just like it (Genesis 38:12; Exodus 2:23; Judges 11:4; and II Chronicles 21:19).

What originally puzzled me was the absence of the definite article "the," as in "**the** process of time." With the definite article in front of the phrase we might assume that the procession of time is meant, even though the word "procession" is never applied to time in Scripture.

Without the definite article, it seems that time is a substance that is processed. For instance, time fills up (Luke 21:24,[1] "fulfilled") as if it is poured into a container.

Science and Process of Time

Is the concept of time, as understood in modern science—physics in particular—at all compatible with the concept of time as revealed in Scripture? Let us take a closer look; we may be surprised.

Scientists treat time as an *independent variable*. It is the most independent of all independent variables.

What is an independent variable?

A variable represents a quantity. For instance, your checking account balance is a variable. The value in your account, the amount of money currently in the account, is a number. The checking account balance is a dependent variable. It can be changed by other, independent variables such as deposit amount or the amount on a check. An independent variable, such as the check amount, may itself also be a dependent variable. The check amount depends on the number of items purchased, the unit cost, and sales tax.

When we say that time is the most independent of variables we mean that time rarely appears as a dependent variable. Consider some of the ways time is used:

- Time may be a constant (length of a second, Planck time length of 10^{-44} sec)
- Time may be a dependent variable. When it does, it usually depends on speed, which itself involves time (miles per *hour*). E.g.,

  $$t_0 = t\sqrt{(1 - v^2/c^2)}$$

  which describes how clocks slow down the faster they travel.
- Time is the least understood concept in science.
- To time is assigned many magical properties; for instance:
  - Evolution's hope against creationism (given enough time…)
  - Unbelievers hope it will erase inconvenient facts.[2]

[1] Luke 21:24 — And they shall fall by the edge of the sword, and shall be led away captive into all nations: and Jerusalem shall be trodden down of the Gentiles, until the times of the Gentiles be fulfilled.

[2] In the early 1980s the chairman of Biology at Baldwin-Wallace College took issue with me about creationism and geocentricity during lunch at the faculty lounge one day. The conversation ended on Joshua's long day, which he dismissed as a local mass hallucination that had spread around the world. When I pointed out that half of the world has a

In short, time is considered to have god-like properties; what can be more independent that that?

Time and Chance

In some Protestant, and even in some Baptist circles, it is reported that nothing happens by chance; that everything is predestinated, under God's controlling hand. But this is not what Scripture teaches.

- **Ecclesiastes 9:11** I returned, and saw under the sun, that the race *is* not to the swift, nor the battle to the strong, neither yet bread to the wise, nor yet riches to men of understanding, nor yet favour to men of skill; but time and chance happeneth to them all.
- **Luke 13:5** [Jesus speaking] I tell you, Nay: but, except ye repent, ye shall all likewise perish.

It is not hard to understand these two passages and to see how they are tied together. In Luke, Jesus is speaking of the Galileans whose blood Pilate had mingled with their sacrifices and to the eighteen killed in the collapse of the tower in Siloam. When we so repent, we put our lives under God's protection. Paul says that doing so harkens back in time to God's foreknowledge which predestinates the truly repentant to be conformed to the image of Christ (Romans 8:29-30;[3] Ephesians 1:5, 11[4]). In contrast, when we decide to go our own ways, we tell God we do not want him to "interfere" in our lives. God obliges and we become subject to chance events, such as the tower's collapse and having the misfortune to be in the wrong place at the wrong time, as was the case of the Galileans. After all, we've forbidden God to intervene on our behalf. That is why time and chance happeneth to all.

Time and chance are also tied together in science, particularly

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story of a long day and the other half of a long night, and that there was even a story of a long sunset in between them, he paused and responded, "Well, the science of phenomenology is a new science. Someday we'll figure it out"; that is to say, given enough time we'll come up with a story that could explain away those facts as a mass hallucination.

[3] **Romans 8:29-30** For whom he did foreknow, he also did predestinate *to be* conformed to the image of his Son, that he might be the firstborn among many brethren. [30] Moreover whom he did predestinate, them he also called: and whom he called, them he also justified: and whom he justified, them he also glorified.

[4] **Ephesians 1:5, 11** Having predestinated us unto the adoption of children by Jesus Christ to himself, according to the good pleasure of his will, … [11] In whom also we have obtained an inheritance, being predestinated according to the purpose of him who worketh all things after the counsel of his own will.

quantum mechanics.

Here, I fear, I have to take some time to explain what chance has to do with quantum mechanics because it runs contrary to the all-is-predestinated advocates among us. Physicists find it easiest to treat objects as if they are points instead of extended objects. Modern physics views an electron as a point-particle, for example. The reality is that there are no points. The smallest created "point" is a Planck particle which is of the order of 10^{-33} centimeter in diameter.[5] The smallest possible wavelength is of the order of 10^{-63} cm.[6]

Quantum mechanics treats all objects as waves. Thus electrons and protons are waves. Sometimes these behave as particles, such as when one wavelength transfers its momentum to another entity, but the particles are always waves. That everything consists of waves is necessary; for if it were not so, we could not "move and have our being" in God (Acts 17:28).

Now consider the wave. At what point is the wave to be found? There is no such point. The wave exists equally over its entire wavelength. This is why quantum mechanics considers the wave's position statistically because although the wave exists equally over its entire wavelength, the wave does not make its presence felt equally over the entire wavelength. I accept quantum mechanics as a discipline because it is the best we have and it works. By contrast, the physics of a truly fully-deterministic model that predestinates everything has no degrees of freedom and is the same as if everyone and everything were encased in a solid lead brick, unable to move at all.

Time and Chance in Quantum Mechanics: The Uncertainty Principles

Because there are no true particles independent of waves, the position of a "particle" (particle-wave) cannot be accurately determined. This results in a set of formulas called uncertainty principles (UPs for short).[7] The Heisenberg Uncertainty Principle (HUP) is one of those. The HUP relates position (**x**) and momentum (**p**) as follows:

$$\Delta\mathbf{x}\,\Delta\mathbf{p} \geq h/2. \qquad (1)$$

In this case, $\Delta\mathbf{p}$ and $\Delta\mathbf{x}$ are the standard deviations of multiple experiments measuring their values under identical conditions. Standard deviation is a statistical term that is a measure of the width of the bell

[5] One electromagnetic theory popular among creationists has the smallest fiber (charge) with a diameter of roughly an order of 10^{-203} cm., but that is not a particle.

[6] The Compton wavelength of the entire universe.

[7] Others, not mentioned in this article, are angular position and angular momentum, and angular momentum in two normal axes.

curve (normal curve) in statistics. That is where chance enters the picture in quantum mechanics as well as reality.

But the above expression tells us nothing about time. For that we have the following mysterious uncertainty expression:

$$\Delta E \, \Delta t \geq h/2 \qquad (2)$$

What makes this "Energy Uncertainty Principle" (EUP) so mysterious is that it is not statistical; particularly, the reader will notice that the E and the t are not in bold face, i.e., they are not vectors. All the other UPs have two vectors or matrices or operators on the left hand side of the principle, but here only ΔE can be cast as an operator (e.g., as a Hamiltonian) but time is not an operator, it is a parameter, the ultimate independent variable. If we force the issue, then this mismatch tells us trivially that $0 \geq 0$, which is useless.

How are we to interpret the EUP? Many proposals have been made, most without merit, but one has promise. The EUP applies only when E is an energy operator, say a Hamiltonian, and t consists of something that has the dimension of time, such as a lifetime of some state[8] with respect to an observable Hamiltonian. Here Scripture gives us the key that can unlock this strange Uncertainty Principle.

Written in the Earth

Our usual perception of time is like a car that drives down a road. The road ahead of us is the future and that behind us is the past. In the car is the present. Thus we perceive time as flowing from the past to the future.

There is a problem with that perception of time, however. In our cars we see the future ahead of us, but we do not behold the past because it is behind us. In reality, we do not see all that far into the future. Driving down a road, we may see several minutes ahead of us, but by so doing we assumption that nothing unexpected, such as a flat tire or a deer jumping out in front of us, impedes us from arriving there. These latter factors determine whether or not we can actually see into the future or whether we forecast it based on present trends and past experience, that is, on momentum. Any valid model of the future needs to consider the turns and twists that we experience in process of time. The problem is solved if time comes to us from the side, "around the corner," as it were.

In this regard, consider Jeremiah 17:13, which has a very mysterious phrasing.

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[8] In quantum mechanical terms, $| t >$, pronounced as "ket tee."

> O LORD, the hope of Israel, all that forsake thee shall be ashamed, *and* they that depart from me shall be written in the earth**,** because they have forsaken the LORD, the fountain of living waters.

Let's study this for a moment. Those that hate the Lord,[9] particularly those that depart from him, shall be written in the earth. This has to be literally true. The God of truth cannot write something that is not literally true, even if it is put in poetic form. Some have proposed that the rocks contain holographic images of past events. Although that properly belongs in the realm of science fiction,[10] it is not all that far from the truth. So, how can these things be written in the earth, literally? That is where current theories of time and memory come into play.

Cosmology and the Mind of Man

It may surprise the listener that cosmology is concerned with more than the structure of the universe. It is also concerned with how our minds perceive the universe, how we develop theories, and so forth. I have written about this in the past, developing a theory about theories and how those relate to the word, not only the linguistic word but the word of God (scriptures which consist of the words of God) and the Word, even the Lord Jesus Christ, as the foundation of all truth (John 1:1;[11] 14:6[12]).[13] The theory of theories, too, is under the purview of a branch of quantum mechanics but beyond the scope of this paper.

The theory of time we are about to look at originates from a collection of observations and experiments about attention spans. These were mostly conducted between 1964 and 1979 and presented in the second paper. By attention span is meant the amount of time it takes for one to drift off subject or to argue in a complete circle. Suffice it to say, that by 1972, my research in attention spans led to the discovery of what I call time sheets.

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[9] For a definition of what a man has to do to be accounted a hater of God, see Exodus 20:5. It amounts to a total rejection of the way, the truth, and the life (John 14:6). Also see Daniel 3 and Revelation 20:4.

[10] Indeed, as far as this author is aware, the idea was first proposed in the early 1950s in a *Science Fiction Theatre* episode.

[11] John 1:1 In the beginning was the Word, and the Word was with God, and the Word was God.

[12] John 14:6 Jesus saith unto him, I am the way, the truth, and the life: no man cometh unto the Father, but by me.

[13] Bouw, G.D., 1996. "Theory of Theories" Parts 1 and 2, *B.A.* Vol. 6, nos. 77 & 78, pp. 22 & 18 respectively.

Time Sheets

In the early-nineties, a Finnish cosmologist named Mati Pitkanen developed a theory called "Topological Geometrodynamics." Topological Geometrodynamics (TGD) came to be because of problems originating from the definitions of inertial and gravitational energy in general relativity. TGD views physical space-times as four-dimensional surfaces in a certain eight-dimensional space. The choice of this space is determined by properties of classical physics and particle quantum physics. When I learned of Pitkanen's theory in February of this year, I was reminded of my time-sheet theory. Are they the same?

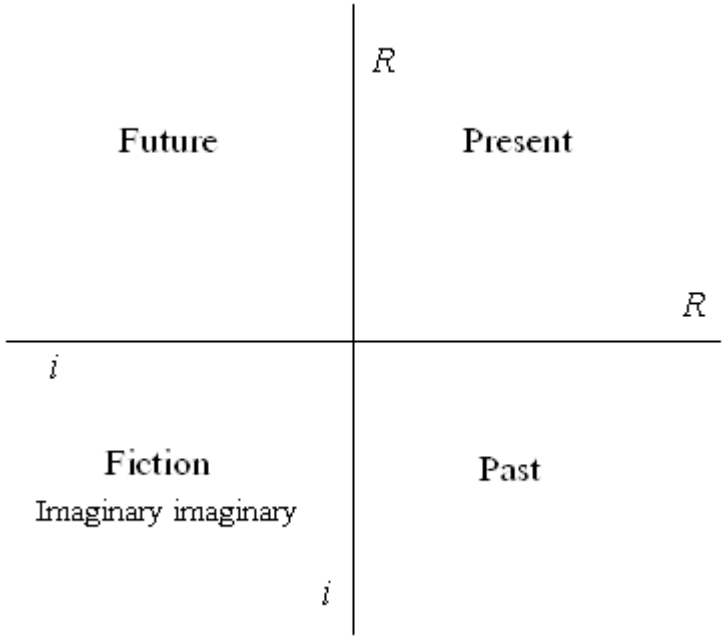

Figure 1: Time sheet coordinate system. The *i* denotes an imaginary axis while *R* denotes a real axis resulting in one real quadrant, the Present, two complex quadrants (Past and Future), and one purely imaginary quadrant which, for lack of a better term is labeled Fiction.

It turns out that the TGD and time-sheet theories are not quite the same, though they cover the same territory. Pitkanen's theory tries to incorporate relativity whereas time-sheet theory throws it out. Relativity is irrelevant if space is absolute and the firmament (Planck medium) is absolute space. So the TGD adherents, though on the right track, have essentially shot themselves in the foot insofar as progress is con-

cerned. The most significant similarity the two theories have is that at the macroscopic (every-day reality) scale, both are rooted in perception. Pitkanen calls it *consciousness*; I call it *attention span*. I shall not go any further into describing TGD. It is couched in obscure technical language that is hard enough for an expert to decipher. Specifically, TGD is a cross product[14] of a four-dimensional Minkowski future space with a two-dimensional complex projective space. A complex space involves imaginary numbers, i.e., involving the $\sqrt{(-1)}$. In picturing my time-sheet theory for this paper, I have projected the two imaginary dimensions into the two bottom quadrants of a regular x-y (Cartesian) coordinate system and the remaining four dimensions into the two upper quadrants. The cross product yields the interactions I shall describe next with reference to Figure 1 on the facing page.

Consider the coordinates in Figure 1. The first quadrant, the one labeled "Present," has a real (*R*) vertical axis and a real (*R*) horizontal axis. The events therein are real. The second quadrant, labeled "Future," has one real axis (*R*) and one imaginary axis (*i*). This means that our imagination can shape the future by dreams and hopes, but only as long as they are realistic. It also means that the future can communicate future events to our mental imaging system. In the third quadrant, labeled "Fiction," both axes are imaginary (*i*). These are the things that could have happened but did not. Also here reside the nightmares of a Stephen King and the romantic novels of Jeanette Oke. Here is found every lie ever told, every distortion or stretch of the truth. It is the realm of dreams. Finally, in the fourth quadrant, is the past. Here one dimension is real (*R*) and the other is imaginary (*i*). Note specifically that the distance to the past is measured from the real (*R*) axis on down. That distance, *D*, is imaginary as per the 4-dimensional Pythagorean Theorem:

$$D = \sqrt{[x^2 + y^2 + z^2 - (ct)^2]} \qquad (3)$$

Effectively it means that one has to exceed the speed of light just to look into the past, let alone travel into it.

Time Sheets in the Past

Some of what follows is speculative, but there are reasons behind each step encountered in the description of the process of time from the future to the past.

The past consists of layer upon layer of time sheets, "frozen" in place. Remember, each sheet is four-dimensional. At the scale we start with, each sheet's three spatial dimensions has a volume equal to the

[14] Also known in some disciplines as a Cartesian product.

volume of the universe and a thickness of a Planck length (1.6×10^{-33} cm) in the time or fourth dimension (about 5.4×10^{-44} second times the speed of light; see the last term in eqn. 3). The total volume of each sheet is about 3.4×10^{31} cm^3. Large though that number might seem, it is only one forty-third of the volume of the sun. If a bulb is turned on in empty space, then after one second the shell of light of light it emits would have filled a volume equal to 2.7×10^{31} cm^3. Each sheet has frozen into it the state of every grain in the firmament (every Planck particle) for that instant of time (5.4×10^{-44} second; we shall call it a *Planck instant*). When one reads cosmological articles about the holographic universe, this is what the author of the article was talking about: the information recorded in a time sheet. After each Planck instant, another sheet is deposited on top of the stack (see the "Past" quadrant in Figure 2).

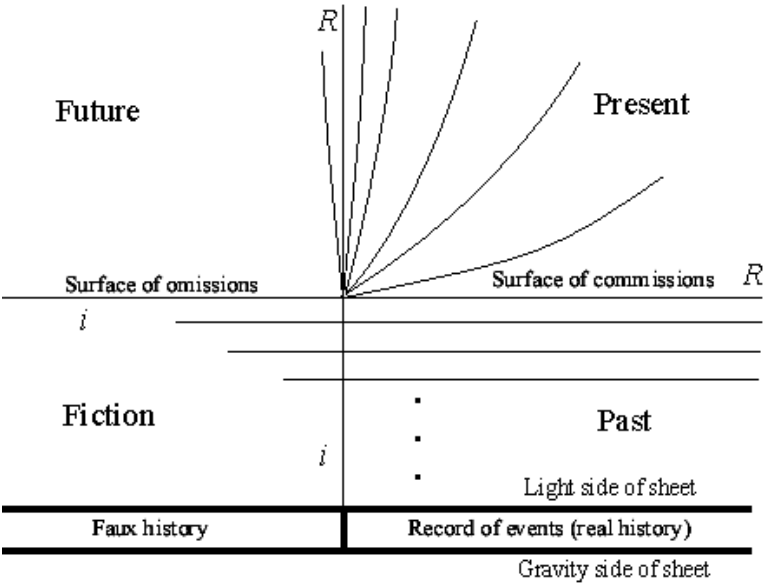

Figure 2: This figure shows the detailed effects of the Energy Uncertainty Principle. The time sheet is torqued from the future and turns through the present until it lands on the topmost sheet of the past. It seems likely that a similar process happens to the complex conjugant sheet, an event which could have happened but didn't, (pictured by the curve to the right of the vertical axis, rotates through the future to land on the Fiction pile of sheets.

Each sheet is a layer of Planck particles. We envision the Planck particles as a layer of ball bearings, each touching its neighbor, with those in the layer above it resting on the lower layer in the most stable

position. This way, the particles are packed as closely as possible. Thus, too, the layers have some overlap.

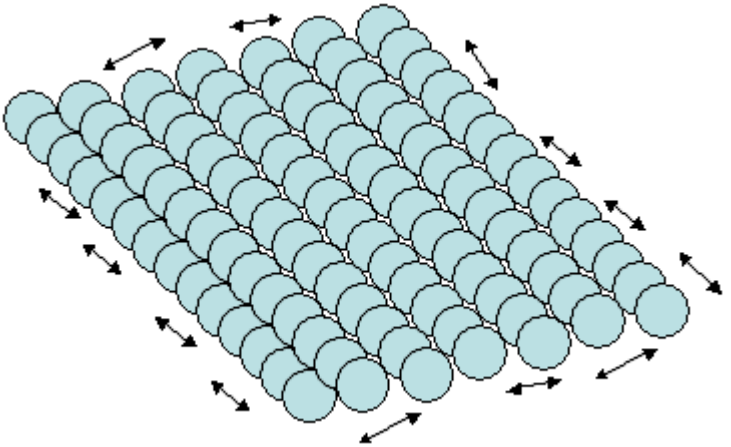

Figure 3: The sheets viewed as layers of Planck particles. The arrows illustrate vibrational modes for the particles. These are small relative to the diameters of the particles. (Figure courtesy of Martin Selbrede.)

To preserve the information, the surfaces of each sheet should have minimum or zero entropy. Only two phenomena are known to have zero entropy and those two are light and gravity. We propose that the top surface of each sheet is light, and the bottom surface is gravity. Having zero entropy on both surfaces means that inside the sheet there is true and perfect information.

Recalling that we are describing an 8-dimensional phenomenon, it behooves us to stand back and see what this looks like from our everyday perspective. Elsewhere we have reported that the speed of light is the same as two of the four possible speeds of sound through the firmament.[15] A photon traveling at the speed of light does not experience any time. As far as the photon is concerned, it travels at infinite speed. According to relativity, however, from the photon's perspective we are the ones that move away from it at the speed of light, so to the photon, we experience no time. To it, we are frozen in time. Thus the record it bears of us on top of a sheet is a moment of our time frozen forever. For it, time is no more; it is a perfect historical record. To us it looks as if the light leaves us with the image of what we were doing at the time

[15] Bouw, G. D., 2002. "Earthquakes, Snowfalls, and Geocentricity," **12**(99):17 (Appendix).

it was emitted intact. In our future, i.e., in the top cone in figure 4, anyone with a powerful enough telescope will be able to focus the light and see that record. By the same token, we see stars whose light left years ago, provided we were in their future at the time the light was emitted. (See Figure 4.)

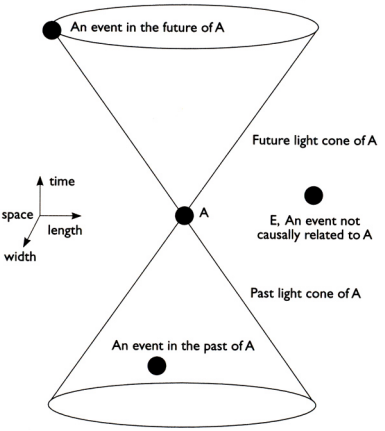

Figure 4: The future for event or location (time and place) A is pictured as a cone. Anything that happens in that cone will be able to see event A. Anything outside the cone would require a transmission speed greater than the speed of light to observe event A. The circle of the cone expands in at the speed of light. Any event inside the bottom cone can be observed by an observer at time and place A and is thus said to lie in the past of A.

We can look at this another way, however. As the sheets pile up, increasing the thickness of the past at the speed of light, the light from the past is left behind and the record fades from view. Anyone with access to our past can see the events of the past.

Formation of a Sheet

We observe, of course, that an automobile keeps moving unless the brakes are applied. As we walk, we move, too. If the EUP were the only uncertainty principle, then all motion would cease with the deposit of the sheet. Such cessation of action would violate the conservation of momentum principle, but that is why God instituted the Heisenberg Uncertainty Principle, for it related momentum and position—as per equation (1) above.

As the present-time sheet lands atop the "past pile," it "bounces." The impact does two things. It solidifies (literally freezes) the information in the previous sheet and invokes a phase change (it becomes fluid) in the present-time sheet, essentially causing the bounce. The change of state "confuses" the present-time sheet and that kicks in the Heisenberg Uncertainty Principle (1).[16] Unless there is a force acting on a

[16] As noted in the first article, there are two additional uncertainty principles, both dealing with angular momentum. Equation (1) here deals with linear momentum. Similar processes as that described here for the Heisenberg Uncertainty Principle will keep a spinning body spinning.

particle, the particle's position is trapped between the constancy of the Planck constant, h, and the conservation of momentum ($d\boldsymbol{p}=0$). As a result, if there is any change, it will be in $\boldsymbol{x}$, position. Thus the impact changes the position of the particle. We call the effect of this bounce *momentum*. That is, it passes its momentum or energy to the next sheet, freezing into place the *sense* in which the energy (or information) was headed; in other words, recording what was going on at that instant.

At the instant the energy is transferred, our attention passes onto the next sheet about to land. Not only that, but the vertical pressure of the bounce jolts loose the next sheet from the vertical axis in the Figure 2, causing it to start its turn through the present.

The stack of sheets on the past-pile gets thicker and thicker. We are not aware of its rising because we are always on top sheets. In essence, time piles up the vertical axis as far as we are concerned—like filling up a container with us floating on the surface.[17]

Earlier in this paper we postulated that gravity is on the underside of the sheet or under all the sheets while light is on the top of each sheet. Our relationship with God will determine where our record falls. If we are in the light, our record is on top. If we are in darkness, working for the wages of sin which takes us to the grave, to death, our record is on the bottom. Life or death, those are the only zero-entropy choices. The gravitational field we are in is the earth's, thus Jeremiah 17:13's "written in the earth" is literally true.

The Books Were Opened

The sheets are bound to a spine, which, for want of better words, I consider a torque plane because along it the sheets are torqued into existence and twisted through the present to be bound into the past by the action of the two spinning uncertainty principles we have not considered. Each sheet is a Planck length thick, and the amount of information stored there may seem too detailed, but here is where the Energy Uncertainty Principle comes into play.

Recall that the EUP required two operators, an energy operator and a time operator. The only time "operation" we know of is the time that something exists. Thus, if instead of looking at an instant of time—a Planck time—what if we looked at a stack of past time sheets a thirtieth of a second apart or thick? We would see what happened in

[17] As more and more gravity is caught in the pile, less of it is available in the present, making the universe look as if there is a missing mass. The mass is not missing; its gravity is merely trapped in the past, unable to operate in the present.

that 30^{th} of the second. If now we slid that 30^{th} of a second upward in the past-pile, we would see a 3-D "movie" of what happened. Sliding the "window" down the pile would play the action backwards in time. By taking a vertical or diagonal slice through the past-pile we can follow the world-line of an individual; any individual, anywhere, anytime in the past.

I submit to you that these may be the books referred to in Scripture; books that are used for judgment: ultimately the books of Revelation 20:12.

> **Revelation 20:12** And I saw the dead, small and great, stand before God; and the books were opened: and another book was opened, which is *the book* of life: and the dead were judged out of those things which were written in the books, according to their works.

The books depend on the cut taken, or the quadrant taken. Man can then be judged not only for what he has done (recorded in the fourth quadrant), but also for what he did not do, for that is recorded in the third quadrant.

Conclusion

It has not been my goal to teach you about time. My underlying motive, if there is one, is to teach you to take my Bible literally. My Bible is the Authorized Version. It and it only provides the precision of wording, the accuracy of revelation that made this work possible. It is the only translation in existence today that has its own, theological language—a pure language. The Masoretic text also has one, but I am not nearly as proficient in Hebrew as I am in English. Perhaps I can see this truth about the AV because English is a foreign language to me. It is the richest language in the world, with French a distant second. So, if you have learned a little bit about time, consider it a plus. If you have not learned that the AV is the word of God, consisting of the words of God, then consider the works it has produced: the richest language in the world, it evangelized the world, and it is a sure guide to learning about the nature of man, the nature of God, the nature of creation, and even cosmology. I, for one, could not have been saved by any other version in existence, no matter what language and no matter how godly its translators may have been perceived.

PANORAMA

A Perpetual Dust Storm on the Moon

Every lunar morning, when sunlight hits the moon's dusty soil after two weeks of the frigid lunar night, a strange dust storm stirs the surface. The long, skinny dust storm stretches all the way from the moon's north pole to its south pole. It swirls across the surface, following the terminator (the dividing line between night and day) as sunrise travels around the moon.

The evidence for the storm comes from an Apollo 17 experiment left behind on the moon in 1972. Called the Lunar Ejecta and Meteorites (LEAM) experiment, it was designed to detect dust kicked up by meteors hitting the moon's surface. The Apollo scientists wanted to know how much dust is kicked up by daily impacts. The LEAM has three sensors, one pointing east, the second pointing west, and the third pointing up. Each of the three sensors records the speed, energy, and direction of tiny particles hitting it. LEAM operated for a short time, gathering only 620 hours of night data and 150 hours of daytime data.

LEAM detected a large number of particles every (lunar) morning, mostly coming from the east or west rather than from above or below, and mostly passing at slower speeds than expected for ejecta. What happens is that when the sunlight hits a dust particle on the moon's surface, the photon knocks off an electron, imparting a positive charge to the dust grain. However, at night the dust particle becomes negatively charged. At the interface between night and day, electrically-charged dust would be pushed sideways—from the dark side to the sunlit side—across the terminator. The sunlit-charged dust stuck to the LEAM. In so doing, it absorbed sunlight and heated the LEAM's instruments so much that they had to be turned off and the data gathering ended.

Astronauts may have seen the storms, too. While orbiting the moon, the crews of Apollo 8, 10, 12, and 17 sketched bands or twilight rays where sunlight was apparently filtering through dust above the moon's surface. This was reported before each lunar sunrise and just after sunset. NASA's Surveyor craft also photographed twilight "horizontal glows," similar to what the astronauts sketched. Possibly, some of the Lunar Transient Phenomena (LTPs) reported by earth-based observers over the last couple of hundred years may be the rising plumes of electrostatically lifted lunar dust.

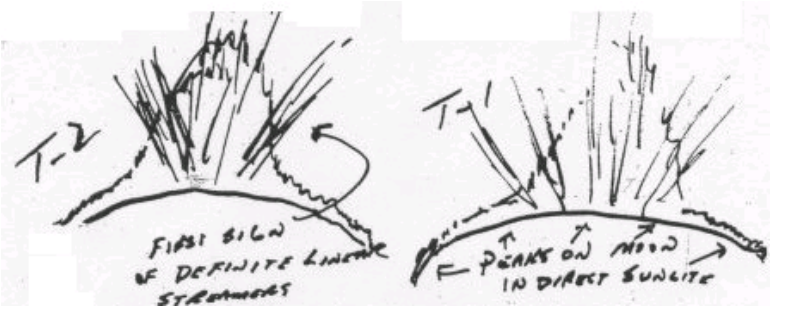

Figure 1: Dusty "twilight rays" sketched by Apollo 17 astronauts. (Courtesy NASA.)

The dust's attraction to NASA's instruments matters to NASA because if astronauts are to remain on the moon at a permanent outpost, the wall of dust may create such problems as coating surfaces, causing hardware to overheat, and clogging spacesuits.

Army Ants and Peleg's Day

A Cornell University study has discredited a long-standing evolution theory which claims that army ants originated separately on different continents and then evolved into the army ants we know all around the world today.

The problem is, how can army ants, whose queens cannot fly or get caught up in the wind, be so similar all around the world? Sean Brady, a Cornell University entomologist, determined to find the answer. Using fossil data and genetic forensics, Brady discovered that all army ants stem from one point of origin. Furthermore, army ants have not evolved even a little bit.

Brady studied the army ant DNA from several locations and compared them with twenty possible evolutionary ancestors within the army ant community. His finds discredited the evolutionists' established theory of army ants. Furthermore, the DNA evidence argues for a recent continental split, even as the Scripture reports happened in the days of Peleg (Genesis 10:25[1]).

[1] Genesis 10:25—And unto Eber were born two sons: the name of one *was* Peleg; for in his days was the earth divided; and his brother's name *was* Joktan.

Extremophiles

An infectious insanity, rampant in world these days, insists on the worship of ancient deities such as Gaia,[2] or Nature. Although most environmentalists are practical atheists, they are concerned with "getting back to the garden," by which they mean the garden of Eden, even though most will deny there ever was a garden of Eden. But the Scripture says the LORD banished man from the garden of Eden and made certain that man could never enter it again (Genesis 3:24[3]). Environmentalists are hostile to the Creator God for blocking them from access to Eden; they favor impersonal goddesses like Mother Nature or Mother Earth, or the lowly Father Sky. As such, they must deny that the LORD God of the Bible knew what he was doing when he created the earth for man. Such denial makes perfect sense in their minds, but to a Bible believer it is absolute insanity.

If God created the earth for man and planned for it to be around until the time came to create the new heaven and new earth (Revelation 20:11; 21:1), then he must have made sure that man cannot destroy this earth before God's time. In particular, this means that we cannot pollute the earth to death.

There are a great many toxic chemicals which have been released on the surface of earth and in the waters. The doomsayers promise to stop the pollution if we would only send them money. The more money they collect, however, the more pollutants they find that need to be cleaned up and which we need to banish from our daily lives. Recycling is an environmental disaster for most recycled items. It takes more energy and creates more pollution to recycle most items than it does to make the material from scratch. Much material is renewable, such as paper, for instance, and so the supply is effectively unlimited. The end product, paper, is always biodegradable. It is the manufacturing process that involves biologically caustic chemicals. Did God not prepare the earth for such pollution?

Recently, scientists discovered the existence of tiny, living creatures that serve as the earth's recycling centers for metals and minerals. Whereas we breathe air, these tiny creatures breathe in other things, things we consider pollutants. The living creatures are called *extremophiles.*

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[2] Gaia is the Hindi name of the elephant whose feet are planted on the back of a giant turtle swimming in a cosmic ocean. On Gaia's back is a flat disk called the earth.

[3] Genesis 3:24—So [God] drove out the man; and he placed at the east of the garden of Eden Cherubims, and a flaming sword which turned every way, to keep the way of the tree of life.

What astounded the scientists was what happens to the products the extremophiles take in. The worthless minerals or metals taken in are "breathed out," redeposited in their original state!

What has captured the imagination of most is one extremophile that breathes in dissolved gold and redeposits it as solid gold. Deep in the ocean's underwater canyons we find hydrothermal vents, even active volcanoes. These have spewed out miles of deposits of dissolved gold. When the extremophiles are introduced into that environment, the microbes rapidly convert the useless gold into a solid metallic form. What was once dissipated by the heat and pressure of the earth's crust and mantle has now been made whole again.

The extremophiles' gold production is not great enough to give a commercial yield, and given its extreme environment it is clearly not cost effective; nevertheless, extremophiles hold a promise that even as the extremophiles can convert the earth's pollution into a safe form, even so they can convert man's pollution into a safe form.

Such creatures are not new. We have long known of bacteria that devour crude oil, for instance. These keep the oceans free of the tar balls that surface from naturally occurring oil wells in the ocean floor. Although environmentalists scream that the tar balls are caused by offshore drilling, the tar balls were just as frequent now as they were before the oil rig was invented.

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COMPREHENDING ENGINEERS

A priest, doctor, and engineer were sentenced to die by the guillotine. The priest was called first. He was led up to the platform, strapped in, and the board lowered into position and his head secured. The executioner pulled the lever and the blade came flashing down. However, halfway down it jammed and came to a stop. The executioner took this as a sign from God and freed the priest.

The doctor was led up to the platform next. The same thing happened and the doctor was freed.

The engineer was led up the platform. He looked up at the guillotine for a couple minutes, then said to the executioner: "You know, I think I see the problem…."

THE STAR OF BETHLEHEM I:
Astronomical Perspectives[1]

This article is the first of two parts, covering astronomical phenomena leading up to the birth of Christ. In the next issue, we shall look at historical matters concerning the birth of Christ.

The usual planetarium presentations about the Star of Bethlehem will present comets or novae (exploding stars) as possible candidates for the Star of Bethlehem. Most of them will end with the triple conjunction of Jupiter and Saturn in Pisces in 7 B.C. (Figure 1), which the astronomer Kepler introduced as the Star of Bethlehem. The planetarium presentation will generally end by confidently proclaiming that the birth of Jesus was in March of 4 B.C. or perhaps even as early as 7 B.C.

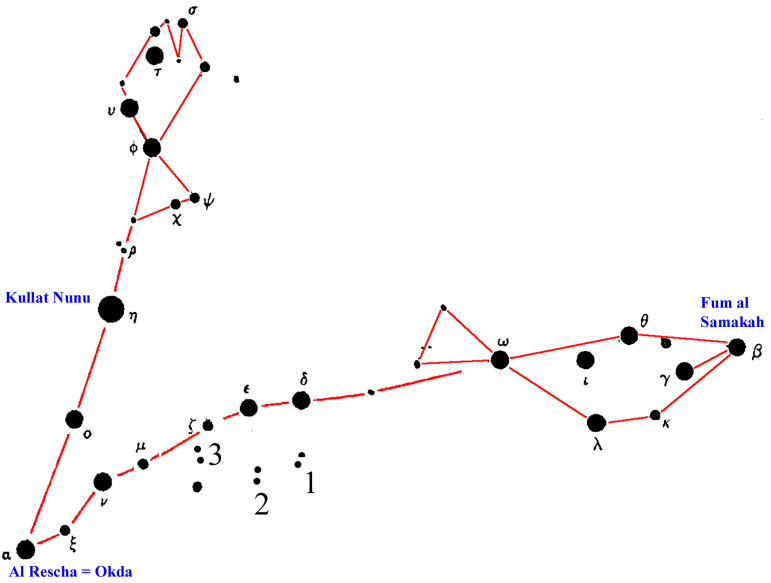

Figure 1: The triple conjunction of Jupiter (upper) and Saturn (lower) of 7 B.C. In the first conjunction, on May 27, the two objects were 0.99 degrees apart. The second happened on 5 October at 0.98-degree separation. The third happened on 5 December at a separation of 1.05 degrees. At no point did the two planets appear less than two full-moon diameters apart.

[1] For a review of many of the arguments involving the date of Christ's birth see G. D. Bouw, 1980. "On the Star of Bethlehem," *Creation Research Society Quarterly* **17**(3):174-181. Also see: Bouw, G.D., 1998. "The Star of Bethlehem," *B.A.* **8**(86):12.

However exciting the events presented by the planetariums at Christmas time may be, they pale in comparison to the astronomical events that took place during a 20-month period from May 3 B.C. to January 1 B.C. This was one of, if not the most remarkable series of celestial events since creation. At the time, these celestial events inspired many wonderful interpretations by the priests, astrologers, and politicians of the time. Moreover, the celestial pageantry occurred when the entire Roman Empire was in celebration. To Rome and to Augustus Caesar, it was as though the heavens were confirming their greatness. But after a year of euphoria, a visit of several wise men to Jerusalem—seeking audience with whom they knew would be the greatest king ever—doused the euphoria and replaced it with a paranoia that would drive kings and emperors mad for millennia to come.

The Heavens Declare

On May 19, 3 B.C., the planets Saturn and Mercury were in close conjunction in Taurus, passing within 40' (the ' denotes minutes of arc) of each other. (For comparison, the diameter of the full moon is 30' of arc.) Next, Saturn moved eastward through the club of the constellation Orion to meet with Venus on June 12, 3 B.C. During this conjunction, the two were only 7'.2 apart.

As if those events were not enough, on August 12, 3 B.C., Jupiter and Venus came into close conjunction just before sunrise, coming within 4'.2 of each other as viewed from earth, and appearing as a very bright morning star. This conjunction took place in the constellation Cancer. Ten months later, on June 17, 2 B.C., Venus and Jupiter joined again, this time in the constellation Leo. The two planets were at best 6" (seconds of arc) apart; some calculations indicate that they actually overlapped each other. This conjunction occurred during the evening and would have appeared as one very bright star.

The constellation Leo was thought to be ruled by the sun, the "chief" star of the heavens. It was considered the "Royal Constellation," dominated by the star Regulus. The name Regulus itself is derived from the Latin word for king; Regulus was considered the "King Star." Leo was thought to bestow royalty and power for any of the planets found within it. Jupiter was regarded by the Romans as the guardian and ruler of the Roman Empire and it was thought to determine the course of all human affairs. Venus, then in conjunction with Jupiter, was claimed to be the mother of the family of Augustus. So here were the two planets dedicated to the origins of Rome and the sovereignty of Augustus merging together in a "marriage" during one of

the most glorious years in the history of Rome—the silver jubilee of Caesar Augustus' undisputed reign—and in the constellation of Leo, at that.

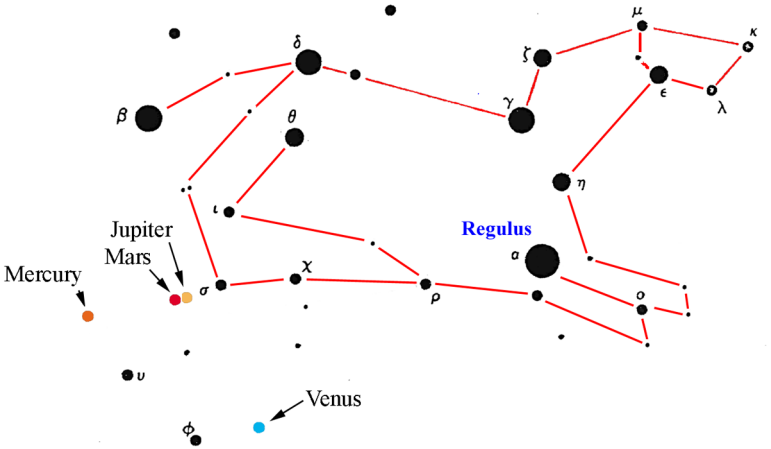

Figure 2: The constellation of Leo, the lion, showing the locations of all the known planets there near the end of the celestial pageantry leading up to the Lord's birth. The date is 27 August of 2 B.C. The sun has just entered Virgo.

That this conjunction occurred during a full moon was also important to the Romans. Full-moon day was especially sacred to Jupiter, and the day itself was called "the Trust of Jupiter." It was celebrated as a time when faith and trust were supposed to be given to the guardian and ruler of the Empire of Rome, whether human or divine (and in the case of Augustus, there was little distinction).

Still another rare astronomical event occurred 72 days after the conjunction of Jupiter and Venus, on August 27, 2 B.C. This was a close grouping, a massing, of the planets Jupiter, Mars, Venus, and Mercury (Figure 2). It also occurred in the constellation Leo and during the month of August when most of the Roman festivities for that unusual year were taking place. This was interpreted by astrologers as "common agreement of purpose." It was seen to herald a new and powerful beginning for Rome and the rest of the known civilized world.

The King Star Assents

On 12 August 3 B.C., just 33 days after the Jupiter/Venus "morning star" conjunction, Jupiter came to within 19'.8 of Regulus. Regulus is the chief star in Leo, lying practically in the path of the Sun, and was

therefore afforded the additional epithet of "Royal Star." Here was the "King planet" now encountering the "King Star," and in the Royal Constellation at that. If viewed in isolation to other astronomical occurrences this single event might not have been significant to star gazers, but combined with the other celestial displays of 3 to 2 B.C., it soon took on increased symbolic meaning. This is because the conjunction was the first of three meetings of Jupiter and Regulus. After Jupiter's first close pass with Regulus, Jupiter continued on its normal journey through the heavens. On 1 December 3 B.C., Jupiter stopped its motion through the fixed stars and began its annual "retrograde" motion. In doing so, it once again headed toward Regulus. Then on 17 February 2 B.C., the two were reunited, 51' apart. Jupiter continued its retrograde motion another 40 days and then reverted to its normal motion through the stars. Remarkably, this movement once again placed Jupiter into a third conjunction with Regulus on 8 May 2 B.C., 43'.2 apart.

As a sign, it appeared as though the King Planet was circling over and around Regulus, the King Star, "homing in" on it and pointing out the significance of the King Star as it related to the King Planet. This circular movement of Jupiter about Regulus would probably have signaled that a great king was then destined to appear. This circling motion also provided another significant astrological observation. The zero line for beginning and ending the 360 degrees of the Zodiac was thought by some astrologers to be located between Cancer and Leo. (That is roughly where the Vernal Equinox would have been at the creation in 4000 B.C.) This meant that the easternmost edge of Jupiter's circle about Regulus lay just touching the origin the astrologers of the time used for astrological measurements. It lay at the starting section of Rome's zodiac.

This interpretation is different from that which may have been designed by Moses. Since the Hebrew year designated at the Exodus started at the Vernal Equinox (first day of spring), the Hebrew zodiac began with the sign of Taurus. At the time of the Exodus (circa 1500 B.C.), the Vernal Equinox was in Taurus. The association of Leo with the tribe of Judah arose from Genesis 49:9-10.[2] Whatever the case, these indications would unquestionably have shown the people of that era that a great king or ruler was then being introduced to the people of the world.

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[2] Genesis 49:9-10—Judah *is* a lion's whelp: from the prey, my son, thou art gone up: he stooped down, he couched as a lion**,** and as an old lion; who shall rouse him up? [10] The sceptre shall not depart from Judah, nor a lawgiver from between his feet, until Shiloh come; and unto him *shall* the gathering of the people *be*.

		EVENTS SURROUNDING THE BIRTH OF JESUS
	May	
		19: Saturn & Mercury conjunction
	Jun	
		12: Saturn & Venus conjunction
3	Jun	
B.	Jul	
	Aug	
C.		12: Close conjunction of Jupiter and Venus (0.08 degree)
	Sep	1: Venus & Mercury conjunction (0.35 degree)
		14: First Jupiter & Regulus conjunction (0.67 degree)
	Oct	
	Nov	
	Dec	1: Jupiter stops its eastward motion & starts its retrograde (westward) motion.
	Jan	Rome celebrates the 750th anniversary of its founding.
		17: Start of Augustus' silver jubilee of his being titled "Augustus" and "Princeps";
		Celebration lasts all year.
	Feb	5: Augustus declared "Pater Patriae" formalizing his absolute power
		17: Second Jupiter & Regulus conjunction (1.19 deg)
	Mar	
	Apr	29: Jupiter's retrograde motion ends; its eastward motion starts 40d fm. Feb. 17
	May	8: Third Jupiter & Regulus conjunction (1.06 deg)/Moon occults Regulus
2	Jun	
B.		17: Jupiter & Venus conjunction (0.04 deg) near Venus' grtst eastern elongation
	Jul	and at full moon
C.		
	Aug	
	Sep	27: Mars & Jupiter conjunction (0.09 deg) / Venus & Mercury converged, all in Leo
		Mary & Joseph go to Bethlehem for feast of tabernacles & paying "party" tax & oath
		Jesus born near first of Jewish year @ New Moon, Aug 31 or Sep 28
	Oct	Jesus, Joseph & Mary may have returned to Nazareth after Jesus' dedication.
		However, Joseph's fear in the wording of Mat. 2:22-23 suggests that they may have
	Nov	decided to stay in Bethlehem to raise Jesus near the Temple and to fulfill Micah 5:2.
	Dec	
		25: Jupiter starts retrograding/Magi visit Jesus/Jesus' family flees to Egypt
	Jan	9: Total lunar eclipse that evening.
1		14: Herod dies.
	Feb	16: End of Augustus' year-long celebration
B		3: Jesus' family returns to Nazareth as the threat is over
C		

Table I: The astronomical events surrounding the birth of Jesus

Heralding the Greatest Man in the World

And who was the greatest ruler then in existence? The average man would have answered, "Caesar Augustus." Now these celestial events coincided with the silver anniversary of Caesar's gain of the titles "Augustus" (Reverend) and the Princeps (Leader) signifying his elevation to supreme power over the Romans. 2 B.C. was also the 750th anniversary of the founding of Rome. That same year the people and Senate of Rome bestowed upon Augustus his supreme title of *Pater Patriae* (Father of the Empire). To those in Rome, it seemed as though heaven itself was giving approval both of the emperorship of Augustus and Rome's divine right to world sovereignty. Hardly a person in Rome would have disputed this interpretation and most people would have agreed that the astronomical evidence in support of this interpretation was overwhelming.

In other parts of the world, however, these astonishing celestial events were interpreted in a different way. The Magi from Persia in the eastern world were also watching the same celestial phenomena and they reached a different conclusion. They interpreted the signs as heralding the advent of royalty; not in Rome, but in Israel. The influence of Daniel on the Magi is readily apparent in both Scripture and history. From Daniel's chronology and a study of the Old Testament, the Magi could have computed the approximate date of the King's birth. They also knew that this was no ordinary ruler but the "stone cut out without hands" (Daniel 2:34). To the Magi, the greatest man in the world was not to be found in Rome and its festivities. The wise men headed toward Jerusalem in Judea, expecting to find a special child whom they considered to be born "King of the Jews." To the wise men, the greatest man in the world was a young child named Jesus.

The Nature of the Star

Having seen the celestial pageantry leading up to the birth of Jesus, we now come to the matter of the star itself.

Because of Jupiter's behavior in the time leading up to Jesus' birth, many have concluded that Jupiter was the Star of Bethlehem. The problem with that interpretation is that Scripture records that the "star, which they saw in the east, went before them, till it came and stood over where the young child was" (Matthew 2:9). The daily motion of a planet such as Jupiter is like the motion of the sun and stars in their daily motion, namely east to west. But the wise men were traveling north to south from Jerusalem. How, then, can the Scripture say

that the star "went before them"? To do that, the star, too, must have moved north to south.

Still, most commentators today favor the "King Planet," Jupiter, as the prime candidate for the Star of Bethlehem. Identifying Jesus with Jupiter in this way suggests that Scripture, too, should relate Jesus to Jupiter. Scripture, however, says in Revelation 22:16 that Jesus is "the bright and morning star." The morning star is Venus,[3] not Jupiter. So it is unlikely that the star is Jupiter.

A minority of expositors claims that Saturn or one of the other planets, even faint Uranus, was the Star of Bethlehem. Astronomers generally claim that the Star of Bethlehem was a nova or a comet. Despite all the pageantry and claims, there is no satisfactory explanation as to how any of those objects could direct the wise men to a specific house in Bethlehem.

Some scholars assert that the star was only visible to the Magi, that it went before them during their journey to Jerusalem and finally led them to Bethlehem. This claim is misleading, but not entirely false. The stars and planets were there for all to see, but it took the training of the Magi to understand the significance of their movements. It is clear from the wording of Matthew 2:9-10[4] that the star did not lead the wise men all the way from the east, otherwise why would they rejoice to see it again? Furthermore, there is a wording in Numbers 24:17 that suggests that the star did the moving. The verse says,

> I shall see him, but not now: I shall behold him, but not nigh: there shall come a Star out of Jacob, and a Sceptre shall rise out of Israel, and shall smite the corners of Moab, and destroy all the children of Sheth.[5]

The references to the star coming out of Jacob and the Sceptre arising out of Israel suggest that a manifestation of the star, as the angel of the Lord, is to arise out of Israel as a physical phenomenon. This would be independent of the celestial pageantry we shall shortly describe. That same star, the angel of the Lord, led the Magi to Bethlehem a year and

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[3] For more on the morning star see Bouw, G. D., 2001. "The Morning Stars," *B. A.*, **11**(97):69.

[4] Matthew 2:9-10—When they had heard the king, they departed; and, lo, the star, which they saw in the east, went before them, till it came and stood over where the young child was. [10] When they saw the star, they rejoiced with exceeding great joy.

[5] The reference is to Sheth, the Egyptian god, not to the son of Adam, Seth. Sheth was the Egyptian name for the devil. The Egyptians considered him the god of exuberant male sexuality—not channeled into fertility. He induced men to participate in pederasty and sodomy. Sheth was also the god of chaos and disorder, the personification of violence and bad faith. In short, Sheth is Satan.

a half later. As seen from the east, the vision of the angelic star of the Lord mentioned in connection with the wise men would likely have been seen rising in the western sky, towards Israel. Since no natural event can behave the way the star behaved, we conclude that the star of Bethlehem was the angel of the Lord.

How Did the Wise Men Recognize the Star?

Most of the Magi's astronomical observations took place in the early morning hours, during which they would have seen the conjunction of Venus and Jupiter in August of 3 B.C. They then searched for further signs, and found them, in the triple conjunction of Jupiter with Regulus. On June 17, 2 B.C., Jupiter again joined with Venus, this time in the early evening. The Magi, observing this conjunction from Mesopotamia, would have seen this conjunction on the western horizon, precisely in the direction of Judea. Jupiter and Venus would have been visible only for a short time before setting in the western horizon. This conjunction likely was what started the Magi to Jerusalem for the celestial pageantry they knew would end in six months, by which time the King of the Jews would certainly be born.

How, then, did the wise men know to recognize the signs of the King's birth? The wisest man in all of Babylon was Daniel. He was great among the Chaldeans of Babylon and a chief of princes. When Babylon fell, its conqueror, Darius the Mede, named the elderly Daniel to be chief of the three princes of his government. Now Darius was a humane and wise ruler and took Babylon without bloodshed beyond the death of king Belshazzar. So it was that the Babylonians highly regarded their conqueror. The Medes, who conquered Babylon, in turn had such a high regard for the Persians that they made them co-rulers of what came to be known as the Medo-Persian Empire. In the sixth century B.C., a man named Zoroaster rose from their number and founded a religion, based on fire. The priests of the Zoroastrian religion were called Magi. Thus the Magi were to the Medes and the Persians what the Chaldeans were to the Babylonians. Zoroaster incorporated quite a bit of Judaism, thus the Magi likely knew of the prophecies of the book of Daniel and knew not only what signs to look for, but even when, as Daniel chapter nine allows the time to be computed. Thus the wise men knew to recognize the signs of the King's birth.

Even the Romans were aware of the prophecies of Daniel and those of Balaam. Roman historians in the early second century wrote of the firm belief that had long prevailed through the East that Rome was destined to be the empire of the world until a time when someone would come forth from Judea to be king of the world. The Roman em-

peror Nero was advised to move his seat of empire from Rome to Jerusalem because that city was then destined to become the capital of the world. Nero declined. However, in 2 B.C. the Romans thought they already had the fulfillment of the prophecy staring at them in the face in the form of Caesar Augustus. They didn't feel the need to look elsewhere for interpretations.

Most Jews respected the Magi of the east because they were not idolaters. Though the Magi believed that the power of the deity was manifested in the natural elements of fire, water, air, and earth, these Gentile priests did not set up material images in recognition of God.

The Arrival of the Magi

When the Magi arrived in Jerusalem and made their presence known, Herod was justifiably alarmed. His own court astrologers had no doubt given Herod their own interpretation of the celestial events of the previous months, but Herod, knowing the reputation of the Magi and the esteem in which they were held by the Jews, decided that he needed more information. Furthermore, to refuse an audience with these Magi, who had the ear and respect of eastern royalty, would have been regarded as a slight, not to mention extremely bad manners. The Sanhedrin, the Supreme Court of the Jews, was also anxious to hear what the Magi had to say.

How many Magi, or their point of origin, is not told. Persons of their stature would not have traveled by camel; they would have made the journey on horseback. So with all due respect to the makers of Christmas cards, the three kings on camels depicted on most Christmas cards has no basis in fact. The legend of the "three kings" probably arose because of the three different gifts presented to the newborn king: gold, frankincense, and myrrh. Three gifts, three kings; the explanation is probably as simple as that.

Depending on their point of origin, the journey would have taken the wise men anywhere from two to four months or more, with a stopover in Jerusalem. This would have put their arrival in Bethlehem somewhere between early September and late December of 2 B.C. Furthermore, they may not have all started from the same place; they could have stopped along the way and picked up, or consulted with, more of their colleagues. Several places have been proposed for their point of origin, including Babylon, Persia, or Sheba in Arabia. Although some think there is a reference in the Old Testament of the Magi coming from Arabia, this is spurious. Most likely they were Persian. There are historical references to an incident that occurred in A.D. 614 when Persian armies invaded the Holy Land, destroying

Christian churches. When the soldiers came to the Church of the Nativity in Bethlehem, they refused to destroy it because of a mosaic depicting the adoration of the Magi. It turns out the soldiers recognized the Magi because of their dress; they were fellow Persians.

Why, if the Magi were well aware of the prophecy concerning the birth of the King of the Jews, did they stop at Jerusalem and ask Herod for directions? For one thing, as emissaries of royalty, they were bound by their own code to pay their respects to royalty in cities through which they passed. Indeed, there is a certain sense of anticipation that the king would live in a palace. Bethlehem was about six miles south of Jerusalem; once the Magi obtained this information, they were on their way, bearing gifts of gold, frankincense, and myrrh, the traditional gifts for newborn royalty.

After departing from Herod, the star went before them and led them the six miles to Bethlehem, stopping over the very house where Mary and Joseph resided. We have earlier noted that the star was the angel of the Lord. The earliest authorities say that the wise men arrived on 25 December. At the time of the wise men's arrival, Jesus was no longer an infant but a young child, for Matthew 2:11 states: "And when they were come into the house, they saw the young child with Mary his mother, and fell down, and worshipped him: and when they had opened their treasures, they presented unto him gifts; gold, and frankincense, and myrrh."

Two of the last three astronomical events in the celestial pageantry surrounding Christ's birth also happened on 25 December. Firstly, since 27 August Jupiter had been proceeding in its usual forward or prograde motion. The prograde motion ended with Jupiter in the constellation Virgo. To the naked eye, Jupiter remained stationary for nearly six days. Secondly, the 25th was at the Winter Solstice, when the sun was also "standing still" in its yearly north-south motion, pausing at its southernmost point to reverse its direction to the north. The third and last astronomical event was the total eclipse of the moon which happened the next month, on 9 January 1 B.C.

We have traced the astronomical events that surrounded the birth of Jesus and how these events were interpreted in Rome and Persia. We looked at the nature of the Star of Bethlehem and concluded that its behavior at the start of the wise men's journey, and especially at the end, could not be explained by any natural phenomenon or star. We thus concluded that the Star of Bethlehem was the Angel of the Lord and that no participant in the celestial pageantry, nor the pageantry itself, could be the Star of Bethlehem.

(Next: Historical Perspectives—the dating of Christ's birth.)

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. All 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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