Synchronicity of the Earth's Rotation with the Moon's Orbital Cycles and Solar Year

by Richard Heath and Robin Heath

This document was prepared by Richard Heath as a letter for Nature magazine and submitted on 14th April 1994 but remained unpublished. For readers of the Matrix of Creation (2nd ed, Inner Traditions Press, 2004) it marks the discovery of a unit of time proposed and named the Chronon, as being 1/10000th of the Moon's orbit and also the difference between the sidereal and tropical day of the Earth. The paper also documents a discovery made, with Robin Heath, later to be documented in his books: that one can divide up the solar year by its excess over the eclipse year to reveal an 18.618:19.618 ratio between these years, and many other interesting numerical facts not mentioned in this place. The puzzle here is a connection between the rotation of the Earth, the solar year and the precession of the Moon's orbit which (a) may be explainable by science (b) appears to have puzzled Megalithic astronomers and (c) should puzzle us today.

We find that the Earth's rotational day divides the year according to the 18.62 year cycle of the Lunar Nodes. From this we conclude that the Earth's orbit, the Moon's orbital precession and the Earth's rotational velocity are most probably interconnected. The tropical solar year in days is factorised almost exactly by 18.618 times 19.618 and the Moon travels one ten thousandth of its orbit in the time difference between sidereal and tropical days.

We have been considering a range of numerical coincidences present in arithmetical and geometrical analyses of astronomical cycles involving the Sun-Moon-Earth system. There is an apparently lawful relationship concerning the Earth, Sun and Moon, one that is most unusual.

The Earth 's rate of rotation is directly proportional to the ratio of angular velocities of the Sun and the Moon ~ orbital nodes; as seen from Earth.

The reason why this fact has been hidden is that we use the day or the degree to manipulate the data concerning these phenomena and since the day is implicated in the above law it obscures the relationship and the degree changes the numbers to further obscure it.

We now refer to the angle travelled by the sun on the ecliptic in one day as a DAY. If we convert the Moon's average daily motion of 13.176 degrees per day to DAYs per day we obtain 13.368 DAYS per day. This is the sidereal frequency per year because DAYS per day is also revolutions per year. This shows the virtue of using DAYS over degrees.

As there is not a great deal of familiarity with the terms used in describing Sun and Moon phenomena, we will recap some terms (see Figure 1).

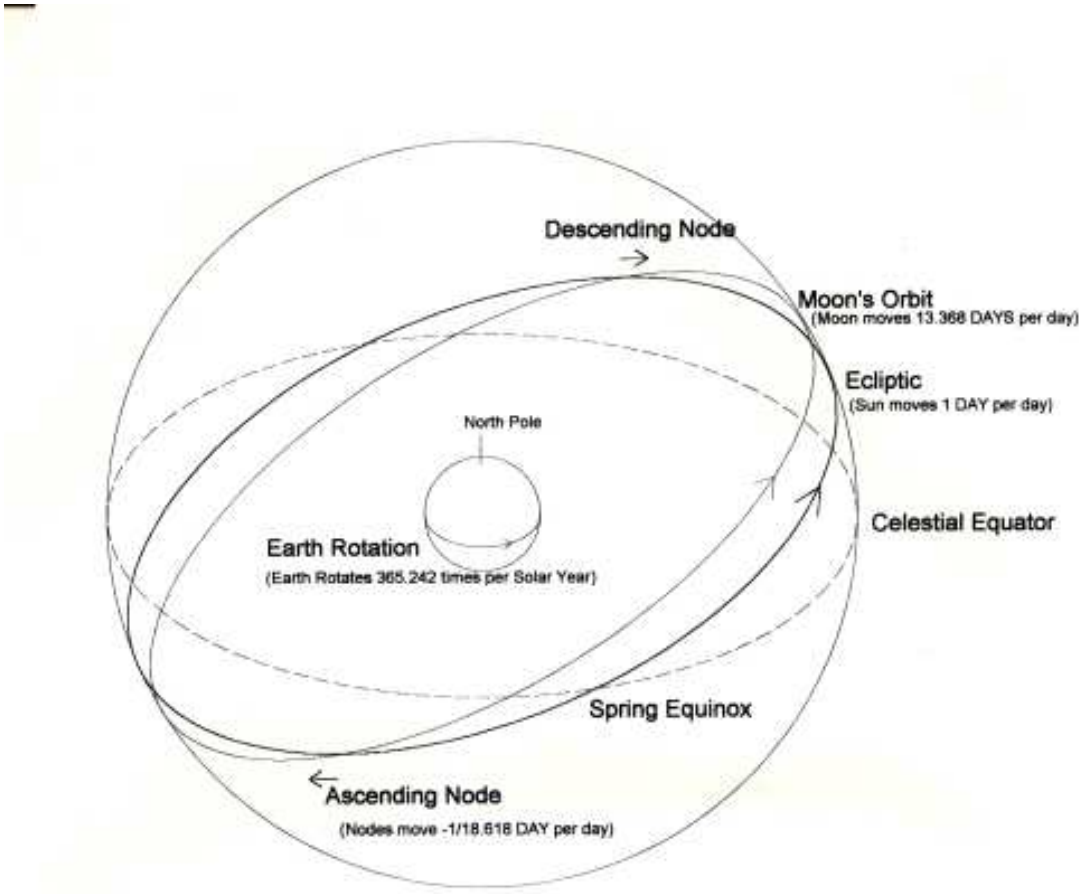


Figure 1: Earth-Sun-Moon Relationships

- The Moon crosses the Sun‘s path or ecliptic at two places, the lunar nodes.
- Full or new moons occurring near a node produce solar or lunar eclipse respectively.
- Whilst the Sun moves East day by day by about one degree, it precesses the Lunar Nodes in the opposite sense, i.e. retrograde. The Sun moves about 18.618 times faster than the precessing nodes.
- Whilst the Sun returns to the same place on the ecliptic after one Solar Year, it will return to a given node after a shorter period an Eclipse Year. In Earth days, a Solar Year is 365.242 units long whilst an Eclipse year is 346.620 units long. The ratio of 1:-18.618 between the angular velocity of the Sun and the Nodes means that after 18.618 solar years, the Nodes will return to the same part of the sky, a period called the Draconic Period. This means that after 1 solar year, the nodes have travelled by 1 /18.618 of the ecliptic. During 18.618 solar years there are 18.618 + 1 eclipse years, the + 1 being due to the complete revolution of the nodes in that period. Because there are 19.618 eclipse years in a Draconic Period, then the nodes must move by 1 /19.618 of the ecliptic in an eclipse year, i.e. before the Sun again meets a given Node. When we draw the ecliptic geocentrically as a circle and place a Sun-Node conjunction at the "top", then the eclipse and solar year node movements can be shown as in Figure 2.

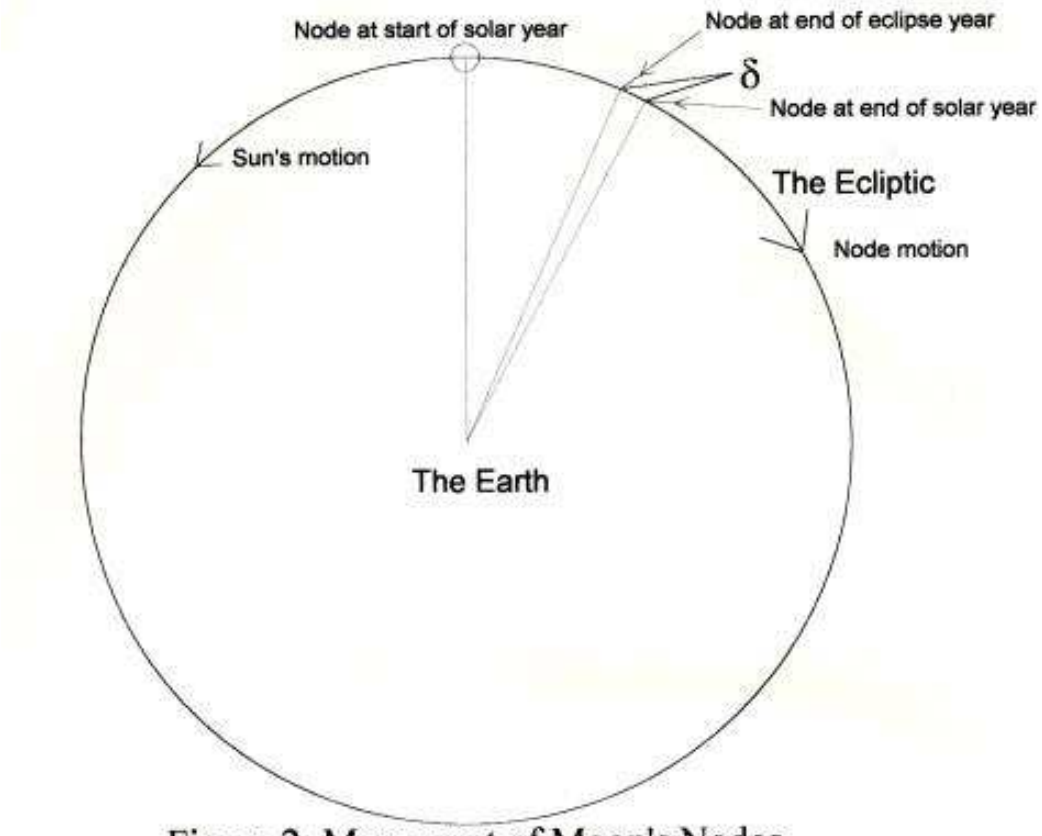


Figure 2: Movement of Moon's Nodes

The question then arises: What is the proportion of the whole circle, shown δ, between the end of the eclipse year and the end of the solar year?

It is,

1 /18.618 - 1 /19.618 which is $\frac{19.618 - 18.618}{18.618 \times 19.618}$ or 1 /365.248 of a solar year!

In other words, the Nodes move in the excess of the solar year over eclipse year by the equivalent of one Earth DAY on the ecliptic. There are 365.2421 tropical days in a solar year. Thus we can state,

The solar year, in days, has the two factors 19.618 and 18.618 and both these numbers are generated by the Moon 's nodal motion with respect to the Sun. The Earth's rotation is the lowest common denominator in the numerocity generated and thus calibrates the cycles involved.

Because of the 18.618 ratio between Sun and Nodal motion, there must be 18.618 days difference between the eclipse and solar years. What also has to be true is that the eclipse year is (1 8.618)2 days long or 346.63 days, which is close to the 346.62 days given [Astrophysical Quantities, C.W. Allen, 1973]. We have come to refer to 18.618 days as a NODE DAY, the time it takes the nodes to move by one DAY on the ecliptic and a fundamental constant in Sun-Earth-Moon astronomy.

We therefore re-assert that,

- The Earth's rate of rotation is directly proportional to the ratio of angular velocities of the Sun and the Moon ‘s orbital nodes; as seen from Earth because,
- The Earth rotates once, with respect to the Sun, in the time it takes the Sun, seen from Earth, to move by the amount the Lunar Nodes move in the excess of the solar year over the eclipse year.

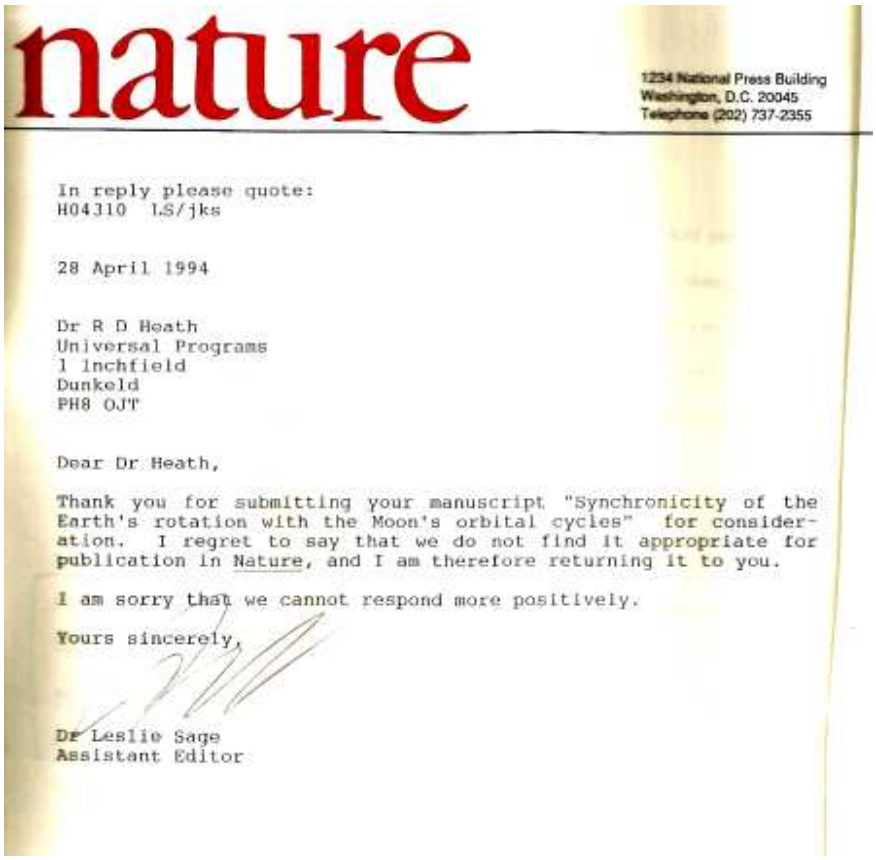
We found another calibrating factor when we moved to DAYs instead of degrees. When we divided 13.176 degrees per day by 360 degrees, we obtained the fraction of a lunar orbit per tropical day. The value is 0.0366009. The same calculation for the sidereal day yields 0.0365009, and both happen to be the number of days in a year of the other type of day, in 1 / 10000ths of a complete lunar orbit. The sidereal day is 365 ths and the tropical day is 366 1 / 10000ths of a lunar orbit: the difference between the two is a calibration unit of 1 / 10000th.

Therefore, we found that,

- The Moon moves 1/10000th of its orbit in the time between one sidereal day and one tropical day. There are 365 such periods in a sidereal day and 366 in a tropical day.

The present understanding of the Earth-Moon system does not account for either of the above calibration effects.

Nature Replied



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Dr R D Heath
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Dear Dr Heath,

Thank you for submitting your manuscript "Synchronicity of the Earth's rotation with the Moon's orbital cycles" for consideration. I regret to say that we do not find it appropriate for publication in Nature, and I am therefore returning it to you.

I am sorry that we cannot respond more positively.

Yours sincerely,

Dr Leslie Sage
Assistant Editor

A Second Opinion

PPARC

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Mr Richard Heath
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16th May 1994

Dear Mr Heath,

Thank you for the copy of your paper on synchronicity of periods. My first thought was that there may be a circularity of argument in your demonstration that in the period of time equal to the difference of the tropical and eclipse years the node of the Moon's orbit moves through closely the same angle as the orbital motion of the Earth in one day. However on working through the details I agree with you that there is not a circularity of argument, and this is a genuine numerical coincidence. Equally your demonstration that the Moon moves through approximately 1/10000 of its orbit in the difference between the sidereal and solar days is correct.

These are interesting results, but I doubt if they are any more than numerical coincidences. There are many numbers associated with the orbits and rotations of the Earth-Moon system, and by manipulating them in various ways it is likely that some combination will be found that gives a relationship among them to some precision. Such relationships have been reported many times among the orbital periods of planets and satellites, giving Bode-type laws. These are usually considered as only numerical coincidences, and it is necessary to demonstrate that they are statistically significant before there is any chance that they will be considered as any more this.

Yours sincerely,

A.T. Sinclair

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