

Earth, — What are you Really Like?

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ABSTRACT

The presented article offers solutions to several issues that have long been of concern to modern Earth Science.

It addresses the physics of Earth's magnetic field, mountain formation, ocean currents, tides, earthquakes, geotectonics, and other natural phenomena caused by the influence of external gravitational forces on the planet's internal mass.

A different perspective on the structure of the planet and the dynamic processes taking place makes it possible to explain many natural phenomena in a simple and, most importantly, well reasoned way.

The physics of the phenomena becomes understandable even to unprepared readers.

This approach, when extended to other planets, may help explain other phenomena in the Solar System.

One hopes that the common sense of scientists will accept the new explanation as a tool for further research into nature and will help avoid mistakes when using it.

Any constructive, relevant criticism is welcome.

Keywords: Gravity, Ocean Currents, Countercurrents, Trade Winds, Tides, Magnetic Field, Geotectonics, Movement of the Planet's Internal Mass, Oil, Planetary Structure.

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Introduction

It all started with the question: "How is a planet's magnetic field (MF) generated?" Studying books did not provide a clear answer. The formulas and the concept of the "geodynamo" did not explain how and where the charges appear, or what makes them move to form an electric current that creates the MF. The permanent magnet option was not considered due to temperature conditions.

And a permanent magnet does not occur naturally on its own — it's a ferromagnetic that has "remembered" the effect of an MF from an electric current.

Only the MF of an electric current is the original source.

Let's not delve into history or recall how much effort has been spent explaining the physics of the MF, or how many hypotheses have existed and still exist [1-3].

I just want to cite one quote — by the Soviet astrophysicist Iosif Samuilovich Shklovsky: "If we knew the physics of planetary magnetic fields, we would learn a great deal about Nature in general."

And that's exactly what happened. Once we understood what and how generates the MF of planets, the physics of this phenomenon, the forces that create the charges and set them in motion, a different model of planetary structure emerged — and a long chain of

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explanations for the phenomena observed on their surfaces followed:

- The main equatorial currents, which determine all the others, and their seasonal migrations;
- Equatorial high altitude winds that are not subject to temperature changes;
- Equatorial countercurrents — the mystery of their formation right in the middle of and against the main current;
- Ocean tides and their strange behaviour;
- Heating of the mass inside the planet;
- Geotectonics and mountain formation;
- Mobilism of continental plates;
- Earthquakes, the abrupt change in astronomical time, and the generation of electromagnetic disturbances at that time;
- Volcanoes, the causes of their occurrence, as well as the strange behaviour of clouds above them;
- The movement of sunspots, as well as the differential motion of its various parts (and, in fact, not only in the case of the Sun);
- The one sided motion of the Moon and many other satellites in the Solar System;
- Even the genesis of oil.

Most likely, this is not a complete list.

These phenomena are not only explained by the proposed physics and the planetary model — they also serve as proof of it: visible, observable, and sometimes even measurable.

This article is devoted to describing these phenomena and the physics occurring on the planet.

I'd like to say right away to those who like to fit everything into formulas: there are none here, and there cannot be any.

Let me explain. Natural phenomena are not a laboratory experiment. Not all parameters are known. All the factors influence each other, and in different ways — even over time. No matter how many mathematical models I've seen in publications, none of them deliver a real result: they all need some kind of correction factor — in other words, they have to be adjusted to match reality, to fit the answer at the back of the textbook. But what's the point? What exactly is being calculated with it? Does the formula for Earth's magnetic field really answer the question of what caused, for example, the Kursk magnetic anomaly, or can it even describe it? [1]

Приведем основные формулы, описывающие геомагнитное поле. Подобно тому как гравитационное поле описывается с помощью гравитационного потенциала V (30), магнитное поле Земли определяется путем разложения магнитного потенциала W по сферическим функциям:

$$W = a \sum_{n=1}^{\infty} \sum_{m=1}^n \left(\frac{a}{r} \right)^{n+1} \{ g_n^m \cos m\lambda + h_n^m \sin m\lambda \} P_n^m(\cos \theta), \quad (42)$$

где a — радиус Земли, r — расстояние до центра Земли, в котором помещено начало сферических координат, θ — полярное расстояние, λ — восточная долгота, g_n^m и h_n^m — коэффициенты Гаусса. Коэффициенты g_n^m и h_n^m измеряются в тех же единицах, что и напряженность магнитного поля. В системе СГС единица напряженности называется «гаусс» и обозначается Гс. В земном и космическом

People often criticize the lack of a mathematical framework, but when you ask them, “What exactly do you want to calculate when describing, for example, the mutual influence of planets? What figures would convince you?” they struggle to answer. And if there's no mathematics, does that mean the phenomenon doesn't exist? There's the Volga River flowing right outside my window, and there's no single formula for it — does that mean the river doesn't exist?

Yes, there's fluid dynamics, and it can be applied in some cases, but that's just a special case.

In works, there's an example of describing the interaction of planets, with parameters provided that aren't properly justified, and all this while the underlying physics isn't fully understood [4,5].

Mathematics is a very useful tool for description and forecasting, but it works only within a certain, limited range of input parameters. You need to know the full set of those parameters, and you also have to take into account that going beyond the known ranges can lead to qualitative changes in the properties of matter. **It's also essential to understand the physics of the process taking place.**

Using mathematics without considering the physics leads to a significant distortion of the real picture. An excessive focus on replacing the properties of nature with models is like retreating into a virtual world that has little in common with reality. Nature didn't know mathematics when it created this world; people invented it for their own convenience, and most of the laws that work was obtained empirically.

Complex, multi parameter processes, unlike the basic laws that hold up in laboratory conditions, probably need to be described in some other way.

For example, the theory of tides by Laplace and Melchior forces you to hunt for coefficients for each location — essentially, you just memorize the times and levels and use those figures [6,7]. But it doesn't reveal the physics of the tide-ebb phenomenon at all; moreover, it's itself based on an erroneous model.

There are many formulas, but little meaning. There are many such examples in “geophysics.”

Criticism of the Current Model of the Earth's Structure, Methods for Studying it, and Some Accepted and Used Concepts

This section is likely to provoke the strongest indignation and objection among specialists who have long been working in these areas of science.

Accepted concepts in Geophysics that are not Real, not Confirmed, and do not Exist.

From article [8]

The Planet's Core

The internal structure of the Earth, as it is commonly believed (Figure. 1), apart from the crust, has not been confirmed by any measurements. It has no analogues in nature and does not correspond to the real facts observed on other objects that exist under the same conditions.

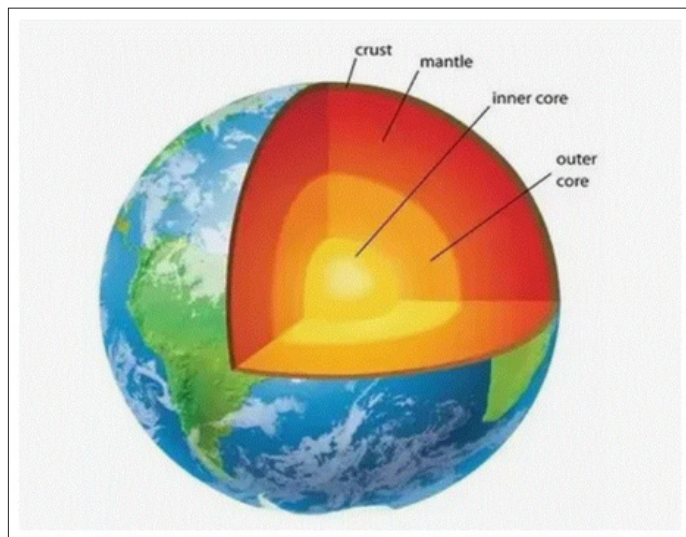


Figure 1: The commonly accepted structure of the planet.

Let us assume that the planet has the structure currently accepted. Figure. 1. In this case, the temperature and pressure in the core would cause the matter to lose its chemical properties and approach the state of a high temperature plasma. This is according to data from physicists who study the properties of materials at high temperatures, investigating them in experimental facilities [9,10].

In geophysics, it is simply stated that the core is iron–nickel!! Moreover, it is said to live its own independent life, rotating separately from the main body of the planet [11-13].

In general, measuring the rotation of a sphere—no matter what kind—is not a simple task. Without markers, it is impossible to detect rotation, and placing markers and then measuring their position using current technical means is not feasible.

Measurements of the nutation of the planet's axis, allegedly caused by the movement of such a core, represent a rather weak hypothesis. Not only is it unproven, but it also contradicts common sense and observed phenomena. Imagining the yolk in an egg rotating independently of the rest while the whole egg turns slowly (one rotation per day) sounds like science fiction and completely ignores the effects of friction and viscosity.

When describing the structure of the planet, they refer to the behaviour of various types of waves passing through the planet's body. But such studies do not inspire confidence — let me explain why.

Longitudinal and Transverse Waves in the Planet's Body

Let's look at what these P and S waves actually are.

P wave — Longitudinal

This is a wave of compression and extension of the material; it propagates in all types and aggregate states of matter. These waves can occur in all sound frequency ranges — seismic vibrations.

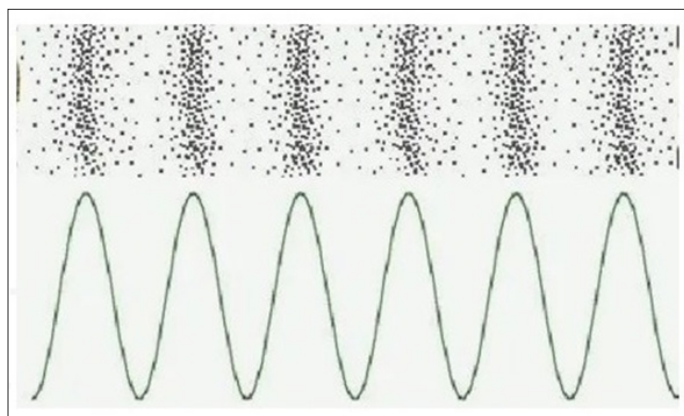


Figure 2: Scheme of longitudinal wave propagation. It consists of regions of material compression and rarefaction.

Any device that responds to motion can act as a receiver for this type of wave — a microphone, strain gauge, pendulum, etc.

Transverse S wave

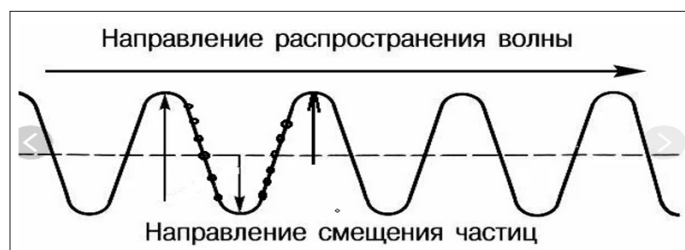


Figure 3: Scheme of transverse wave propagation.

As an example of this type of oscillation, they cite the movement of a rope, a whip, or a string. If one end is made to oscillate perpendicular to the direction of wave propagation, this oscillation will be transmitted along the chain to the end of the body, due to the direct connection of the material with the adjacent section.

A necessary condition for such an oscillation is the possibility of free perpendicular movement. For example, if you cover a string with a cushion, there will be no oscillation. Likewise, there will be no oscillation if the adjacent sections (along the direction of wave propagation) are not physically connected — if the movement of one particle is not transmitted to the next.

Sand, soil, independent blocks of solid material, liquid, or any kind of melt — in other words, everything that makes up the planet — **cannot transmit a transverse wave**.

It is Fundamentally Impossible to Study the Planet's Structure Using this Type of Wave

It turns out that, in reality, a transverse wave can only be a surface wave, and even then, only under limited conditions. Moreover, it is unclear whether what is observed might actually

be a longitudinal wave: the compression zones could be causing the crust to rise, while the rarefaction zones cause it to subside.

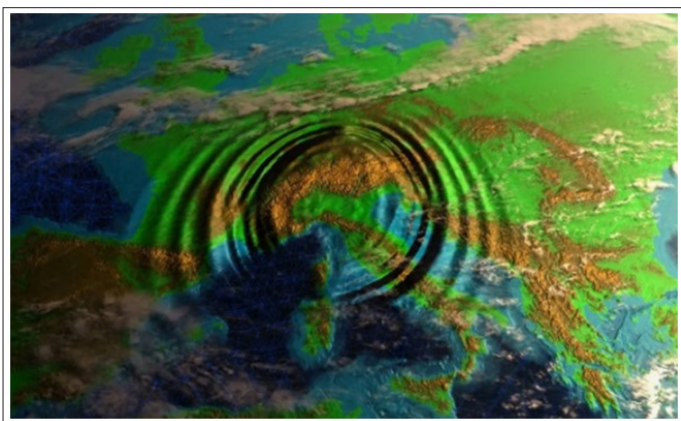


Figure 4: Schematic illustration of surface wave propagation.

Moreover, no matter how much I looked, I couldn't find any explanation of how a detector for these waves actually works.

How would it react if a longitudinal wave reached its sensor from a direction perpendicular to the wavefront? It should pick it up and register it as a signal — but that would be a false signal.

Seismic noise is continuous throughout the planet's body, and it's practically impossible to separate the signal from a specific event on the opposite side of the planet from any other noise — except in the case of catastrophic events. And it's even more difficult to distinguish P and S oscillations originating from that event.

That is precisely why such measurements and images (Figure. 5) do not inspire confidence.

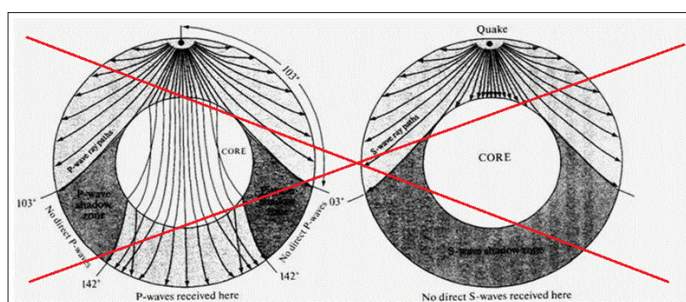


Figure 5: Study of the planet's body using waves of various types.

“Coriolis Force” —

Here is one of its definitions: “The Coriolis force is one of the inertial forces introduced to account for the influence of the rotational motion of a moving coordinate system on the relative motion of a material point.”

Some definitions explicitly state that this “force” is fictitious.

This force does not actually exist. It is a conditional “force” introduced to describe the behaviour of a body when transitioning between different frames of reference. There is no source of this force in nature. It does not move anything or act on anything.

Just because an observer changes their position, and during the flight of a stone (or a projectile) the planet rotates by some angle, the stone does not change its rectilinear motion.

It is used to explain cyclones and currents. But a fictitious force cannot be used to explain real phenomena.

Everything that happens on the planet occurs in a medium (water, atmosphere) that moves together with the planet. A cloud hanging motionless overhead is actually hurtling along at a linear speed of approximately 1,600 km/h. Any water current occurs within the ocean mass, which is moving uniformly at the same speed.

Satellites do not Fall onto their Planets, nor do they “Miss” them

They move in orbits where centrifugal forces are considered equal to centripetal (gravitational) forces.

In physics, the motion vector during free fall is directed towards the centre of mass — towards the Earth.

The acceleration of curvilinear motion — not free fall — is what shapes the trajectory; it compensates for the deviation from rectilinear motion.

Precisely because there is no free fall, tidal effects caused by the influence of the Sun and the Moon are observed on Earth. They are well recorded by gravimeters. Such effects could not arise under conditions of free fall.

And if there is no fall, then separation of substances by specific weight inside the planet is possible under the influence of an external gravitational force. A simple spherical aquarium serves as a clear example of such separation.

Convection Inside the Planet

There is no Convection in the Planet's Body, and there Cannot be Any

When describing convection, people often cite a heating kettle as an example, but a planet is not a kettle — it is more like a thermos. And there is no convection in a thermos, nor can there be: once the temperature is distributed, it does not change that distribution unless there are external influences. If the planet is not heated by the Sun, the surface temperature drops below zero, which means that the internal heating of the planet is very small.

In a Closed, Thermally Insulated Volume of the Planet, the Processes of Heating and Cooling cannot Occur Simultaneously — this Contradicts All Known Laws of Physics

Such figures, and similar ones, do not reflect reality: ascending flows, without cooling, will not descend. The ocean does not boil, it does not absorb heat, and the temperature difference between the planet's surface and beneath the crust exceeds 3,000 °C. There is no active heat transfer. It is a thermos — and a very good one, operating for many centuries.

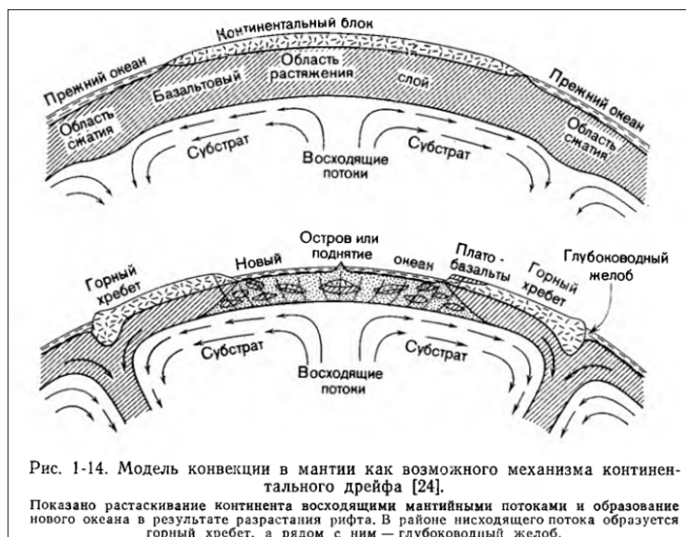


Figure 6: Convection in the planet's body (figure from Uyeda's book [3]).

These flows are used to explain the generation of the planet's magnetic field; they are used to explain tectonic movements; they give rise to fabulous plumes, jerks, and many other things. This is precisely the kind of "hidden properties that have no place in experimental philosophy, in science," as I. Newton said.

By accepting the convection hypothesis as a working model and building theories on its basis, "scientific" workers stray far from reality, replacing it with fantasies and models. But reality, even using the kettle as an example, shows that eventually the kettle boils, and there is no convection left in it — there is vigorous mixing, with a uniform temperature throughout the entire volume. (For reference: the boiling point of iron and silica is only 2,800 °C.)

Additionally, it should be noted that convection implies a constant influx of energy. This means that there must be a perpetual, inexhaustible heat source inside! The reality observed on the planet provides no examples of such a source.

It should also be mentioned that there is such a physical phenomenon as simple thermal conductivity, which, even in thermal insulators, exceeds the supposed speed of convective flows (5–8 cm/year) and which levels out the supposed temperature difference (a 10 cm thick brick in a furnace heats up in half an hour).

The possibility of the supposed convection is ruled out by any of the above facts.

Based on the above, it Must be Considered that Anything Based on the Convection Hypothesis is Inherently False.

It is Doubtful to Consider a Nuclear Reaction (The Radiogenic Hypothesis) as the Source Maintaining the High Temperature Inside the Planet, for the Following Reasons

The lava erupting from volcanoes is only slightly radioactive — compared, for example, with the radiation in a nuclear

power plant reactor. Furthermore, the proportion of radioactive elements is very small relative to the planet's total mass, and there are no prerequisites for their concentration at the centre. Most of them have a short half life and should have decayed over the planet's lifetime.

The Tidal Rise of Ocean Water does not Correspond to, but is Even Opposite to, the Tidal «Bulge» of the Earth's Crust

Example: if you press a plastic bowl with water from below, the water will spill toward the edges, and there will be a low tide the point of pressure. This is precisely why tides are mainly observed near coasts and are practically absent in the open ocean — and why they do not follow the Moon and Sun as modern theories of their origin suggest [Laplace, Melchior] [6].

There is no Such Concept as “Geodynamo” in Classical Physics — A Concept Supposedly Responsible for Generating the Planet's Magnetic Field

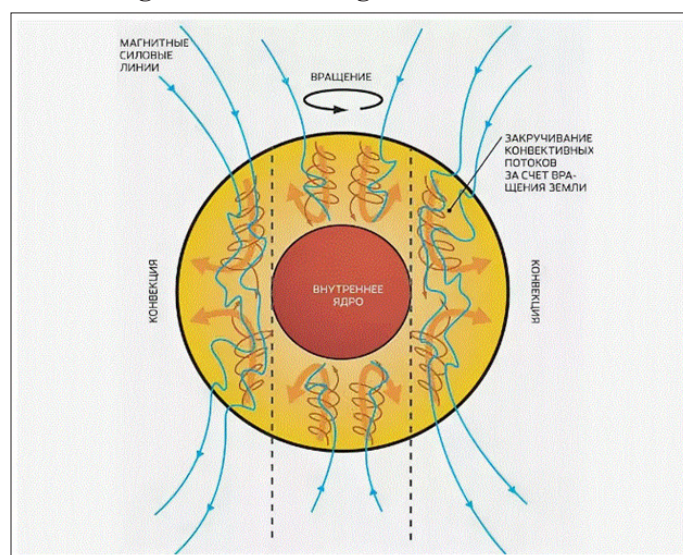


Figure 7: Geodynamo — a diagram from a lecture on the structure of the planet's core.

Such diagrams demonstrate violations of several laws of physics at once:

1. Continuous convection in a closed volume is impossible — this is an example of a contrived perpetual motion machine, contrary to all known physics.
2. The Earth's rotation cannot twist any flows in the way shown in the diagram, directing them first in one direction, then in the opposite one. It cannot twist anything inside the planet at all. (Consider the egg example.)
3. Neutral flows, regardless of the material they consist of, cannot generate a magnetic field. If they are polarized, then what and how charges them — and why do they not neutralize each other, given the conditions of good conductivity?
4. The magnetic field lines produced by such depicted flows would not create a magnetic field oriented as it is in reality.

This is an example of attributing contrived, hidden properties to an object and building theories on this basis — theories that have nothing in common with reality, and are not supported by

verified laws of physics, observable surface phenomena, or any measurement data.

They failed to find the true cause, so they came up with the concept of “geodynamo”.

The Term “Geodynamo” is used in Almost All Publications that Deal in One way or another with the Nature of Planetary Magnetic Fields.

In classical physics, a magnetic field is created either by an electric current or by a ferromagnet magnetized by such a current — in the form of a permanent magnet.

But a magnet retains its magnetization properties only up to certain temperatures.

Natural Oscillations of the Planet

This is equivalent to saying “natural oscillations of a brick.” The meaning is the same. Yes, anybody has its own resonance frequency, but this is not “natural oscillation” — it is the frequency at which the body responds most strongly to an external influence. When that influence disappears, the body returns to its initial state of rest, with its own damping time. But the Earth, like a brick, does not oscillate on its own; there is no perpetually operating mechanism inside it. Only an external influence can take anybody out of the state of lowest entropy.

Distribution and Motion of Masses Inside the Planet. Measurement Data, Gravitational Waves

It should be noted that hypotheses about the moving core of the planet were considered earlier (Korovyakov and Nikitin, 1998; Avsyuk et al., 2001; Sidorenkov, 2002; Barkin Yu. V.; and others), but this motion was never considered in conjunction with other planets, their trajectories, and fields [11,13,14].

No causes triggering this motion, its trajectory, influencing factors, or consequences of this motion have ever been identified. Moreover, the motion of the core itself was envisioned differently.

The Earth is predominantly under the influence of two gravitational fields — those of the Moon and the Sun. Both of these fields can be considered to be of roughly equal potential with respect to the Earth. Any distance on the Earth is much smaller than the distance to the Moon and the Sun.

Let us consider what kind of object could serve as a prototype for the planet. A well known spherical aquarium fits this purpose very well. It is filled with water and various materials of different specific gravities: sand, stones, plastic toys, fish, a feeder, etc. Everyone knows how they are distributed. If you tilt the aquarium, a shift occurs; if you roll it, there will be a constant movement of the heavy mass directed towards the Earth. The aquarium is in the constant gravitational field of the Earth, just as the Earth is in the gravitational field of the Sun. And the Earth is like that same aquarium relative to the Sun, with a similar distribution: the heavier masses are closer to the Sun, and the lightest ones are on the opposite side.

If we now imagine that the walls of the aquarium are made of a soft material, similar to rubber, we can simulate the behaviour of the Earth’s crust under the influence of the Sun’s gravitational forces. If you add water to an inflated balloon and then spin the balloon, you will get a clear idea of how the Earth’s crust behaves — the formation of a “bulge” and its movement.

The only significant difference between these two vessels is that the weak gravitational forces of the mass located inside the aquarium do not affect its distribution — or rather, they do not manifest themselves in any way. Whereas the large volumes, and consequently the masses, of the planet’s body can redistribute themselves and significantly influence the measurement data and the phenomena observed on the opposite side of the planet.

Everything said about the influence of the Sun also applies to the influence of the Moon. It is currently difficult to say which influence is greater or lesser — there is not enough measurement data, and the mathematical apparatus has not yet been fully developed. There are too many mutually influencing, multidirectional forces and masses involved in the process. One thing can be said: their influences are approximately of the same order of magnitude. During a solar eclipse, the disks of the Sun and the Moon appear almost the same size; perhaps this can somehow help in understanding the issue, but for now, this question remains open.

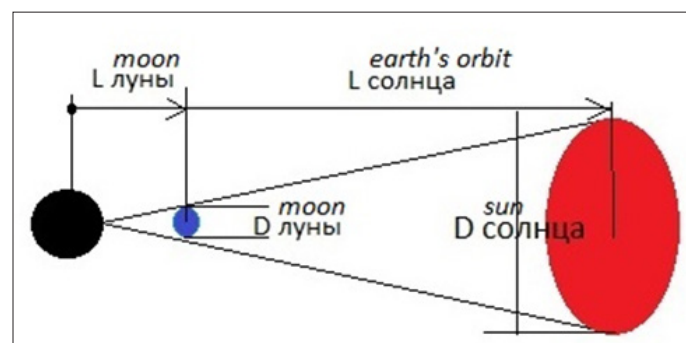


Figure 8: The coincidence of the Moon’s and the Sun’s outlines during an eclipse.

Since there are two main external sources — the Sun (distant but powerful) and the Moon (much less massive but much closer) — there are consequently two locations where heavy masses tend to accumulate. Let us consider which gravitational forces, from which masses, affect the gravimeter readings. (Figure. 9)

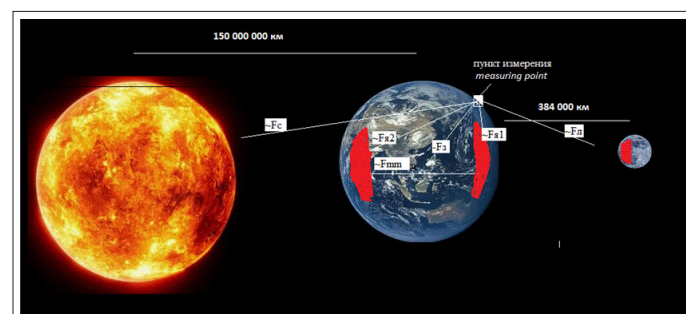


Figure 9: A schematic diagram of the forces contributing to the gravimeter readings.

- F_3 — the constant gravitational force of the planet's fixed mass.
- $\sim F_L$ — the variable gravitational force of the Moon.
- $\sim F_{\Sigma 1}$ — the variable gravitational force from the internal mass attracted by the Moon.
- $\sim F_{\Sigma 2}$ — the variable gravitational force from the internal mass attracted by the Sun.
- $\sim F_c$ — the variable gravitational force of the Sun.
- $\sim F_{mm}$ — the variable gravitational force between the masses.

At the same time, $F_{\Sigma 1}$ and $F_{\Sigma 2}$ depend on the values of F_c and F_L , as well as on the positions of the Sun and the Moon relative to each other and to the Earth.

Moreover, the measurement data are affected by the locations of the masses attracted by the Sun and the Moon, since the projections onto the vertical axis are measured: the same mass located directly beneath the sensor will yield a higher reading than one at the same distance but at an angle.

The movement of the internal mass and its influence are clearly demonstrated by gravity measurement data. For example, in November 2013, they looked as shown in Figure. 10.

The gravity force measurement data were provided by the staff of the gravimetry laboratory at the Pacific Oceanological Institute, Far Eastern Branch of the Russian Academy of Sciences (TOI FEB RAS), and part of them is presented in work [15].

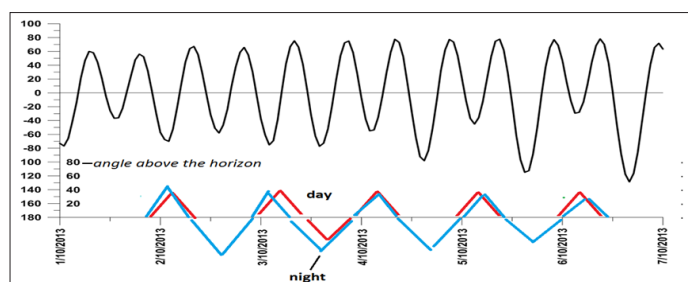


Figure 10: Gravity measurement data (μGal) and the schematic positions of the Sun (red) and the Moon (blue), in degrees above the horizon. Time is in UTC (local time — UTC+10:00).

The interval was deliberately chosen for the period when the Sun and the Moon follow a similar trajectory and simultaneously exert a comparable influence on the planet's internal mass.

It can be seen how the gravitational pull from the Sun and the Moon reduces the Earth's gravitational attraction during daytime. At night, a nearly equal reduction occurs due to the "pulling away" of the planet's internal mass to the hemisphere opposite the measurement point. In this case, the gravitational force decreases in proportion to the square of the distance. As we can see, the influence of such masses leads to differences from the physics observed in an aquarium.

In reality, the situation is somewhat more complex, but this is sufficient for a general understanding.

"Gravitational Waves"

The variations in the measured values of Newton's gravitational

constant G at different times led scientists to hypothesize that external gravitational forces — termed gravitational waves — were influencing it. Many research organizations are now actively searching for these waves, investing substantial resources in developing detection facilities.

A. V. Vikulin's works provide a detailed examination of the history and the challenges encountered in studying these phenomena. For instance, he states [16,17]:

"The conclusion that there is a relationship between geodynamic processes and cosmic phenomena fully aligns with Mach's principle of the universal interconnectedness of all processes occurring in the Universe. Gravity can be the only 'cosmic' link that binds all parts of the Universe into a single whole. The 'terrestrial' link in the relationship between geodynamic processes and phenomena occurring in space may be rotational geodynamic waves, which are as characteristic for a block like rotating geological medium (geomedium) as volumetric seismic (elastic) waves are for an 'ordinary' solid body. The existence of a relationship between cosmic (gravitational) phenomena and geodynamic processes is almost obvious. The possibility of this approach to the problem has been discussed in various studies."

As we can see, he came close to understanding the processes involved. And if we now replace the newly introduced concept of "rotational geodynamic waves" with the simpler notion of "mass movement," everything falls into place, and the problem of gravitational waves is resolved.

In other words, we can put it this way: sound waves are produced by a vibrating diaphragm, electromagnetic waves by an alternating current, and gravitational waves by the changing distance between the planet's main mass and the detection instrument. And they should be sought not in space, but "right under our feet."

Moreover, these measured values of G , recorded at different moments, might allow us to estimate the magnitude of the moving mass. Especially since these changes are well recorded and appear to be periodic, depending on the positions of the Sun and the Moon.

Figure. 11. An example of such measurements. One might think that the changes in the data are caused by the gravitational pull of the Sun and the Moon as they move relative to the measurement point, but their behaviour indicates something else.

The graph shows that even when the trajectories of the Sun and Moon coincide (from 6 to 14 May), the signal shape is far from sinusoidal — which it would be if only these bodies influenced the instrument readings.

Since the gravimeter responds only to mass, this behaviour of the readings indicates the presence of another variable influencing mass — and it is located inside the planet.

Thus, it turns out that the source of the gravitational waves should be sought within the planet's body, or, at the very least,

the movement of the internal mass and its influence should be taken into account during measurements.

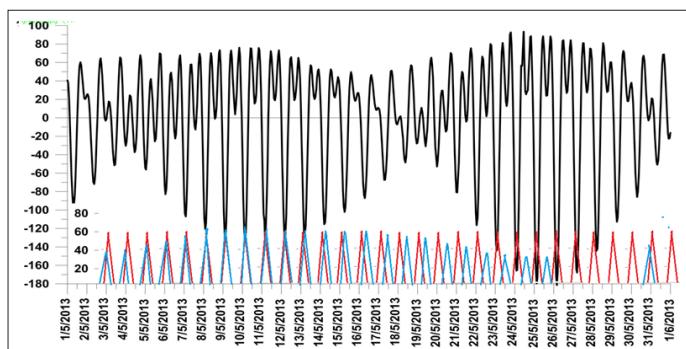


Figure 11: Behaviour of gravitational forces (μGal) in May 2013, the Sea of Japan coastal area. The Sun's position is marked in red, the Moon's — in blue: sunrise, zenith, sunset, and the angle of rise above the horizon.

Similar measurements are presented, for example, in work [18].

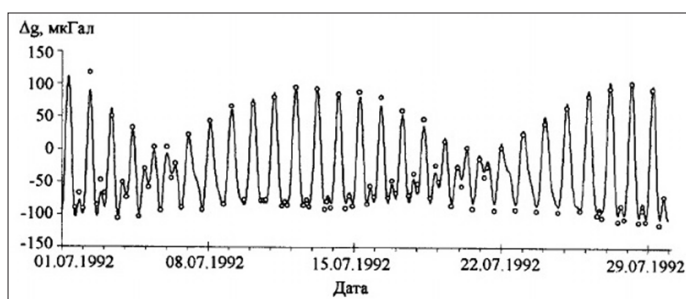


Figure 12: Gravity measurement data (G) in the Borovoye area, Siberian Branch of the Russian Academy of Sciences (Novosibirsk Region).

We will Show how the dips in the readings appear at night

The influence of the Sun and the Moon is described by a sine wave — the upper graph.

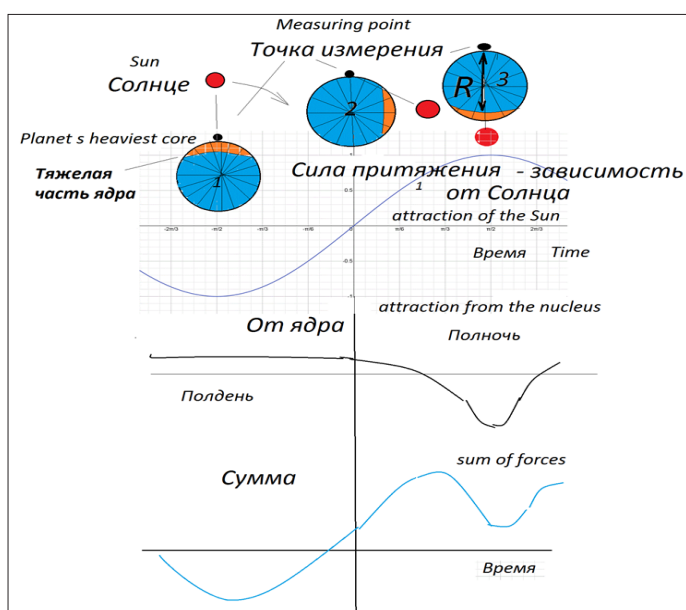


Figure 13: View from the pole. The influence on the Earth's internal mass of the Sun and the Moon located next to it is

shown. The figure is schematic. The gravimeter is located at the measurement point.

At the initial stage, the movement of the internal mass has little effect on the instrument readings because the projection of the gravitational force vector onto the vertical axis at the measurement point changes only slightly.

Later, the dependence, being inversely proportional to the square of the distance R , decreases sharply, creating a dip against the background of the overall increase in the Sun's gravitational pull.

Overall, the resulting graph shape matches the measured one.

Seasonal variations in the trajectory of the internal mass movement

As the planet rotates, the heavier part of the internal mass moves from east to west and spirals north-south and back, as the planet's position relative to the Sun changes (i.e., with the change of seasons) (Figure. 14).

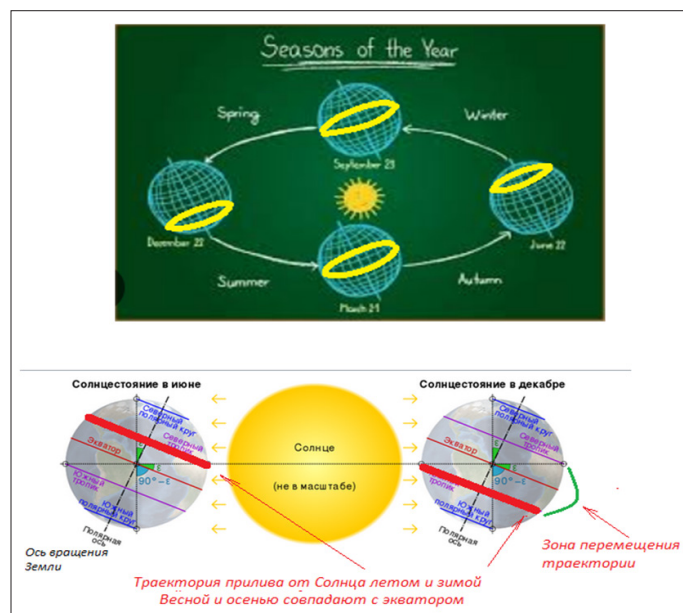


Figure 14: Seasonal changes in the trajectories of the planet's heavy mass component, dependent on the Sun.

The influence of the Moon is somewhat more complex: it follows the dynamics of the satellite's motion and superimposes on the solar effect.

Analysis of the gravitational force measurement results.

Studying the graphs of gravitational forces provided by the staff of the FEB RAS laboratory, together with the positions of the Sun and the Moon calculated for the same time period and tied to the station's location, confirms the mechanism of the planet's internal mass behaviour that was previously considered using the aquarium analogy.

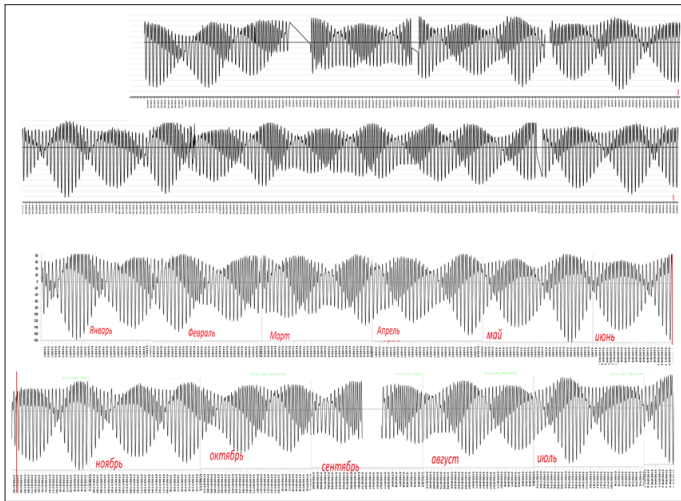


Figure 15: Behaviour of gravitational forces up to 22 June, the summer solstice, 2016 (upper graph) and 2013 (lower graph), and their mirror image pattern afterwards. The Sea of Japan coastal area.

The gravity graphs for the year (Figure. 15) clearly indicate a change in the trajectory of the heavy part of the core.

One can clearly see an almost perfect match between the values before 22 June and the mirror image pattern after it. That is, after the day of the solar solstice, the mass inside the planet returns to the Southern Hemisphere with the same daily and monthly dependence. Reaching its maximum distance on 22 December, it then begins to move back. And so, it goes on endlessly — a perpetual motion.

The graphs also show a decrease in amplitude during the spring and autumn months.

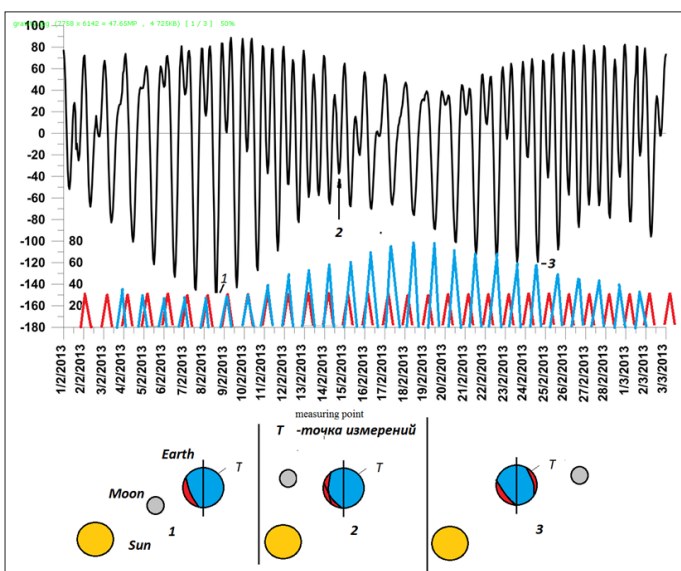


Figure 16: Graph of gravitational forces (μGal) and a schematic illustration of the planetary positions corresponding to the selected minimum values, which occur at night.

February 2013. The Sun's position is marked in red, the Moon's — in blue: sunrise, zenith, sunset, and the angle above the horizon.

If we assume there is no movement of mass inside the planet, then in winter — when both the Sun and the Moon rise lowest above the horizon — the variation in gravitational forces should be smallest in amplitude. However, the measured values indicate otherwise.

The increase in the signal amplitude is caused by the approach and retreat of the planet's internal mass. The heavier part of the mass can move a considerable distance away from the measurement point. Such a displacement will inevitably lead to a change in the gravimeter readings — and this is exactly what is observed. Moreover, the change is very sharp, following a quadratic dependence.

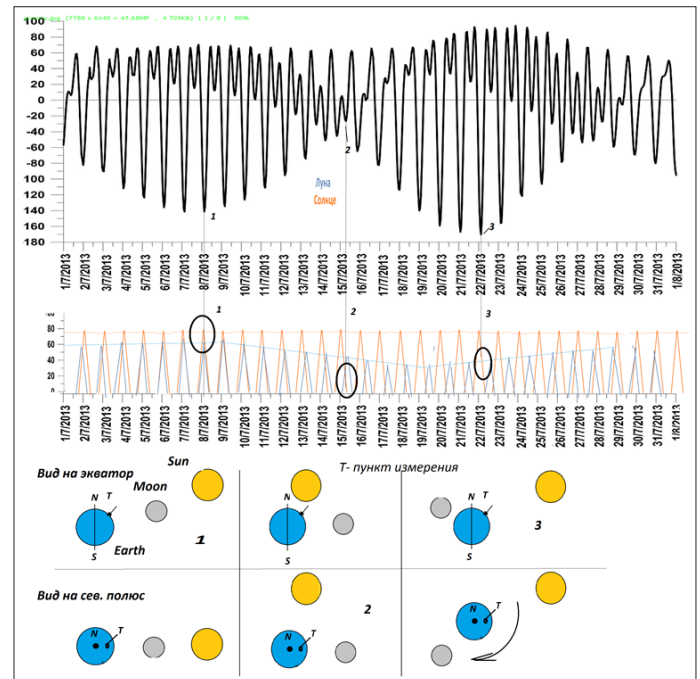


Figure 17: Graph of gravitational forces and a schematic illustration of the planetary positions corresponding to the selected minimum values occurring during daytime.

July 2013. The view is shown in two projections, schematically.

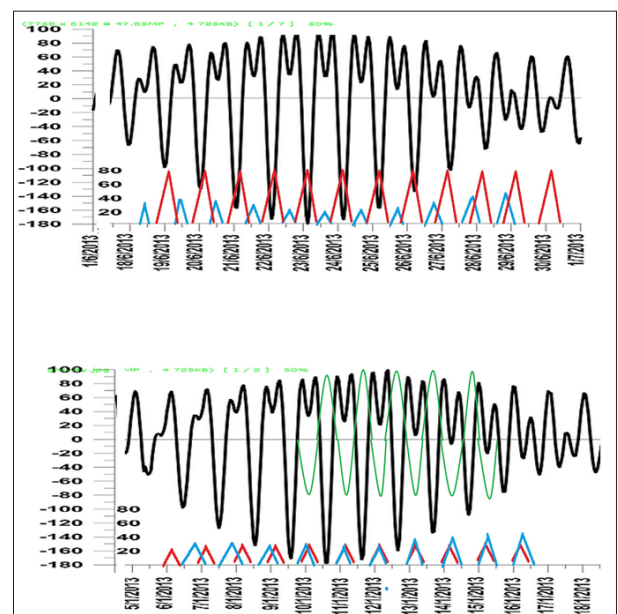


Figure 18: Nearly identical signal shape despite completely different positions of the external forces. June and January 2013. In June, the minimum occurs at noon, whereas in January, it occurs at midnight.

The green line schematically shows what the graph would look like in the absence of internal mass movement.

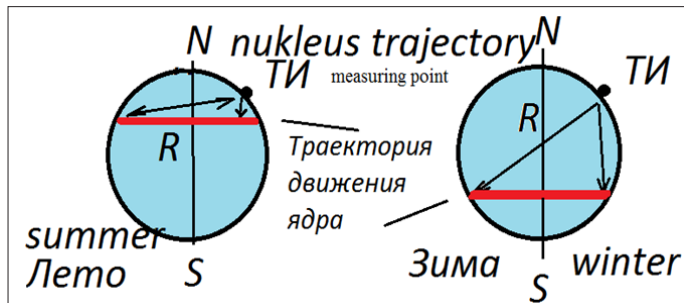


Figure 19: Distances from the measurement point to the position of the planet's heavy mass component in summer and winter.

In summer months, the distance R is smaller than in winter; however, in winter, the measurement point is initially located farther from the core mass.

This mass movement and the resulting dip in gravitational force explain the occurrence of a planetary surface tide at night. That is why it is located exactly opposite the daytime tide.

Everything said about the Sun's influence also applies to the Moon's influence.

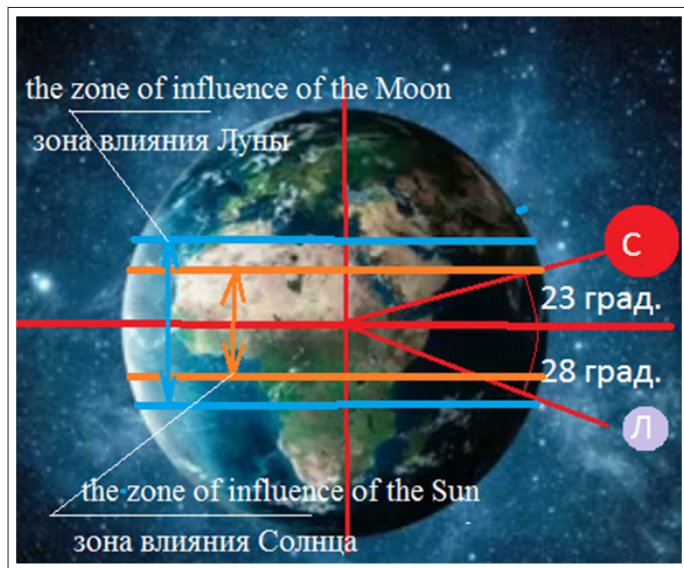


Figure 20: Schematic representation of the zones of influence of gravitational forces from the Sun and the Moon.

The constant movement of mass within the same sector of the planet inevitably leads to a “bulging” of the Earth's crust, giving the planet the shape of a geoid.

Intermediate Conclusion:

the analysis of gravitational force measurement data leads to an unambiguous conclusion about the influence on the gravimeter readings of gravitational forces from masses moving inside the planet's body.

The periodicity of these changes exhibits daily, monthly (sidereal month), seasonal, semi annual, and annual (astronomical year) dependence.

The amplitude and shape of the signals are also cyclical and depend both on the absolute position of the Sun and the Moon relative to the measurement point and on their mutual arrangement in the sky.

Note:

In the work “Rotational Factors of Tectogenesis — History of the Issue and Current State” by L. I. Ioganson (Schmidt Institute of Physics of the Earth, RAS), the approach to the issue of the planet's core movement is systematised in great detail [19]. The paper presents many variants for explaining this movement, traces the evolution of knowledge on the subject, and shows how many scientists have dealt with this question. By referring to this work, I aim to pre-empt any criticism regarding the relatively short list of references used.

There is no need to cite sources that do not form the foundation of the argument, nor those that are not supported by measurement data or natural phenomena.

The mere mention of “core movement” does not yet define the causes that drive this movement, nor does it describe all of its consequences. And the fact that the term appears somewhere does not mean the issue has been resolved there.

This is the only place in the article where I allow myself to criticise the current approach to explaining the Earth's structure. The aim of the article is not to criticise various models, but to reveal and explain what has been measured and what manifests itself as natural phenomena — while taking the laws of physics into account.

Since many authors refer to the works of Yu. N. Avsyuk, we will take them as generally accepted, although other works are hardly different [11]. For example, consider the following statement: “The rigidity of the coupling and the frequency of free oscillations of the Earth's inner core have been estimated by several authors. Through the value of the coupling stiffness coefficient kkk , the magnitude of the force acting on the inner core can be converted into its displacement. There is some uncertainty in the value of the coupling coefficient kkk , which depends on the difference between the core density σ_1 and the density of the surrounding liquid material σ_2 . Therefore, several variants of $(\sigma_2 - \sigma_1)$ were considered in the calculations.

Estimates show that forced displacements of the inner core, on the order of 0.4–11.6 m with a periodicity of half a sidereal month ($6.10 \cdot 10^{-7} \cdot 6.10^{-7} \text{s}$), ‘mix’ the liquid surrounding the core with a power of $3.5 \cdot 10^{18} \text{J}$ – $10.5 \cdot 10^{18} \text{J}$.

$\dot{m} \cdot 10^{18} \{3.5-10.5\} 10^{18} \text{ erg/s}$. Consequently, the power of the core displacement process, driven by solar perturbations, exceeds the upper limit of the power of a 'generator' capable of regenerating the Earth's magnetic field. To maintain a system of currents supporting the modern dipole field of 0.6 G, a generator with a power of $10^{14}-10^{15} 10^{14}-10^{15} \text{ erg/s}$ is required. For a toroidal field of 100 G, the 'generator' must be more powerful, on the order of $10^{17}-10^{18} 10^{17}-10^{18} \text{ erg/s}$."

The assumption that the movement of the axis (geographic pole) is caused by the displacement of the planet's core is, of course, permissible as a hypothesis. But what is the connection between the periodicity of half a sidereal month and the movement of the Sun?

Such a displacement — a few metres — would not be reflected in real gravimeter readings and would not create daily, monthly, seasonal, or semi annual periodicities. Yet such dependencies exist, and they are clearly observable — which means the issue is not about the core, or at least not about this particular understanding of its movement and location.

On the other hand, we all know very well how the imbalance of a body affects its behaviour during rotation. Even a few grams on the rim can cause noticeable vibrations in a fairly massive car wheel. Similarly, in the case of the planet, a relatively small accumulation of mass at some point on the inner side of the crust would lead to a change in the Chandler motion of the axis.

There is abundant data on changes in the planet's rotation period during major earthquakes, and these events occur quite far from the core [20].

The power values cited by Avsyuk are not substantiated in any way and do not reflect reality. It is not shown how or why the core moves. Nor is there even a basic explanation of how the "generator" works (in traditional physics, there is no such concept as a "magnetic field generator"; a magnetic field is created either by a permanent magnet or by an electric current). It is not explained how the current appears, where it flows, or how the actual magnetic field (MF) is generated. Moreover, it is stated that the MF must be constantly regenerated — but why?

A permanent magnet, which is ultimately what the planet's body becomes, does not need to be regenerated. For example, how could one regenerate the Kursk magnetic anomaly without making other regions anomalous as well?

As we can see, practically nothing is supported by measurement results, known laws of physics, or natural phenomena. That is precisely why such works and similar ones are not included in the reference list.

The situation is even worse with various "mathematical models." In them, electric current can flow in a circle rather than along the path of least resistance; magnetic "seeds" can develop; and field lines can twist into figure eights.

Physics is completely ignored. Paper can endure anything.

The Temperature Inside the Planet, Changes in the Properties of Matter

What the temperature is and what changes occur in the properties of matter inside the planet — this should better be explained by professionals who study the behaviour of matter using equipment that allows approaching these conditions.

The changes in the properties of matter with increasing temperature and pressure are described in detail in the works of Doctor of Physical and Mathematical Sciences D. A. Kirzhnits (Kirzhnits D. A., 1971); here is an excerpt from the article [9]:

"At relatively low pressures and temperatures, matter continues to exhibit the exceptional diversity of its forms that is characteristic of it in a cold, uncompressed state. Accordingly, the characteristics of matter remain very sharp and non monotonic functions of its composition.

However, as pressure or temperature increases, matter acquires an increasingly universal structure, and its characteristics become increasingly smooth functions of the matter's composition. This clearly pronounced tendency is due to the fact that, thanks to the increase in the internal energy of the matter, a certain ordering and "simplification" of its structure becomes possible. Molecules or molecular complexes break down as pressure or temperature rises, and the matter transitions into a purely atomic state. The electron shells of the atoms are rearranged, acquiring an increasingly regular filling of the energy levels. At the same time, the outer electrons — which determine the chemical identity of the substance — are stripped away.

Finally, if the matter remains in a solid state during the compression and heating process, its crystal lattice also becomes ordered. Passing through a series of structural transformations, it becomes increasingly densely packed and ultimately acquires a single structure common to all substances (body centered cubic*)."

As has already been stated, the mass movement occurs within a limited sector of the planet's body, determined by the tilt angle of the rotation axis and the direction toward the external forces (Figure. 20).

The mass displacement takes place at an extremely high linear velocity. If we assume that this occurs at the Mohorovičić discontinuity, it is even hard to imagine, but the velocity is close to the speed of sound in air — approximately 1 300 km/h (360 m/s). (This is only an assumption!!)

The movement of masses causes heating of the rubbing parts and serves as a heat source that maintains the planet's temperature at its current level.

No real evidence of other energy sources is observed.

As mentioned earlier, all other known energy sources would have long since been depleted over the planet's lifetime.

The maintenance of the internal temperature is supported by the Earth's crust having low thermal conductivity. This follows from the fact that, given the enormous temperature difference between the planet's interior and its surface, a noticeable decrease in the surface heating occurs when intense solar radiation disappears.

The Planet's Magnetic Field

Polarization of the Planet's Internal Mass

The emergence of electric current and the planet's magnetic field.

Note:

A little criticism of the currently prevailing hypothesis of the Earth's magnetic field.

The dynamo effect hypothesis assumes that convective and/or turbulent motions of the conductive liquid in the core contribute to the self excitation and maintenance of the field in a steady state.

But it's hard to imagine that charged flows would always rise due to temperature in exactly the same direction — if it's convective motion, or that the turbulence arising from rotation would be so constant as to maintain the self excitation effect, and moreover in one direction, and also create a magnetic field like the one that actually exists.

The very nature of the turbulence is unclear — over time, in the absence of external forces, the Earth's internal matter, due to viscosity, would also rotate uniformly together with the shell.

It also remains unclear where the potentials on this core come from. Why don't they cancel out if the substance is conductive?

Why doesn't this theory work on other planets?

It also doesn't explain the field's inversion. The authors of this theory themselves considered it far from proven.

Some theories introduce “plumes”, “jerks”, “superchrons”, and the mythical concept of “frozen in” field lines that magically change their configuration, which leads to the amplification of a “magnetic seed”. Or the rotation of the somehow iron nickel core is said to give rise to a magnetic field, never mind that this contradicts the basic laws of physics.

Free electrons, separated as a result of heating and increased pressure and carrying a negative charge, are hundreds of times lighter than the remaining positive ions. The ions, like pebbles in an aquarium, will settle to the bottom — that is, to the side facing the external gravity (the Sun, the Moon), displacing the electrons.

The mass, separated by external gravity inside the planet, creates an electric dipole — or rather, volumes with different potentials. The heavy, positively charged part will be located closer to the Earth's surface and to the external sources of gravity (Figure.21).

In reality, everything is somewhat more complex and chaotic,

since it occurs during the constant movement of a huge volume of internal matter.

Note:

Let us recall that an electric current is defined as the directed movement of charged particles. The direction of the current is conventionally taken as the movement of positive charges. The direction of the magnetic field lines generated by this current is determined by the corkscrew (right hand) rule.

We should also note that the American physicist H. Rowland demonstrated in 1878 that the motion of charges on a moving conductor is magnetically equivalent to a conduction current in a stationary conductor.

A common objection goes like this: “Coulomb forces are much stronger than gravitational forces, and they won't allow the latter to separate the matter.”

Here, some confusion arises:

1. Under the conditions considered, free electrons have already been separated from nuclei and ions due to temperature and pressure.
2. The interaction involves not the gravitational forces between two particles, but the immense gravity from the Sun acting on particles of different masses. And this gravity is so strong that it keeps the planet in orbit.
3. Coulomb attractive forces imply attraction between oppositely charged particles, but not between volumes of differently charged particles, where they act only at the boundary layer. The farther from the contact boundary, the more dominant become the repulsive forces between like charged particles.

A real life example is thunderclouds: they have different potentials, as proven by lightning, yet they do not tend to merge.

This same phenomenon illustrates charge separation under the influence of gravity: during water evaporation, convective currents lift charged vapor ions above the Earth, forming thunderclouds.

The movement of these heavy, positively charged masses, as the planet rotates, occurs from east to west.

Since positively charged masses are moving, the direction of the current will also be from east to west. According to the corkscrew (or gimlet) rule — whichever term you prefer — the magnetic field lines generated by this current will be directed from the geographic South Pole to the geographic North Pole.

That is, everything matches what we observe in reality. Figure. 21.

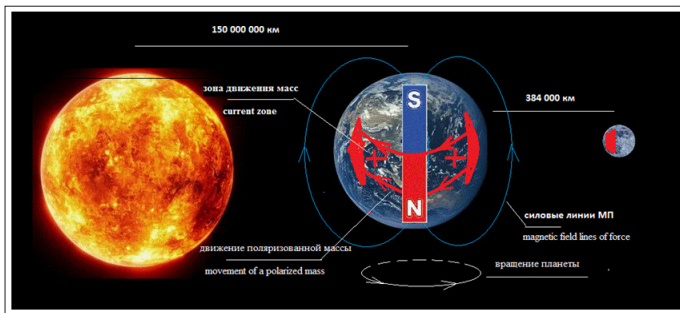


Figure 21: Dipole separation, the flow of positively charged masses, and the magnetic field generated by it.

This moving flow creates a variable (pulsating) magnetic field of the Earth

The magnetic field is pulsating (for a point on the surface) with a period of 1 day; it is maintained by the paramagnetic properties of the planet's body, which smooth out and stabilize its behaviour. At the same time, the planet's body itself becomes magnetized. The variable field manifests itself only as fluctuations of the main field.

The magnetized mass of the planet creates the main (primary) magnetic field of the Earth

It is clear that the existing magnetic field anomalies formed under different directions of charged flow movement, as well as under different velocities and potentials. The current field is not capable of remagnetizing them.

This flow is well recorded by gravity measurement data.

On different planets, these flows have various directions and trajectories, and this aligns well with the magnetic fields they generate.

The main magnetic field arises as a manifestation of the Earth's body magnetization due to the variable field; therefore, it is not possible to determine the value of the variable component. On the planet's surface, only the main field can be measured, and it consists of effective, to some extent fixed, values of the variable field that have existed at various times.

It has a very complex shape, and attempts to fit it to any formula are a waste of time and amount to completely ignoring the causes of its formation. Moreover, according to the physics of its generation, it should not be constant — which is confirmed by the observed drift of the magnetic poles.

Thus, the formative and driving force for the charges that create the magnetic field of any planet is the combined gravitational forces from the Sun, satellites, and nearby masses moving relative to the planet's body.

Confirmation of the theory under consideration can be found in the daily and annual variations in the direction of the magnetic field's intensity, i.e., the dependence of the field on the Earth's position relative to other influencing objects, which adjust the mass separation, charge, and trajectory of the mass movement [21]. (In the case of the currently accepted hydromagnetic dynamo hypothesis, such an influence should not exist.)

The staff of the Institute for Monitoring of Climatic and Ecological Systems, Siberian Branch of the Russian Academy of Sciences, presented very interesting measured data in their work (Yu. P. Malyshkov et al., 2009) [22].

Based on long term studies of the Earth's natural pulsed electromagnetic fields (NPEMF) in the seismically active regions of the Baikal area, they concluded that the planet's core is moving, and this is associated with natural phenomena — seismic activity, effects on the human body, etc. These are truly remarkable works that continue, at a more technologically advanced level, the research of A. Chizhevsky [23].

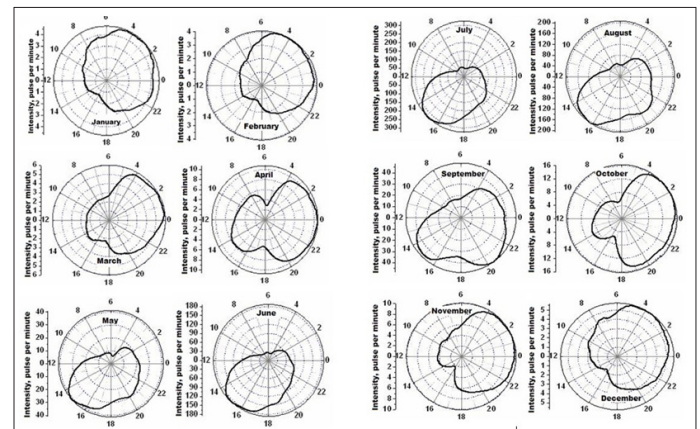


Figure 22: Patterns of the intensity variations of the Earth's natural pulsed electromagnetic fields (NPEMF).

The patterns of the intensity variations of the NPEMF at different points in time exactly match the movement of the heavy part of the planet's mass [22].

These graphs show how the intensity of electromagnetic field disturbances changes over the course of a day and depending on the season. It can be seen that in the winter months the intensity decreases significantly, and the maximum shifts to nighttime — that is, when it is summer in the Southern Hemisphere and the heavy part of the mass is located there, directly opposite the measurement site.

As noted in this work, the thunderstorm region migrates throughout the year, following the heavy part of the planet's mass. This can also be explained by the interaction between the polarized internal volume and the clouds, akin to a huge capacitor. This phenomenon well deserves a separate study.

Comparison of the Magnetic Fields of Planets

Based on what has been said, it becomes clear why magnetic fields appear on other planets — on those that have satellites or are subject to the dynamic influence of the Sun — and why they are absent on those that do not. For example, Venus has no magnetic field: it has no satellites, and it rotates very slowly — once every 243 Earth days around its axis and once every 225 days around the Sun. That is, even if polarization is created inside it, it is not sufficiently dynamic. Or the planet has cooled down and no longer has a liquid inner core (like the Moon).

A change in the polarity of the magnetic field may be linked to a changed direction of satellite(s) rotation (Mars), or a complex field may arise from the complex interactions between a planet and its satellites (Uranus, Neptune).

Interestingly, Mercury, which has no satellites, still has a magnetic field similar to Earth's — though significantly weaker. However, Mercury itself acts as a satellite of the Sun: it is close to the Sun and orbits it relatively quickly — in 89 Earth days, although it rotates on its axis once every 59 days. Mercury's field is symmetric and aligned with its rotation axis. The tilt of its equator relative to the orbital plane is only 0.1 degrees. This suggests that the field arises not only from the planet's own rotation (as with Earth) but also from its motion around the Sun.

Uranus rotates in a retrograde manner. Its satellites also have retrograde orbits, and their orbits are strongly inclined to the ecliptic plane. The plane of Uranus's equator is tilted at 97.86° relative to its orbital plane — meaning the planet rotates “lying on its side.” While other planets can be likened to spinning tops, Uranus is more like a rolling ball. Uranus has a very specific magnetic field: it is not directed from the planet's geometric centre, and it is tilted by 59° relative to the rotation axis. In fact, the magnetic dipole is offset from the planet's centre towards the south pole by about one third of the planet's radius. This unusual geometry results in a highly asymmetric magnetic field, and its polarity is opposite to Earth's.

A good indicator of how motion trajectories influence the shape of a magnetic field is a comparison of the fields of Jupiter and Earth. Jupiter's field more closely resembles a flat disk: most of its satellites orbit in regular circular paths within the equatorial plane, and the planet's rotation axis is only slightly tilted. There are no seasons on Jupiter. In contrast, Earth's field resembles an apple. This can be compared to the fields produced by two different electromagnetic coils: one wound tightly, turn by turn, onto a “sleeve,” and the other similar to a tape reel in a tape recorder.

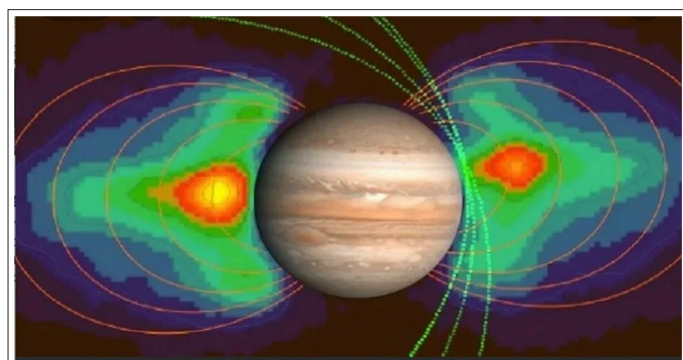


Figure 23: Jupiter's magnetic field resembles a disk — the rotation axis almost does not change its position.

Movement of the Magnetic Poles, Field Inversion

It also turns out that the Earth's outer shell (the crust) is weakly coupled to the processes occurring between the planets, which determine the emergence and maintenance of the magnetic field. Therefore, the crust can “freely” move relative to the centre of mass (similar to the rotation of the outer rim of a bearing

while the inner part remains fixed). This movement changes the position of the magnetic poles on the Earth's surface without changing their position in space.

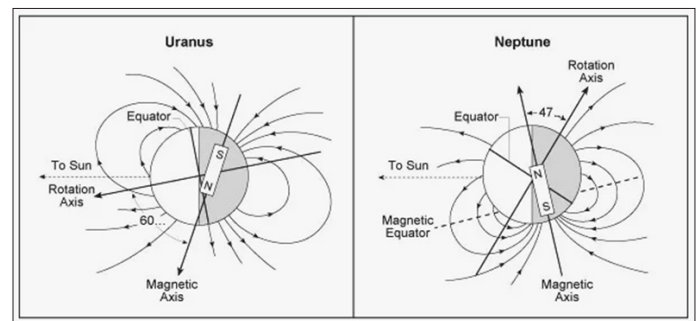


Figure 24: Complex shapes of the magnetic fields of Uranus and Neptune, and their various orientations, corresponding to the different rotation directions.

The shift continues until the crust settles into one of the local stability points. This does not necessarily have to be a complete pole reversal, but an inversion is more likely, since the internal flows, over many centuries, have already established certain movement routes and shaped the planet in a particular way. It is easier for the flows to follow these established paths, simply moving in the opposite direction.

Mountain Formation, Earthquakes, Rogue Waves, Mobilism

Origin of Mountain Systems

In our case, it doesn't matter how the planet evolved — whether it formed from an accumulation of dust or was a molten fragment of something. We accept it as it is: molten inside, with a cooled “foam” on top in the form of the crust. This is what we observe.

The Earth's crust has been measured and classified. It is known that its inner surface is uneven. It is also known that individual parts of the crust “overlap” each other. The unresolved question has been: where do such titanic forces come from, and how do they affect tectonic movements?



Roerich



Figure 25: Drawing of mountains and a photo of ice ridges (hummocks).

“Orogenesis — the geological process of mountain formation under the influence of intense upward tectonic movements, the rate of which exceeds the rate of processes leading to the leveling of the Earth’s surface” — this is the conventional explanation of the process. However, as noted earlier, there are no upward movements inside the planet, and convection in a closed volume cannot exist. Yet mountains do exist; in some places they grow, in others they erode.

The phenomenon in nature most similar to mountain formation is an ice drift on a river. On a river, there is a flow of water beneath the ice; inside the planet, there is movement of mass beneath the crust.

On both the river and the Earth, geophysics recognizes phenomena such as spreading, collision, shear, and subduction — **but not as a result of convection, rather as a response to the impact of an internal flow.**

There is an overlapping of large masses onto each other — this is what forms ice ridges (hummocks) on a river; on land, it forms mountains.

In most cases, mountain ranges are oriented north–south — across the direction of the mass movement inside the planet; similarly, ice ridges are mostly arranged across the current. However, exceptions exist in both cases.

The analogy is complete (Figure. 25). The movement of mass inside the planet is constant and has been ongoing for many centuries. Mountain formation alternates with the destruction and weathering of mountains.

Origin of geosynclines (deep basins filled with sediments).

Ueda writes: “...many of the rocks that make up modern mountain ranges originally accumulated on the seabed, and their thickness often exceeded 10,000 meters [3].”

If the seafloor can be uplifted by several kilometers during mountain formation, why shouldn’t depressions also be able to form in the process? If you look at how ice ridges form, everything becomes clear.

Causes of Volcanic Eruptions and other Magmatic Processes

Let us return to the rotating aquarium. Its contents — or, more precisely, the heaviest and densest part — move along the wall, along the boundary of the casing. The same thing happens inside the planet.

Where is this boundary located? Perhaps it is the Mohorovičić discontinuity?

(The Mohorovičić discontinuity (commonly abbreviated as Moho or M) is the geophysical interface between the Earth’s crust and mantle, where there is a sharp jump in the velocity of seismic wave propagation and in the density of the material.) In other words, it is the inner side of the crust.

Judging by the behaviour of the mass in the aquarium, this is quite plausible. If we imagine the inner surface of the aquarium not as smooth glass, but, say, as the bed of a mountain stream, various deposits in the form of fine fractions will appear, with bare boulders rising above them — in our case, these are the “subsurface” parts of mountain ranges.

Just as in ice during the formation of hummocks, voids and cracks appear in the Earth’s crust. Through these, magma is forced to the surface under the pressure of the constantly moving internal mass. A channel that forms once, becoming molten and forming a vent, remains a site of eruptions for many centuries.

It is important to note that the pressure of the moving mass will not be directed towards the planet’s centre, but towards the external gravitational force — that is, the Sun and the Moon. As this mass moves beneath the vent, it will force the magma out like a piston.

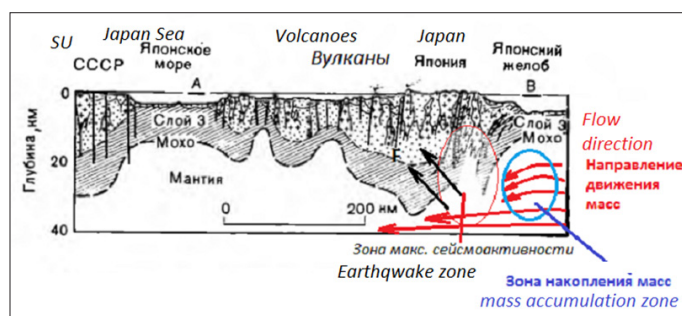


Figure 26: The diagram from Ueda’s book has been supplemented with the direction of movement of the material mass, which causes pressure in the area of existing volcanic vents [3]. The area of mass accumulation before an earthquake and the area of maximum seismic activity are also indicated.

Since Ueda is Japanese, it is natural that the data he presented mainly relate to his homeland.

Causes of Deep focus Earthquakes

Let us consider the effects observed during earthquakes:

- oscillations and movements of the Earth’s crust;
- eyewitnesses report a rumbling sound, similar to the movement of a large mass, like a mountain avalanche;

- electromagnetic disturbances, magnetic storms;
- a sudden change in the Earth's rotation period;
- the effect of a “calm” period — a decrease in seismic activity and in the background electromagnetic radiation before major earthquakes (Malyshkov [22]).

Ueda also pointed out another interesting effect: “It is worth mentioning another striking fact. It has long been known that every major earthquake occurring in Japan causes the Pacific coast of the country to rise by several meters. However, between earthquakes, the coast gradually subsides.”

For weak earthquakes, only the first point applies.

It is logical to assume that these are two different types of events, with different underlying physics.

Since we are interested in the type of deep focus events, we will focus on their causes and consequences.

When the flow moves and a critical mass accumulates in a suitable zone, a kind of collapse can occur — this triggers an earthquake. As, for example, shown in Figures. 26 and 27. During the collapse, pressure naturally develops from below on the continental part. In the case considered by Ueda, this is the Pacific part of the island. Subsequently, this part returns to its original position. The current interpretation of earthquake causes cannot explain this behaviour of the crust.

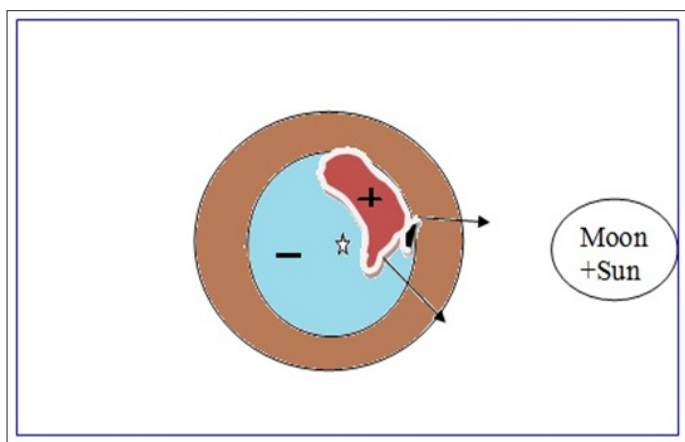


Figure 27: Schematic representation of the collapse process that triggers an earthquake.

This mechanism of earthquake generation is also supported by the fact that most earthquake foci are located at the boundaries of lithospheric plates — that is, in areas of geological irregularities.

This phenomenon may cause movements in the surface layers of the crust, leading to the emergence of additional earthquake foci.

The “quiet period” effect — a decrease in seismic activity and background electromagnetic radiation before major earthquakes — is well known. As described in works [24,25]: “...prior to many earthquakes, we detected not an increase, but a decrease in field intensity. Depending on the energy of the impending earthquake, the reduced pulse count lasted from several hours to

several days and was observed during night and afternoon hours, in both summer and winter months. If the fields were increasing, one could speak of additional sources being activated in the zone where rock destruction had begun. The reduction in the pulse flow was puzzling.”

The “quiet period” effect of seismic activity and background electromagnetic radiation described in this work is caused by the accumulation of a critical mass.

According to eyewitnesses, during major earthquakes a loud rumbling is heard, as if a huge avalanche were sliding — that is, masses are moving over considerable distances.

Another argument in favour of the collapse hypothesis is the fact that, according to acoustic studies, an earthquake occurs almost simultaneously over a large area of the Earth's surface (up to 1 000 km).

It should also be noted that magnetic storms on Earth are accompanied by low frequency oscillations of the Earth's body, and, conversely, earthquakes are accompanied by electromagnetic radiation (EMR). Thus, these two phenomena are interrelated. This may also serve as confirmation, since surges in electric charge (or the flow of charged matter) occur, and a transient process, as is well known, has a broader spectrum than a direct current.

The explanation of EMR appearance by the supposedly arising piezoelectric effect is a hypothesis that does not account for reality. The crystals in the crust cannot be arranged in a strictly defined order, so that the minuscule EMF generated in each crystal under compression could sum up.

Due to the heterogeneity of the Earth's crust's inner surface, the impacts on it will naturally be non uniform. Powerful “collapses” of the accumulated mass during earthquakes will, in a sense, nudge the planet and cause a change in its rotation period — that is, a change in astronomical time.

Rogue Wave

Seafarers are familiar with the natural phenomenon known as a “rogue wave” (or “freak wave”).

Not long ago, scientists considered sailors' stories about gigantic rogue waves that appear out of nowhere and sink ships to be nothing more than maritime folklore. The existence of ocean waves 20–30 meters high seemed to contradict the laws of physics and did not fit any mathematical model of wave formation.

Some Characteristic Features of Rogue Waves:

- **Anomalous height.** They usually reach 20–30 meters, and sometimes even more.
- **Sudden appearance.** They arise unexpectedly, without obvious causes.
- **Short duration.** They “exist” for only a few seconds to several minutes, then disappear just as unexpectedly.
- **Anomalous steepness.** They form an almost vertical wall of water.

- **Can occur either as a single wave or as a wave group (packet).**

The proposed physical model can quite logically explain the mechanism of their formation through the same interactions between the moving mass and the internal irregularities of the planet's body — these effects are transmitted to the ocean surface.

Continental Drift (Mobilism)

The internal mass of the planet, influenced by various gravitational forces from the Sun and the Moon — which sometimes combine and sometimes counteract each other — moves along the “inner” surface of the Earth's crust. It is constantly mixing, encountering irregularities, and carving out a new pathway every day.

The inner part of the Earth's crust is continuously subjected to this impact, which is transmitted to the tectonic plates, gradually forcing them to move — and thus shifting the continents. The continents indeed move more in the latitudinal direction (east–west) than in the longitudinal one (south–north).

Sometimes, literature links this movement to tidal forces. However, tidal forces are interpreted differently, and a completely different physical meaning is attributed to these words. It is supposedly due to the differential nature of the gravitational pull from the Moon and the Sun.

Even if we accept this interpretation, tidal forces alone cannot generate tectonic shifts, because they act first towards the East and then, for exactly the same amount of time and with the same magnitude, towards the West.

Only the moving mass inside the planet is consistently directed from East to West.

Oceanic Equatorial Currents, Trade Winds, Countercurrents

The conventional understanding of the physics of ocean currents and winds.

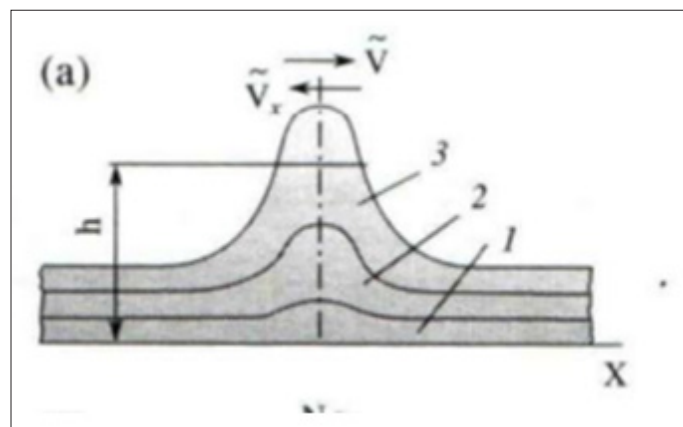
“The causes of ocean currents include wind, horizontal pressure gradients, uneven distribution of temperature and salinity (i.e., density), the tidal forces of the Moon and the Sun, etc. Ocean currents reflect not only the forces that generate them but also secondary forces — such as the Earth's rotation (the Coriolis force), which deflects currents to the right in the Northern Hemisphere and to the left in the Southern Hemisphere.” — this is the most widely accepted definition in the literature.

Classification of Currents

Three main groups of currents are distinguished: gradient currents, wind driven currents, and tidal currents. All these types of currents do not explain the globally persistent current in the equatorial region, directed from east to west, which, in the absence of continents, would close into a circular flow. Explaining it by winds does not stand up to simple scrutiny: even if there are winds — not high altitude ones, but those in contact with the water surface — they are not always aligned in that direction, and they cannot generate deep currents [26].

Regarding the supposed “Coriolis force,” we have already discussed this: it does not actually move anything. The waters of the oceans, together with the planet's body, undergo uniform rotation.

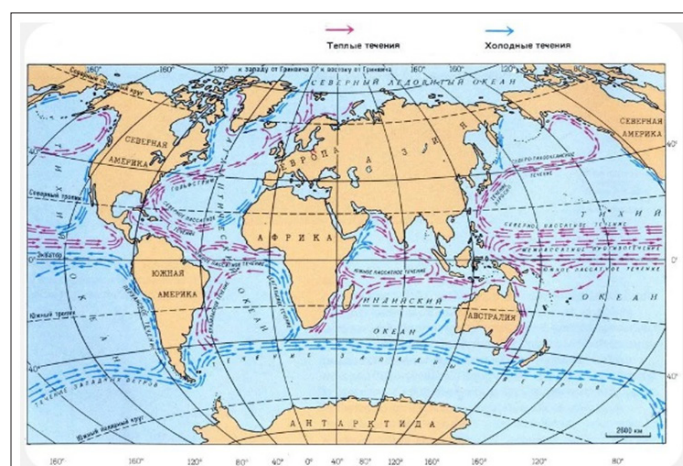
The authors of article (Garetsky, 2006) came closest to understanding what is happening; they focused on the moving “hump” of the mantle created by tidal forces (the tide is caused by differential gravitational influence from the Sun and the Moon), which, as the Earth rotates, induces water movement (discrete wave motion) [27].



But it is not taken into account that the “hump” moves at depth, while the main current flows do not extend below 200 meters (Shtockman, 1948). Thus, such a mechanism cannot work [26].

The direct action of the gravitational forces from the Sun and the Moon on the ocean body also cannot generate such a current, because these forces act on the water masses first from the East, and then, with exactly the same strength and for the same amount of time, from the West. Even if — which is impossible and not observed — they were to shift the water mass in one direction, they would then shift it back by the same amount.

But the currents do exist, and they are quite significant: their velocities range from 30 to 150 cm/s (Shtockman, 1948) [26]. This means there must be forces causing them. Moreover, these are long term forces with a constant direction. There are no observable external forces, so the forces must be internal.



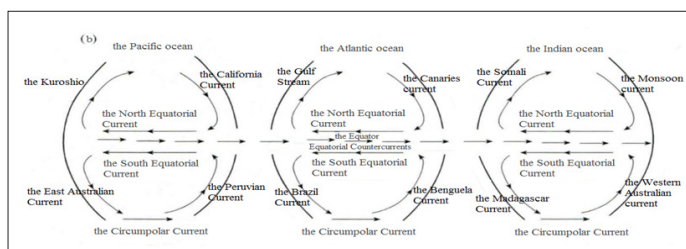


Figure 28: A map of currents and a schematic drawing (Garetsky, 2006) showing the similarity of the large scale current structures in the Pacific, Atlantic, and Indian Oceans [27].

As can be seen from Figure. 28, the primary currents that give rise to all the others are the North and South Trade Wind Currents. If there were no continental landmasses, they would close into a single global circular current.

The North and South Trade Wind Currents are, in essence, a single Equatorial Current, divided by the surface equatorial countercurrent.

When this flow encounters continents, it diverges away from the equator. Since the ocean basins are essentially closed, the water mostly moves along a closed loop, generating all the other currents.

As we discussed earlier, in the equatorial zone, the planet's main internal mass is in motion. This movement occurs at a relatively small distance from the water (presumably at the Mohorovičić discontinuity).

The gravitational effect of this mass on the ocean waters is what generates the trade wind currents. This is the only force that is consistently directed from East to West.

A similar gravitational effect on air masses leads to the formation and maintenance of the ring like trade winds, which reach stratospheric levels — where land is not an obstacle. These winds can no longer be influenced by temperature effects related to the heating of the Earth's surface.

Thus, another factor causing the currents is the gravitational attraction between the moving mass inside the planet and the mass of water in the ocean.

In other words, it is the gravitational interaction between the two masses.

Since this influence extends throughout the entire water volume, it is difficult to detect it with any instruments — especially because gravitational forces are rather weak and only manifest themselves in the presence of large masses. And it is precisely these large masses that we have here: the waters of the oceans and the moving mass inside the planet.

A similar mechanism of influence is also observed on other celestial bodies: on the Sun, the influence of Jupiter's mass leads to the appearance of differentiated rotation zones; a comparable effect occurs on Jupiter due to the influence of the Sun.

Countercurrents

Several quotes characterising the countercurrents:

“The equatorial countercurrent is the most remarkable current in terms of its constancy and the mystery of its origin. It is located as a narrow band between the northern and southern equatorial currents and flows in the opposite direction — to the east.”

“A velocity of 50–60 cm/s fairly well characterises the average speed of the countercurrent in the Pacific Ocean.”

“The countercurrent in the Pacific Ocean exhibits remarkable stability, and its boundaries, located on average between 4–10° N, are particularly distinct. In particular, as Defant notes, the northern boundary of the countercurrent is visible to the naked eye in summer as a line separating waters of different shades, crossing the ocean surface from horizon to horizon.” — Shtockman [26].

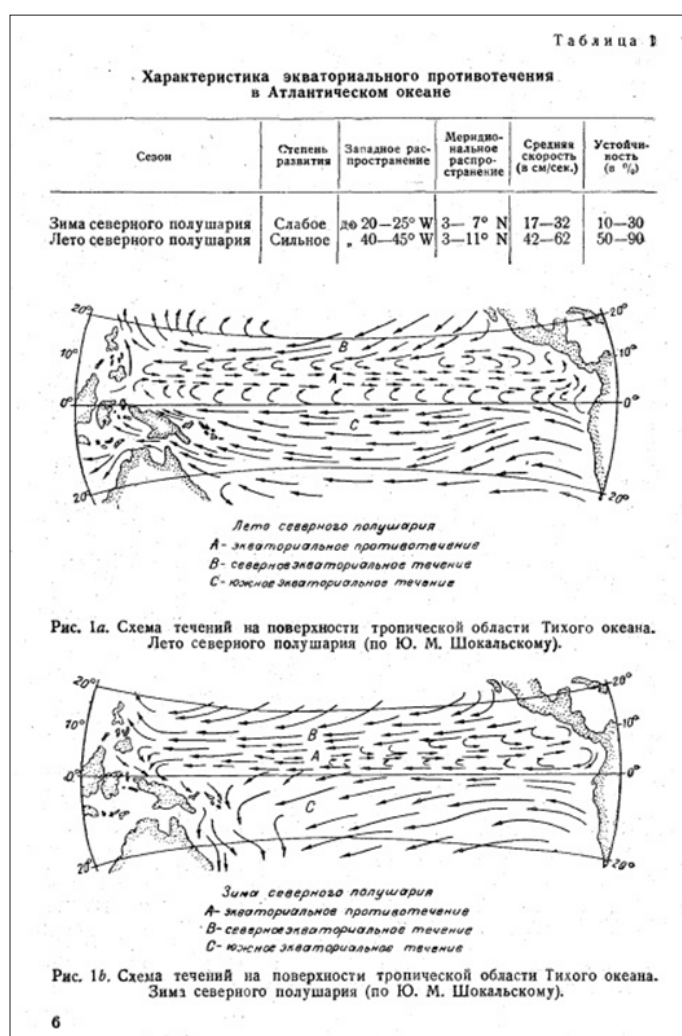


Figure 29: Schemes of currents and countercurrents in the Pacific Ocean.

Causes of the Countercurrents

The influence of the internal mass movement leads to higher sea levels in the western parts of the ocean basins compared to the eastern parts [28]. This causes compensatory countercurrents — but they are driven not by wind, but by gravity. These equatorial countercurrents, which appear in all three ocean basins precisely

in the middle zone of the main currents, very well support the proposed physical model.

Although attempts to explain the causes of the countercurrents have been made for a long time, they were based solely on temperature and wind factors and did not succeed [7]. It also becomes clear why these currents shift seasonally [26]: this is due to changes in the trajectory of the internal mass movement, caused by variations in the tilt angle of the planet's rotation axis.

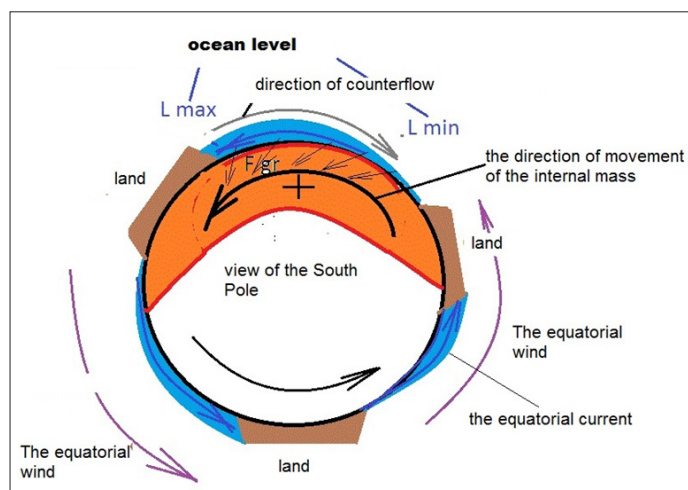


Figure 30: The influence of internal moving masses on the water and air masses on the planet's surface. The figure is schematic. View from the South Pole.

This explanation of the countercurrents is rather rough and does not take into account the curvature of the Earth and the vast distances between the continents. In reality, the physics is somewhat more complex and requires additional research, but the basic idea of how they form is exactly this.

Tides in the Oceans

The Accepted View of the Physics of Oceanic Tides

Unfortunately, a clear definition of the causes of tides and ebb has not been found. But in all explanations, there is one common element: the influence of the gravitational pull of the Sun, and to a greater extent, the Moon, on the waters of the oceans. This influence causes a differentiation of gravitational forces across the depth of the ocean or across the diameter of the planet.

In some explanations, the cause is attributed to the rotation around the common center of mass of the Moon and Earth, with quadrupole forces being invoked — while the participation of the Sun is overlooked. In such cases, one would need to consider a center of mass for three bodies. In other approaches, hypotheses about oscillatory phenomena that supposedly generate tides and ebb are considered [6].

Oceanic tides are viewed as the upward movement of water due to the attraction of the Sun and the Moon. However, since these forces do not align with the trajectory or the time of celestial bodies' passage across the sky, attempts have been made to reconcile this with mathematical models by introducing correction coefficients and accounting for the lag of water

relative to the planet's rotation, etc. This approach was actively pursued by Pierre-Simon, Marquis de Laplace, and later by Paul Melchior. In the end, a coherent mathematical model emerged, but it required inserting specific coefficients for each location and time — which is no better than simply recording the time and level empirically.

It cannot be that the difference in gravitational forces over an interval of several hundred meters (ocean depth) or over the planet's diameter, at a distance of 380,000 km from the Moon and 150,000,000 km from the Sun, is so great as to cause the rise and movement of water. Any points on Earth are practically attracted equally to the Moon, just as any points on Earth are attracted to the Sun.

The Earth is in a nearly equipotential gravitational field of the Moon, and even more so of the Sun. Moreover, right next to the ocean water is the entire mass of the Earth, which is significantly larger than that of the Moon.

The Real Causes of Tides

From articles [29,30].

Let's imagine the Earth as a sphere with a relatively thin shell (the crust) compared to its total volume. This shell can deform due to the movement of the internal mass when it is pulled towards an external mass (the Sun, the Moon). Roughly, this can be compared to an inflated balloon into which some water has also been poured.

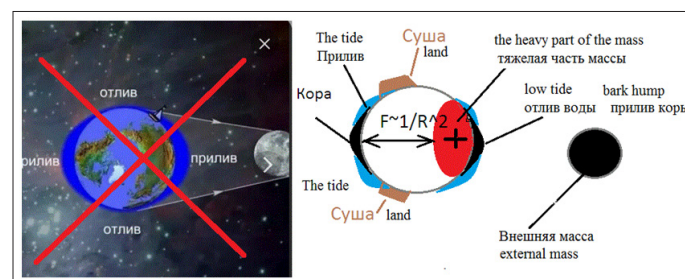


Figure 31: A schematic illustration of the conventional and the proposed mechanism for the occurrence of tides.

Due to Earth's gravity, the water causes deformation of the shell; and as the "ball" rotates, this deformation moves along the circumference — **this is analogous to the tide in the Earth's crust.**

But this is not an ocean tide! The tide at the coasts will be caused by the ebb of water from the point of maximum uplift of the Earth's crust.

For example, if you pour water into a plastic plate and press from below, the water will flow to the edges, to the shores. This effect is clearly visible when superimposing graphs of the measured behaviour of gravitational forces, the water level, and the positions of the Sun and the Moon at a single measurement point (Figure. 32).

A time interval was specifically chosen when the Sun and the

Moon are close in the sky and simultaneously affect the mass inside the Earth.

It can be seen that a couple of hours before the Sun and the Moon reach the zenith point, an ebb of water occurs, along with a decrease in the gravitational force — i.e., a tide (uplift) of the solid part of the planet. An ebb of water is also visible at night, when the crust rises due to the internal mass of the planet moving to the opposite side of the Earth — which is almost the entire diameter of the planet.

The moving “hump”, caused by the deformation of the Earth’s crust due to the attraction of the heavy internal mass, is practically imperceptible to an ordinary observer. It leads to the ebb of ocean water away from the location of the “hump” towards the coastal parts of the oceans, thereby causing ocean tides. **That is why ocean tides never coincide with the passage of the Sun or the Moon through the zenith point at a given location, but the ebbs do coincide.**

For the same reason, there are no significant tides in the open ocean: it’s like a plate without edges. Whereas, according to the modern interpretation, they should be maximal there and follow the Sun and the Moon.

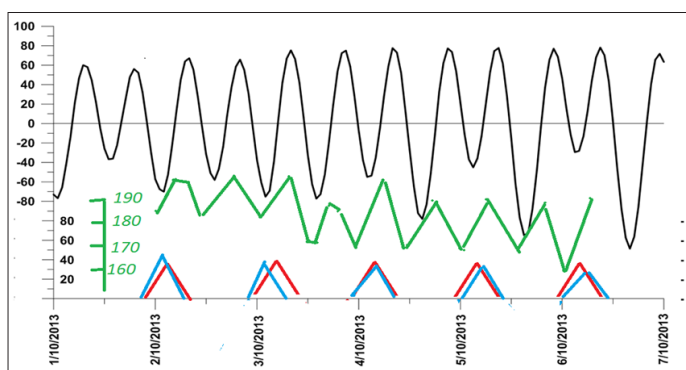


Figure 32: Measurement data. Posyet Station, Pacific coast.

The horizontal axis shows Universal Time.

Black — measured gravity force, μGal .

Red — Sun’s position in degrees above the horizon (times of sunrise, maximum elevation, sunset).

Blue — Moon’s position in degrees above the horizon (times of rise, maximum elevation, set).

Green — ocean water level, cm.

A time interval was deliberately chosen when the Sun and the Moon are close in the sky and simultaneously affect the internal mass of the Earth.

The gravity force data were provided by the staff of the Gravimetry Laboratory at the Pacific Oceanological Institute, Far Eastern Branch of the Russian Academy of Sciences.

The ocean level data come from measurements taken at the Posyet weather station.

The times of sunrise, maximum elevation, and sunset, as well as

the elevation angles for the Sun and the Moon, were taken from the StarCalc software, adjusted to the station’s location.

The “hump” on the crust will change its position and magnitude daily, depending on:

- the time of year (the tilt of the planet’s rotation axis);
- the distance between the Moon/Sun and the Earth;
- the “phase mismatch”, i.e., the relative positions of the Moon and the Sun.

Consequently, the water tide at the coast will not be constant but will depend on these factors and on the seabed topography.

In the open ocean basins, amphidromic points arise (where there are no tides). (These points are sometimes called tidal nodes; the tidal wave “circles” around this point, either clockwise or counter clockwise.) There are also cotidal lines (lines on a map connecting all locations where the crest of the tidal wave appears simultaneously — i.e., places where high water occurs at the same time).

If the tide were caused solely by a direct effect on the water, such phenomena could not exist, because the Moon (and the Sun) cannot be in several places at once, nor can they exert influence in some areas and none in others.

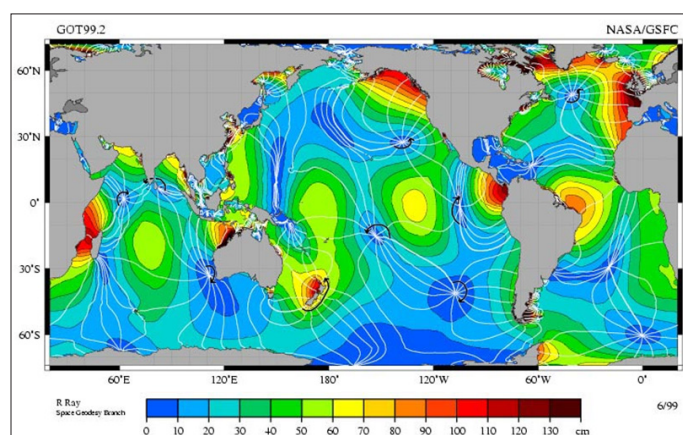


Figure 33: Cotidal lines.



Figure 34: Clouds above volcanoes.

Volcanoes and Cloud Behaviour

A very beautiful and illustrative effect is observed — the formation of clouds above volcanoes. This phenomenon strongly supports the idea of different electrical polarities of the charges in the internal mass and in the clouds.

The connection between the nearby internal positively charged mass and the negatively charged clouds is like two plates of a huge capacitor. Naturally, this leads to the emergence of electrostatic attractive forces, “anchoring” the clouds to the volcanic peaks.

The appearance of clouds above a volcano that has not been active for a long time may perhaps serve as a precursor to an eruption. To confirm this assumption, field observations or surveys of the local population are required.



Figure 35: Lightning above a volcano.

In volcanoes where the internal mass can get as close to the surface as possible, “dirty thunderstorms” are observed during eruptions — lightning amidst the ejected ash.

The theory of ash polarization leading to lightning has no grounds: ash particles do not rub against each other; they are, so to speak, flying parallel to one another. If they were polarized, they would clump together and neutralize (as happens in industrial electrostatic precipitators).

There are no lightning strikes during large fires.

Moreover, the lightning is directed between the crater or the ground and the clouds — the ash and the rising gases, which

carry a positive charge, only facilitate the formation of a breakdown channel.

Seasonal Changes in the Planet’s Rotation Period

This section of the article is based on the data presented in the excellent monograph by V. M. Kiselev, Doctor of Physical and Mathematical Sciences (Siberian Federal University), The Rotation of the Earth from the Archean to the Present Day [31].

The IERS (International Earth Rotation and Reference Systems Service) publishes information on changes in the rotation period on its website:

https://datacenter.iers.org/data/latestVersion/224_EOP_C04_14.62-NOW.IAU2000A224.txt

We will use the graph constructed by the author of the monograph based on these data.

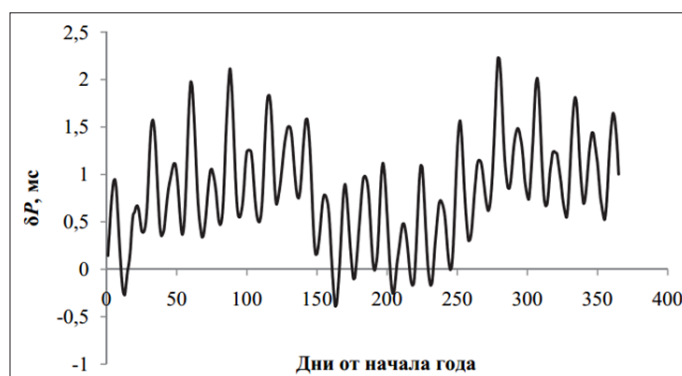


Figure 36: The graph shows periodic changes in the planet’s rotation period — semi monthly and annual variations.

Let us attempt to explain these fluctuations.

As mentioned earlier, the mass inside the planet not only moves in a circular path but also shifts, depending on the season, from one hemisphere to the other, reaching approximately mid latitudes and then returning. This change in the location of the mass movement results in the path of the mass varying: it is minimal at the poles (during winter and summer) and maximal at the equator (during autumn and spring) (see Figure. 36).

It is clear that the longer path of mass movement in the equatorial region causes greater resistance to the planet’s rotational motion, thereby increasing the rotation period (the length of a day).

The semi monthly fluctuations are explained by the separation or, conversely, the clustering of the internal planetary mass under the influence of solar and lunar gravity, depending on the relative positions of the Sun and the Moon with respect to Earth. A more detailed study of this influence is yet to be carried out.

Genesis of Oil

From article [32,33]:

A bit of history.

The concept of the biological origins of all naphthides is countered by the idea of the deep, abiogenic (inorganic) origin of oil and gas, which was put forward by A. Humboldt in 1805 and later substantiated by D. I. Mendeleev — one of the first Russian chemists, who suggested that oil could form through the interaction of metal carbides with water under conditions of high temperature and pressure.

Nikolai Alexandrovich Kudryavtsev, a Soviet geologist, put forward a hypothesis in 1951 about the deep (abiogenic) origin of oil. He noted the presence of hydrocarbons in places where there were no remains of organic life and considered this to be an argument in favour of the inorganic origin of oil.

Vladimir Linderman and Vladimir Kropotkin, Soviet scientists, actively developed Kudryavtsev's ideas, suggesting that oil and natural gas could form at depth as a result of geochemical processes.

Thomas Gold, an American astronomer and geophysicist, supported the abiogenic hypothesis. He believed that hydrocarbons could come from the depths of the mantle and, rising to the surface, form oil deposits.

I will quote from a review of his book *The Deep Hot Biosphere: The Myth of Fossil Fuels* [34].

“This book presents a number of truly controversial and astonishing theories.

First, it asserts that beneath the Earth's surface lies a biosphere whose mass and volume exceed those of the biosphere — the totality of all living organisms on the planet's continents and in its oceans.

Second, it claims that the inhabitants of this subsurface biosphere are not plants and animals as we conventionally understand them, but rather heat loving bacteria that feed exclusively on hydrocarbons — that is, on natural gas and oil.

And third — perhaps the most heretical idea — the book puts forward the striking notion that most hydrocarbons on Earth are not a byproduct of biological decay (“fossil fuels”), but rather a widespread component of the materials from which the Earth itself formed some 4.5 billion years ago.

The implications of this are remarkable. The theory offers answers to frequently asked questions: Did life originate in the deep hot biosphere? Does a deep biosphere exist on Mars and other seemingly barren planets?

An even more provocative question is whether vast reserves of hydrocarbons may be rising from the Earth's depths, potentially providing us with abundant supplies of gas and oil.

No matter how far fetched these ideas may seem, they are supported by a growing body of evidence, as well as by the undeniable authority and seriousness with which Gold approaches any scientific discussion.

In this book, we see a brilliant and bold thinker — a type increasingly encountered in modern science — who is developing potentially revolutionary ideas about how our world works.”

And here's the Review:

“Most scientists believe that the oil we extract comes from decomposed prehistoric plants. Gold believes it has been there since the Earth's formation, that it sustains its own ecosystem deep underground, and that life their predated life on the planet's surface.

If Gold is right, the planet's oil reserves are far larger than policymakers expect; earthquake forecasting procedures would need to be revised; moreover, astronomers hoping to make contact with extraterrestrial civilizations might want to stop searching for life on other planets and instead investigate whether life exists there at all.” *Publishers Weekly*

Let us show that, although he “develops potentially revolutionary ideas,” he is not far from the processes actually occurring in nature. Work is accepted as the scientific basis for the proposed chemical transformation [35]. Let us give the floor to the authors of this work:

« In most modern studies of lithospheric (petrogenic) carbon reservoirs in the earth's crust, it is assumed that crude oil and natural gas (petroleum) are thermal generation products from the relics of biological organic matter accumulated in sedimentary rocks during geological time and deeply buried in a region of high pressure and temperature. In this sedimentary-migration (“biogenic”) concept of the origin of oil, the direction of the proposed evolutionary process of carbon transformation was determined: buried biological material → kerogen → oil → gas as a manifestation of progressive metamorphism (pressure and temperature increase). However, the discovery of kerogen in the meteorite's composition does not allow us to suggest a biological source of carbon for the formation of this polymeric “organic” substance, but in turn allows us to suggest inorganic sources of kerogen, namely “oil” and “gas” non methane hydrocarbons (HCs), originated in the depths of their parent bodies (icy planetesimals). The genetic relationship of oil, natural gas and carbon matter of black shale formations (kerogen) on Earth is also beyond doubt, and therefore, in this paper, the evolution of petrogenic carbon reservoirs, including oil shale rocks in the lithosphere, is considered on the basis of a deep inorganic concept, in which the direction of the carbon transformation process is the opposite of the biogenic concept and is represented as HCs → gas → oil → kerogen. The analysis of phase diagrams and experimental data made it possible to determine two trends in the evolution of non-methane hydrocarbons in the Earth's interior. In the upper mantle, the “metastability” of heavy (with a lower H/C ratio) HCs increases with depth. However, at temperatures and pressures corresponding to the surface mantle-crustal hydrothermal conditions, the “relative

metastability” of heavy hydrocarbons increases with approach to the surface. When deep HCs fluids rise to the surface, petrogenic oil reservoirs are formed as a result of the decreases in hydrogen fugacity and a phase transition: gas HCs $\rightarrow$ liquid oil. At the physical and chemical conditions of an oil reservoir, metastable reversible phase equilibria are established between liquid oil and H₂O, gas HCs and CO₂, and solid (pseudocrystalline) “mature” and “immature” kerogens of “oil source” rocks. A decrease in hydrogen pressure and temperature leads to a stoichiometric phase transition (“freezing”) of liquid oil into solid kerogens. This occurs as a result of oil dehydrogenation in the processes of high-temperature CO₂ fixation and low-temperature hydration of oil hydrocarbons, which are the main geochemical pathways for its transformation into kerogen. Thus, the formation of carbon matter in petrogenic reservoirs is the result of regressive (retrograde) metamorphism of deep hydrocarbon fluids, natural gas, liquid oil, and naphthide accumulations. »

As we can see, everything is described logically and with utmost clarity.

However, a question remains: how can oil, supposedly formed at a depth of 500 km or more, reach the near surface layers of the planet? And how does the water necessary for the reaction get there?

The model of the planet’s internal structure used by the authors does not provide an answer to this question. Moreover, this generally accepted model does not align with measurements of gravitational forces, does not correspond to observed natural phenomena on the Earth’s surface, and in some places even contradicts the basic laws of physics.

One could, of course, refer to the supposed convection — a mechanism that, incidentally, is invoked to explain many things in geophysics. But convection does not and cannot exist in a closed volume, which the Earth essentially is; we have already explained why earlier.

Since the movement of the Earth’s internal mass occurs at a very high speed (over 1 000 km/h), it causes intense heating precisely in the zone of contact with the planet’s crust — presumably at the Mohorovičić discontinuity, the lower boundary of the crust. Since no other real heat sources are observed (the currently accepted radiogenic hypothesis is easily refuted), it follows that the highest temperatures are located just beneath the crust [34]. It is in this zone that the conditions are created for the processes described above — the formation of natural gas, liquid oil, and naphthenes.

Furthermore, the relatively shallow location of these processes makes it possible to deliver the water required for the chemical reactions to these areas.

In addition to creating the appropriate temperature conditions, the movement of this mass acts like a piston in the resulting peristaltic pump: it not only moves in a circular path but also pushes the forming mass towards the planet’s surface, creating a radial component of motion. This is precisely the reason why oil appears in the upper layers of the Earth’s crust.



Figure 37: Peristaltic pump.

This, incidentally, is also the driving force behind the magmatic processes occurring in volcanoes, forcing lava to rise to the surface.

In volcanoes, A. Humboldt discovered oil, bitumens, and petroleum gases.

The physics of oil genesis presented here shifts oil from the category of non renewable natural resources to renewable ones.

This explains the reappearance of oil in previously exhausted wells — according to some reports, this effect does indeed occur.

The Moon’s Behaviour

Why do we see only one side of the Moon?

From work [36]:

“Usually, this is explained by the fact that the Moon makes one rotation on its axis during one orbit around the Earth. But what forces it to behave this way, and how does this happen?

There is another explanation — tidal forces — but how do they affect the Moon, and what exactly are tidal forces on the Moon? If there are tides, there should also be ebbs, but none have been observed.

In principle, both explanations are valid, but the mechanics of this motion need to be explained a little more thoroughly. By the way, many moons in the Solar System behave in the same way, rotating synchronously around their planets.

Evidence of the Moon’s former rotation is provided by the presence of meteorite craters across its entire surface, not only on the side facing outer space — the direction from which meteorites arrive.

This prior rotation is further supported by the fact that the Moon once had a strong magnetic field, whereas now it has

only a residual one: what remains in the form of magnetised particles in the lunar soil. A magnetic field could only arise from the movement of electric charges, and such movement is only possible with rotation.

During the evolution of the Solar System and the cooling of the Moon, the heavier masses of its interior ceased to move. They clustered on the side facing the Earth, effectively turning the Moon into a kind of “Vanka vstanka” (a Russian tipping doll), forcing it to present the same heavier side to us.

And just like this well known toy, the Moon rocks slightly around its heavy part, producing what is known as libration. This allows an Earth based observer to glimpse slightly beyond the geometric edges of the visible flat disk (Figure. 38).

Apparently, a similar fate may await the Earth in the future.”



Figure 38: A schematic illustration of the Moon's behaviour as it moves relative to the Earth.

Thus, the Earth's gravitational force not only keeps the Moon in its satellite orbit but also causes it to constantly turn, presenting the same face to us. This process requires energy, and it is conceivable that it could contribute to a partial cooling of the Earth. On the other hand, the Moon's mass influences the motion of the Earth's inner core, and this movement, due to frictional forces, leads to heating of the planet's interior.

Warning: see details in [37].

“If we continue the analogy between the Moon and the toy, it should be noted that the thickness of the walls in the toy (including the weight) is, like the crust on the satellite, not uniform around the circumference — it is thicker on the side facing the Earth.

On the opposite side, it may be very thin.

If we compare the sizes of the Moon — 3 500 km — and the Earth — 12 700 km — and knowing that the thickness of the Moho

layer on Earth ranges from 5 to 100 km, then, by comparing these celestial bodies, we can assume that this layer is rather thin on the Moon.

This crust could be easily disrupted even by a relatively small mechanical impact, let alone explosions. And, according to some reports, it is precisely through such methods that they intend to explore the Moon.

What will happen to the Moon after the crust is disrupted? It is unclear. A possible outcome is a “collapse” or compression due to internal gravitational forces, followed by the satellite's destruction.

And what will happen to the remnants of the satellite?

One cannot rule out the possibility that they will fall onto the Earth, as the nearest massive body — and this could lead to a global catastrophe.

Even a simple destruction of the satellite would cause a drastic change in the Earth's climate, its magnetic field, the main (and therefore also the secondary) currents generated by them, etc., and thus again lead to cataclysms.”

The fact that most moons orbit their planets while always showing them the same side, and that the rotation of planets such as Venus and Mercury is synchronised with Earth's motion (these two planets, when approaching Earth, turn the same hemisphere towards it), suggests that the planets interact with each other as bodies with displaced centres of mass [2].

In the case of a liquid, mobile core, this centre of mass can shift within the planet's solid outer shell.

Examples of the Proposed Physics on Other Planets

The Sun — the 11 year cycle of solar activity

One can notice a pattern that was known to the Pulkovo astronomer Yu. I. Vitinsky but, for some reason, has been overlooked: the coincidence between the orbital period of the largest planet in the Solar System, Jupiter, and the 11 year cycle of solar activity, as well as the influence of this period on the number of “sunspots” formed. Jupiter exceeds Earth by a factor of 1 320 in volume and 317 in mass, and its influence on the Sun surpasses the combined influence of all other planets. It is only about 1 000 times smaller than the Sun itself.

Here is what he writes about the history of solar activity research (Yu. I. Vitinsky, 1983) [38]:

“In the mid 19th century, amateur astronomer H. Schwabe and R. Wolf were the first to establish the fact that the number of sunspots changes over time, with an average period of this variation amounting to 11 years. ... R. Wolf, convinced that solar cyclicity is the result of the influence of the Solar System's planets on the Sun, himself initiated the search for such connections. ... Finally, already in the 1940s, one of Wolf's “successors” at Zurich, M. Waldmeier, dared to question the correctness of his

“scientific great grandfather” and shifted the cause of the 11 year cyclicity to the interior of the Sun itself.”

And: “Perhaps the most intriguing question that arises in the study of the Sun can be formulated as follows: ‘Where does solar activity come from, and how is it related to the features we have discussed in this book?’ If a reasonably clear answer to this question could be given, humanity could rightfully consider itself at least the master of its own planet. Unfortunately, no unified theory of solar activity has yet been created that could provide a sufficiently complete answer, at least without clearly visible contradictions. ... At first glance, it might seem that there is nothing to ponder here: since the activity is solar, it must originate on the Sun. But this view has become prevalent only recently. It all began in the mid 19th century with a hypothesis put forward by R. Wolf himself. According to this viewpoint, solar activity is caused by the planets of the Solar System — more precisely, by their tidal influence on the Sun. This hypothesis had some grounds. After all, Jupiter’s orbital period around the Sun (11.7 years) is strikingly close to the average length of the solar activity cycle (11.1 years), and the amplitude and duration of this cycle do not change over time in a completely random, chaotic manner.”

Thus, for some reason, the original idea of an external source influencing solar activity was replaced with an internal one — and perhaps that was a mistake.

If we imagine that this “heavy” centre of the Sun, following Jupiter’s influence, moves in the subsurface region and, moreover, carries an electric potential, this could help explain the appearance of “magnetic tubes” on the surface — that is, the locations where both poles of local magnetic fields emerge. Everyone has probably observed how counter directed vortices form in still water when a paddle moves through it.

Differential rotation of the Sun - is a phenomenon in which different parts of the star rotate at different angular velocities: at the equator, one rotation takes approximately 25 days, while at the poles it takes about 34 days. Unlike a solid body, where all points rotate synchronously, the Sun consists of plasma (ionised gas), so its parts are not rigidly connected and can move independently.

Jupiter, exerting a significant influence on the Sun, would cause a shift of the Sun’s internal mass closer to its surface and force it to move in response, thereby increasing the rotational speed specifically in the star’s equatorial region.

On Jupiter and Saturn, a similar differentiated motion of various zones is caused by the influence of the Sun.

In the latitudinal direction, the rotation period at Jupiter’s equator is approximately 9 hours 50 minutes 30 seconds, while at mid and high latitudes it is about 9 hours 55 minutes 40 seconds. Thus, the equatorial regions complete a full rotation faster.

On Saturn, visible atmospheric features (such as bands and vortices) rotate at different speeds depending on latitude.

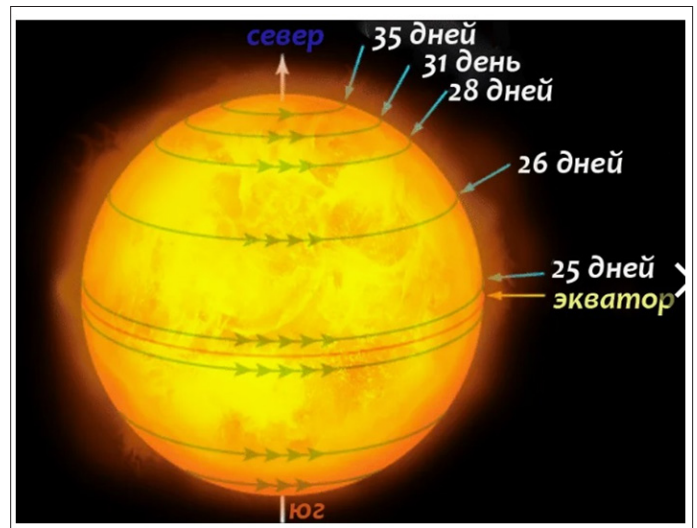


Figure 39: Differential rotation of the Sun.

Zone 1 (equatorial belts) — rotation period of 10 hours 14 minutes.

Zone 2 (other latitudes) — initially estimated at 10 hours 39 minutes, but later revised to 10 hours 34 minutes 13 seconds.

A. L. Chizhevsky, in his long term studies of the influence of solar activity on the Earth’s biosphere, unequivocally demonstrated a direct relationship between these processes. He proposed that disturbances observed as “sunspots” give rise to emissions which, upon reaching the Earth’s surface and penetrating into it, affect all living and non living matter (A. L. Chizhevsky, 1976) [23].

Thus, Jupiter, by influencing the Sun, triggers processes that ultimately affect the Earth. The proposed mechanism may help explain the emergence of electromagnetic radiation (magnetic storms) across a wide range of frequencies, resulting from abruptly changing flows of charged solar material.

Venus, as mentioned earlier, due to its slow rotation, has no magnetic field and no obvious surface signs of internal mass motion.

The cause of all periodic phenomena occurring on the planets most likely needs to be sought in their external environment and in their interaction with other planets — this is, incidentally, the basis of astrology.

Any celestial body, if unaffected by other bodies, will tend to adopt an arrangement of its constituent parts such that the interaction between them is minimal and its temperature equals that of the surrounding environment — that is, to minimise entropy.

Even chemical and radioactive processes have a finite duration.

Only external influences can periodically drive a planet out of its established, balanced state.

Why are the Trajectories of the Planets in the Solar System Located in a Single Plane?

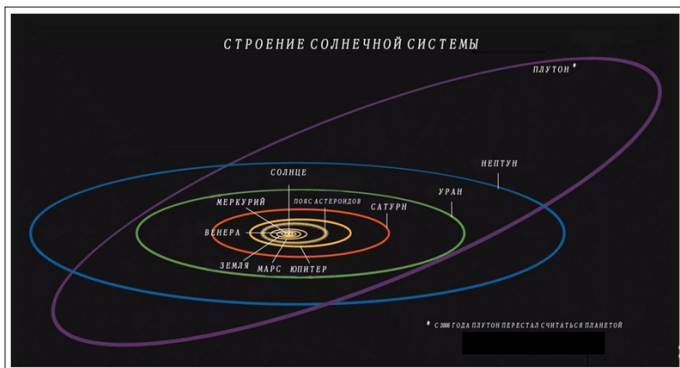


Figure 40: Structure of the Solar System.

(From article — although this does not relate to the internal structure of the planets [36].)

“But really, why is this so?”

(The angle between the ecliptic plane and the orbital plane is called the inclination (or tilt). Before it was stripped of its planetary status, Pluto was the planet with the greatest inclination — 17° . Mercury is the only planet with a significant inclination of 7° .)

Currently, the main forces governing the influence of celestial bodies on each other are considered to be gravitational forces.

Let us imagine that one of the planets “breaks rank” and begins to move outside the common plane. Then, as it passes near the “neighbouring” planets, forces will immediately arise that compel it to return to the general alignment. That is, in addition to centrifugal and centripetal forces, a force vector perpendicular to the trajectory will appear. Ultimately, this will force the planet back into the plane.

Apparently, those planets that currently have an inclination different from zero have not yet fully established their orbits. Most likely, Jupiter, being the largest and most massive planet, is the one that determines the orientation of the Solar System’s ecliptic. All the other planets “adjust” to its influence.

The zero-inclination angle is traditionally taken as the inclination of Earth’s orbit — since we live on this planet — and all other angles look like this:

- Mercury — 7.005°
- Venus — 3.395°
- Earth — 0°
- Mars — 1.850°
- Jupiter — 1.303°
- Saturn — 2.489°
- Uranus — 0.773°
- Neptune — 1.770°

If, instead, we take Jupiter’s orbit as the zero-inclination angle, the spread becomes noticeably smaller and looks like this:

- Mercury — 5.702°
- Venus — 2.092°
- Earth — 1.303°
- Mars — 0.547°
- Jupiter — 0°
- Saturn — 1.186°
- Uranus — 0.53°
- Neptune — 0.467°

Apart from the planets, most moons also stay fairly close to the common plane.

It seems simple enough, but for some reason I haven’t come across an explanation for this behaviour of the planets anywhere — that’s why I decided to write about it.

Conclusion

For those who have read this far:

You have probably noticed that, in principle, there is nothing overly complicated in what has been said. You do not need to be a major expert in the hypotheses and models presented in “scientific” books on these topics, nor do you need to parse long strings of formulas to grasp the essence of the issues under discussion. A secondary school level of knowledge, an understanding of the basic laws of physics, and, most importantly, the desire to figure things out are sufficient.

Mathematical models that are not based on measured data, not grounded in observable effects, not rooted in real facts, and not built upon well known and tested laws of physics — and sometimes even run counter to them — cannot lead to any meaningful positive result. Moreover, to construct even moderately realistic models, the available data are often insufficient.

The multitude of surface manifestations of processes occurring inside a planet confirms the validity of the proposed physics. Explaining many natural phenomena by a single real, observable, and measurable cause allows us to reduce the number of hypotheses that arise around the phenomena in question. A single cause can be studied more thoroughly by examining the many facets of its manifestations.

I would also like to highlight and warn space explorers and consumers of natural resources about the extremely fragile structure of planets and the unique nature of a planet such as Earth. For millennia, people knew nothing of its internal structure; it is only thanks to measurement data obtained on Earth and other planets that we have begun to glimpse the hidden inner nature of our planet. Yet even now, there are more questions than answers.

Thank you very much for reading. Wishing everyone creative success.

All comments and questions should be sent to: danvlad@bk.ru.

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I dedicate this work to my grandson Yaroslav, with the hope that he will study Earth sciences with this material in mind.

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