

360 DAY YEAR AND THE SUNDIAL OF AHAZ

In the creation account in the book of Genesis 1:14, God said,

“Let there be lights in the dome of the sky to separate the day from the night; and let them be for signs and for seasons and for days and years,”

So the light in the sky (the sun, moon and stars) are to be signs for us to identify days, seasons and years. The period of time during which the Earth completes one rotation with respect to the Sun is called a solar day (24 hours). A month is a unit of time based on the revolution of the Moon around the Earth and defined as the period between two successive new moons (currently on average, 29.53 days). Month and Moon (Moonth) are cognates, they have the same etymology (they are related and originate from the same source). A year is the orbital period of the Earth moving in its orbit around the Sun. Currently it takes 365.2425 days for the earth to orbit the Sun.

Ancient civilizations all over the world including Arabia, Assyria, Babylonia, China, Egypt, Greece, India, Japan, Mexico, Palestine, Persia, Peru and Rome used a 360-day calendar with a 30-day moon cycle. Some of these ancient cultures are known to have possessed knowledge of square roots and trigonometry, and therefore their calendars should have been highly accurate.

As a matter of fact, a line of ancient peoples (Sumerians, Akkadians, and Babylonians) who lived in Mesopotamia (now southern Iraq) noticed the circular track of the Sun's annual path across the sky and knew that it took 360 days to complete one year's circuit. Consequently, they divided the circular path into 360 degrees to track each day's passage of the Sun's whole journey. That's how we got a 360-degree circle.

So how did we go from a 360 day year to a 365.25 day year and a 30 day lunar month to a 29.5 day lunar month?

Isaiah 38

Hezekiah's Illness

In those days Hezekiah became sick and was at the point of death. The prophet Isaiah son of Amoz came to him, and said to him, “Thus says the Lord: Set your house in order, for you shall die; you shall not recover.” Then Hezekiah turned his face to the wall, and prayed to the Lord: “Remember now, O Lord, I implore you, how I have walked before you in faithfulness with a whole heart, and have done what is good in your sight.” And Hezekiah wept bitterly.

Then the word of the Lord came to Isaiah: “Go and say to Hezekiah, Thus says the Lord, the God of your ancestor David: I have heard your prayer, I have seen your tears; I will add fifteen years to your life. I will deliver you and this city out of the hand of the king of Assyria, and defend this city.

“This is the sign to you from the Lord that the Lord will do this thing that he has promised: See, I will make the shadow cast by the declining sun on the dial of Ahaz turn back ten steps.” ***So the sun turned back on the dial the ten steps by which it had declined.***

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.

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).

So how much time is 10 steps on the sundial?

If the sun shines an average of 12 hours per day, then the 12 hours of sunlight would be spread out over the 360 step sundial. Therefore 1 hour of sunlight would traverse 30 steps ($360 / 12 = 30$). If 1 hour equals 30 steps then 10 steps would be a third of an hour, 20 minutes.

So it appears that the sun “turned back on the dial the ten steps” which would mean that 20 minutes of time was added.

How could this happen?

Now this gets quite interesting:

The earth is currently orbiting the sun at 29.79 km/s (kilometers per second) and has been doing so for several thousand years. This constant speed of 29.79 km/s means that for the earth to make one orbit of the sun (one complete circle), it will take 365.2425 days (the current time for a full solar year).

If we had a 360 day year then the earth would have to orbit the sun at a faster rate of 30.22379 km/s.

The difference in speed between 365.2425 days per year and 360 days per year is equal to 20.9688 minutes per day ($5.25 \text{ days} \times 24 \text{ hours} \times 60 \text{ minutes} = 7,560 \text{ minutes}$ divided by 360 days equals 21 minutes per day).

So one way to explain the miracle of the sun dial and to reconcile the ancient calendar of 360 days to the current calendar of 365.2425 days is to posit that God slowed the orbiting speed of the earth around the sun from 30.22379 km/s to 29.79 km/s. This would add 21 minutes per day or 5.25 days per year to the time it takes for the earth to orbit the sun, resulting in the length of years increasing from 360 to 365.2425 days.

Hezekiah lived in the 8th century BC and ancient history records that around that time additional days had to be added to the calendar to reflect an unexplained change that had occurred in the length of the year at that time.

There is no time dilation or anything extraordinary here. We have only slowed the orbital speed of the earth down. We have not changed the 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!

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 dragging the moon with it. The earth orbits around the sun once every 365.2425 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 way 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 (the current lunar cycle based on 365.2425 days and earth's orbital speed of 29.79 km/s).

What happens to the lunar month with a 360 day year when we change the orbital speed to 30.22379 km/s?

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, giving us a 30 day lunar month.

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!

So there you have it, Faith and Science working in tandem to put forth a reasonable explanation on how to reconcile the ancient calendar with the calendar of today. Science alone has limitations when it excludes God, Divine Revelation and the miraculous as part of reality.