360 vs. 365

By Guy Cramer

360 Day Years - Fact or Fiction

Did the earth have a 360-day year with a 30-day lunar month within the last 3,000 years?

Our year is actually 365.2422 days and our lunar month (from new moon to new moon) is 29.531 days.

So why did early civilizations around the world use calendars with months of 30 days and years of 360 days? These calendars seemed to function well until sometime in the 8th century BC when suddenly it became necessary to change them. Most civilizations around the world began to modify their calendars to allow for 5 extra days for the year and 6 fewer days for a lunar year. A lunar year is 12 full months; a modern lunar year is 354 days (12 months x 29.5 days).

Were these early civilizations incapable of accurately measuring the astronomical cycles that governed their calendars prior to the 8th century?

The 8th century BC was a time between 799 BC - 700 BC. Let's look to the Bible in that period of time to see if we can find any changes mentioned. There are a number of books in the Bible that were written during this time. 2nd Kings, Amos, Hosea, Micah, Isaiah... In the book of Isaiah we find the story of the sundial going backwards.

This is the earliest mention of a sundial in historical literature.

Isaiah 38 tells us about Hezekiah king of Judah, a man near death, told by Isaiah to put his house in order because God told Isaiah that Hezekiah would die and not live. Hezekiah prays to God and God tells Isaiah that He has heard Hezekiah's prayer and will add 15 years to his life. God even says to Isaiah that He will give Hezekiah a sign that God will do this.

"Behold, I will bring the shadow on the sundial of Ahaz ten degrees backward." So the sun returned ten degrees on the dial by which it had gone down. (Isaiah 38:8)

This story is repeated in 2 Kings 20:1-11

How much time would this 10 degrees take?

360 degree circle (on the sundial), divided by 12 hours of sunlight (average day) = 30 degrees per hour

1/3 of an hour = 20 minutes

10 degrees would = 20 minutes.

Now a modern sundial is round and would only show a 180 degree change for 12 hours, but the sundials from this time were not round but a set of stairs that had two sides that stepped up towards each other

and met in the middle. We don't know how many steps this particular sundial of Ahaz had. If it had 360 steps then 20 minutes could be an accurate estimate.
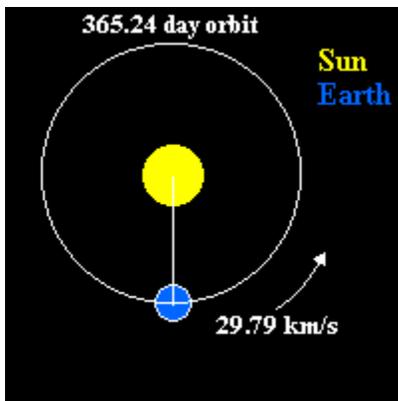
Why 360 steps? The Hebrew in Isaiah can be translated literally as steps (NIV) but it can also mean degrees (KJV), so if the meaning were 10 degrees then 360 degrees would = 360 steps.

A sundial positioned properly with 360 steps could tell you not only what hour of the day it was but also what day of the year it was (if the year had 360 days).
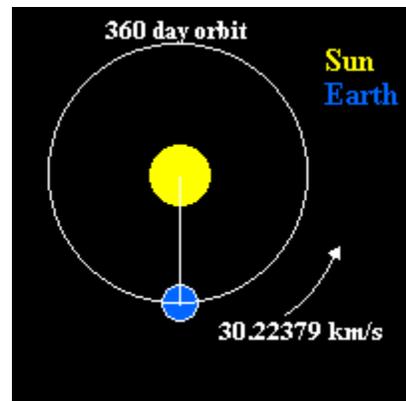
Some commentaries on this sign of the sundial going backwards have said that it could have been due to sun refraction. Would the creator of the universe give a sign that could be confused with natural phenomenon? These commentaries would be written by people of little faith.

Now this gets quite interesting:

The earth is orbiting the sun at 29.79 km/s (kilometers per second) and has been doing so for many thousands of years. This constant speed of 29.79 km/s means that to make one orbit of the sun (one complete circle) will take 365.2422 days.

If we speed up the orbit of the earth to 30.22379 km/s we would end up with a year that is 360 days long.

If we had a year of 360 days and slowed the orbit of the earth from 30.22379 km/s back to 29.79 km/s then the year would equal our current solar year; 365.2422 days per year.

The difference in speed between 365.2422 days per year and 360 days per year is equal to 20.9688 minutes per day. This is not a difference in our 24-hour time period but it would take the earth 20.9688 minutes less time per day to travel that same distance in the orbit around the sun.

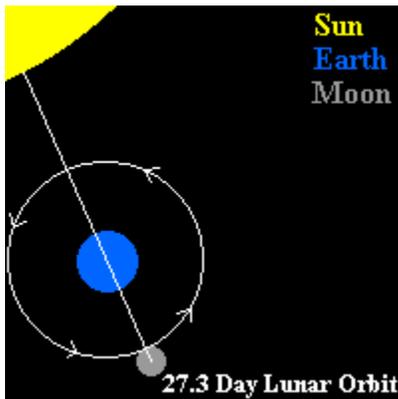365.2422 days -20.9688 minutes per day = 360 days

If you had a year = 360 days per year and slowed the orbit of the earth around the sun by 0.433792 km/s (The difference between 30.22379 km/s and 29.79 km/s), you would end up with a year that takes 365.2422 days. This slower speed would cause 5.2422 days extra per year to make one complete revolution around the sun.

There is no time dilation or anything extraordinary here. We have only slowed the speed of the earth down. We have not changed spin of the earth in a 24-hour period and we have not changed the speed of the moon around the earth.

However, if the earth had a year of 360 days per year (= earth's orbital speed of 30.22379 km/s) the moon would now automatically have a 30 day lunar month without changing the speed of the orbit of the moon!
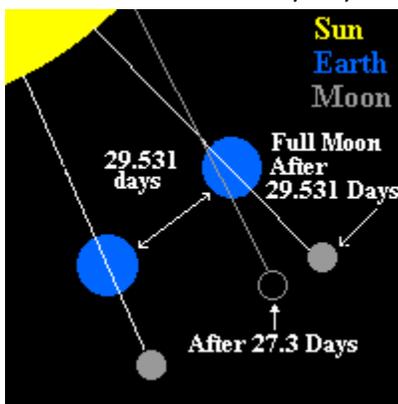
Confused, let me elaborate.
With our modern calendar the Moon takes about 27.3 days to make one complete orbit around the earth with relation to the stars.

But the earth is also moving around the sun draging the moon with it. The earth orbits around the sun once every 365.2422 days (= earth's orbital speed of 29.79 km/s). The earth and moon in 27.3 days have moved as a system about 1/12 of the ways around the sun. This means that from one full moon to the next full moon, the moon must travel 2.2 extra days before it appears full this is due to the curve of the earth's orbit around the sun. The moon is still making one complete orbit (circle) in 27.3 days, but to line up with the earth and sun to become a full moon again it takes 29.531 days.
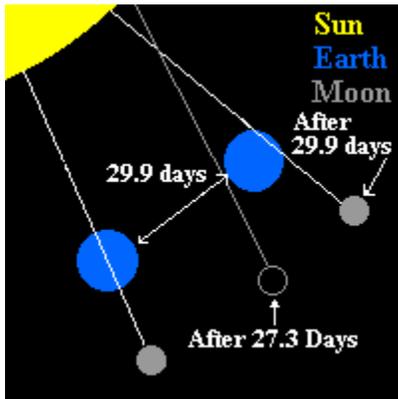
29.531 day lunar months x 12 lunar months = 354.372 days per lunar year
A difference of 10.87 days a year between a lunar year and a solar year of 365.2422 days per year.
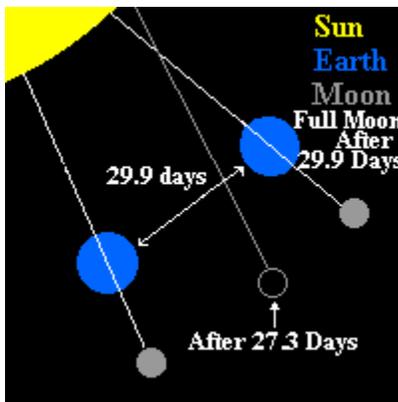

If we did not speed up the orbit of the earth but had our current speed of 29.79 km/s and let the earth travel half a day further, then after 29.9 days we see that the moon has gone half a day past the full

moon. (To achieve a full moon the moon must be in a straight line with the middle of the earth and the sun.)

With a calendar of 360 days per year:
Now if we changed nothing else except to increase the speed of the earth's orbit to 30.22379 km/s to achieve a 360 day year, then the time it takes from one full moon to the next full moon would be 29.96785 days (30 days). The moon would still be making one complete orbit every 27.3 days but the moon would now need to travel 2.6785 extra days (added to the 27.3 days) to become full again.

29.96785 day months x 12 months = 359.6142 days per lunar year
A difference of 9 hours a year between a lunar year and a solar year of exactly 360 days per year.

By adjusting the speed of the earth around the sun to give us a year of 360 days we automatically end up with a month that equals 30 days (29.96785 days). It just so happens that all ancient calendars had 12 - 30 day months, which equaled 360 days. These ancient calendars also had 1 solar year = 360 days!

All these 360-day solar/lunar year calendars suddenly begin to change in the 8th century BC to either a 365 day solar year or a lunar year of 354 days per year (or both). Which match our modern calendars.

In the 8th century BC, the Bible tells us the sun moved backward on a sundial, our calculations estimate that this distance on the sundial would equal about 20 minutes. A miracle so subtle you would only notice if you were watching a sundial.

The difference between 360-day year with a 30-day month and our 365.2422-day year with a 29.531-day month is orbital speed, which can also be translated into time, about 20 minutes extra per day.

We're not done yet

The Book of Enoch.

While doing this research I came across a reference to the Book of Enoch.

Enoch was the seventh generation from Adam. (Genesis 5:18-24)

The Book of Enoch is known as an "apocryphal" writing,

"Apocryphal" comes from the Greek word meaning "hidden" or "secret".

These apocryphal book's, were considered by some to be sacred and they were taught alongside the bible, both by the Jews and the early Christian leaders. These books were usually reserved for leaders and teachers only, leading to the term - secret.

In the 4th century AD some prominent church leaders decided that the book of Enoch should be destroyed, because they did not agree with some of the statements made in the text. So the Book of Enoch was pretty much wiped from the face of the earth, except for 3 copies that had survived (hidden) at a church in Ethiopia. These copies were found in 1773, which brought about the controversy on the date of origin for these copies.

The Book was once believed to be 1st century post-Christian in origin because of the similarities in some of the text.

Then they found the Dead Sea Scrolls at Qumran with ten fragments of Enoch manuscripts among the scrolls. Many of the Scrolls predate the Christian era by hundreds of years.

Part of the problem with the book may be that additions were added to any original copies owing to the confusion. Chapters 37-71 of the Ethiopian copies were probably added to the original after or during the time of Jesus since no fragments of these chapters were found with any of the Dead Sea Scrolls. There seem to be many similarities between the New Testament books and these chapters, which may indicate that they were written during or after the first century.

The only reason I give any mention at all the Book of Enoch is that the New Testament Book of Jude quotes from the Book of Enoch

Now Enoch, the seventh from Adam, prophesied about these men also saying, " Behold, the Lord comes with ten thousand of His saints, to execute judgment on all, to convict all of their ungodly deeds which they have committed in an ungodly way, and of all the harsh things which ungodly sinners have spoken against Him."
(Jude 1:14-15)

Compare this with:

And behold! He cometh with ten thousands of His holy ones To execute judgement upon all,
And to destroy all the ungodly:
And to convict all flesh Of all the works of their ungodliness which they have ungodly committed,
And of all the hard things which ungodly sinners have spoken against Him.
(The Book of Enoch 1:9)

The Book of Enoch in the Chapter 74 gives us some detailed astronomical data that does not match our current measurements.

We read in the Book of Enoch that a solar year = 364 days
A lunar year (12 months x 29.5 days) 354 days, falls behind a solar year by 10 days.
Enoch takes these calculations farther and states that in 8 years the moon falls behind 80 days.
So a lunar year will fall behind a solar year by 80 days after 8 years.

With our current 365.2422 days per year and lunar year equal to 354.372 days, then in 8 years the moon will fall behind by 86.9616 days.

The Chart below shows difference between the solar year and lunar year if we are only speeding up the orbit of the Earth around the sun.

Speed of Earth's Orbit	=	Days per Solar Year	Days per Lunar Month	Days per Lunar Year (12 lunar months)	Days difference after 8 years
29.79 km/s	=	365.2422	29.531	354.372	86.9616
29.80977 km/s	=	365	29.56651	354.79812	81.61504
29.89166 km/s	=	364	29.63452	355.61424	67.08608
29.97401 km/s	=	363	29.71785	356.6142	51.0864
30.05681 km/s	=	362	29.80118	357.61416	35.08672
30.14007 km/s	=	361	29.88452	358.61424	19.08608
30.22379 km/s	=	360	29.96785	359.6142	3.0864

Would Enoch's 80-day difference be possible with a 364-day year using the same calculation?

Speed of Earth's Orbit	=	Days per Solar Year	Days per Lunar Month	Days per Lunar Year (12 lunar months)	Days difference after 8 years

29.82 km/s	=	364.81	29.567017	354.804204	80.0464

Again the moon is still making one rotation every 27.3 days in everyone of the above calculations. The differences are due to the speed of the earth's orbit around the sun.

If this part of the Book of Enoch was written by Enoch then the speed of the earth around the sun was 29.82 km/s during his time, which would equal a solar year of 364.81 days and a lunar month of 29.567017 days.

Enoch was the Great Grandfather of Noah. If parts of the book are genuine (authored by Enoch) then his observations were made before the flood.

Read what the Book of Enoch says about the coming judgement in Chapter 80:2

2 And in the days of the sinners the years shall be shortened,
And their seed shall be tardy on their lands and fields,
And all things on the earth shall alter,
And shall not appear in their time:
And the rain shall be kept back
And the heaven shall withhold (it).
3 And in those times the fruits of the earth shall be backward,
And shall not grow in their time,
And the fruits of the trees shall be withheld in their time.
4 And the moon shall alter her order,
And not appear at her time.
5 [And in those days the sun shall be seen and he shall journey in the evening on the extremity of the great chariot in the west]
And shall shine more brightly than accords with the order of light.
6 And many chiefs of the stars shall transgress the order (prescribed).
And these shall alter their orbits and tasks,
And not appear at the seasons prescribed to them.
7 And the whole order of the stars shall be concealed from the sinners,
And the thoughts of those on the earth shall err concerning them,
[And they shall be altered from all their ways],
Yea, they shall err and take them to be gods.
8 And evil shall be multiplied upon them,
And punishment shall come upon them So as to destroy all.'
(The Book of Enoch 80:2-8)

Interesting how Enoch would make a prophecy that the years shall be shortened. Just by speeding up the orbit of the earth will fulfill the most of his above statements. Given enough time a 364-day calendar is going to be out by 4 days every year if the year was shortened to 360 days per year (verse 2). The moon will be 6 days different per year (verse 4).

During the time of the flood Noah tells us that a 150 days started on the seventeenth day of the second month, and ended on the seventeenth day of the seventh month (Genesis 7:11,24 and 8:3-4).
150 days divided by 30 days a month = 5 months
30 days x 12 months = 360 days

Did they have a similar 364-365 day year to our own at the time of Enoch before the flood?
Did Enoch prophesize about the 360-day year that was to befall Noah's time?
Could this orbital speed change cause the biblical flood?

Do we embrace the Book of Enoch?

The answer to the last question is **no**. There could be parts of the book that may be written by Enoch. The problem is this - which parts? If chapters 37-71 were added during the 1st century then how much of the rest of the Book is tainted. There are also a number of areas of the book with which I have difficulty with.

Jude, (son of Mary and Joseph) the half brother of Jesus, quotes directly from one passage in Enoch. Is he quoting fiction or did Enoch really say that?

The detailed astronomical data in the book just happens to match precisely to the calculations with earth's orbital speed shifts. Until the time of Galileo this would have been guesswork at best. Copies of the astronomical text's portions of the book of Enoch were discovered with the Dead Sea Scrolls.

Without using this apocryphal writing - the Book of Enoch, is there a Biblical case for 365-day years before the flood?

In my last paper [#X115](#) the data seems to indicate that God placed the life span limit on man to 120 years of 365 days per year. God made His decision 100 years before the flood in Genesis 6:3. Noah indicates that during the flood the year was 360 days long with 30-day months (Genesis 7:11,24 and 8:3-4). Then in Genesis 11:10 (2 years after the flood) there could be some confusion over which calendar to use 365 days per year or 360 days per year (see paper [#X112](#)).

This Biblical data seems to indicate that before the flood the calendar could have consisted of approximately 365 days per year. Then the years changed to 360 days per year - this would take some time to get use to which may account for the confusion in Genesis 11:10. Then the year again became our modern 365.2422 days per year - possibly in the 8th century as reflected in the calendar changes around the world at this time.

Isn't it strange how the story of Jehoiada and his long life span (see: [#X115](#)) only works with God's rule from Genesis 6:3, only if the years were equal to 365 days per year when the rule was made. This will only work if we account for Jehoiada's years past 120 as being added on by God for a time that is equal to the years Jehoiada hid Joash. Then we read the story in Isaiah 38, which tells us about God adding years to Hezekiah's life and using a miracle to prove it. That miracle and the calculations that surround it begin the discovery of a simple way (speed of the earth's orbit) of converting a 360 day year with a 30 day month to our modern 365.2422 day year with a lunar month equal to 29.531 days. Of course the

Creator of the universe (God) is the only being capable of altering the speed of the earth's orbit faster or slower.

Interestingly enough earth may be headed for a 360-day year again!

Daniel 7:25 speaks about the last part of the tribulation with the Antichrist in power as lasting three-and-one-half years. The book of Revelation 11:2 and 13:5 describes the same period of time as being 42 months. Revelation 11:3 and 12:6 tells us that it is 1,260 days.

1,260 days divided by 42 months = 30 days per month.
42 months of 30 days per month = 3 1/2 years exactly of 360 days per year

To achieve a 30 day month the earth's orbit around the sun must be speed up so a year would = 360 days

Jesus speaking on the tribulation:
"***And unless those days were shortened, no flesh would be saved; but for the elects (chosen ones) sake those days will be shortened.***
(Matthew 24:22)

"***But as the days of Noah were, so also will the coming of the Son of Man be.***"
(Matthew 24:37)

Our Calendar of 365.2422 days per year x 3.5 years = 1278.3477 days
Revelations Calendar of 360 days per year x 3.5 years = 1260
This time period of 3.5 years would be shortened by 18.3477 days

By the way, according to the bible (Genesis 5:23,24)(Hebrews 11:5) Enoch did not die, but was taken (raptured) by God when he was in his **365**th year.

This paper is Part 1 To goto Part 2 see:Isaiah's Sundial & Joshua's Long Day

Isaiah's Sundial & Joshua's Long Day

By Guy Cramer

Orbital Mechanics 101: Factoring the Creator into the equation

This paper is Part 2 of 360 vs. 365

A number of questions have arisen from 360 vs. 365

Does NASA factor in to their rocket launch calculations; the Day the Sun and Moon stood still for Joshua (Joshua 10:12,13) and the Sundial incident in Isaiah 38:8?

Would the change in orbit cause a temperature increase that would wipe out all life?

How did the Earth slow down and speed up?

What about the Sun and Moon incident in Joshua, can you explain that?

Does NASA factor in to their rocket launch calculations; the Day the Sun and Moon stood still for Joshua and the Sundial incident in Isaiah 38:8?

I have been asked this question a number of times even before I wrote paper 360 vs. 365. From the standpoint of the general public this question might seem to be a good one. From the standpoint of anybody with a little knowledge in this area this question appears ridiculous.

The answer is; No, NASA does not calculate any Biblical matters into their rocket launch's. The only important calculations to NASA would be current speeds and distances. Even if there were changes in the past these would not factor into modern calculations.

The reason this rumor was started about NASA factoring in this data was probably to cause people to believe that these Biblical accounts could be verified by scientific means. The truth is that the rumor has done more damage to allowing a faith in God for those with a scientific background. The rumor is ludicrous and unintelligent from a scientific standpoint. This rumor is not the way to bring people to faith in God.

How did the Earth slow down and speed up?

"Behold, I will bring the shadow on the sundial of Ahaz ten degrees backward." So the sun returned ten degrees on the dial by which it had gone down. (Isaiah 38:8)

In paper 360 vs. 365 I explained that the earth's orbital speed around the sun slowed down from 30.22379 km/s to 29.79 km/s because of this event. The question is how? There are a number of possibilities.
1. God slowed the earth in its current orbital path.
2. God moved the Earth farther away from the Sun, which would create a larger orbit and thus a longer year.
3. God moved the Sun that in turn caused the Earth to slow down.

Did God slow the Earth's rotation in its current orbital path?

We must look at the events of Isaiah 38:8. If the sun appeared to move backwards either the earth had to rotate backwards or the sun moved. If the Earth rotated backwards there would be cataclysmic effects on earth. Massive Winds, tidal waves and earthquakes alone would probably wipeout mankind, so this idea must be discarded.

Did God move the Earth farther away from the Sun, which would create a larger orbit and thus a longer year?
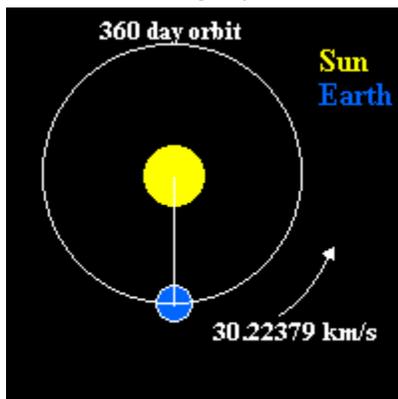
This concept would allow for a longer year without changing the speed of Earth's orbit. So our orbital speed around the sun would be 29.79 km/s before the Event of Isaiah 38:8 and the same after but the earth would now be further away from the Sun and thus take longer to make one complete orbit at that speed. The problem with this theory is that the earth must keep a certain distance from the Sun for the right temperature. Moving the Earth to close to the Sun could create a temperature to hot for life as we know it to exist. Moving the Earth farther away from the Sun could cause a temperature shift that would be too cold for life. This theory doesn't explain the sundial incident anyway so on a number of points we must also discard this theory.

(note, this speed 29.79 km/s is an average speed in one year. This speed does fluctuate up and down throughout the year but the average works out to 29.79 km/s)
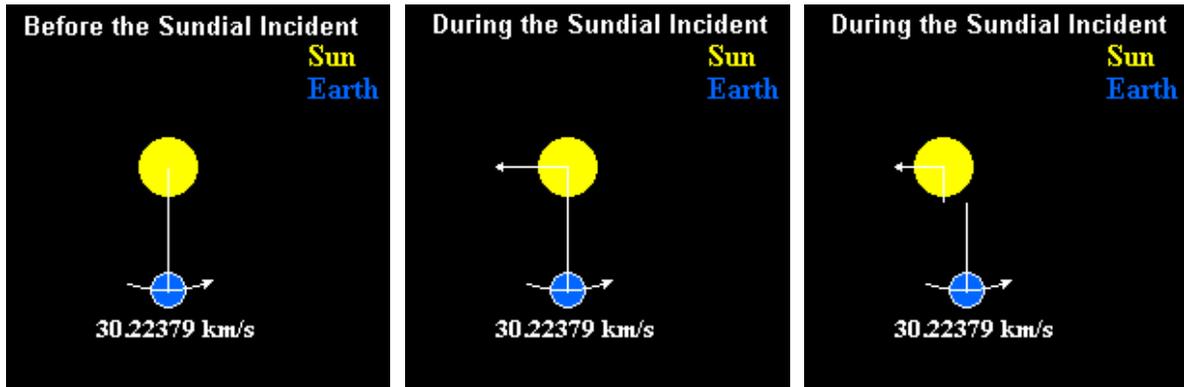
Did God move the Sun down which in turn caused the Earth to slow down?

We know that the Earth couldn't rotate backwards so the only other option for the event in Isaiah 38:8 is that the Sun moved. Now if the Sun moved backwards in relation to the Earth, the gravitational effect of the Sun on the Earth would pull the Earth, thus slowing down the orbital speed of the Earth. This would also allow the Earth to keep the same distance from the Sun. This theory would fulfill all requirements.
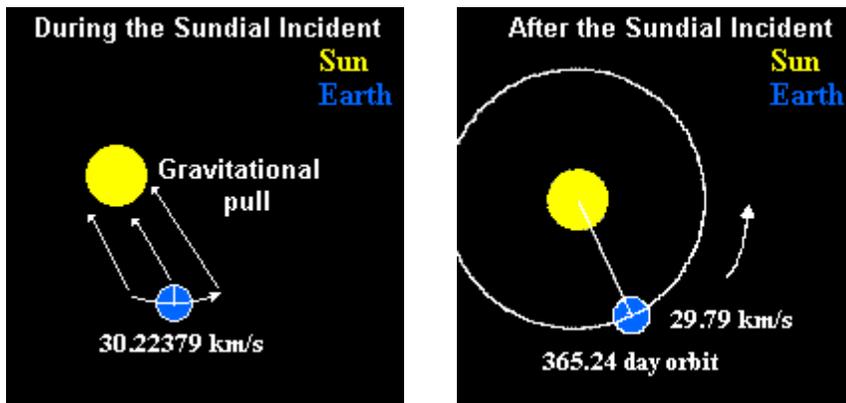
Before the Sundial Incident the Earth would be orbiting around the Sun at an average speed of 30.22379 km/s, this average speed would cause a year to equal 360 days per year.
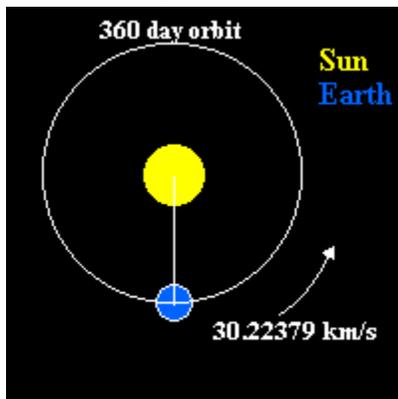
According to the information in Isaiah the Sun moved backwards, so from a birds eye view of the Sun and Earth the Sun would move in the opposite direction (but approximately parallel).

The resulting movement of the Sun would cause a gravitational pull on the orbit of the Earth in the opposite direction of travel. This would in turn slow the orbit of the Earth down to our current speed of 29.79 km/s and result in a year of our current 365.24 days per year.
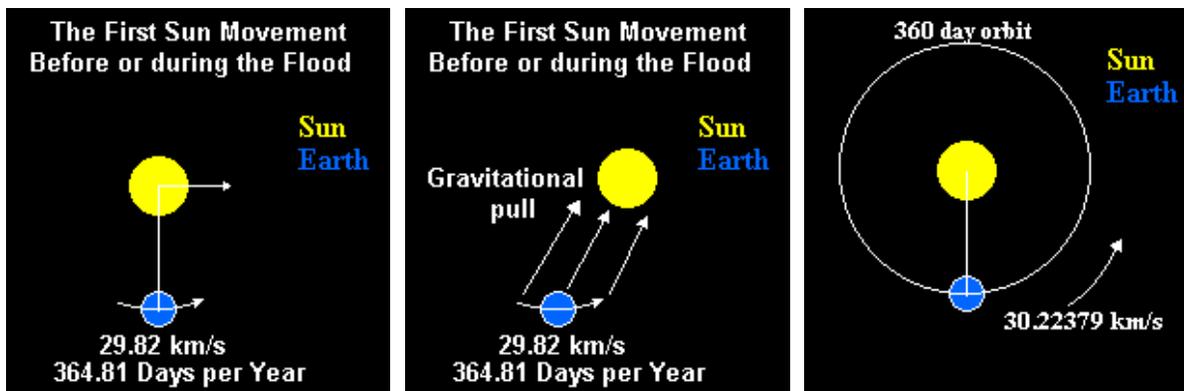

The interesting aspect here is that for the shadow of the sun to go backwards on the sundial, the Sun must move in the opposite direction to Earth's orbit. Only this direction of travel by the Sun would result in a slower orbital speed of the Earth. So we had a 50% chance right there that the theory could be proven wrong, but it wasn't.

Of course all the other planets would also be affected by this movement of the Sun and every planet does show eccentricity. Mercury (0.2056) and Pluto (0.2484) show the most dramatic eccentricity while Venus (0.0068), Neptune (0.0100) and Earth (0.0167) show the least affect. An eccentricity of 0.0000 would equal a perfect circle around the Sun. Pluto's orbit is so (elliptical) eccentric that it crosses through Neptune's orbital path making Neptune the farthest planet until the year 1999 when Pluto again becomes the farthest planet for 200+ years.

Could we use the eccentricity data to calculate how much the Sun may have moved?

No, Since this would have been at least the second movement of the Sun. If you refer back to paper 360 vs. 365, I stated that the Earth's orbit speed up around the time of the flood. This would mean that the Sun moved in the same direction (but parallel) to Earth's orbit to cause the orbit of the Earth to speed up.

This too would also cause a shift in the other planets. So if we factor two shifts into the eccentricity of the orbits then we have no way to determine what the eccentricity was of all the planets during the time between the Flood event and the Sundial event.

Eccentricity can also be caused by the gravity of other planets such as the massive Jupiter... so eccentricity itself does not prove any part of this theory. If there was only one movement of the Sun then we might be able to calculate from the current eccentricity where all the planets were when this event took place. With two events at two different times this calculation would be impossible.

God supplies us with evidence but not proof. For absolute proof would require no faith.

How would God move the Sun?

For a 3 dimensional being this would prove impossible, but for the creator of the Universe and everything in it, who also exists in at least 10 dimensions… This task of moving the Sun in the right direction, at the right time, at the correct angle, so our orbit remained the same distance from the Sun. This would probably be quite easy. A miracle is something that we cannot explain. Moving the Sun would be classified as a Miracle.

Cause and Effect

Our God is a God of cause and effect miracles. If He so chose, could He not cause the Sun to move backwards without adjusting the orbital speed of the Earth? I would guess that He could, but our Lord likes to leave a trace (evidence). In this case there seems to be just enough evidence to warrant the possibility that our calendar changes are due to divine intervention. We cannot explain the cause of the Sun moving, but we can see the effect - a calendar change from 360-day year with a month equal to 30 days to a 365.24-day year and a month of 29.531 days.

What about the Sun and Moon incident in Joshua, can you explain that?

"Sun, stand still over Gibeon; And Moon, in the Valley of Aijalon."
So the sun stood still and the moon stopped till the people had revenge upon their enemies.
...So the sun stood still in the midst of heaven and did not hasten to go down for about a whole day.
(Joshua 10:12-13)

No, I cannot explain this. Again this would be a miracle, but again God seems to leave a trace. In paper 360 vs. 365, I calculated that the astronomical data from the Book of Enoch indicated a year would equal 364.81 days before the flood. Then before or during the flood the timespan of the year shortened to 360 days per year until the Sundial incident in Isaiah 38:8 (around 700 BC) when the year then became 365.24 days per year.

The difference between Enoch's year of 364.81 days and our current year of 365.24 days is an increase of 0.43 days, which equals 10.32 hours. Depending on the season our daylight lasts for about 8 hours in the winter months and 16 hours in the summer months. Lets take an average day with 12 hours of daylight. Stop the sun at 12 noon for a time period of 10.32 hours and then continue with the rest of the day. You now have one day, which has almost doubled the average daylight hours from 12 hours to 22.32 daylight hours.

...So the sun stood still in the midst of heaven and did not hasten to go down for about a whole day.
(Joshua 10:13)

Now this miracle could have been a localized event or a global event. In any case there seems to be evidence of some event that took over 10 hours at sometime between the flood event and the Sundial event around 700 BC. It appears that in the Isaiah 38:8 Sundial event, God also allowed an extra 10.32 hours per year to represent evidence of the Joshua 10:12,13 event.

Again, this evidence hardly proves the events of Joshua 10:12,13 but does provide a trace that God has been in control.