Unknown Earth

unknown hypotheses

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ISBN: 9798336201499

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1 WHAT IS THIS BOOK ABOUT AND WHO IS IT FOR

Thank you very much for purchasing my booklet.

To build hypotheses that can contribute to scientific discoveries, it's good to have a professorial title, expensive laboratory, highly qualified staff, some grants, and paid research work. But if you don't have all of that, an old computer, access to the internet, knowledge acquired from high school, curiosity, and skepticism towards paradigms might be enough. The vast and continually growing resources of data on the internet enable the acquisition of knowledge necessary to delve into an interesting topic, formulate hypotheses, verify them, discard erroneous ones, seek explanations, until finally being able to present one's own concepts, which may turn out to be scientific discoveries.

As the title suggests, in this book you will find a previously unpublished hypothesis regarding the structure of the Earth's interior and many examples of phenomena confirming it, observed on Earth and in space. In the following chapters, I will show how a single assumption can simply explain the causes of many phenomena that have hitherto been explained in a complicated or perhaps even erroneous manner.

The popular science style of the text, simple drawings and graphs make the content of the book understandable to a wide range of readers, especially amateur scientists. I place calculations and references on the Unknown-Earth.science website.

So I invite you to a fascinating "journey" into the depths of the Earth and into space. Let's activate our curiosity, and we'll discover phenomena nobody expected.

2 DO WE REALLY KNOW WHICH FORCE RAISES THE OCEANS

I

Tramore, Ireland. In the picturesque, wide bay there is a long sandy beach - or it does not exist. When it's there, we stroll to the sea through the beach for several hundred meters, and when it's not there, we plunge knee-deep into the water directly from the promenade.

The disappearance of the beach in Tramore is, of course, a result of tides, which occur approximately every 6 hours. Tides, according to the prevailing theory, are caused by the gravitational attraction of water by the Moon and the Sun. Therefore, tides should be clearly correlated with the forces exerted by these two bodies, right? With one caveat: let's talk about tides in the open ocean (as tidal waves on shores tend to bend, reflect, interfere, as various waves typically do).

What is commonly known is not always true. Do you remember the diagram of tides with the Moon, Earth, and bulges of the oceans on the side facing the Moon and on the opposite side? Well, forget about it.

In November 2019, I analyzed monthly tide data from 79 measurement stations located on small islands far from continents [1]. In 62 stations, the **Moon was closer to the low tide than the high tide**. On average, high tides missed the culmination of the Moon by 3 hours and 42 minutes (difference between meridians 55°), while low tides missed by an average of 2 hours (30°) [2].

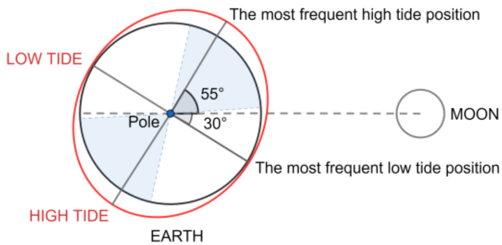

Figure 1. Average positions of the Moon during high and low tides

The so-called the lunar interval is explained by the inertia of the oceans, but it may raise the first small, tiny doubt: is the Moon really the main cause of tides?

One can encounter the opinion that water rises not because the Moon lifts it, but due to its pulling of water horizontally. This concept seems closer to the truth because the greatest horizontal force occurs at the Moon's rising and setting, precisely at the opposite moment to the maximum vertical component of lunar gravity [3]. This could explain the fact that high tides occur more frequently when the Moon is closer to the horizon than when it is at its zenith above the observer. However, even this concept does not explain another tide-related phenomenon (referring to periodic changes in amplitude), which will be discussed later in this chapter.

II

Let's check whether the disappointing observation result, because it is not consistent with the current theory, is not caused by not taking into account the position of the Sun. Let's take a closer look at the balance of variable forces related to the Moon and the Sun that affect the ocean in the vicinity of the tide measurement station, namely:

- the gravitational pull of the Moon,

- the centrifugal inertia force resulting from the Earth's rotation around the barycenter of the Earth-Moon system,

- the gravitational pull of the Sun,

- the centrifugal inertia force resulting from the Earth's rotation around the Sun.

In calculations, it is necessary to take into account the elliptical shapes of orbits because the momentary balance of gravitational and centrifugal forces depends on the current distance between objects (with centrifugal force dominating in extreme positions).

Calculations [4] showed that at each station measuring tides in the month in question, the balance of forces related to the Sun dominated, and **the vertical component of the resultant forces had only one maximum and one minimum per day**. The maximum vertically upward force occurred at midnight, when the Sun was on the opposite side of the globe from the measuring station, because at that month the centrifugal force resulting from the Earth's orbit around the Sun was greater than the Sun's gravitational force (due to the Earth's slightly elliptical orbit). However, it is known that the tide occurs twice a day, so we can assume that **it is unlikely that the reason for the tides is the vertical component of forces associated with the Moon and the Sun.**

Meanwhile, the horizontal component of the resultant force had two maxima within a day, similar to tides.

The tides at the station occurred at slightly longer intervals than the maxima of the resultant horizontal force, causing the time gap between these quantities to increase from 0 to about 13 hours over a period of 14 days, after which the cycle repeated [5]. This suggests that the inertia of the water masses causes them to move at a slower speed relative to the driving force.

It seems that we have obtained confirmation of the hypothesis that tides are a result of the horizontal component of the forces associated with the Moon and the Sun. However, the next phenomenon related to tides will cast doubt on this hypothesis.

III

By observing the tides for many days, we notice that the water level at the peaks of high and low tides gradually changes [1].

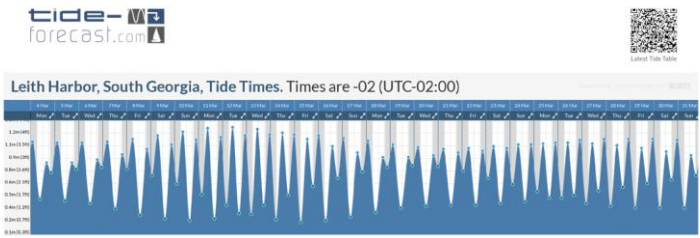

Figure 2. Example of 30 day tidal changes - Leith Harbor in the South Atlantic at latitude -54°

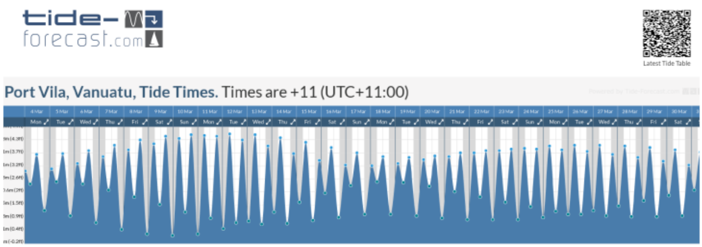

Figure 3. Example of tidal changes over 30 days - Port Vila in the South Pacific at latitude -18°

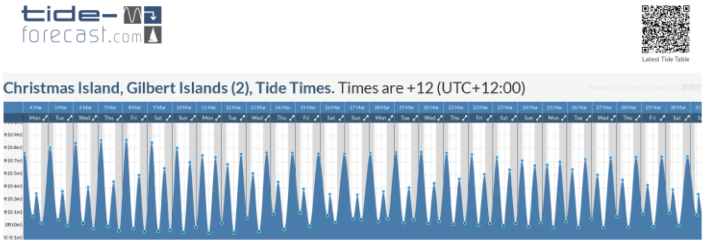

Figure 4. Example of tide changes over 30 days – Christmas Island, Gilbert Islands in the Pacific near the equator (latitude 2°)

At all measuring stations we can observe two characteristic tide features:

a) **the tide amplitudes change roughly sinusoidally with a period of about two weeks,**

b) **high tides and low tides have two amplitude envelopes (every second tide and every second low tide are bounded by a different envelope).**

AD a.

<u>Why does the tide amplitude change roughly sinusoidally with a period of about 2 weeks?</u>

According to the official theory, the increase in tidal amplitude is caused by the summation of the gravitational forces of the Moon and the Sun when these bodies are aligned with the Earth, i.e. during the full and new moon.

However, if we consider the sum of all the variable forces associated with the Moon and Sun, we see that **there is no significant difference in the maximum net force acting on the ocean during different alignments of the Earth with respect to the Moon and Sun**. When the gravitational forces of the Moon and the Sun are arranged in perpendicular directions (Figure 6), the centrifugal force resulting from the Earth's rotation around the barycenter of the Earth-Moon system can reach a greater value, because then the rotation arm reaching from the measurement point to the barycenter is able to reach a greater length. This centrifugal force almost completely compensates for the reduced sum of gravitational forces caused by the transverse orientation from the Earth to the Moon and Sun.

The two Figures below depict gravitational and centrifugal forces and their sums, every 6 hours, in two situations: when the Sun and the Moon are aligned with the Earth, and when they are aligned perpendicular to each other [7]. Similarities in resultant forces are visible in both situations. (The resultant force is directed opposite to the Sun here because at the observed time, the centrifugal force resulting from the Earth's rotation around the Sun was greater than the gravitational force of the Sun.)

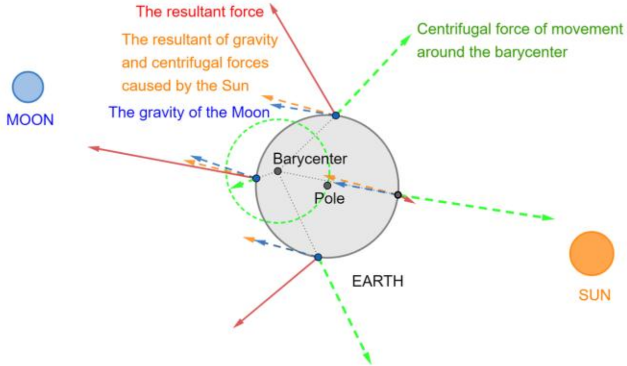

Figure 5. Forces on the ocean caused by the Moon and the Sun during the full moon (every 6 hours, in November).

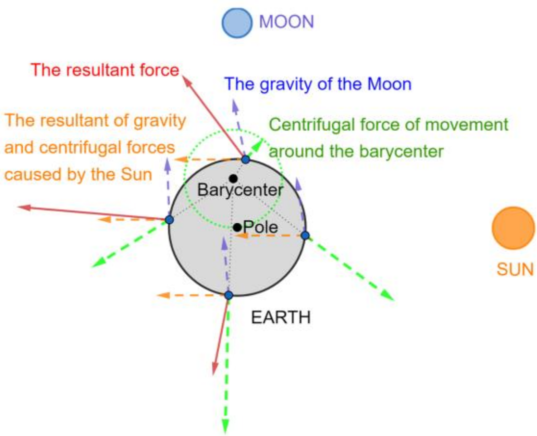

Figure 6. Forces on the ocean caused by the Moon and the Sun during the Moon phase of 50% (every 6 hours, in November)

Conclusion 1: **the sum of gravitational and centrifugal forces during the full moon and the quarter moon does not exhibit increases and decreases in the resultant force, which would justify the occurrence of so-called neap tides (with low amplitude) and spring tides (with high amplitude) based on the Earth's alignment with the Moon and the Sun.**

The consequence of small changes in the resultant forces associated with the Moon and the Sun (compared to the clearly visible changes in tide amplitudes) is small variations in the vertical and horizontal components of the resultant force over the course of the month. Below is a comparison of the monthly tide heights predicted for the measurement station and the calculated resultant vertical and horizontal forces acting on the ocean there. To clearly show changes in tide heights, only daily high tide maxima (marked with blue circles) and minimum water levels during low tides (marked with red circles) are indicated. [8]

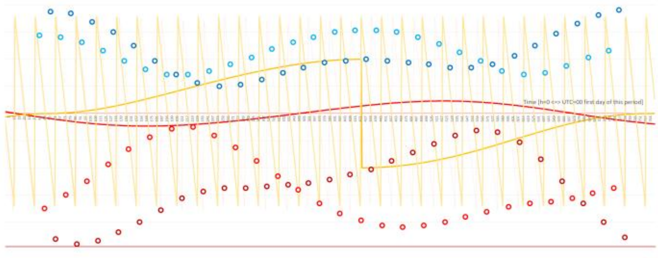

Figure 7. Tide amplitudes (blue circles) and low tide levels (red circles) over the course of the month in Port Vila at latitude -18° (yellow line - Moon phase, red - Moon declination, thin light brown - angle between the observation point and the Moon's culmination meridian, thin yellow - angle between the observation point and the meridian where the Sun is at its zenith)

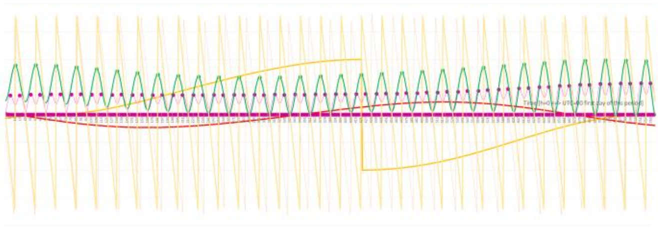

Figure 8. The amplitudes of the vertical (green line) and horizontal (purple line) resultant forces associated with the Moon and the Sun during the tide observation in Port Vila

Comparison of these charts is disappointing. During the observed period, the amplitude of the net force associated with the Moon and Sun does not show the increase around new and full moons that is visible in the amplitude of the tides. We also do not find the two amplitude envelopes that characterize tide courses (the subsequent maxima of which are alternately larger and smaller).

Similar, almost flat, amplitude charts appear for all measurement stations, despite the quite diverse tide patterns at individual stations.

Conclusion 2: **the course of the resultant forces associated with the Moon and the Sun does not justify changes in tidal amplitude.**

<u>If the forces from the Moon and Sun have a different pattern than the observed tidal amplitudes, could there be some other force moving the oceans?</u>

3 WHAT MOVES THE OCEANS

In seeking the force driving tides, one must consider that its frequency of changes should be two cycles per day, as that is the frequency of tides. Speculations about the influence of other planets can be dismissed, as each approaches Earth at intervals longer than a year. Suspicion may still fall on the two Kordylewski moons orbiting Earth, but even this speculation can be dismissed due to their small mass (they weigh about 10 tons each) [9].

If we can't find a suitable source of force in the sky, let's look underground - is there a massive body in the depths of the Earth that can move the oceans?

According to modern knowledge, under the thin, hard Earth's crust, which is several to several dozen kilometers thick, there is a 2800 - 2900 km thick Earth's mantle with a consistency that is initially rigid, and later semi-liquid due to the temperature increasing with depth to about 5000°C. Beneath the Earth's mantle the liquid outer core, forming a spherical reservoir with a diameter estimated at 6660 km (more than half the diameter of the Earth) filled mainly with liquid iron. At the center of the Earth there is a ball of solid iron and nickel, with a very high density and a diameter estimated at 2400 - 2500 km; it is the inner core of the Earth. [10]

Eureka!

So theoretically, this iron-nickel ball at the center of the Earth could move in the liquid outer core if there was a force capable of moving it.

The mass of the solid inner core is 46% greater than the mass of the Moon, and it is, of course, incomparably closer to the oceans. Its shift would result in an increase in gravity on one side of the Earth and a decrease in gravity on the opposite side.

However, the increase in gravity would cause the ocean to ebb at that location, and on the other side of the globe there would be a high tide due to the decreased gravity. Such a phenomenon has not been observed, on opposite sides of the globe there are more or less simultaneous low tides and simultaneous high tides.

To induce ebb tides on opposite sides of the globe, we would need to have two inner cores displaced from the center of the Earth in opposite directions. However, gravity would cause them to merge unless both cores, separated from each other, are divided by something akin to a permanent crossbar.

Eureka!

A single elongated core would also cause increases in gravity around the center of mass of each of its halves.

Hypothesis 1: THE EARTH'S INNER CORE IS NOT SPHERICAL, BUT IS ELONGATED IN SHAPE.

I

Let us first assume this concept of an elongated inner core and check whether, on the Earth's surface, it could cause a change in the gravitational force at least comparable to the resultant of the forces coming from the Moon and the Sun (which have so far been blamed for ocean tides).

First, let us introduce a simplified model of the inner core: let the inner core consist of two identical spheres (representing the masses of the halves of the elongated core) with a total mass equal to the currently estimated mass the inner core, which are spaced apart and separated by a bar of negligibly small volume and mass.

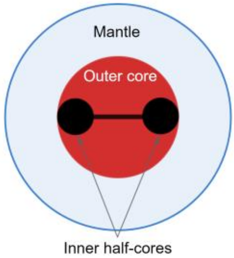

Figure 9. Preliminary model of the inner core with distributed masses

Assuming that the "half-cores" alter the density of matter at their occurrence in such a way that the material with the density of the outer core is replaced by material with the density of the inner core [60], it can be estimated that spreading the halves of the inner core to the outer boundary of the liquid outer core would result in a change in surface acceleration near the "half-cores" about 150 times stronger than the change caused by the Moon and the Sun [11].

Conclusion 3: **the Earth's elongated inner core would have a much greater ability to move the oceans than the Moon and Sun.**

II

For such an internal core with distributed masses to induce migrating ocean tides, it would have to rotate, generating local increases in gravity causing ebb tides at successive locations around the Earth's circumference.

Is there a force capable of rotating the Earth's elongated core at the speed of ocean tides?

The elongated inner core, suspended in the liquid outer core, could align itself in a position consistent with the resultant force acting on it (similar to how a compass needle aligns along the lines of magnetic field force).

Let us again consider the forces changing during the day, i.e. gravitational and centrifugal forces associated with the Moon and the Sun, this time acting on the hypothetical elongated inner core.

It can be assumed with high probability that these forces are too weak to move the inner core relative to the center of the Earth, which is held by the Earth's gravitational force directed centrically towards the center of the Earth. The direction of the forces caused by the Moon and Sun changes every hour, so their influence, which would tend to move the core, does not accumulate over a long period of time.

Another scenario concerns the potential rotational movement of the inner core relative to the Earth's mantle: since the rotational motion of the Earth and the Moon has had the same direction since their formation, even a weak force, accumulating its influence over the course of 4.5 billion years of the existence of these celestial bodies, might possibly induce a rotational movement of the core.

The interpretation of the calculation results [12, 13, 14] of forces that may affect the momentary position of the longitudinal inner core leads to quite surprising conclusions. It turns out that **the orientation of the core is practically unaffected by the gravitational force of the Moon, the gravitational force of the Sun, or the centrifugal force resulting from the Earth's rotation around the Sun.**

Could it be a miscalculation?

-No, eureka!

The result of the calculations indicating the lack of influence of the mentioned three forces on the positioning of the core becomes apparent when we notice that these forces, acting on each half of the core, have almost the same values due to nearly identical distances from the Moon and the Sun, but they cancel each other out! The opposing action of these forces is caused by the fact that the longitudinal inner core acts as a lever with a fulcrum at the center of its gravity, maintained at the center of the Earth by the Earth's gravitational force. Let's consider the forces one by one.

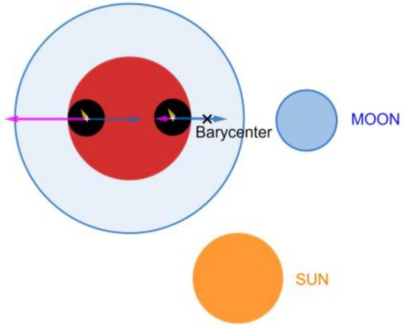

Figure 10. Forces acting on the core halves: blue vector - the gravitational force of the Moon, purple - the centrifugal force resulting from the Earth's rotation around the Earth-Moon barycenter, yellow - the difference between the Sun's gravitational force and the centrifugal force resulting from the Earth's rotation around the Sun.

Sun: on each of the arms of this lever there is a net force resulting from the gravity [12] of the Sun and the centrifugal force [13] caused by the Earth's rotation around the Sun. Since the resultant of both forces acts on each arm of the lever with the same direction and almost the same magnitude (because the distance of each half of the core to the Sun is almost the same), the forces balance on this lever without affecting the position of the core.

Moon: a similar situation applies to the gravitational force of the Moon [14], which acts almost identically on both arms of the lever formed by the longitudinal core. The gravitational forces of the Moon also balance on the arms of this lever, without exerting any influence on the position of the core.

A completely different effect is produced by the centrifugal force resulting from the rotation of the Earth around the barycenter (center of rotation) of the Earth-Moon system. Since this barycenter is located at a short distance from the core (inside the Earth's globe [15]), the differences in distance between the barycenter and each of the spread-out halves of the core are significant. Because the centrifugal force is proportional to the length of the radius, **this centrifugal force [16] is greater on the half of the core that is farther away from the barycenter and can reach a maximum at the greatest possible distance, i.e., when this half-core is exactly on the opposite side of the Earth's center from the Moon (as shown in Figure 10); therefore, this centrifugal force tends to maintain the core in this position.**

In Figure 10, there are identical vectors on both halves of the core - vectors of the Sun's force balance and vectors of the Moon's gravitational force, as well as two vectors of different lengths representing the centrifugal force resulting from the movement of the Earth around the barycenter of the Earth-Moon system.

Eureka!

Conclusion 4: **the longitudinal inner core can be consistently maintained towards the Moon due to the centrifugal force associated with the rotation of the Earth around the barycenter of the Earth-Moon system.**

If the Earth spins around its axis independently of the position of the inner core, constantly indicating the position of the Moon, we obtain rotational motion of the longitudinal inner core relative to the Earth's surface.

Hypothesis 2: THE LONGITUDINAL INNER CORE OF THE EARTH ROTATES RELATIVE TO THE SURFACE OF THE EARTH IN ACCORDANCE WITH THE POSITION OF THE MOON.

Perhaps, despite the long duration of interaction spanning 4.5 billion years, the resultant centrifugal force acting on the longitudinal inner core (on the order of 10^{18}N [62]) may be too small to set the inner core in motion within the dense material of the outer core. In that case, it seems possible that this force aligned the longitudinal core towards the Moon's direction early in the formation of Earth and the Moon, when the core was still moving in the vacuum of space. (Such a sequence of Earth's formation will be proposed in Chapter 5.)

III

An elongated core rotating relative to the Earth's surface will cause outflows in areas where the core halves are closer to the surface, and therefore simultaneously on both sides of the globe. The water "squeezed out" by the low tides will accumulate in areas where gravity is weaker, i.e. near the meridians 90° away from the low tides, creating high tides there (the effect of a balloon squeezed with both hands).

If the oblong core is held towards the Moon, the maximum low tide at the measuring station should occur when the Moon is above the station's meridian (or above the meridian at its antipodes, since the other half of the oblong core is then below the station).

Conclusion 5**: the presence of the Earth's elongated inner core can explain the occurrence of low tides closer to the moments of the Moon's culmination over the measurement site and its antipodes, as well as the occurrence of high tides at times closer to the rising and setting of the Moon** (which was noted in Chapter 2.I).

HYPOTHESIS 3: THE DIRECT CAUSE OF OCEAN TIDES IS NOT THE MOON'S GRAVITY, BUT THE CHANGES IN GRAVITY CAUSED BY THE MOTION OF THE INNER CORE RELATIVE TO THE EARTH'S SURFACE.

AD 2.IIIb

<u>Can we explain why tides rise and then fall over a period of 2 weeks and whether the elongated core can explain why high tides (and low tides) occur in pairs - larger and smaller?</u>

The Moon orbits the Earth in a period of 27.3 days, changing its position relative to the plane of the Earth's equator twice during this time: for almost 2 weeks it is located over the southern hemisphere, reaching as high as -23° (in the considered month), and for almost 2 weeks over the northern hemisphere, up to +23° above the equatorial plane. The angle to the Moon from the equatorial plane is called declination.

We assume that the inner core is elongated and held towards the Moon.

Notice that the **distance of the measurement location on the Earth's surface from the closer half of the elongated core determines the gravity force from the core** [19], as gravity force is inversely proportional to the square of the distance (thus, the half of the core that is farther away from the measurement location has a significantly smaller gravitational influence).

Eureka!

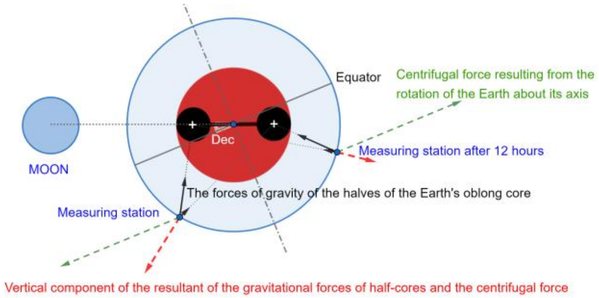

Figure 11. Forces influencing the acceleration due to gravity at the measuring station during the lunar culmination and after 12 hours - two different maximum values of the resultant force are visible (centrifugal and resultant forces are larger than in the drawing, proportionally)

Figure 11 shows that the half-core can approach the measurement location only up to a certain distance, depending on the current declination of the Moon [17]. During large declinations, the arms of the core trailing behind the Moon are positioned at higher latitudes, and therefore closer to the latitude of the measurement station, allowing them to approach the measurement location more closely.

In the example shown in Figure 11, the tide or gravity measurement station is located in the southern hemisphere, while the Moon is over the northern hemisphere (during positive declination). In this scenario, the station in the southern hemisphere is quite distant from the nearest half-core, as this half is being held by the Moon in the northern part of the globe [18].

After 12 hours, this station will be on the opposite side of the Earth from the Moon and will approach the second half-core. The second half-core will be closer to the station than the first half-core was because this half is now in the southern part of the globe, just like the station is.

So, after 12 hours (and 12.5 minutes needed to catch up to the Moon's new position), the gravitational force is greater because it comes from the second half-core, which is at a shorter distance than the first half-core was 12 hours earlier.

Of course, during the negative declination of the Moon, as well as in the northern hemisphere, the station approaches the closer half of the core in the opposite order to that described.

At the equator, the station's minimum distance from the core halves is the same when the Moon is above the station as when it is above the station's antipodes, so there should be no alternating changes in gravitational force due to this. However, during the Earth's rotation during 12 hours, there is a slight change in the Moon's declination, which at the station causes a change in the gravitational force of the core, because at the equator this force is greatest during exactly zero declination (then the Moon is above the equator, so the end of the elongated core is directly below him).

After adopting the concept of an elongated inner core, it turns out that the current declination of the Moon

affects the momentary amount of gravity at any point on Earth.

Conclusion 6: **two distant halves of the inner core justify the occurrence of tidal amplitudes changing every 12 hours, which on a monthly chart are bounded by two envelopes (observed phenomenon in section 2.IIIb), as one of these envelopes is attributed to one half of the core, creating greater attraction during positive Moon declination and lesser during negative declination, while the other envelope is attributed to the second half, in the reverse order.**

During larger Moon declinations, the changes in the station's distance from the core halves are greater, thus resulting in a larger amplitude of gravitational changes, causing tides at the station.

Conclusion 7: **the elongated inner core of the Earth should cause a variable increase in gravity at a measuring station located away from the equator, with an amplitude changing every 12 hours, and this is consistent with the observed phenomenon that low tides (and high tides) occur in pairs - smaller and larger.**

Conclusion 8: **the Earth's elongated inner core in places far from the equator should generate tides with an amplitude proportional to the current declination of the Moon. Since the Moon's declination reaches two extremes per month (just like the tides), we receive further confirmation of the hypothesis that the cause of the tides is the existence of the Earth's elongated inner core.**

Hypothesis 4: THE CAUSE OF SPRING AND NEAP TIDES IS NOT THE SUMMATION OF THE GRAVITATIONAL FORCES OF THE MOON AND

THE SUN DEPENDING ON THE MOON'S PHASE, BUT RATHER THE CYCLICAL CHANGES IN THE MOON'S DECLINATION IN PERIODS OF $27\frac{1}{3}$ DAYS, WHICH LEAD TO CHANGES IN THE TILT OF THE EARTH'S INNER CORE RELATIVE TO THE EQUATORIAL PLANE, RESULTING IN VARIATIONS IN THE AMPLITUDES OF LOCAL GRAVITATIONAL CHANGES.

In Figure 11, the centrifugal force resulting from the Earth's rotation around its own axis [20] is also indicated, which occurs at the geographic latitude of the measurement station. After considering (in subsequent considerations) the probable size of the longitudinal core, it turns out that this force is significantly greater than the gravitational forces of the inner core, so the balance [21] of the vertical components of the gravitational forces of the half-cores and this centrifugal force is directed upwards. It can be seen in Figure 11 that the vertical component of the resultant force on the side facing the Moon is not as greatly reduced by the forces of the half-cores as on the opposite side of the Earth, where in the presented situation, the half-core is closer to the measurement station.

IV

It's time to compare the occurring tides with the calculated monthly changes in force considering the gravity of the hypothetical longitudinal inner core (modeling its various, as yet unknown, lengths).

And eureka!

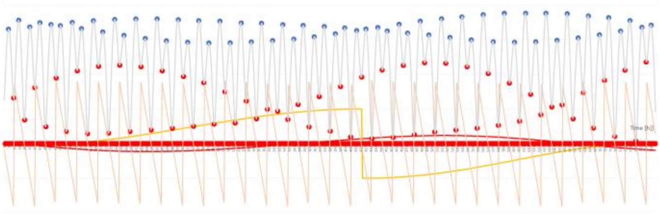

Figure 12. The calculated changes in Earth's acceleration in Port Vila caused by the longitudinal inner core of the Earth during a month of tide observations (red dots represent gravity maxima, blue ones - minima, the yellow line shows the Moon phase, and the thin red line - Moon declination, the brown one indicates the angle between the meridian of the measurement station and the meridian over which the Moon is at its zenith)

It turns out that the **plot of calculated gravity changes induced by the hypothetical longitudinal inner core of the Earth exhibits the same characteristics as the tidal changes depicted in Figure 7:**

a) gravity change amplitudes increase twice during the month,

b) gravity increments are bounded by two envelopes of similar shape and period as in the case of tides.

We also find the same similarities on all other islands, for example:

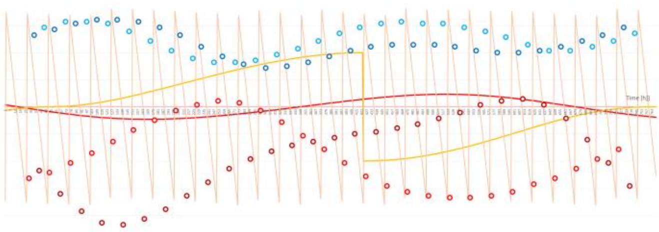

Figure 13. High and low tides at Leith Harbor at parallel -54

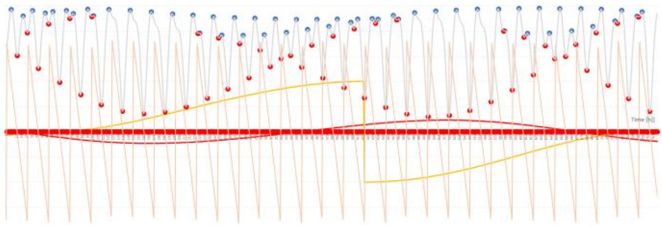

Figure 14. Calculated changes in Earth's acceleration in Leith Harbor, mainly caused by the elongated inner core

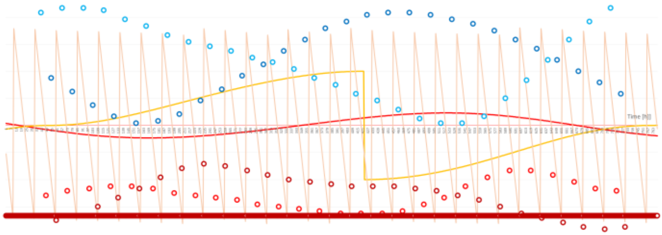

Figure 15. High and low tides at Christmas Island (at latitude 2°)

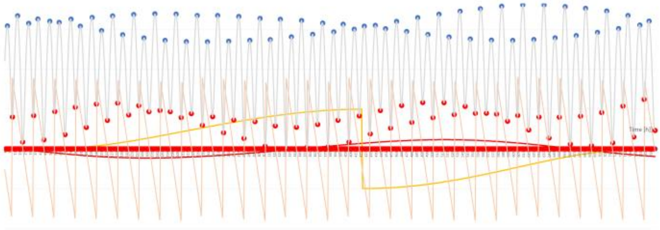

Figure 16. Calculated changes in gravitational acceleration at Christmas Island, Gilbert Islands, driven mainly by the longitudinal inner core

The red dots on the force graphs occur when the end of the elongated core is closest to the measurement station; at that time, the gravitational force of this core end most significantly reduces the force balance, which is directed upwards (due to the much greater centrifugal force resulting from the rotation of the Earth around its own axis). **Increased gravity (at the moments marked by red dots) affects lower water levels, causing low tides.**

The blue dots on the force graphs occur when both ends of the elongated core are at the greatest distance from the measurement station, meaning they point to meridians differing by 90° from the meridian at the measurement location. At these moments, the elongated inner core has the least influence on the gravity at the measurement site; water is not pulled towards the center of the Earth with increased force, hence there is a high tide (the magnitude of the high tide is influenced by the magnitude of low tides occurring in other areas at that time).

In the graphs of gravity changes caused mainly by the elongated inner core, it can be seen that:

- **changes in gravitational acceleration caused by the elongated inner core are characterized by increased amplitude during large declinations of the Moon** (this phenomenon was justified in conclusion 8),
- **the period of changes in the amplitude of both tides and the gravitational force of the elongated core is two weeks**,
- t**he two envelopes of Earth's acceleration amplitude, quite similar to the two envelopes of tides, are caused by the interaction at the measurement point of both halves of the inner core alternately**, with one approaching the station more than the other (as explained in conclusion 6).

Conclusion 9: **the two-week changes in ocean tides can be explained by the presence of the Earth's inner longitudinal core.**

V

Measurements of seismic waves indicate a surprising phenomenon contrary to the concept of a spherical core, called seismic wave anisotropy, where the speed of wave propagation through the core in the equatorial plane is several percent slower than the wave passing along the Earth's rotation axis [6].

The observed **difference in seismic wave velocities through the core in the equatorial plane and waves along the Earth's axis appears to be justified when considering Hypothesis 2 about the elongated inner core aligning towards the Moon**, thus near the equatorial plane.

4 MEASUREMENTS AND CONCLUSIONS

The structure of the Earth's interior is most often inferred from measurements of seismic waves propagating during earthquakes. Analyzes of randomly occurring measurements from the last several decades lead to the conclusion that the inner core rotates at a slightly different speed than the globe, and there is no agreement among researchers in which direction it rotates, at what speed and what the cycle of changes is [6].

For measurements to provide sufficient information about a periodic phenomenon, the time between measurements must be at least twice as short as the period of change. Therefore, if, according to hypothesis 2, the rotation of the Earth's surface relative to the core occurs daily, then core measurements based on earthquakes should take place at least every 12 hours. Because earthquakes occur irregularly, and strong quakes (over magnitude 6.1) enabling core exploration occur on average once every 3 days [57], measurements made from them cannot reflect the true nature of the faster movement.

Of course, ocean tides are only an approximate representation of the forces causing them.

However, there are precise instruments called gravimeters that record such small changes in acceleration that diurnal changes in the acceleration due to gravity become visible due to the change in the gravimeter's position relative to the Moon and the Sun due to the Earth's rotation.

Data from gravimeters are processed to remove the influence of the Moon and Sun, as these instruments are used to study the local density of the Earth's crust, from which conclusions are drawn about the natural resources located below the surface. However, some research centers publish raw data, which is very interesting for us if we want to verify the hypothesis about gravity changes caused by the elongated inner core of the Earth, and then we want to measure this effect and on this basis deduce the positions and sizes of the inner core. If the position of the inner core can be correctly predicted, it will be possible to predict the changes in gravity on Earth caused by it at any place and time.

I

We will consider the acceleration changes recorded by the gravimeter in Rustrel [22] (a location inside Europe, away from the influence of oceans) at the same time as the discussed tide observation.

Eureka!

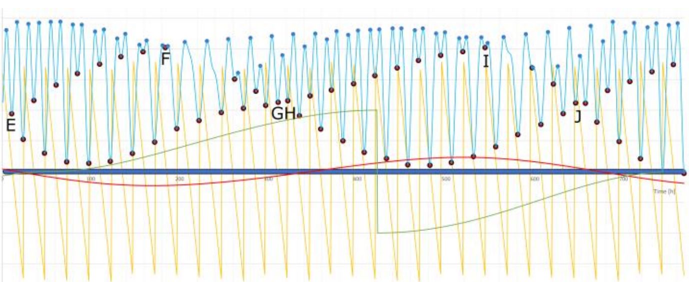

Figure 17. Changes in gravitational acceleration (blue line) recorded with a gravimeter (green line - Moon phase, red line - declination, yellow line - angle between the meridian of the Moon's culmination and the meridian of Rustrel)

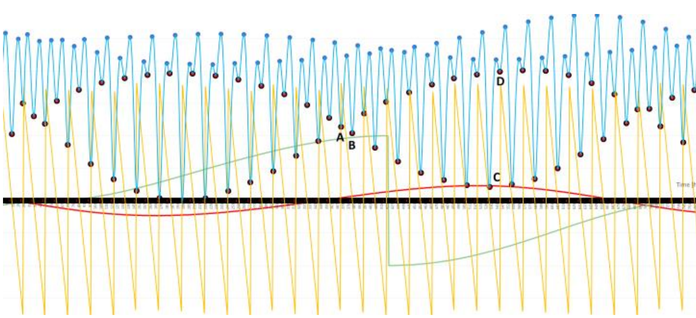

Figure 18. The influence of the Earth's elongated inner core on changes in gravitational acceleration in Rustrel

One can notice a significant resemblance between the acceleration changes calculated considering the model of the Earth's elongated inner core and the acceleration changes observed by the gravimeter.

1. **In both plots, there are two peaks of Earth's acceleration within a day.**

2. In both graphs, the gravitational acceleration maxima are approximately proportional to the Moon's declination and have a variation period of 27 days.

3. The hours at which the acceleration measured in Rustrel reaches extremes align with the hours predicted by the longitudinal core model.

Conclusion 10: **gravimeter measurements show high convergence with calculations taking into account the model of the Earth's elongated inner core.**

At the same time, there are certain differences between the measured and calculated trends. Let's try to infer what deviations from the adopted model need to be introduced. To do this, let's explain the occurrence of characteristic moments in gravity changes using the longitudinal inner core model.

Points A and B: the declination of the Moon is close to zero, the Moon is over the equator, aligning the inner core in the equatorial plane. The minimum distance of the measurement station in Rustrel from the half of the elongated core occurs when the Moon is over the meridian of Rustrel, as at that moment, the core half is directly beneath the surface of the measurement station. The small distance from the core signifies a local increase in gravity, significantly reducing the centrifugal force of the Earth's rotation directed upwards (the resultant vertical force is represented at **point A**).

In the following hours, as the Earth rotates, the station moves away from the end of the core oriented towards the Moon, causing a decrease in the gravitational influence of the core on the station. After about 6 hours, the station is at the greatest distance from that half of the core, with the station's meridian differing by 90 degrees from the meridian over which the Moon now dominates. The gravitational influence of the core on the station is minimal at this point, so the resultant force directed upwards reaches its maximum (the blue **point of maximum between A and B**).

In the following hours, the station approaches the opposite half of the elongated core, resulting in a gradual increase in gravity on it, which will reach another maximum when the station is directly above that half. Here, the second minimum of the resultant force directed upwards occurs (**point B**).

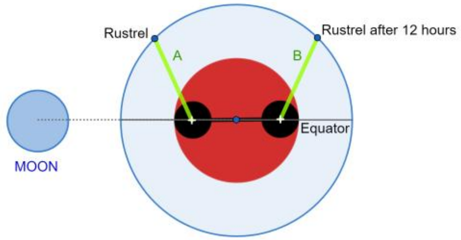

Figure 19. Smallest distances from the measurement station to the dominant half of the elongated core (preliminary model) during zero declination of the Moon

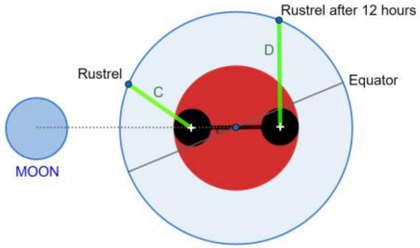

Figure 20. The shortest distances from the measuring station to the dominant half of the elongated core (preliminary model) during non-zero lunar declination

Points C and D: the lunar declination reaches its maximum, and the centrifugal force of the Earth's orbit around the barycenter, directed opposite to the Moon, continues to align the elongated core towards the Moon, thus at the same angle to the equatorial plane as the declination. When the Moon is at its zenith over the meridian of Rustrel, the tip of the elongated core positioned in the northern hemisphere approaches Rustrel more than when the core is located in the equatorial plane, as Rustrel is also in the northern hemisphere. Therefore, at this moment, the gravity in Rustrel from the core reaches its maximum value, while the resultant force upwards reaches its minimum (**point C**).

Again, as Rustrel moves away from the tip of the core, gravity decreases until it reaches a local minimum (hence, on the graph, there is a blue maximum of the resultant force upwards **between points C and D**), and after 6 hours, Rustrel begins to approach the opposite end of the core, causing another increase in gravity. However, this opposite end of the core is now located in the southern hemisphere, so Rustrel cannot approach it as closely as it did 12 hours ago to the half located in the northern hemisphere, nor as close as when the core was in the equatorial plane at zero lunar declination. Therefore, the reduction in centrifugal force from Earth's rotation is minimal, and the resultant force upwards reaches **point D** at this moment.

Returning to the issue of discrepancies between the measurements and calculations, two inconsistencies can be observed:

a) shifting the envelope in time,

b) the deformation of the shape of the sinusoids representing the envelopes of the acceleration measured by the gravimeter.

AD a)

Characteristic moments, such as the equalization of the two force amplitude envelopes (A, B), appear slightly earlier on the gravimeter graph (by 1-2 days) than on the force graph taking into account the longitudinal core. The envelope maxima are similarly shifted in time.

Hypothesis 5: THERE IS A LEAD OF THE CORE'S DECLINATION BEFORE THE MOON REACHES THAT DECLINATION, CHANGING IN THE RANGE OF APPROXIMATELY 36 - 48 HOURS.

Parameterizing the force graph observed in Rustrel (Figure 18), a lead of the Moon's declination by the longitudinal inner core of 48 hours was assumed, allowing accelerations indicating the core's position in the equatorial plane to occur at the same time (points A, B and G, H).

Additionally, the periods between the alignments of both amplitude envelopes in Rustrel (time intervals E-G and H-J in Figure 17) are not identical; over the observed month, the difference between the two periods was one day. This may indicate **uneven rates of motion of the longitudinal core relative to the equatorial plane, possibly due to resistances encountered in the outer core.**

AD b)

A particular difference in the shape of the amplitude envelopes between the measurement and the model is evident on the lines of gravity extremes between points E-F-G and H-I-J in Figure 17. These extremes are attributed to the half of the core farther from Rustrel, approaching a distance "D" in Figure 20. The segment of the envelope between points E-F-G corresponds to the first half of the core approaching a distance "D" during negative lunar declination, while the segment between H-I-J corresponds to the second half approaching a distance "D" during positive declination.

The increasing declination modulus means that as gravity changes from point E to F (and from H to I in Figure 17), the approach of Rustrel (the length of section "D" in Figure 20) to the more distant half of the core becomes increasingly limited. However, the measurements presented in Figure 17 show a slower than the model rate of increase in the distance "D", and then a faster than the model rate of decrease in the distance "D" during the movement from point F to G (and also from I to J). The time between E and F is not equal to the time for gravity to change from F to G.

At the same time, it can be observed that the differences compared to the model are much smaller for the envelope generated by the half-core that is closer to Rustrel (at a distance "C" in Figure 20), indicating that each of the closer halves to Rustrel changes its distance very similarly to the calculated model.

If the Earth's inner core is a rigid body, then changes in the distance of its closer and farther halves at the same time should have the same character; however, measurements show an unidentical character of changes.

An explanation for this discrepancy with the assumed model could be the assumption that **a portion of the inner core is not a rigid body but rather takes the form of a dense mass (or debris) surrounding the core's center, reacting with a delay to changes in the inclination of the rigid core relative to the equatorial plane**, and then being rapidly pulled towards the center of the Earth by gravity.

Considering the movement of a hypothetical dense mass surrounding the inner core, circulating in planes parallel to the equator, it can be assumed that such a mass circulates at a constant speed given to it by the arm systematically rotating behind the Moon, which can explain the very good agreement between the hours of occurrence of acceleration extremes in the measurements and in the model. However, in the plane perpendicular to the plane of the equator, the arm of the elongated core moves alternately to the north and south (like the declination of the Moon), and the mass surrounding the inner core may respond to these movements with a delay, which can explain the deformed shapes of the envelope of gravity amplitudes measured with a gravimeter.

Hypothesis 6: THE EARTH'S INNER CORE IS SURROUNDED BY A FLUID MASS OF SIMILAR DENSITY.

II

Gravimeter measurements together with the currently recognized density distribution of the Earth's core [60] allow for the estimation of the dimensions of the elongated inner core. Assuming different core lengths in the model, we come to the conclusion that spherical core halves, even directly in contact with each other, would cause changes in the gravitational force much greater than those indicated by the gravimeter [23]. Hence the conclusion that not all the mass of the inner core is located in its arms.

We obtain force diagrams similar to gravimetric ones if we assume that approximately 20% of its mass is contained in the elongated arms of the inner core [24] and this mass is adjacent to the core; the graphs presented in Figures 12, 14, 16 were prepared with a similar assumption.

Based on the currently accepted core matter density distribution [60], the size of such an inner core can be estimated.

Conclusion 11: **the inner core may have a shape similar to the shape of a rugby ball with diameters of approximately 2300 km and 4400 km** [25].

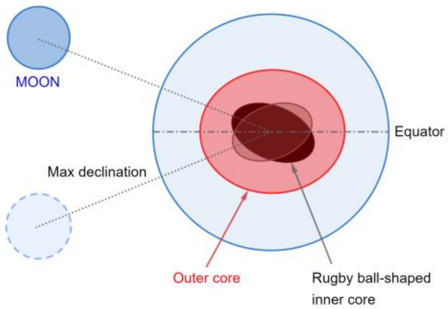

Figure 21. The inner core shaped like a rugby ball

Such deformation of the core from a spherical shape is sufficient to cause gravity changes nearly two times greater than changes in Earth's acceleration due to forces related to the Moon and the Sun [26].

III

We infer the elongated shape of the inner core based on changes in gravity visible on the Earth's surface. The shape similar to a rugby ball is most similar to the sphere suggested by previous seismic studies. However, it is possible to imagine other shapes that could induce the same changes in gravity on the surface of the globe.

In particular, the distance between the centers of mass of the inner core's arms could be significantly larger if there is less mass in both arms. In this case, the low-mass arms would reach smaller distances from the Earth's surface, causing the same gravity changes on it as a centrally located slightly elongated core.

Therefore, the following shape of the inner core cannot be ruled out: **two rod-shaped arms reach deep into the**

outer core, perhaps up to the Earth's mantle, while the rest of the core's mass is located in its center.

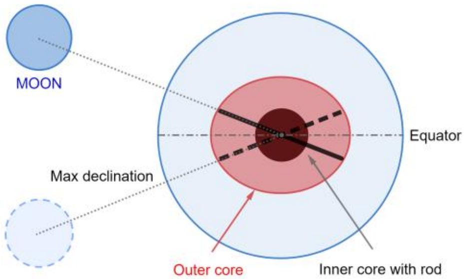

Figure 22. The concept of the inner core on the rod

Such a rod induces gravitational changes similar to those measured by the gravimeter if it contains about 10% of the mass of the inner core [27]. **A rod with such mass of arms running through the entire outer core would have a length of 6660 km and a diameter of about 500 km** [28].

Conclusion 12: **the Earth's inner core may be a sphere sitting on a rod that passes through even the entire outer core.**

IV

The Earth's crust rotates around its axis along with the underlying mantle, so the mantle, through friction, sets the liquid matter of the outer core in motion. According to Hypothesis 2, within the rotating liquid matter there is a solid inner core, almost immobile, as its longer axis is constantly oriented towards the Moon.

There are visible asymmetries in the concepts of the shape of the inner core presented in Figures 21 and 22: the inner core is longer in the plane of the equator than in the north-south axis.

In Figures 21 and 22 it can be seen that the outer core is also asymmetric**: the outer core has a larger diameter in the equator plane than in the north-south axis**. In the following sections we will examine whether this assumption is supported by various phenomena.

5 IS IT POSSIBLE

The assumption of a non-spherical shape of the inner core raises questions:

- how could such a core have formed,

- how could such a shape be maintained inside the Earth?

According to modern theory, the inner core crystallized 3.2 billion years after the formation of the Earth [29].

The gradual crystallization of the core in the center of the globe would indicate the formation of a sphere due to the even distribution of gravitational forces directed towards the center of the Earth. Although the centrifugal force resulting from the Earth's rotation could cause the core to elongate, it would be expected to extend it in all directions of this force, which would lead to the formation of a barrel-shaped shape, i.e. not having two arms, as indicated by the assumptions contained in the previous chapter.

Perhaps other concepts for the formation of the inner core should be considered, such as:

1. **elongation of the core during the cosmic collision that formed the Moon,**

2. **the launch of an oblong iron block in the explosion of a supernova star.**

AD 1.

It is currently believed that the Moon formed about 50 million years after the Earth took shape, as a result of a collision between Earth and a Mars-sized planet, which caused a piece of the mixed mass of both planets to break off [30].

We can therefore assume that as a result of such an impact, the iron accumulated in the center of the Earth could have been deformed, temporarily ejected from the interior of the globe, solidified in the cold space around the Earth, and then pulled down by gravity and immersed in the still liquid Earth, thus creating an elongated inner core.

AD 2.

The iron from which the core is made is formed inside stars and is thrown into space as a result of supernova explosions. You can imagine the fragments of these explosions in various shapes.

Iron fragments of supernova explosions with irregular shapes can be good seeds for the formation of planets and moons. A large piece of iron can gravitationally attract iron particles orbiting the Sun along with cosmic dust, building the future outer core. In this way, **a large lump of iron ejected in a supernova explosion can become the inner core of a planet.**

Volcanoes sometimes eject the so-called “pele hair” – very thin strings several feet long [31]. Similar strings, but on a cosmic scale, could be the result of supernova explosions. Such iron strings, after attracting other planet-forming material, could become rod-shaped internal cores.

Such courses of events (as in points 1 or 2) would mean that the Earth's inner core was formed earlier and in a different way than is currently believed.

A bigger mystery is the justification for the non-melting of the arms of the inner core in the molten iron of the outer core. Various reasons can be assumed, for example:

- the outer core is not molten iron,

- under conditions of very high pressure, the material of the core behaves in a way unknown to us,

- the outer core is not as hot throughout its volume as currently estimated,

- we do not know yet.

6 WHY IT IS HOT IN HELL

I

According to modern knowledge, the Earth's interior is very hot, reaching a maximum temperature of 5500°C at the border of the outer and inner core.

The fact that the Earth's internal heat has been sustained for 4.5 billion years is attributed to the persistence of primordial heat (generated by the friction of particles forming the Earth from cosmic dust), trapped beneath the Earth's mantle and heated by the radiation of isotopes of long half-life radioactive elements. The content of radioactive elements in the Earth's mantle is deduced based on models, the composition of meteorites or measurements of neutrinos emitted in the Earth. The measurements are still subject to high uncertainty [33].

Assuming the hypothesis of a longitudinal inner core, another source of heat inside the Earth can be anticipated — the heat generated by the friction of the inner core's arms during the Earth's rotation around its own axis. The arms of the inner core rub against the rotating matter of the outer core, and perhaps also against the Earth's mantle.

Based on the dimensions of the inner core (calculated using the density distribution [60]), it follows that if the arms of the inner core extend all the way to the Earth's mantle, their ends likely rub against the mantle at a speed of approximately 900 km/h, generating heat on the inner side of the mantle, within the range of the arms' movement (in some years, corresponding to ±29° of the Moon's declination, with such an inclination of the core, the friction speed decreases by 13%). With this assumption, one can speculate that the highest temperature prevails at the boundary between the outer core and the mantle, with lower temperatures in both the outer and inner cores.

If the core is shaped like a rugby ball, then the speed of its end relative to the mantle is probably around 570 km/h, and the greatest amount of heat is generated at the ends.

An elongated inner core, whether it's shaped like a rugby ball, in the form of a rod, or otherwise, induces similar phenomena inside the Earth because it interacts with the matter of the outer core and mantle either directly or through the vortex prevailing in the outer core.

Hypothesis 7: THE SOURCE OF HEAT INSIDE THE EARTH IS TIDAL HEATING INSIDE THE PLANET.

Conclusion 13: **the persistence of the outer core in a liquid or semi-liquid state is possible due to the heat generated by the friction produced by the inner core.**

Conclusion 14**: the thermal energy inside the Earth is generated at the expense of the kinetic energy of rotational motion.**

II

It can be assumed that **at a certain distance from the heat-generating area, the mantle material begins to solidify**. The Earth's mantle in areas not subjected to continuous heat supply, such as to the north and south of the positions reached by the longitudinal core arms, likely solidifies at a shorter distance from the center of the Earth. This means that the mantle extends deeper into the Earth along the north-south axis than in the vicinity of the equatorial plane.

Adopting hypothesis 2, that the arms of the longitudinal inner core have inclinations to the equatorial plane no greater than the declinations of the Moon, leads to the conjecture that the space in which the longitudinal inner core emits heat through friction is flattened, justifying the assumption advanced in section 4.IV about the flattened shape of the outer core.

Hypothesis 8: THE OUTER CORE OF THE EARTH IS FLATTENED TO SOME EXTENT ON THE NORTHERN AND SOUTHERN SIDES.

The Earth's diameter measured between the poles is 43 km shorter than the diameter measured at the equator [35]. This polar flattening is currently explained by the centrifugal force caused by the Earth's rotation around its own axis (as this force is greatest at the equator).

However, it can be assumed that the previously inferred flattening of the outer core may result in a similar (though probably weaker) flattening of the Earth's mantle and crust covering it.

Hypothesis 9: THE SLIGHT FLATTENING OF THE EARTH AT THE POLES IS THE RESULT OF THE FLATTENING OF THE EARTH'S OUTER CORE.

III

We can try to check whether any changes in the heat released in the core were visible on Earth in the past.

In Figures 21 and 22, there is an apparent, slightly flattened shape of the outer core. Due to the restriction of the movement of the inner core's arms to angles corresponding to the declinations of the Moon, the Earth's mantle, as a result of solidification, may extend to the points where the arms end their movement in the northward and southward directions. The flattened northern and southern inner side of the mantle forms a kind of "floor" and "ceiling”.

If we assume that the core arms do not reach the Earth's mantle, then their proximity to the "floor" and "ceiling" causes an increase in the pressure of the rotating matter of the outer core - the pressure occurring between the core arms and the northern and southern inner surfaces of the mantle.

The approaching of the inner core's arms to the "floor" and "ceiling" occurs during extreme lunar declinations and should result in direct impacts on the Earth's mantle or impacts on it by the matter of the outer core under increased pressure. **During moments of extreme lunar declinations,**

stronger friction and increased heat generation can therefore be expected.

A.

During a month, the Moon's declination (and the inclination of the inner core) reaches extremes twice. However, we are separated from the places of increased heat release during extreme declinations by at least 2800 km of the Earth's mantle and crust, so it is difficult to expect that we will notice these changes in the amount of heat on the surface of the globe.

B.

The extreme declination of the Moon is not a constant quantity. Observing the extreme values over the last few hundred years, we see that **the extreme declination of the Moon gradually reaches its highest value of ±28.8°, and then in the following years it reaches lower and lower values, up to ±18.5°, after which the cycle repeats every 18.6 years.**

The last time the highest declination values were reached was in 2006 (from February to November), the next ones will be in 2025, while the last time the Moon reached the lowest declination extremes was in 2015 (in January), and the next such year will be 2034 [37].

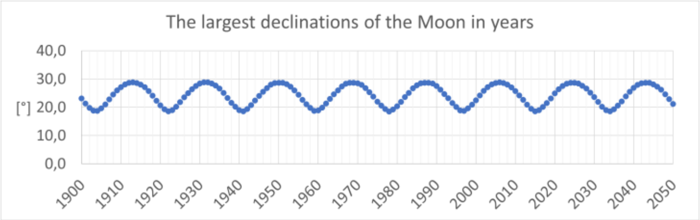

Figure 23. The highest declination values of the Moon over 150 years

The changes in the Moon's maximum declinations over an 18.6-year period are caused by the precession of the plane of the Moon's orbit (similar to the wobbling plane of a spinning top). The angle of inclination of the Moon's orbital plane to the ecliptic (the plane in which the Earth orbits the Sun) is on average 5.14° (ranging from 5.0° to 5.3° [40]). This angle is added to or subtracted from the tilt of the Earth's axis in its entirety only when the precessing Moon's orbit is tilted towards or away from the Earth, occurring in cycles lasting 18.6 years.

In periods when the Moon's declination, and therefore the inclination of the arms of the inner core, can reach relatively small values, the distance of the core arms from the northern and southern inner walls of the Earth's mantle cannot become as small as during the greatest declinations. During this time, less pressure is exerted on the inner northern and southern walls of the mantle by the vortex or the shoulders themselves, as a result of which the mantle can solidify deeper on both sides for several years, until the Moon reaches its greatest declination again.

Conclusion 15: **every 18.6 years, the Moon's declination increases to its maximum value, causing the inner core's arms to encounter the collapsing northern and southern walls of the Earth's mantle that have been**

solidifying for several years. This may result in increased friction and heat generation every 18.6 years.

These predicted almost nineteen-year changes in temperature are difficult to detect on the Earth's surface because, according to current estimates, heat from the Earth's interior constitutes only 0.03% of the total energy budget on the surface, where heat from solar radiation dominates [36]. Moreover, it is expected that the increased amount of heat released in the core will reach the Earth's surface after a long time needed for the hot spot to travel through the mantle and the Earth's crust with a total thickness of approximately 2850 km, so thermal phenomena on the surface will occur with a long delay in relation to phenomena at the border of the Earth's core and mantle.

Nevertheless, **studies have found a noticeable variability of air temperature over a cycle of 18.6 years** [50].

C.

In the distant past, there were even greater changes in the extreme declinations reached by the Moon.

The inclination of the Earth's rotation axis to the ecliptic is relatively stable (currently it is 23.4° and decreasing at a rate of 0.14° per 1000 years), but over long periods of time it changes from 21.5° to 24.5° [38]. Milanković showed that changes in the inclination of the Earth's rotation axis over a period of 41,000 years (and several other factors with different repetition periods) are closely related to periods of glaciation and climate warming. The combination of these factors means that for about 10,000 years we have been living in another peak of high temperatures, which previously occurred 120,000 years ago and lasted for about 10,000 years.

Of course, changing the tilt of the Earth's rotation axis does not affect the amount of solar energy reaching the globe. Milanković explained the impact of the increase in inclination on the increase in average global temperatures by the exposure of circumpolar ice to the sun during the summer, the melting of a large part of it and the reduction of the white surface of the globe reflecting solar energy, which was supposed to cause the occurrence of several secondary phenomena that intensified melting; as a result, the Earth would absorb more solar energy.

However, it may be questioned whether the lower reflection of rays around the poles can actually be a significant factor in climate change around the globe. On the other hand, changes in the tilt of the Earth's rotation axis during Milanković cycles do correlate with climate changes [48]. Perhaps we should look for another phenomenon caused by changes in the tilt of the Earth's rotation axis over long periods of time (41,000 years).

The phenomenon sought may be changes in the amount of heat released by the friction of the longitudinal inner core. A different inclination of the Earth's rotation axis to the ecliptic means the Moon's declination occurs in other ranges. If the inclination of the Moon's orbit to the ecliptic was 5.0°…5.3° as today (and it was probably greater in the past [39]), then the **inclinations of the Earth's rotation axis in the range of 21.5° to 24.5 ° caused the Moon to reach its greatest declinations in wider ranges, ranging from 16.2° at the time of the lowest inclination, up to 29.8° within 20,500 years** (half of the period).

Similar to conclusion 15 that increased heat is gained every 18.6 years as a result of the Moon reaching its greatest declination, we can conclude that even more heat is gained every 41,000 years due to the Moon's unusually high declination and, therefore, increased friction the elongated inner core against the northern and southern walls of the Earth's mantle, which has not been abraded by the inner core in this area for almost 41,000 years and has probably thickened.

Hypothesis 10: THE RISE IN EARTH'S TEMPERATURE DURING PERIODS OF INCREASED TILT OF ITS AXIS TO THE ECLIPTIC IS CAUSED BY INCREASED FRICTION OF THE ELONGATED INNER CORE AGAINST THE NORTHERN AND SOUTHERN INNER WALLS OF THE EARTH'S MANTLE DURING GREATER EXTREME LUNAR DECLINATIONS, WHICH RESULT IN GREATER MAXIMUM TILTS OF THE ELONGATED INNER CORE RELATIVE TO THE EQUATORIAL PLANE.

The phenomenon of the Earth's temperature rising during large inclinations of its rotation axis to the ecliptic is consistent with hypothesis 7 about the elongated inner core as a source of heat inside the Earth.

D.

Around 630 million years ago, a period of two major global glaciations ended, occurring 5 million years apart [51]. During this time, nearly the entire Earth was covered in ice for a total of 74 million years, with temperatures reaching -50°C. These glaciations were far more powerful and lasted much longer than those known from the time of the mammoths.

Scientists are searching for the causes of global glaciations, primarily suspecting a reduced amount of carbon dioxide in the atmosphere. The mechanism by which Earth emerged from the "Snowball Earth" state seems even more puzzling, as the ice covering the entire globe reflected so much solar heat that Earth should have remained frozen.

The hypothesis of an elongated inner core allows us to create an assumption explaining the mechanism of increasing the temperature of the frozen Earth.

The intense freezing of the globe for several tens of millions of years probably caused the cooled Earth's mantle to solidify deeper and deeper at a faster pace, reducing the area of the liquid outer core. Therefore, the longitudinal inner core, in its rotation behind the Moon, encountered the advancing thickening Earth's mantle, which must have resulted in increased friction and greater heat release than before the Earth froze.

As a result of the prolonged freezing of the Earth, more heat began to move to the surface of the globe from the Earth's interior, warming the planet and providing more fuel to volcanoes emitting greenhouse gases into the atmosphere.

Hypothesis 11: THE END OF THE ERA OF GLOBAL GLACIATION WAS CAUSED BY THE FRICTION OF THE LONGITUDINAL INNER CORE AGAINST THE DEEPENED SOLIDIFIED EARTH'S MANTLE, RESULTING IN INCREASED EARTH'S TEMPERATURE AND ENHANCED ERUPTIONS OF VOLCANOES EMITTING CARBON DIOXIDE.

7 WHY EARTH IS SLOWING DOWN

Over long periods of time, the Earth's rotation slows down slightly, and the rate of slowing is not constant. Over the last 2500 years, the day has increased by an average of 1.7 milliseconds per century [44].

In hypothesis 7, we assumed that the elongated inner core, held towards the Moon, while the Earth rotates, rubs against (directly or indirectly) the rotating mantle of the Earth. Let's ask ourselves: <u>is this rubbing strong enough to cause noticeable slowing of the Earth's rotation?</u>

A.

Day lengths are precisely measured by IERS (International Earth Rotation and Reference Systems Service). Let's look at the last (on the day of writing) three-month graph of the increase in the length of days (so-called LOD) [52] and compare it with the graph of the Moon's declination module [4], which, according to hypothesis 2, affects the position of the inner core.

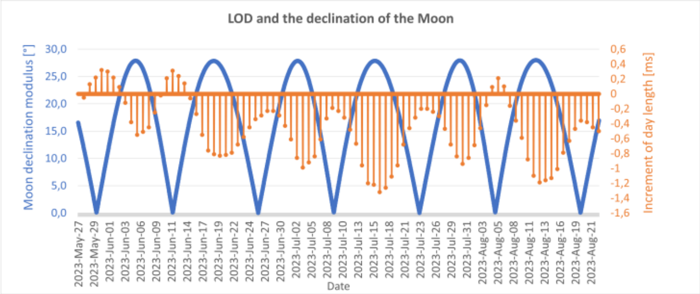

Figure 24. Moon declination module and changes in the length of the day over 3 months

The graph shows that the length of the day alternates between increases and decreases: when the Moon's declination is close to zero, the Earth's rotation slows down, and with increasing declination, the rotation speeds up in proportion to the declination.

If the change in the length of the day was caused by braking caused by something, there would be no periods of acceleration of turnover. The occurrence of accelerations of rotation during the increasing declination modulus of the Moon indicates that the Earth's moment of inertia decreases, as a result of which the angular velocity increases, in accordance with the principle of conservation of angular momentum.

Conclusion 16: **the decreasing moment of inertia of the Earth with increasing declinations of the Moon (and inclinations of the longitudinal inner core) is probably caused by the movement of the arms of the inner core and the part of the tidal water mass that follows them away from the equator, which decreases its distance from the Earth's rotation axis.**

B.

In the Precambrian era, the day probably lasted 21 hours [54]. “Suddenly”, about 600 million years ago, the day began to systematically lengthen [55]. The reasons for this phenomenon can be found in the elongated inner core of the Earth.

The moment when the Earth's rotation began to slow down occurred "just after" a series of global glaciations, lasting a total of about 74 million years, during which the temperature on Earth dropped to -50°C. As we noted in Chapter 6.III.D, such long-term cooling of the globe probably caused the Earth's mantle to solidify more deeply, and then the inner surface of the mantle began to contact the ends of the elongated inner core or came so close to them that the outer core vortex began to significantly interact with the mantle earthly. The Earth's mantle, rotating with the Earth, began to rub (directly or indirectly) against the inner core held towards the Moon, causing a thermal and braking effect.

Hypothesis 12: THE EXTENSION OF THE DAY OBSERVED FOR APPROXIMATELY 600 MILLION YEARS WAS CAUSED BY THE COOLING OF THE EARTH'S MANTLE, WHICH REACHED NEAR THE ENDS OF THE LONGITUDINAL INNER CORE DURING THE GLOBAL GLACIATIONS THAT OCCURRED DIRECTLY PREVIOUSLY.

8 WHY WE SEE ONE SIDE OF THE MOON

I

The fact that the same half of the Moon is still visible from Earth is explained by the early period after the formation of our natural satellite when its material was still elastic, allowing it to stretch under the influence of Earth's gravity. At that time, the slightly elongated Moon assumed a fixed orientation towards Earth. Later on, its shape was rounded without changing its orientation over the course of 4.5 billion years.

The current theory may raise doubts, if only because the Earth did not fix its position with one side towards the Sun in a similar way.

One could propose an explanation for this phenomenon, known as the synchronous rotation of the Moon, with the hypothesis of a longitudinal inner core anchored in the Moon. Presumably, to some extent, the elongated, solid core of the Moon, under the influence of centrifugal force, aligned itself with Earth, and since the Moon probably lacks a fluid outer core, the entire Moon is kept in the same direction as its elongated core.

Since all large spherical moons in the solar system rotate synchronously, it can be assumed that each moon has an elongated core oriented towards the planet.

Hypothesis 13: THE SYNCHRONOUS ROTATION OF MOONS IS CAUSED BY AN ANCHORED ELONGATED INNER CORE WITHIN THEM.

II

If there is an elongated metallic core inside the Earth and its moons, then it can be assumed that such a core exists inside many celestial bodies. We can therefore imagine the following process of creating planetary systems, in which the Moon is formed differently than currently believed.

Supernova explosions eject iron in the form of irregular clumps, which are then captured by the gravitational pull of stars; some clumps fall onto the star, while others begin to orbit around it, becoming the embryos of future inner cores. Orbiting heavy iron clumps attract other clumps, which either merge with them or form a binary system orbiting not only around the star but also around a common barycenter. In binary systems, under the influence of centrifugal forces, the clumps align their longer axes towards each other (each irregular clump is elongated more in some directions than others), forming the embryos of the core of a future planet and its moon or a binary planet system.

Heavy iron masses attract metals orbiting around the star, space dust and rocky debris, which gradually sticks to and surrounds them. Hitting the block at its own speed, this material generates enough heat to melt the top layer of the iron block, this layer absorbs the momentum of the impacts and begins to circulate around the block - the future outer core is created. In an effect resembling a rolling snowball, more and more mass attracts more and more material, creating an increasingly larger object, which the force of gravity shapes into a ball: inside there is a heavy iron core, and on top of it is a lighter rock mantle, which solidifies into a crust on top.

Smaller objects, such as Earth's Moon, lose heat quickly, so the core freezes in the surrounding material and the entire object rotates at the same speed, so there is no friction and no heat is produced inside.

In large objects, the hot outer core persists longer due to a greater ratio of mass to surface area through which heat escapes into space.

As seen in the case of Earth, planets in the best position for heat retention are those with sufficiently large moons capable of keep an elongated inner core independent of the planet's rotations. This leads to friction between the inner core and the rotating outer layers, resulting in prolonged heat generation within the planet. Tidal heating phenomena may also occur within certain moons; for example, it is considered a source of heat on Jupiter's moon Io.

However, in planets that do not have large enough moons, the inner core rotates with the rest of the planet, as a result of which there is no internal friction, the outer core solidifies, and the magnetic field from the rotating outer core, which could protect possible life from the solar wind, disappears.

The planets without moons are Mercury, Venus, Mars (Mars only has two small captured asteroids).

Hypothesis 14: IRON NUGGETS ARE THE SEEDS OF CELESTIAL BODIES.

III

It is a common belief that the Moon is responsible for the stability of Earth's axial tilt relative to the ecliptic, and consequently, for the stability of the seasons. However, this belief cannot hold true within the current model of Earth, in which the planet consists of layers forming spheres with a common center and a symmetrical distribution of mass.

The motion of the Earth and Moon orbiting the barycenter traces out a disk in space that maintains a stable inclination to the ecliptic due to the gyroscopic effect. This phenomenon stabilizes the Moon's orbit, but it would not be able to maintain a constant angle of the Earth's axis of rotation to the ecliptic, because **any change in the angle of the axis of rotation of a completely spherical Earth would not change the angular momentum of the Earth-Moon system.**

The fact of the stability of the Earth's axis tilt can be explained by the model of the Earth presented in this publication, which assumes a longitudinal inner core and a flattened outer core.

An attempt to increase the tilt of the Earth's axis, when the inner core is oriented toward the Moon, would cause the longitudinal core to encounter the northern and southern walls of the flattened outer core (either directly or through the increased pressure of vortices in the outer core). Therefore, if the Earth wanted to increase the tilt of its axis of rotation, it would lean on its elongated inner core, which would counteract the increase in axial tilt.

This mechanism, operating over billions of years, leads to a limiting of the tilt of the Earth's axis of rotation.

Conclusion 17: **the elongated inner core oriented towards the Moon and the flattened outer core are responsible for stabilizing the tilt angle of Earth's rotation axis.**

9 PREDICTION OF EARTHQUAKES

Since we assume that the Earth's inner oblong core rotates relative to the Earth's mantle, rubbing against it directly or through vortices in the outer core, the question arises whether the influence of the core on the mantle is visible in the form of earthquakes.

The connection between core movements and earthquakes is not necessarily visible, because the boundary of the Earth's mantle is at a depth of about 2900 km, and earthquakes are only recorded to a depth of about 800 km. Most earthquakes have epicenters up to a depth of 300 km, with deeper earthquakes being considered deep-focus.

Let's analyze deep-focus earthquakes, as they are closer to the core-mantle boundary. If there is a connection between these earthquakes and the position of the inner core, earthquakes will occur more frequently at certain core positions.

Over the past 56 years, there have been 71 strong (above magnitude 7) deep-focus earthquakes [59].

As many as 49 earthquakes, or 69%, occurred in years when the Moon was capable of reaching declinations greater than average (above the line marking 23.6° on Figure 23) [61]. A rate higher than 50% suggests that **the period during which the Moon can achieve high declinations is a time conducive to deep-focus earthquakes. This can be explained by the increased pressure of the elongated inner core on the northern and southern inner walls of the flattened mantle, caused by the inner core being oriented at a greater angle relative to the plane of the equator.**

We have noticed that in years when the Moon is able to reach higher declinations, more deep earthquakes occur. <u>But do quakes mainly occur at moments of large declinations?</u>

The statistical distribution of deep-focus earthquakes from the past 56 years can be represented in a graph.

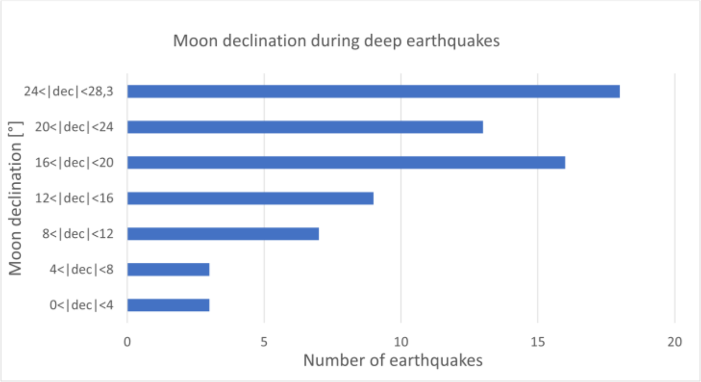

Figure 25. Lunar declinations during deep-focus earthquakes

A small number of earthquakes are visible when the Moon was within declination ranges close to the plane of the equator (within +/- 8°).

It should be noted that one cannot expect an even distribution across the entire range of possible lunar declinations because larger declinations (in absolute value) than 18.5° occur less frequently (Figure 23). The statistical distribution of deep earthquakes, adjusted proportionally to the time the Moon spends in each declination range, indicates a strong correlation between earthquakes and the Moon's declination.

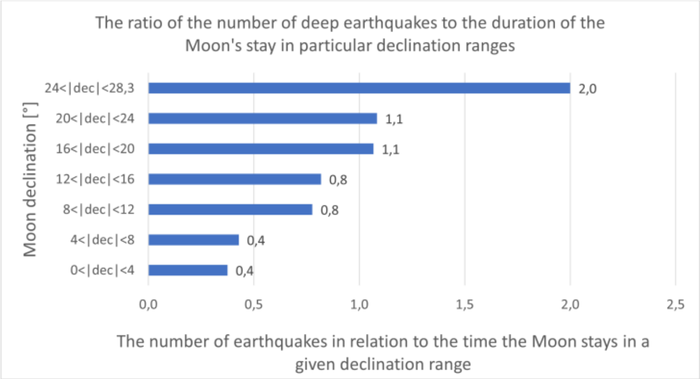

Figure 26. The number of deep earthquakes taking into account the duration of the Moon's stay in particular declination ranges

Compared to a uniform distribution (where the number of events in each corrected declination range would be the same), we observe **more than twice as few deep earthquakes when the Moon is near the plane of the equator (within +/-8°) and twice as many deep earthquakes during the Moon's highest declinations (over +/-24°).**

Conclusion 18: **the statistical distribution of deep earthquakes seems to confirm Conclusion 15, that the longitudinal inner core of the Earth rubs (directly or indirectly) against the northern and southern inner walls of the flattened mantle during the Moon's highest declinations.**

Hypothesis 15: AT LEAST SOME DEEP EARTHQUAKES ARE CAUSED BY THE FRICTION (DIRECTLY OR INDIRECTLY) OF THE LONGITUDINAL INNER CORE AGAINST THE EARTH'S MANTLE. DEEP EARTHQUAKES OCCUR MORE FREQUENTLY DURING LARGE LUNAR DECLINATIONS.

If even some deep earthquakes are caused by the friction of the inner core against the Earth's mantle, one might suppose that an earthquake in a given location on the globe occurs more frequently when the end of the longitudinal inner core is beneath it. However, the statistics of deep earthquakes contradict such an assumption: the average difference between the longitude where the earthquake occurred and the longitude where the Moon was at its zenith was 48°, with a standard deviation of as much as 26°, indicating randomness in the timing delay.

Conclusion 19: **deep earthquakes do not occur when the Earth's inner core hits the Earth's mantle, but friction at the boundary of these two centers probably causes structural disruption and the collapse of fragments of the mantle after a rather random delay time.**

10 WHAT NEXT

The hypothesis of the Earth's elongated inner core oriented towards the Moon finds much confirmation, as presented in the contents of this booklet.

We can continue to investigate this hypothesis in two directions:

1. by conducting measurements that allow for the most precise determination of the position and dimensions of Earth's core, as well as the movement of the surrounding mass,

2. by searching for phenomena that show dependence on local gravitational variations caused by the movement of the inner core relative to Earth's surface.

Phenomena depending on small changes in gravity can be expected in both inanimate and animate nature, for example:

- in the movement of tectonic plates,
- in the directions of ocean currents,
- in the directions of the main winds,
- in biological clocks for such mysterious phenomena as synchronous bamboo flowering, synchronous coral spawning.

On the website Unknown-Earth.science I will try to update information related to the topic covered in this publication.

THE END

Mirosław Trynkiewicz

Zawiercie, Poland, May 2024.

Footnotes

[1] https://www.tide-forecast.com/: Scotia Bay, Laurie Island, South Orkneys, Royal Bay (Moltke Harbor), Macquarie Island, Leith Harbor, Stanley, Port aux Francais, Kerguelen Islands, Waitangi, Raoul Island, Norfolk Island, Hanga Piko, Easter Island, Cato Island, Rikitea, Gambier Islands, Noumea, Mururoa Atoll, Avarua, Rarotonga, Cook Islands, Nuku`alofa, Pointe des Galets, Reunion, Suva, Port Vila, Levuka, Ovalau Island, Forari, Lautoka, Mellish Reef, Pago Pago, American Samoa, Suvarov Island, Port Refuge, Cocos Islands, Christmas Island, Taio Hae Bay, Nuku Hiva Island, Auki, Fongafale, Funafuti, Tuvalu, Ascension Island, Fernando de Noronha (Distrito Estadual),

Hithadhoo, Abemama Atoll, Gilbert Islands, Tarawa, Christmas Island, Gilbert Islands (2), Tabuaeran (Fanning) Island, Line Islands (2), Maale, Palmyra Island, Port Rhin, Mili Atoll, Metalanim Harbor, Ponape Island, Majuro Atoll, Arno Atoll, Ailinglapalap Atoll, Koror, Pulap Atoll, Ngulu Islands, Nomwin Atoll, Murilo Atoll, Maloelap Atoll, Kwajalein Atoll (Namur Island), Wotje, Tomil Harbor, Yap Island, Ujelang Atoll, Likiep, Ulithi Islands, Rongelap, Rongerik Atoll, Eniirikku Island, Bikini Atoll, Chalan Pago, Apra Harbor, Tanapag, Tarrafal, Johnston Atoll, Porto Grande, Cape Verde Islands, Wake Island, Hilo, Kawaihae, Big Island, Kahului, Kaunakakai, Molokai (Hawaii), Honolulu, Oahu (Hawaii), Pearl Harbor Entrance, Bishop Point, Oahu Island, Hanapepe Heights, Nawiliwili, Marcus Island (Minami Tori Shima), Sand Island, Midway Islands, Saint Georges, Sable Island, north side, Jackos Point.

[2] https://unknown-Earth.science/2

[3] https://unknown-Earth.science/3

[4] https://unknown-Earth.science/4, https://ssd.jpl.nasa.gov/horizons/app.html#/, https://www.mooncalc.org/

[5] https://unknown-Earth.science/5

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[7] https://unknown-Earth.science/7

[8] https://unknown-Earth.science/8

[9] https://en.wikipedia.org/wiki/Kordylewski_cloud

[10] https://en.wikipedia.org/wiki/Internal_structure_of_Earth

[11] https://unknown-Earth.science/11

[12] https://unknown-Earth.science/12

[13] https://unknown-Earth.science/13

[14] https://unknown-Earth.science/14

[15] https://en.wikipedia.org/wiki/Barycenter_(astronomy)

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[19] https://unknown-Earth.science/19

[20] https://unknown-Earth.science/20

[21] https://unknown-Earth.science/21

[22] https://ites.unistra.fr/

[23] https://unknown-Earth.science/23, http://igets.u-strasbg.fr/

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[29] https://journals.aps.org/prl/abstract/10.1103/PhysRevLett.125.078501

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[51] https://en.wikipedia.org/wiki/Snowball_Earth

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[54] https://www.sciencedirect.com/science/article/abs/pii/0301926887900738?via%3Dihub

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[60] https://assets.press.princeton.edu/chapters/s7559.pdf

[61] https://unknown-Earth.science/61

[62] https://unknown-Earth.science/62