Abraham's Three Truths of Astronomy

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Index, Home

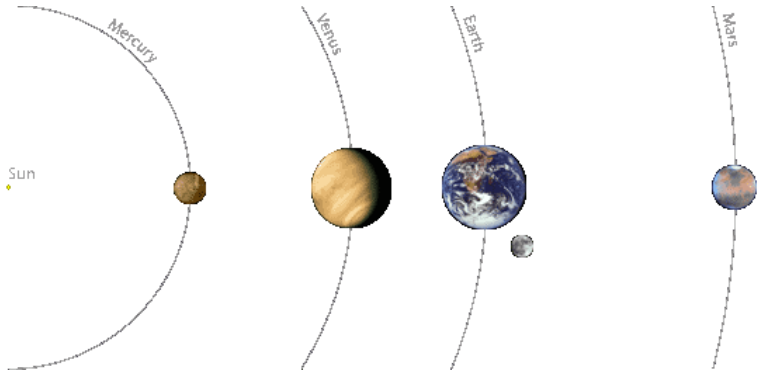
Contents

Abraham's great vision on astronomy revealed the design of the heavens and can be summarized as three truths.

Is the universe ruled by intelligence or chance? Modern science is currently enamored with the theory that chance rules the universe, from the tiny atomic scales of quantum mechanics to our entire universe of the supposed "Big Bang." The Lord, however, has made it clear that intelligence governs. Even for believers, however, the question arises, "Just how much of a role does chance play?" For example, did our solar system form naturally according to God's laws from a condensing cloud of interstellar matter with planets having more or less random periods of rotation and revolution, or was it designed as a precision timepiece? This article proposes that Abraham's vision on astronomy (Abraham 3) is the key to understanding that the Lord designed our solar system to be a Great Timepiece.

When the anti-Christ Korihor refused to believe in God, Alma used the high degree of order found in the solar system as a proof of the existence of a Creator. Alma refuted Korihor's agnostic teachings by declaring, "all the planets which move in their regular form do witness that there is a Supreme Creator" (Alma 30:44). Atheists today would not be convinced by Alma's argument because most scientists believe that our solar system formed according to natural law and that all can be explained without God. Indeed, scientists have discovered many wonderful natural laws such as Kepler's laws and Newton's laws which the planets all faithfully follow. Computer studies have shown how a random collection of particles could form into a solar system, with a sun and planets very much like our own. So how would Alma's argument fare today, with new age atheists claiming that the solar system simply created itself, according to these apparently self existent laws of

physics? Should the witness of the planets be relegated to an unenlightened age during which Korihor was forced to remain mute only because he didn't have today's scientific responses at the tip of this tongue? If Korihor had lived today, and had quoted all the modern laws of physics and principles of self-organization, could Alma have had an answer for him?



Alma argued for a Creator from the orderly planetary motion.

This article proposes that Alma could respond today that the solar system is far more orderly than the known laws of physics would predict, and hence a Creator is still required to explain it. This order leads to the proposal that the solar system is indeed a Great Timepiece, designed to display time very much like an ordinary clock. This huge clock in the sky is a testimony that there is indeed a Watchmaker who created it. Moreover, as we have seen in past articles, it appears that the Watchmaker is using his Timepiece to schedule key events of history.

The Lord has prophesied that

> *And also, if there be bounds set to the heavens or to the seas, or to the dry land, or to the sun, moon, or stars--*
>
> *All the times of their revolutions; all the appointed days, months, and years, and all the days of their days, months, and years, and all their glories, laws, and set times, shall be revealed in the days of the dispensation of the fulness of times--*
>
> *According to that which was ordained in the midst of the Council of the Eternal God of all other gods before this world was, that should be reserved unto the finishing and the end thereof...* (D&C 121:30-32)

This passage makes it clear that the times of revolutions of the sun, moon, and stars have not only been appointed, but that their "set times" shall be revealed in this current dispensation. Moreover, even the timing of when those set times would be revealed was planned in the great Council before this world was created. Modern astronomers have discovered the periods of rotation and revolution of the planets in

our solar system to a very high precision, which seems to qualify as at least partially fulfilling this prophecy that their times of revolutions would be revealed in our days. The keys to discovering the incredible order and precision of the solar system, however, and each of the "set times," are given in the great revelation on astronomy in the Book of Abraham.

Let us begin by discussing some of the ways that scientists recognize intelligent forces in action, review some examples of order found in our solar system, and then begin to explore in detail how the Book of Abraham unfolds the workings of the Lord's timepiece.

1. Law and Order

When order is observed in nature, it usually indicates to a scientist one of three things: either 1) there is a natural law which explains it, 2) it is the result of blind chance, or 3) there is an intelligence which created the order. For example, if a lot of acorns are found at the foot of an oak tree, the law of gravity most likely was influential in arranging them on the earth's surface. If acorns are found in a hole in the tree, where no natural law is known to explain it, then one might argue that the arrangement is the result of mere chance. Perhaps the wind blew the acorns into the hole as they fell. In many cases the probability of a certain arrangement can be calculated, and a simple appeal to reason can be made. In this case, the wind explanation is so improbable that the third alternative of an organizing intelligence, such as a squirrel, is far more likely to be correct.

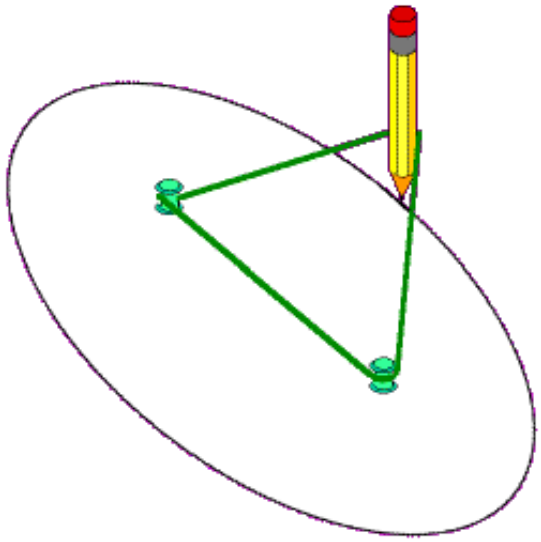
Of course, when scientists make the distinction between an intelligence and a natural law, they usually avoid the question, "Who wrote the laws of nature?" The scriptures tell us: "God ... hath given a law unto all things, by which they move in their times and their seasons" (D&C 88:41-42). Thus, in reality, at least two of the three explanations of order actually involve intelligence because God wrote the laws of nature.

Let us now discuss some of the higher order found in the solar system, and decide for ourselves whether or not it should be attributed to "natural laws," to mere chance, or to the hand of the Creator (D&C 59:21).

1.1 An Organized System

The solar system is composed of the sun, a

number of planets which revolve around it, their moons, and other miscellaneous objects including comets and asteroids. One of the greatest signs of order in the solar system is that the sun and all of the principal planets are located nearly in a plane and all revolve around the sun in the same direction.[1] A similar phenomenon is seen throughout our universe: there are many flattened disks of stars, which apparently are nearly all revolving in orbits in the same direction around a center. Statistically, that is so incredibly unlikely to have happened by chance that either a law or an intelligent ordering is clearly indicated.

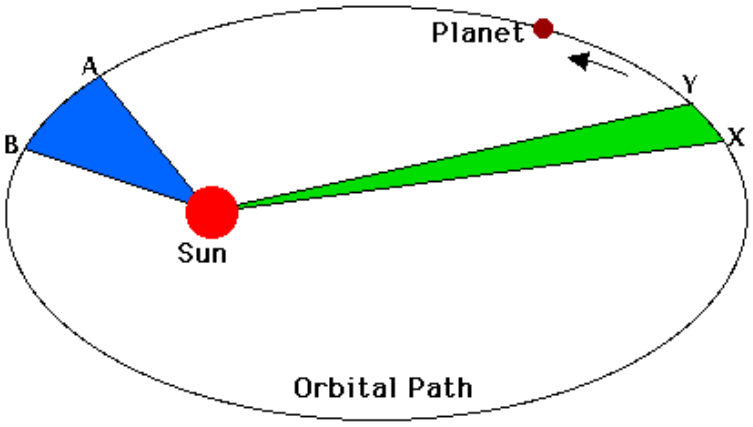


Planets orbit the sun in ellipses.

Science and scripture agree on the explanation of this ordering: orbiting bodies all follow a law (D&C 88:42). Newton's laws of motion and his law of gravity explain all but the tiniest deviations in their orbits, and Einstein's modifications account for the rest. Thus, these laws greatly simplify God's creative work, because his law includes self-organization. That is, even if one starts with a random accumulation of particles, there will almost always be some amount of spinning of the group as a whole. As the particles interact with each other, they will tend to fall into the plane of rotation and stay there in an orbit as the gravitational force toward the center is balanced by the inertial reaction away from it.

1.2 Kepler's Three Laws

Three other regular motions discovered in the solar system were articulated by Kepler. His first law is that the planets do not move in perfect circles around the sun, but in ellipses. His second law is that the speed of the planet revolving around the sun is slower when it is farther away from the sun and faster when it is closer, according to a precise mathematical law. His third law is that a planet's orbital period is determined solely by an average distance from the sun, again according to a mathematical law, and not by its size, shape or mass.



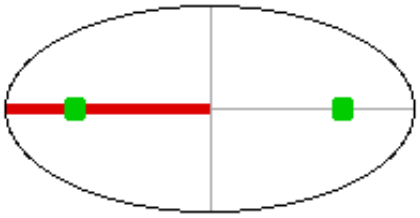
Planets move faster when near the sun.

When Newton arrived on the scene, he showed that all three of these laws were derivable in turn from his three laws of motion and his law of gravity. These self-organizing natural laws provide for a very orderly universe.

1.3 Bode's Law

Another observation of order in the solar system is called Bode's Law, which states that the distances of the planets from the sun tend to approximately follow a mathematical equation. This result has been harder to explain as being the result of Newton's laws because the equations of motion are much harder to solve when many bodies are involved. Computer studies have now shown that Bode's Law also seems to follow from Newton's laws.[2] Moreover, planets also tend to lock into orbits which are approximately small integer multiples of each other. For example, five Jupiter orbital periods of about 12 years each approximately equal two of Saturn's period of about 30 years.

The order of the solar system just reviewed summarizes most of the ordering which has been discovered by scientists in the solar system.[3] It can all be achieved by beginning with a random set of particles governed by the known laws of physics. Hence, no compelling evidence for including a Creator in the history of the formation of the solar system has been scientifically required.



Planetary periods depend on half the long axis of the ellipse.

There is one important area, however, where most scientists have not noticed any order and therefore have not needed to explain it. That is in the precise periods of revolution of the planets around the sun. Both the earth's period of rotation (the day) and of revolution (the year) have been assumed to be simply random periods of time, determined by whatever chance initial angular momentum our planet happened to have when the solar system formed. Similarly, the periods of revolution of all of the planets are thought to be essentially random numbers, except for being within approximate whole-number ratios. Interestingly, that is precisely the area where the Lord revealed to Abraham that there is a high degree of order designed into our system. Let us now look in detail at what is contributed to this subject by the Book of Abraham.

2. Abraham's Truths

Abraham's vision occurred at night.

Even as we have Kepler's laws, Newton's Laws, and Bode's Law, the Lord revealed to Abraham what could be called "Abraham's Truths." These three truths differ somewhat from the other laws in that they each have to do with *design principles* for the solar system, rather than deduced mathematical relationships. I refer to them as "truths" rather than laws because they enjoy a privileged status not common in science. Science deals with theories, and makes no claim to have absolute truth. Most scientists have not had the privilege of being invited to see the design of the entire system, as taught by the Designer himself. Let us review just what the Lord showed Abraham in that marvelous vision, and restate the results as Abraham's Three Truths.

2.1 Abraham's First Truth

Abraham gazed into the Urim and Thummim and describes the following marvelous vision:

> *And I saw the stars, that they were very great, and that one of them was nearest unto the throne of God; and there were many great ones which were near unto it;*
>
> *And the Lord said unto me: These are the governing ones; and the name of the great one is Kolob, because it is near unto me, for I am the Lord thy God: I have set this one to govern all those which belong to the same order as that upon which thou standest.*
>
> *And the Lord said unto me, by the Urim and Thummim, that Kolob was after the manner of the Lord, according to its times and seasons in the revolutions thereof; that one revolution was a day unto the Lord, after his manner of reckoning, it being one thousand years according to the time appointed unto that whereon thou standest. This is the reckoning of the Lord's time, according to the reckoning of Kolob.* (Abraham 3:2-4)

Here we are given a great truth, directly from the Creator, who told us what would otherwise be incredibly hard to discover by ourselves. The period of one earth year (365.242 days) is not a random number at all, but was designed to be such that 1,000 of our years is equal to a day of the Lord. Scientists may not have even discovered Kolob yet, much less its period of revolution. And if we had, how could

we know that the earth's orbit was designed such that 1,000 years is one revolution of Kolob, rather than it just being a chance coincidence? The place where the Lord's revelations are the most important seems to be in the areas where man could never discover those truths by himself.

Although we have been told elsewhere that a day unto the Lord is as a thousand years (2 Peter 3:8), one could get the impression that a "day of the Lord" might be a vague term, meaning simply a "long time." When Abraham actually saw Kolob, and heard the Lord explain the design, he must have clearly understood that one revolution of Kolob precisely determines one day of the Lord, even as one rotation of the earth determines one day on earth.

Kolob, which governs all of the stars of the order to which we belong, apparently also is the master clock of the entire order. It is "first in government, the last pertaining to the measurement of time" (Fac. 2, Fig. 1). As an example of Kolob being a time standard, we are told that, "Oliblish, which is the next grand governing creation" has a time period "which is equal with Kolob in its revolution and in its measuring of time" (Fac. 2, Figs. 2, 4). Thus, Kolob is like the heart of the order of stars to which we belong. It both governs the order, and its heartbeat rate is the time regulator even as a quartz crystal regulates our watches.

Thus, let us summarize this information as **Abraham's First Truth:**

One revolution of Kolob is one day unto the Lord, being 1,000 earth years.

The significance is that the length of the year is not a random unit of time, but was designed to be 1/1,000th of one day of the Lord. We are not told the precision of this statement, so it is not clear whether a revolution of Kolob is 365,242 earth days, or perhaps 365,000. The important point here is that the length of our year is not a random number but was carefully designed.

First Truth:
One revolution of Kolob is one day unto the Lord, being 1,000 earth years.

The fact that the Lord has synchronized the earth's orbit with one day on Kolob suggests that the Lord might actually be using the earth's orbit for measuring time. That is, when someone goes to the trouble to synchronize his watch with someone else's, it is usually because he has an appointment with them, and wants both parties to be on time. Why make a clock if it is not going to

be used?

2.2 Abraham's Second Truth

But what about the sun, moon and other planets in the solar system? Are their periods just random numbers, or were they also designed? The Lord told Moses that the lights in the firmament, which includes the stars and planets, were designed to be "for signs and for seasons" (Gen. 1:14), but that could mean only that they are useful for reckoning time, even with random periods. Let's look more at Abraham's revelation, which was received over five centuries before Moses.

The Lord showed Abraham more of the workings of our solar and stellar systems. Abraham was given to know the "set times" of the sun, moon, and earth:

> *And the Lord said unto me: The planet which is the lesser light, lesser than that which is to rule the day, even the night, is above or greater than that upon which thou standest in point of reckoning, for it moveth in order more slow; this is in order because it standeth above the earth upon which thou standest, therefore the reckoning of its time is not so many as to its number of days, and of months, and of years.*
>
> *And the Lord said unto me: Now, Abraham, these two facts exist, behold thine eyes see it; it is given unto thee to know the times of reckoning, and the set time, yea, the set time of the earth upon which thou standest, and the set time of the greater light which is set to rule the day, and the set time of the lesser light which is set to rule the night.* (Abr. 3:5-6)

Let us restate this as **Abraham's Second Truth:**

> *There are set times for the earth, moon and sun which were designed to reckon time.*

What does "set time" mean? Grant Athay, one of the first L.D.S. astronomers to attempt any interpretation at all of the Book of Abraham, tentatively proposed a meaning for the set times of the earth, moon and sun. He said he suspected that the set time of the earth refers to the day, the set time of the moon to the lunar month, in which the moon completes its cycle of phases, and the set time of the sun to the tropical year, in which the sun makes its annual excursion through the north and south parts of the sky, causing the seasons. However, he took that interpretation no further, noting that, "Those parts of the Book of Abraham that discuss set periods of

time for the sun, moon, and planets do not invoke a strong interest from astronomers."[4] He must be correct, because very few other professional astronomers have commented at all on the Book of Abraham.

Second Truth:
There are set times for the earth, moon and sun which were designed to reckon time.

It appears that Athay's proposed interpretation for the set times of the earth, moon and sun is correct for the reason that those three periods form the basis of the lunisolar calendar, which the Lord later commanded Moses to use. It is called "lunisolar" because its months are determined by the phases of the moon (luni = "moon") and the years are determined by the seasons of the sun (solar = "sun"), both of which are measured by the average solar day (based on rotation of the earth). Thus, the "set times" of the earth, moon and sun, which were designed for reckoning time, most likely refer to the fundamental periods of the Hebrew lunisolar calendar.

The Hebrew calendar also includes the time interval of the week of seven days built into it. [5] Mathematically, the 7-day week is the best interval for measuring both the month and the year because a month is nearly 4 weeks and a year is nearly 52 weeks. Again, this shows the consistency of the Lord in telling Moses to use 7-day weeks and also to use a lunisolar calendar.

The earth and moon have set times.

The importance of Abraham's Second Truth is that no one needs to apologize for the Hebrew calendar being more complicated than our simple (Gregorian) solar calendar. It is the result of design, not chance. Moreover, the Designer seems to be using such a lunisolar calendar, as we would expect. That is, many key events in religious history have occurred on days of the Hebrew calendar which the Lord has designated as holy, as I have discussed at length in my other articles.[6]

The set time of the Earth. The set time of the earth apparently refers to the mean solar day. The day is a very stable unit of time because the rotating earth is such a good clock that it only slows down by about 1.5 milliseconds (thousandths of a

second) per century.[7]

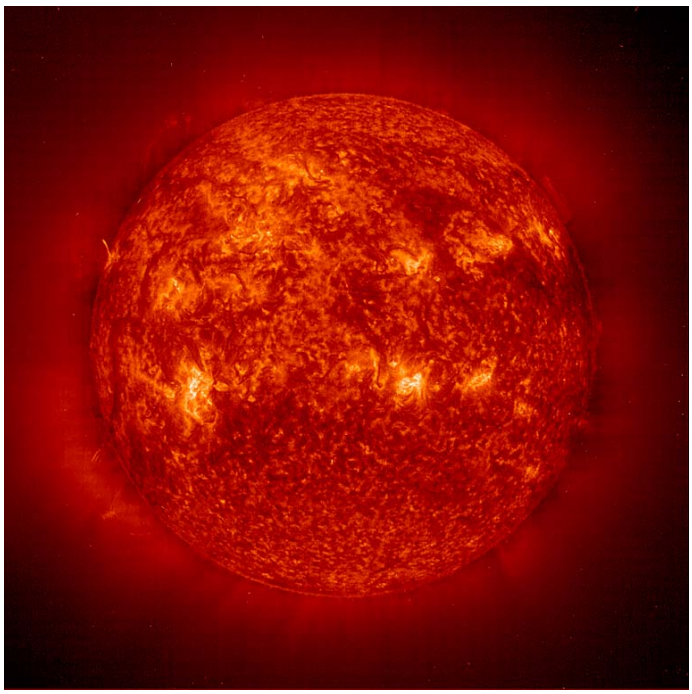
The Hebrew value for the "set time" of the moon is super accurate.

The set time of the moon. The Lord stated that Abraham knew the set time of the moon. The value for the average length of the lunar month on which the Hebrew calendar has long been based is 29.530594 days.[8] That value is far better than any other used in antiquity, and today's calculation of the average value (29.530593 days) only differs by 0.000001 day, which is less than a tenth of a second. The Hebrew value is so phenominally good that I've believed for years that it must have been revealed and that the lunar orbit was designed to come out even in Hebrew time units.[9] This revelation to Abraham might explain the origin of this super-accurate value. It is also possible, however, that the value had been known by Enoch, and was contained in the records in Abraham's possession (Abr. 1:31). The revelation states only that he knows it, not that it was being revealed at that time.

The set time of the sun. Abraham also knew the set time of the sun, which apparently means the length of the seasonal year. Our best modern estimate for a historical average is 365.2425 days,[10] which is the value used in our modern Gregorian calendar.

The length of the year is not nearly as fixed as the length of the lunar month, although it is still a very precise unit of time. The current value for the length of the year is 365.2422 days, which shows a variation of 0.0003 days from the 7,000-year average value of 365.2425. In contrast, the current value for the length of the month is 29.530588 days, which shows a deviation of only 0.000005 days from the historical average value of

29.530593. That means that a calendar based on a fixed length for the cycle of the moon, as is the Hebrew calendar, is a much more accurate calendar than one based on a fixed length for the sun's seasons, like our Gregorian calendar.



The sun's set time was known to Abraham.

The reason for this difference in stability might be worth noting because it again suggests design in the solar system. Various frictional effects, especially the tides, cause the earth to slow down in its rotational speed very slightly, causing the day to lengthen by about 0.0015 seconds every century. That effect causes the length of the year as measured in days slowly to decrease because the number of rotations of the earth is less in every orbital revolution, meaning a smaller number of days per year. There is also another effect equally as important to the length of the year. As the earth encounters frictional drag from encountering particles in its path as it speeds around the sun, it loses energy and the distance to the sun sightly decreases (by less than an inch per year), which also causes the length of the year to shorten by about the same amount caused by the lengthening of the day. Thus the two effects combine to double the shortening rate of the length of the year as measured in mean solar days.

On the other hand, as the tides slosh around, they tend always to rotate ahead of the moon which is causing them, and this effect actually accelerates the moon in its orbit around the earth, causing the moon slowly to recede from the earth. This effect slowly increases the length of the month and tends to *compensate for the lengthening of the day*. In other words, even though the length of the month is getting longer, so also is the length of the day, so that the number of days in a month is nearly constant. Hence, the month is a much better length of time on which to base a calendar than is the sun, which again points to the Hebrew lunisolar calendar as being inspired by the Designer.[11] So far, however, the atheist will not be impressed with the "set times" of the earth, moon and sun, because they still appear to be random numbers. It is as we explore the Third Truth that the design of the "set times" will become more apparent.

2.3 Abraham's Third Truth

The revelation to Abraham continued, revealing perhaps the most important concept. The Lord told Abraham, as they talked face to face,

> *"Now the set time of the lesser light is a longer time as to its reckoning than the reckoning of the time of the earth upon which thou standest.*
>
> *And where these two facts exist, there shall be another fact above them, that is, there shall be another planet whose reckoning of time shall be longer still;*
>
> *And thus there shall be the reckoning of the time of one planet above another, until thou come nigh unto Kolob, which Kolob is after the reckoning of the Lord's time..."* (Abr. 3:7-9)

Let us restate this concept more briefly as **Abraham's Third Truth:**

> *The planets form a progression of increasing set times, designed to reckon time, beginning with the earth and moon and ending with Kolob.*

Third Truth:
The planets form a progression of increasing set times, designed to reckon time, beginning with the earth and moon and ending with Kolob.

Thus, it is not just the orbits of the earth and moon which have been precisely designed, but also the periods of reckoning of the other planets in our solar system, and even of a progression of stars, which take us right to Kolob. This is a huge piece of news for the astronomical community, who would not otherwise suspect that the orbital periods of the planets are anything other than random numbers. Armed with this knowledge that the lights in the heavens were indeed designed with timekeeping in mind, we can proceed to consider the set time of each of the planets. Before doing so, let us understand where the system was designed to be viewed from.

Earth-based View

One key point from the revelation is that the progression starts from the earth, from

The Lord's Timepiece is to be viewed from earth.

which it was clearly designed to be viewed. What use would a great clock in the sky be to man if it had to be viewed from the sun? When the Lord told Abraham to begin at the earth and to count the moon as second in the progression, he was not implying that the earth is fixed nor that is in the center of the universe. He was simply explaining the design of the solar system, namely that there is a progression of planets designed to keep time, *as seen from the earth*. In that progression of "one planet above another" the moon "standeth above the earth" because it "moveth in order more slow," meaning the earth is first and the moon, in the slot above it, being second in the order of increasing periods. The Lord implied that the sun stands above the moon in this progression because its period (the year) is greater than the moon's (the lunar month).

The year can be thought of two different ways. It can be thought of as the period of the sun's annual motion through the sky which causes the seasons, which is the view of the Book of Abraham. We moderns tend to think of the year as the period of the earth's orbit around the sun, rather than the sun's motion relative to the earth. These are simply two ways at looking at the same relative motion. The Lord is explaining that the system was set up to be viewed from the earth, and that the period of one earth year is referred to as the "set time" of the sun.

Abraham was shown the governing stars near to the throne of God, and they were a long way away from the earth. Clearly, Abraham did not think that the earth was the center of the universe, for it was dwarfed by the brilliant stars near to the throne of God. It is Kolob, which is near the center of government and of time-keeping, which is most likely also near the center of the Lord's creations. The prophets have long known that "it is the earth that moveth and not the sun" (Hel. 12:15). The Lord was merely explaining that the Great Timepiece of the solar system was designed to be viewed from the earth.

Next month's article will take a detailed look at the planetary progression in our solar system, referred to in Abraham's Third Truth, which progression also

continues with certain stars, until we come nigh unto Kolob.

Notes

1. Pluto's orbit is inclined about 17° to the earth's orbit, but it is not a principal planet. All of the other planets are all within about 7° of the plane.
2. Hills, J.G. "Dynamic Relaxation of Planetary Systems and Bode's Law," *Nature* **225** (Feb 28, 1970), 840-2.
3. Other points could include that most of the planets rotate on their axes in the same direction as their revolution and that the ecliptic plane approximately coincides with the sun's equatorial plane.
4. R. Grant Athay, "Worlds Without Number: The Astronomy of Enoch, Abraham, and Moses" *B.Y.U. Studies* **8**, No. 3 (Spring 1968), pp. 257, 264.
5. The civil year can only begin on a Monday, Tuesday, Thursday, or Saturday. If the phase of the moon indicates one of the other days, then the beginning of the civil year in the fall is postponed one day. This creates more order to the calendar by allowing more realignments of months and years with the week. It also prevents most of the holy days from occurring on a Friday or Sunday, but helps them to align with Saturday, the weekly Hebrew sabbath day.
6. A summary of all such events published so far is found at www.johnpratt.com/items/docs/lds/dates.html along with references to sections of my articles which discuss those dates.
7. Allen, C.W., *Astrophysical Quantities* (London: Athlone Press, 1981), p. 19.
8. Dershowitz, N. & Reingold, E., *Calendrical Calculations* (New York: Cambridge U. Press, 1997), p. 87. The Hebrew day is divided into 24 hours of 1,080 parts each. The length of the lunar month is given as 29 days, 12 hours and 793 parts.
9. Allen's *Astrophysical Quantities* gives the value at time T as 29.5305882 - 0.0000002T, where T is the number of centuries after 1900 (p. 20). Averaging from 4,000 B.C. (T=-59) to A.D. 3,000 (T=+11) yields 29.530593.
10. Allen's *Astrophysical Quantities* gives the value at time T as 365.242199 - 0.000013T, where T is the number of centuries from 1900 (p. 19). Averaging from 4,000 B.C. (T=-59) to A.D. 3,000 (T=+11) yields 365.2425.
11. Now that we have applauded the Hebrew calendar, we must note that the version which is used today has some shortcomings, indicating that some of the features may have been lost since the time of Abraham and Moses. The length of the year on the modern Hebrew Calendar is based on inserting 7 extra lunar months every 19 years, which leads to an average of 365.2468 days. That value is not nearly as accurate as 365.2425 days, which leads to a serious long-term drift of about one day every 240 years. Another weakness of the modern Hebrew calendar is that it has no repeating pattern; each year is determined by calculations. These shortcomings have been corrected in the author's Perpetual Hebrew Calendar, the details of which are yet to be published.